



# TransFigures

March 2005

**TransFigures** is TPDC's new quarterly Transport Research and Statistical Bulletin. It will feature the latest in TPDC's research and data analysis on a wide range of topics such as personal and commercial travel, public transport usage, transport modelling, trip forecasts and other special transport issues.

## Car Travel in Sydney: Changes in the Last Decade

### About this issue

This first issue provides information on trends in car travel of residents in the Sydney Statistical Division (SD) between 1991 and 2001. It presents analysis on movements in car usage in terms of number of car trips and vehicle kilometres travelled. It also investigates the characteristics of car travel by different population groups and how this has evolved in the last decade. Changes in car travel by geographical areas are likewise explored.

### Broad trends

In Sydney as in other major cities of the world, travel by private vehicle is larger than all other modes combined. In 1991, 70%<sup>1</sup> of all trips were made in a private vehicle. This majority share was sustained a decade later in 2001 as car usage continued to grow. The prevalence of the car can be evidenced from all indicators of car travel which increased at a faster pace in comparison to population. Between 1991 and 2001, the number of car driver and passenger trips made on an average weekday grew annually by 1.8% from about 9 million to about 11 million trips. The total number of household vehicles rose from 1.7 to 2.1 million by a faster rate of 2.2%. The number of licence holders increased by 2.1%. Vehicle kilometres travelled (VKT) also grew from 64 to 80 million kilometres, up by an average of 2.3% every year. These growth rates outpaced the annual growth in population of 1.3% (Figure 1).

Supporting this strong growth in car travel has been the health and resilience of the economy, which posted significant gains in the last decade. During this ten-year period, the NSW Gross State Product grew by an annual average rate of 5%.<sup>2</sup> The unemployment rate for Sydney also fell steadily from highs of close to 10% in the early part of the 1990's to a low of 4.8% by 2001.<sup>3</sup> Coinciding with these strong employment figures was the rise in total household expenditure which had an annual growth of 5% during the period. Private expenditure towards transport specifically also expanded by the same magnitude.<sup>4</sup>

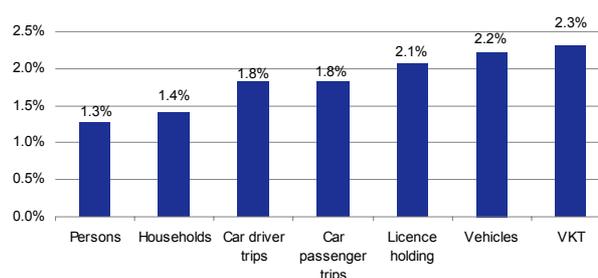


Figure 1 Annual growth between 1991 - 2001 (Sydney SD)

## Purpose of car trips

The distribution of car driver trips by purpose indicates that trips for work account for the largest share of trips made on a weekday. In 1991, about 39% of driver trips were for work or work related business (Figure 2). This share contracted slightly to 37% in 2001 despite the number of work trips actually growing by 1.4% annually on average since 1991. This is due to non-work trips growing at a faster pace and gaining a bigger share.

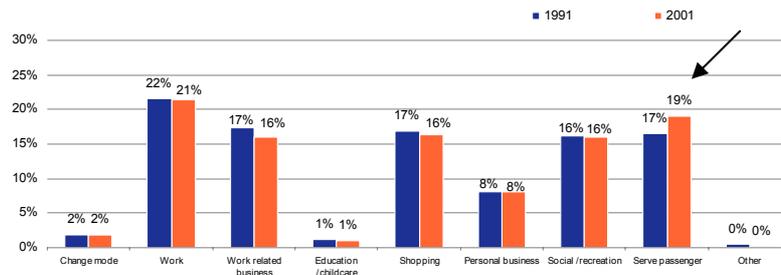


Figure 2 Purpose of car driver trips, Weekday (Sydney SD)

Note: 'Change mode' refers to car driver trips made to 'change to' or access another mode, eg train, bus, etc.

The most significant expansion in driver trips was to 'serve passenger', that is, to drop-off, pick-up or accompany someone which grew from close to 17% of all driver trips in 1991 to 19% in 2001. Corresponding to this increase, was the rise in the share of car passenger trips for education and childcare from 14% in 1991 to 17% in 2001 (Figure 3). A significant number of driver trips were also for shopping, social activities and recreation. About 33% of all driver trips in 1991 were for these purposes and this proportion was maintained in 2001. The proportion of trips for other purposes remained largely stable (Figure 2)

In terms of VKT, trips for work captured an even bigger share, 51.4% in 1991 and down slightly to 50.1% in 2001. The proportion of trips for other purposes remained stable except for those to 'serve passenger' which expanded its VKT share as it did its share of car driver trips from 11.6% in 1991 to 13% in 2001.

Car driver trips made during weekends were largely for shopping (27%), social and recreation (38%). These levels were largely stable between 1991 and 2001 as is the case for trips for other purposes. In terms of VKT, trips made on weekends for shopping (19%), social and recreation (47%) further dominated.

Car passenger trips made on weekdays were mainly for social and recreational purposes, to serve passenger (for passenger trips, this is largely to accompany someone), for education and childcare as well as for shopping (Figure 3).

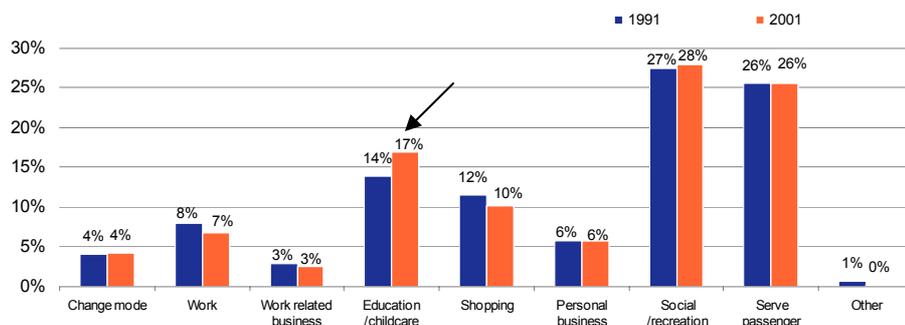


Figure 3 Purpose of car passenger trips, Weekday (Sydney SD)

In 1991, 58% of passenger trips were made by persons aged 19 and below and this share rose to 62% in 2001. Figure 4 shows the substantial growth in passenger trips for this group in comparison to population, the most significant of which were for those aged 5-19 years.

Trips for childcare comprised most of the increase in passenger trips made by children aged 0 - 4 years. This is indicative of the increased labour force participation by women which created demand for childcare services. For children aged 5 to 14 years, the growth in trips was largely across all purposes but marginally greater for education and childcare. For those aged 15 to 19 years, however, the increase was clearly concentrated in passenger trips for education and childcare. The older age group of 65 years and over which also showed a comparatively high growth undertook more passenger trips for social activities, recreation and personal business.

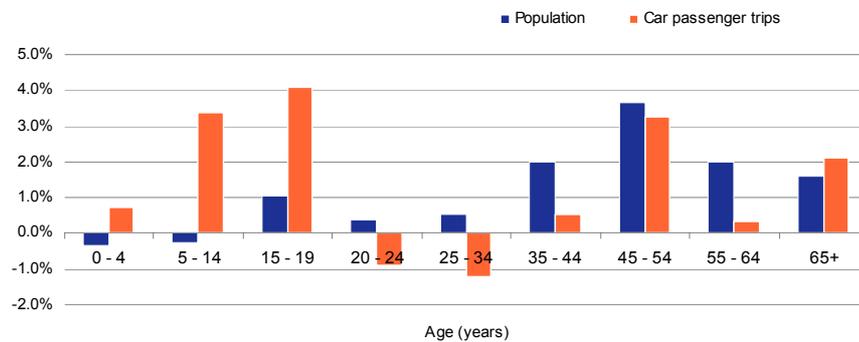


Figure 4 Annual growth 1991 - 2001 by Age groups (Sydney SD)

## Distance and travel time

The average distance of car driver trips grew by 5% from 10.1 kilometres in 1991 to 10.6 kilometres in 2001 (Table 1). Across all purposes except 'change mode', the average distance increased during the period. The largest increase in distance, 34% was for trips to education and childcare.

The average duration per driver trip also rose accordingly by about the same rate of increase as the average distance, 6% during the period from 18 to about 19 minutes.

Table 1 Average distance per car driver trip by Purpose, Weekday (Sydney SD)

	1991	2001	% Change
Change mode	10.1	9.5	-5%
Work	13.6	14.0	3%
Work related business	13.0	14.5	11%
Education /childcare	12.5	16.8	34%
Shopping	6.4	6.9	7%
Personal business	8.0	8.2	4%
Social /recreation	10.1	10.8	7%
Serve passenger	7.1	7.2	2%
Other	8.9	14.2	60%
All car driver trips	10.1	10.6	5%

The distribution of car driver trips by time of day is shown in Figures 5 (weekday) and 6 (weekend). The graphs indicate that the pattern of car driver trips by time of day has not changed considerably in the last decade. The weekday morning peak for car travel remained largely concentrated around the 7am to 9am band. The weekday afternoon demand still peaked at 3pm and 5pm coinciding with school and business closing times.

However, there is evidence of peak spreading as can be seen in the broadening of the morning and afternoon peak into the shoulder periods in 2001. The peaks are also steeper indicating that the increase in trips is focused during these periods. The increase in car driver trips between 1991 and 2001 was highest at 8am (26%) and 5pm (23%).

The pattern of weekend car travel was also similar between 1991 and 2001. Peak demand was broad beginning at 9am and extending till midday. Demand then gradually tapered off after noon until the next less prominent peak between 3pm to 5pm. There was no indication of peak spreading in the weekend with most of the travel in both 1991 and 2001 undertaken between the commercial hours of 9am to 5pm. However, there was a considerable increase in car driver trips during the period with the largest (23%) occurring at 10am. Although the magnitude of car travel during weekends is quite significant, these trips tend to be shorter and dispersed in suburban locations.

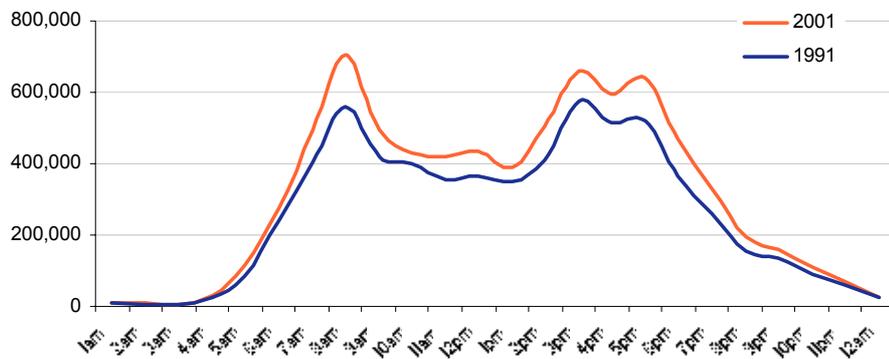


Figure 5 Car driver trips by Time of day, Weekday (Sydney SD)

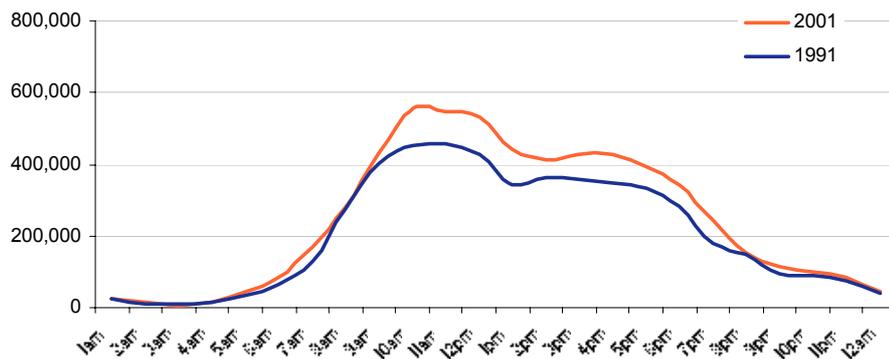


Figure 6 Car driver trips by Time of day, Weekend (Sydney SD)

## Demographic dimension of changes

In 1991, males accounted for 59% of vehicle driver trips on an average weekday (Figure 7). In 2001, this proportion dropped to 56%. The proportion of vehicle driver trips undertaken by females rose correspondingly from 41% to 44%. This gender redistribution is a result of the faster growth in car trips among females, 2.4% annually on average compared to 1.4% for males. In terms of VKT, males accounted for a bigger share but the percentage also dropped from 66% to 64% and rose for females from 34% to 36%.

The increase in driver trips made by females is associated with the growing proportion of licence holders in this gender group. This, together with high vehicle ownership has accorded greater mobility as reflected in the growth in car trips across all purposes but most prominently for trips to serve passenger. Labour force participation among women which has also risen in the last decade likewise contributed to this growth.

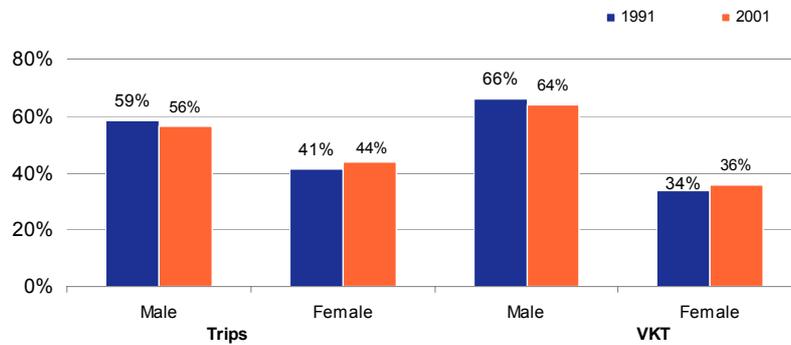


Figure 7 Gender distribution of car driver trips and VKT, Weekday (Sydney SD)

The age distribution of car driver trips in 1991 and 2001 (Figure 8) shows that those between 25 and 54 years had the biggest share in car driver trips. These groups correspond to the working age population which also generated the highest share of car driver trips compared to other labour force status groups (Figure 10). The basic shape of the distribution of car driver trips reflects the age profile of the population and has not changed markedly between 1991 and 2001. The difference is in the contraction of the contribution to overall car driver trips by the younger age groups corresponding to the expansion of the share attributed to the older groups, the most significant being in the 45-54 age bracket (Figure 8).

The age redistribution has taken place because of some age groups generating car driver trips and VKT at a faster pace than the growth in population within the demographic group. Growth in car usage in terms of both trips and VKT was strongest in the upper age groups namely the 45-54, 55-64 and 65+ age groups (Figure 9). Overall, the biggest expansion in car travel for these older age brackets was for trips to 'change mode' as well as for social and recreation.

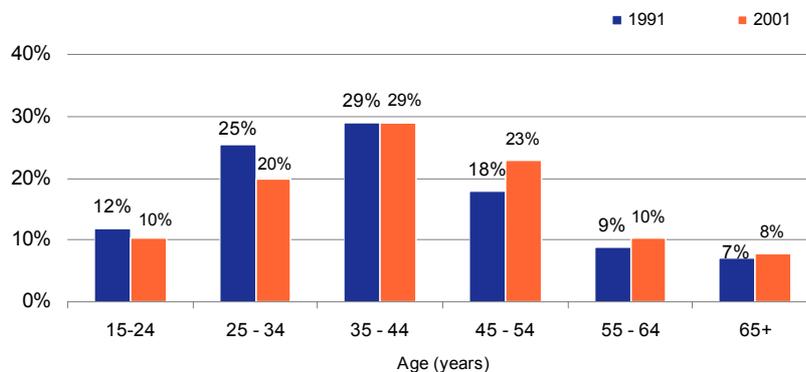


Figure 8 Age distribution of car driver trips, Weekday (Sydney SD)

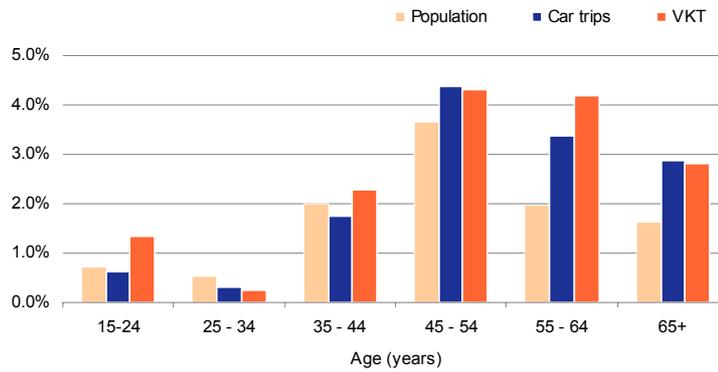


Figure 9 Annual growth 1991 - 2001 by Age groups (Sydney SD)

Full-time and part-time/casual workers together accounted for three-quarters of the total vehicle driver trips (Figure 10). This majority share of workers has not changed substantially between 1991 and 2001 except for a marginal shift towards part-time and casual workers capturing a bigger share, up from 14% to 17% which corresponded to a decrease by the same magnitude in the share attributed to full-time workers. This expansion in share is significant because of the strong growth in the number of part-time and casual workers during the period and the even stronger growth in driver trips (3.9%) and VKT (5.2%) for this labour group (Figure 11). This result is indicative of the flexible nature of this work status which creates potential for increased participation in activities that in turn generate trips.

The number of full-time workers also posted a considerable increase of 2.1% annually, consistent with the high employment experienced during the decade. However, the equivalent increment in driver trips (1.3%) and VKT (1.8%) was comparatively less, indicative of the high proportion of full-time workers that use public transport.

Car usage also grew among students reflecting the expansion in the share of driver trips for education and the marked increase in the average VKT for this purpose shown earlier (Figure 2 and Table 1). Likewise exhibiting a high increase in car use were the retired and age pensioner group for which growth was concentrated in car trips for social, recreation and personal business (Figure 11).

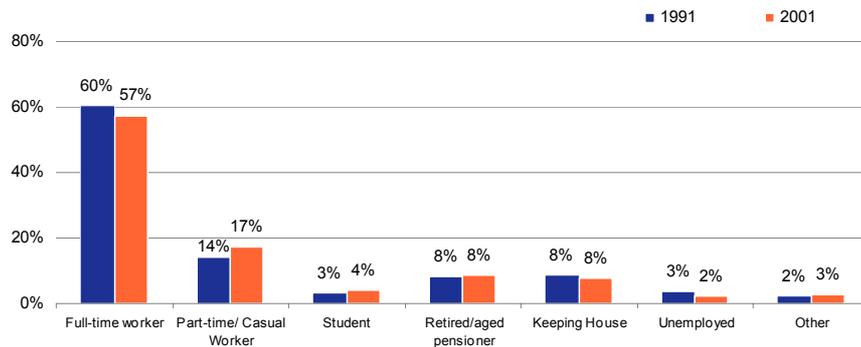


Figure 10 Distribution of car driver trips by Labour force status (Sydney SD)

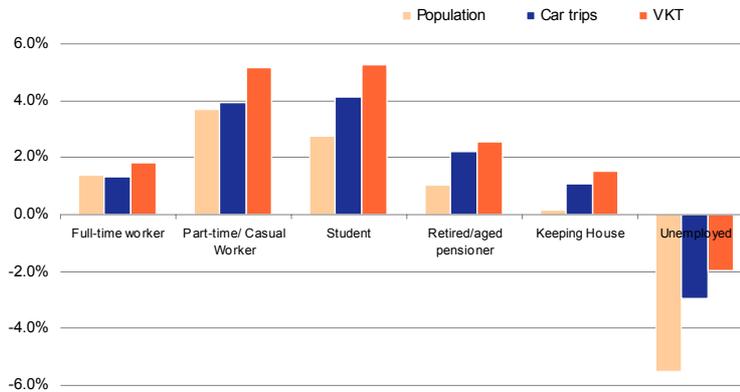


Figure 11 Annual growth 1991 - 2001 by Labour force status (Sydney SD)

## Changes by geographical area

There is a clear pattern of higher VKT levels per person the further people are located from the Sydney Central Business District (CBD) (Figure 12). Outlying Statistical Local Areas (SLAs) which had lower concentrations of population relative to geographical area such as Hawkesbury, the Blue Mountains and Wollondilly, as well as those located further away from employment centers such as Gosford tended to generate higher VKTs per person. In inner Sydney and surrounds where public transport services are significantly more established and available, and where access to employment and services are in closer proximity, VKT per person tended to be lower.

This pattern of increasing VKT per person from the city centre has been existent since 1991 but the number of areas generating higher levels of VKT increased by 2001. Table 3 summarises the actual and percentage increases in VKT per person for each SLA and highlights those areas with the largest growth. In most cases, the biggest increases can be observed in SLAs which are in outer Sydney.

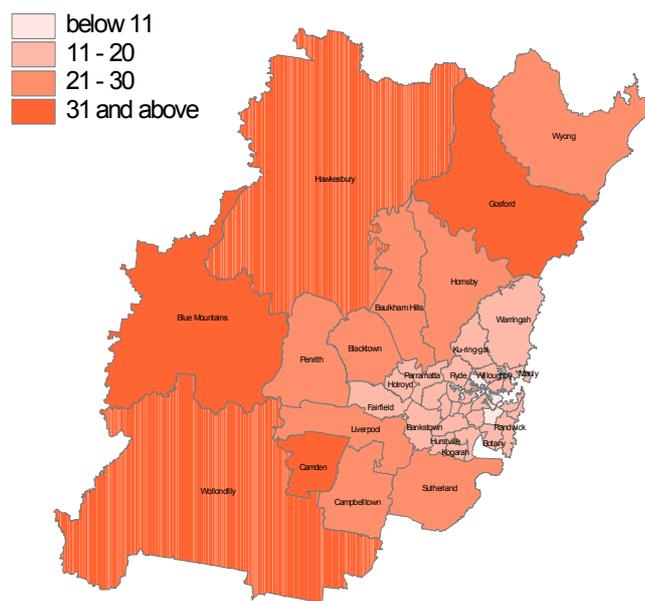


Figure 12 Average VKT per person by Statistical Local Area of Residence, 2001 (Sydney SD)

Table 3 Average VKT per person by Statistical Local Area of Residence (Sydney SD)

SLA	1991	2001	% change	actual change	SLA	1991	2001	% change	actual change
Ashfield	10.3	11.6	12%	1.3	Leichhardt	17.7	11.3	-36%	-6.4
Auburn	9.4	12.9	38%	3.5	Liverpool	17.0	22.7	33%	5.7
Bankstown	15.8	16.3	3%	0.5	Manly	12.3	16.2	32%	3.9
Baulkham Hills	27.3	27.6	1%	0.4	Marrickville	12.0	12.4	3%	0.4
Blacktown	19.3	21.0	9%	1.7	Mosman	11.1	11.5	4%	0.4
Blue Mountains	29.7	31.4	6%	1.7	North Sydney	11.0	11.7	7%	0.7
Botany	11.2	13.3	19%	2.1	Parramatta	17.4	15.3	-12%	-2.0
Burwood	9.3	11.7	25%	2.4	Penrith	24.4	28.7	18%	4.3
Camden	24.9	36.1	45%	11.2	Randwick	10.1	11.0	9%	0.9
Campbelltown	24.8	28.7	16%	4.0	Rockdale	11.7	12.8	9%	1.0
Canterbury	11.3	11.4	1%	0.1	Ryde	17.4	15.7	-10%	-1.7
Concord	10.7	13.9	31%	3.3	South Sydney	6.3	8.8	40%	2.5
Drummoyne	9.2	13.5	48%	4.4	Strathfield	7.7	13.1	70%	5.4
Fairfield	11.4	15.2	33%	3.8	Sutherland	22.8	24.6	8%	1.8
Gosford	24.1	31.9	32%	7.8	Sydney Inner <sup>a</sup>	55.8	4.8	-91%	-51.0
Hawkesbury	32.1	37.1	16%	5.0	Sydney Remainder <sup>a</sup>	8.6	4.4	-49%	-4.2
Holroyd	16.4	17.7	8%	1.4	Warringah (incl Pittwater)	19.8	20.9	5%	1.0
Hornsby	22.5	21.7	-4%	-0.8	Waverley	11.5	12.7	11%	1.2
Hunters Hill	27.2	16.1	-41%	-11.1	Willoughby	12.1	13.6	12%	1.5
Hurstville	12.9	16.8	31%	3.9	Wollondilly	46.2	45.0	-3%	-1.3
Kogarah	17.0	16.7	-2%	-0.3	Woollahra	11.7	11.8	1%	0.1
Ku-ring-gai	20.0	18.1	-9%	-1.9	Wyong	26.8	27.9	4%	1.1
Lane Cove	10.8	10.1	-6%	-0.7					

a The 1991 figures for these SLAs are unreliable because of the smallness of the sample.

## Summary

Car travel in Sydney is growing and changing, a fact that makes our understanding and planning of the city’s future even more challenging. Population increase and demographic changes are important indicators for predicting demand but the fact that there are variations in usage within groups and faster growth in some compared to others show that the planning process can not be static but dynamic, requiring regular rethinking.

Notable is the higher growth in car usage among women which can be attributed to improved mobility afforded by the higher proportion of licence holding in this gender group and the overall increase in vehicle ownership. Greater access to the car and the high incidence of part-time and casual workers have a significant impact on usage for females who being the primary caregiver tend to generate more trips. This effect is evident in the growth in car trips across all purposes for female drivers and most especially for trips to ‘serve passenger’.

Persons aged 55 years and above posted the largest per capita growth for car driver trips and VKT compared to other age cohorts. Considering the aging of the population, this result has important implications in forecasting future demand. For this older age group, however, the increase was marked for social and recreational trips, the types of trips which can be expected to exert less pressure on peak hour travel.

The rise in car passenger trips for persons aged 5 to 19 years was over three times the population increase for this group. The increase was also largest for trips for education and childcare. This finding is related to the expansion in driver trips to serve passenger mostly undertaken by female drivers.

Economic prosperity which has characterised the last decade, and in particular high employment, also appears to be directly correlated with the increase in car usage. The working population accounts for the largest proportion of car driver trips; therefore,

improvements in labour force participation tend to result in greater car usage. More specifically, the expansion in part-time and casual employment which has been the trend in the recent ten years has an accelerating effect on car usage. This is indicated by the strong growth in car usage compared to population for this labour group. Higher labour force participation by women has also created demand for child care services which tend to be accessed using the private vehicle, thus, resulting in more driver and passenger trips for this purpose.

Notwithstanding the increase in car usage attributed to workers, it is worth noting that the expansion in use was more pronounced for non-work trips. This is because a healthier labour market also results in higher levels of disposable income which in turn facilitate engagement in non-work trip-making activities. This, together with the increase in vehicle ownership, also associated with good economic conditions, and higher proportions of licence-holding impact on car use.

The distribution of car driver trips by time of day indicates no major variations between 1991 and 2001 in the patterns for weekday and weekend. However, it should be noted that the increase during the period is not even across time bands but largest in the morning and late afternoon peaks for weekdays and concentrated in the 9am to 5pm period during weekends.

The geographical analysis of car usage demonstrates that the proximity and accessibility of public transport infrastructure, employment and services exert a strong influence. In the Sydney SD, there is a clear pattern of increasing VKT per person from the CBD, where accessibility is at its best, to the fringe areas. This situation existed in 1991 and prevailed in 2001 despite the addition of 485,000 people.

#### Footnotes

- 1 This mode share has been revised from estimates published in earlier publications. Some trips have been excluded from the 1991 HIS data to enable direct comparison with the HTS.
- 2 Australian Bureau of Statistics (ABS), 2004, Australian National Accounts: State Accounts, Cat No 5220.0 (GSP used is based on current prices)
- 3 ABS, 2005, Labour Force, Australia, Detailed - Electronic Delivery, Cat No 6291.0.55.001
- 4 ABS, 2004, Australian National Accounts: State Accounts, Cat No 5220.0

#### Source of Data

The 2001 figures were derived from five years of pooled data (1997/1998 to 2001/2002) from the Household Travel Survey (HTS) weighted to 2001 population benchmarks to enable detailed analysis. The HTS is the continuous travel survey conducted by TPDC since 1997 with an annual net sample of about 3500 households. The 1991 figures were derived from the Home Interview Survey (HIS) which was a major one-off travel survey with a net sample of 12,000 households undertaken in 1991/1992.

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