

**PUBLIC TRANSPORT TRAVEL PATTERNS IN
THE GREATER SYDNEY METROPOLITAN AREA
1981 TO 1991**

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ABSTRACT

Evidence from Australia and around the world shows a declining mode share for public transport. At the same time however, society is becoming increasingly concerned about the deterioration of the environment due to car dependence. In response to these concerns governments are trying to develop policies to encourage greater use of public transport.

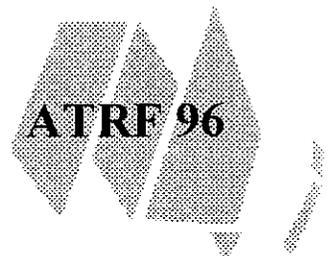
In order to redress the decline in public transport's mode share it is important to identify the who, where, when, why and how of travel behaviour and mode choice. That is, who travels, where people travel to and from, when people travel, why people travel, and what modes people use. Once we accurately understand these factors and identify opportunities for mode choice flexibility it will be possible to formulate policies to effectively influence a shift towards public transport use.

This paper analyses travel patterns from the data collected in the Transport Data Centre's Home Interview Surveys of 1981 and 1991 to identify the factors influencing mode choice and how these factors can change over time.

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1. INTRODUCTION

Establishing an accurate picture of Sydney's travel patterns is important to provide a sound basis for effective transport policy making and infrastructure and service planning. The Transport Data Centre (TDC) collects and maintains a number of data bases on personal travel in order to provide information to facilitate the development of a high quality transport system. The main source of data is a large scale home interview survey, which has been conducted throughout the Sydney Metropolitan Area in 1971, 1981 and 1991. This survey collects data on all travel undertaken by all members of selected households, over a nominated 24 hour period as well as data on the characteristics of the household.

Using the data from the 1981 and 1991 Home Interview Surveys (HIS), this paper presents an analysis of the transport mode share in 1991 compared to 1981 and a profile of users of private vehicles and public transport. In addition to looking at changes in mode choice, the paper discusses some of the factors influencing the overall decline in public transport use by Sydney's residents between 1981 and 1991 and the corresponding increase in private vehicle travel. However, there are some instances where there have been increases in public transport use, and these will be examined in the paper.

There were a number of methodological differences in the collection of data in 1981 and 1991. To account for these, the analysis presented only uses data within the scope of the 1981 Home Interview Survey. This data covers the personal and travel characteristics of a sample of persons aged 4 years and over living within the Sydney Statistical Division, which includes Gosford, Wyong and the Blue Mountains.

In this paper, unless otherwise specified, "public transport" refers to bus and train travel and "private vehicle" refers to vehicle driver and passenger trips. Ferry trips are included in "other" modes due to their very small number in both 1981 and 1991. Walking trips are also included in "other" modes.

2. HOW PEOPLE TRAVEL - MODE SHARE

Between 1981 and 1991 the total number of trips on an average weekday increased from 11.9 to 12.0 million trips, an increase of 2.8 per cent. Weekend travel also grew over the period by 7.8 per cent, from 9.6 to 10.4 million trips. From 1981 to 1991 the number of public transport trips decreased overall by 12.8 per cent while private vehicle trips increased by 5.5 per cent.

This section begins by examining the mode share on weekdays and weekends and concludes with a profile of the users of the different modes.

2.1 Weekdays and Weekends

Table 1 presents a breakdown of the main mode of travel for weekdays and weekend days in 1981 and 1991. It also gives the percentage of trips by main mode, as well as the percentage change for each mode (*Main Mode is defined in Appendix A*)

Table 1: Average Weekday and Weekend Trips: Main Mode by Year

Weekday	1981		1991		Change	
	No.	%	No.	%	No.	%
Vehicle Driver	5,618,653	47.4	5,866,770	48.9	248,117	4.4
Vehicle Passenger	2,038,396	17.2	2,209,262	18.4	170,866	8.4
Bus	810,917	6.9	639,299	5.3	-171,618	-21.2
Train	639,236	5.4	615,919	5.1	-23,317	-3.6
Walking	2,485,230	20.9	2,466,269	20.5	-18,961	-0.8
Other/unknown*	271,586	2.3	212,199	1.8	-59,387	-21.9
Total	11,864,017	100.0	12,009,718	100.0	145,701	1.2

Weekend Day	1981		1991		Change	
	No.	%	No.	%	No.	%
Vehicle Driver	4,188,946	43.6	4,610,137	44.5	421,191	10.1
Vehicle Passenger	3,387,033	35.2	3,486,343	33.6	99,310	2.9
Bus	164,788	1.7	199,788	1.9	35,000	21.2
Train	183,832	1.9	185,325	1.8	1,493	0.8
Walking	1,414,612	14.7	1,693,328	16.3	278,716	19.7
Other/unknown*	279,490	2.9	196,458	1.9	-83,032	-29.7
Total	9,618,700	100.0	10,371,379	100.0	752,679	7.8

* Other includes ferry, taxi, bicycle, wheelchair, monorail and other.

Table 1 shows that in 1981 and 1991, on weekdays and weekends, vehicle trips accounted for a much larger proportion of trips than public transport. The number and proportion of trips by public transport declined on weekdays in 1991 compared with 1981. Although bus and train trips made up a smaller proportion of weekend than weekday trips, there was an increase in public transport trips on weekends in 1991 compared with 1981. On weekdays there were 21 per cent less trips by bus in 1991 compared to ten years earlier. On weekends however, bus trips grew by 35,000 or 21 per cent. The number of trips by train fell on weekdays by over 23,000, or 3.6 per cent, from 1981 to 1991. The number of rail trips on weekends was similar in both survey years.

On weekdays between 1981 and 1991 there was a continuation of the trend towards growing private vehicle usage and declining public transport and walking trips (SATS 1974 & STSG 1985). Vehicle passenger trips experienced a greater increase than vehicle driver trips on weekdays. On weekends however, the majority of the increase in vehicle trips is accounted for by driver trips which grew by over 400,000.

Although this paper concentrates on private vehicle and public transport trips, it should be noted that walking trips are an important mode of travel on both weekdays and weekends.

2.2 Profile of Travellers

Analysis of the people using private vehicles and public transport provides some insight into the reasons for the changing mode share between 1981 and 1991.

2.2.1 Sex

A breakdown of weekday trips by mode (Figure 1) reveals that in 1991 while females were still more likely than males to travel by public transport, and males more likely to travel by car, this difference in mode preference is declining.

Figure 1 also shows that the increase in total vehicle driver trips is solely accounted for by an increase in trips by females. Weekday vehicle passenger trips on the other hand, grew for both males and females, with females continuing to make more vehicle passenger trips than males in 1991.

Both males and females made less trips by bus in 1991 than in 1981. Males also appear to have made slightly less rail trips in 1991, whilst the number of rail trips by females remained constant.

As with weekday travel, males continued to undertake the majority of weekend vehicle driver trips in 1991 and females were more likely to be a vehicle passenger. Figure 2 shows that females also accounted for the increase in weekend vehicle driver trips from 1981 to 1991, while males were responsible for the increase in weekend day vehicle passenger trips.

The number of trips by bus on weekends increased slightly for both sexes, whilst train trips remained stable.

Therefore weekend mode shares also demonstrate the trend of convergence of male and female vehicle travel patterns.

2.2.2 Age

Table 2 presents a breakdown of travellers into 10 year age categories and compares mode share in 1981 and 1991.

Overall, there has been a decline in the use of public transport by all age groups, with the exception of those between 20 and 39 years. For this age group there appears to have been an increase in the number of trips by public transport and other modes, and a decrease in trips by private vehicle.

The proportion of people aged 19 and under travelling by private vehicle increased from 1981 to 1991. There was a corresponding decrease in the proportion of trips by public transport and other modes for this age group.

Figures 1: Weekday Trips - Main Mode by Sex, 1981 & 1991

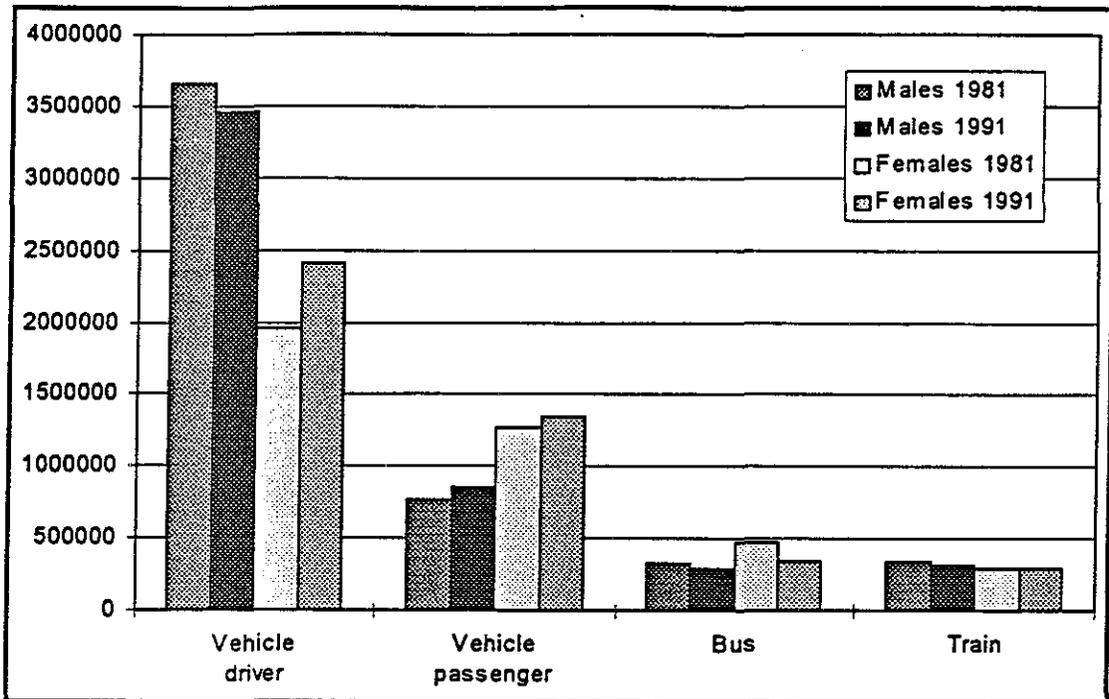


Figure 2: Weekend Trips - Main Mode by Sex, 1981 & 1991

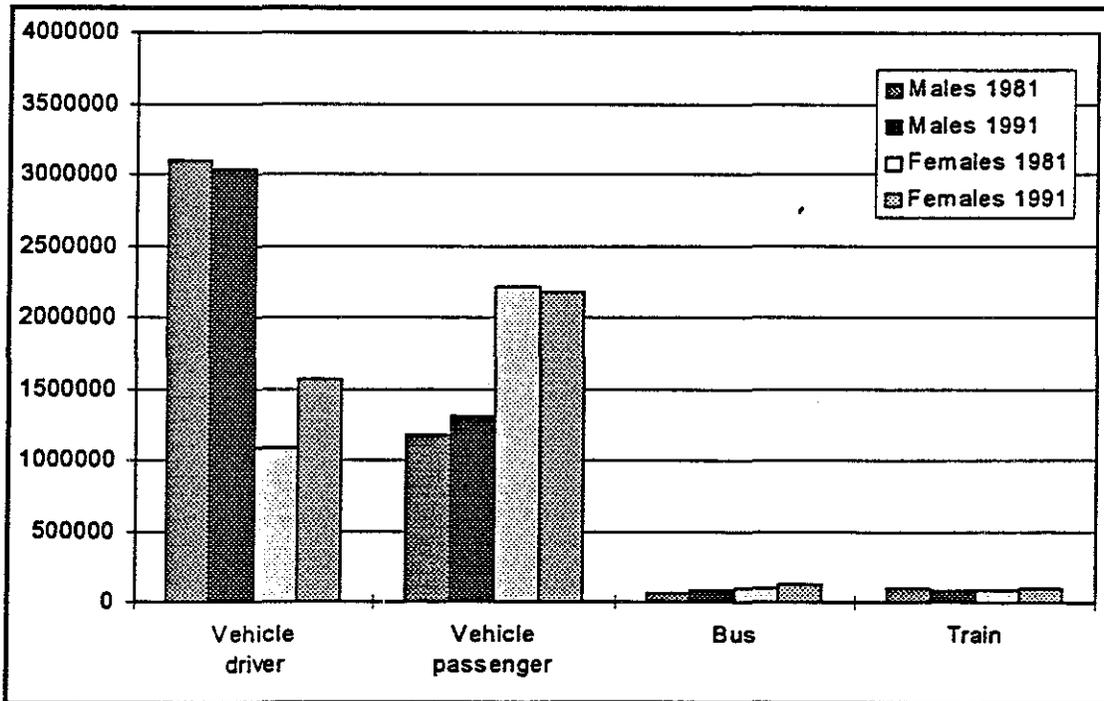


Table 2: Average Weekday Mode Share by Age

1981 Age (years)	Private Vehicle		Public Transport		Other Modes		Total	
	No.	%	No.	%	No.	%	No.	%
9 & under	496,196	52.6	105,697	11.2	342,185	36.2	944,078	100.0
10-19	741,500	37.9	475,332	24.3	738,158	37.8	1,954,990	100.0
20-29	1,698,152	70.7	255,260	10.6	448,680	18.7	2,402,092	100.0
30-39	1,883,383	78.3	170,275	7.1	351,083	14.6	2,404,741	100.0
40-49	1,237,921	77.7	126,104	7.9	229,873	14.4	1,593,898	100.0
50-59	905,309	70.8	137,061	10.7	235,930	18.5	1,278,300	100.0
60 & over	694,589	54.1	180,424	14.0	409,633	31.9	1,284,646	100.0
Total	7,657,050	64.5	1,450,153	12.2	2,755,542	23.2	11,862,745	100.0

1991 Age (years)	Private Vehicle		Public Transport		Other Modes		Total	
	No.	%	No.	%	No.	%	No.	%
9 & under	598,499	66.3	60,474	6.7	243,166	27.0	902,139	100.0
10-19	777,333	47.6	331,086	20.3	525,946	32.2	1,634,365	100.0
20-29	1,409,550	65.1	278,977	12.9	478,009	22.1	2,166,536	100.0
30-39	1,970,405	73.2	206,695	7.7	513,493	19.1	2,690,593	100.0
40-49	1,674,731	79.2	132,136	6.2	307,705	14.6	2,114,572	100.0
50-59	760,870	73.6	79,890	7.7	193,682	18.7	1,034,442	100.0
60 and over	884,645	60.3	165,960	11.3	416,150	28.4	1,466,755	100.0
Total	8,076,033	67.2	1,255,218	10.5	2,678,151	22.3	12,009,402	100.0

For people aged 40 to 49 and 50 to 59 years there was an overall increase in the proportion of trips by vehicle and other modes, while public transport trips declined slightly.

People aged 60 years and over experienced similar travel patterns to those aged 19 years and under, namely an increase in the proportion of trips by private vehicle and a decrease in the proportion by public transport and other modes.

3. FACTORS INFLUENCING MODE CHOICE

This section discusses some of the factors influencing the choice of mode which may explain the overall decline in public transport use compared to private vehicle travel from 1981 to 1991. The factors discussed are: increasing vehicle ownership, changing travel purposes, the greater average duration of public transport trips compared to private vehicle trips, and growth in population in the outer areas of Sydney. Convenience and perceptions of safety are also likely factors influencing the declining rate of public transport usage compared to private vehicle use.

3.1 Vehicle Ownership

The growth of private car use has been influenced by the greater availability of vehicles for household use as well as the shift of population to low density urban fringe areas, which are less accessible by public transport. The percentage of households with no vehicles declined from 18.7 per cent in 1981 to 17.5 per cent in 1991. While the percentage with one vehicle

remained constant, the percentage of households with two or more vehicles increased from 33.5 per cent to 37.2 per cent (see Table 3).

The total number of vehicles reported in the surveys as "usually parked at the household" grew by 40 per cent from 1981 to 1991. These figures include company owned/leased cars, which comprised approximately 14 per cent of vehicles usually parked at the household in both years.

Table 3: Number and Percentage of Households by Number of Vehicles in Households by Year

Vehicles in Household	1981		1991		Change	
	No.	%	No.	%	No.	%
No vehicles	161,941	18.7	213,488	17.5	51,547	31.8
One vehicle	395,173	45.7	552,583	45.3	157,410	39.8
Two or more vehicles	306,899	35.5	454,389	37.2	147,490	48.1
Total households*	1,065,325	100.0	1,220,460	100.0	155,135	14.6

* Excludes households that did not state number of vehicles.

The faster growth of vehicle passenger trips compared with vehicle driver trips on weekdays between 1981 and 1991 is reflected in the increase in vehicle occupancy rates from 1.55 to 1.64 for non-work purposes. The vehicle occupancy rate has declined, however, from 1.15 to 1.10 for work purposes, indicating a decline in car pooling for work trips. This pattern differs somewhat from with US research which found that between 1980 and 1990 car pooling decreased for both work and non-work travel (Pucher 1995).

3.2 Reasons People Travel

Between 1981 and 1991 there were some changes in the reasons why people travelled that appear to have influenced the mode choice of Sydney's residents. Table 4 shows the number and proportion of trips by the different trip purposes on weekdays and weekends for 1981 and 1991 (*Trip Purpose is defined in Appendix B*). While the percentage share of trips across different purposes has remained fairly constant, their growth rates have varied. The greatest changes, and those that have had the most influence on mode share, are discussed below.

3.2.1 Weekday Trips by Purpose

Overall on weekdays there has been a decrease in trips traditionally associated with weekday travel, such as trips to work, to education and for personal business. The trips that increased in importance were for purposes previously associated with weekends and/or those that are often more easily made by private vehicle, such as social/recreation, shopping and serve passenger trips. Figure 3 presents travel purpose by proportion of trips by mode in 1981 and 1991.

Travel to work and for work related reasons on weekdays made up a lower proportion of

trips in 1991 than in 1981. On weekdays travel for work/work related reasons declined from 21.4 per cent of trips in 1981 to 19.9 per cent of trips in 1991. This represented a decline of nearly 6 per cent in the number of trips for this purpose, and reflects the downturn in the economic cycle in 1991 which coincided with changes in the structure of the workforce, and in particular, a growth in unemployment. A breakdown of trip purposes by males and females indicates that the decline in work/work related trips is entirely the result of the drop in these trips made by males.

Table 4: Weekday and Weekend Trips: Purpose by Year

Weekday Purpose	1981		1991		Change	
	No.	%	No.	%	No.	%
Home	3,883,817	32.7	4,030,029	33.6	146,212	3.8
Work/Work Related*	2,539,444	21.4	2,393,596	19.9	-145,848	-5.7
Education	641,877	5.4	566,063	4.7	-75,814	-11.8
Shopping	1,421,935	12.0	1,476,898	12.3	54,963	3.9
Social/Recreation	1,421,494	12.0	1,553,390	12.9	131,896	9.3
Personal Business	800,916	6.8	712,468	5.9	-88,448	-11.0
Serve Passenger	1,152,041	9.7	1,207,874	10.1	55,833	4.8
Other/unknown	2,492	0.0	69,401	0.6	n.a.	n.a.
Total	11,864,017	100.0	12,009,718	100.0	145,701	1.2

Weekend Day Purpose	1981		1991		Change	
	No.	%	No.	%	No.	%
Home	3,570,903	37.1	3,782,081	36.5	211,178	5.9
Work/Work Related*	456,442	4.7	492,762	4.8	36,320	8.0
Education	9,555	0.1	15,658	0.2	6,103	63.9
Shopping	1,160,325	12.1	1,659,072	16.0	498,747	43.0
Social/Recreation	2,985,309	31.0	2,911,522	28.1	-73,787	-2.5
Personal Business	454,505	4.7	380,743	3.7	-73,762	-16.2
Serve Passenger	979,792	10.2	1,074,615	10.4	94,823	9.7
Other/unknown	1,870	0.1	54,926	0.5	n.a.	n.a.
Total	9,618,700	100.0	10,371,379	100.0	752,679	7.8

n.a. Not applicable as figure for 1981 is for unknown trip purposes only.

* Combines commuting and work related business trips.

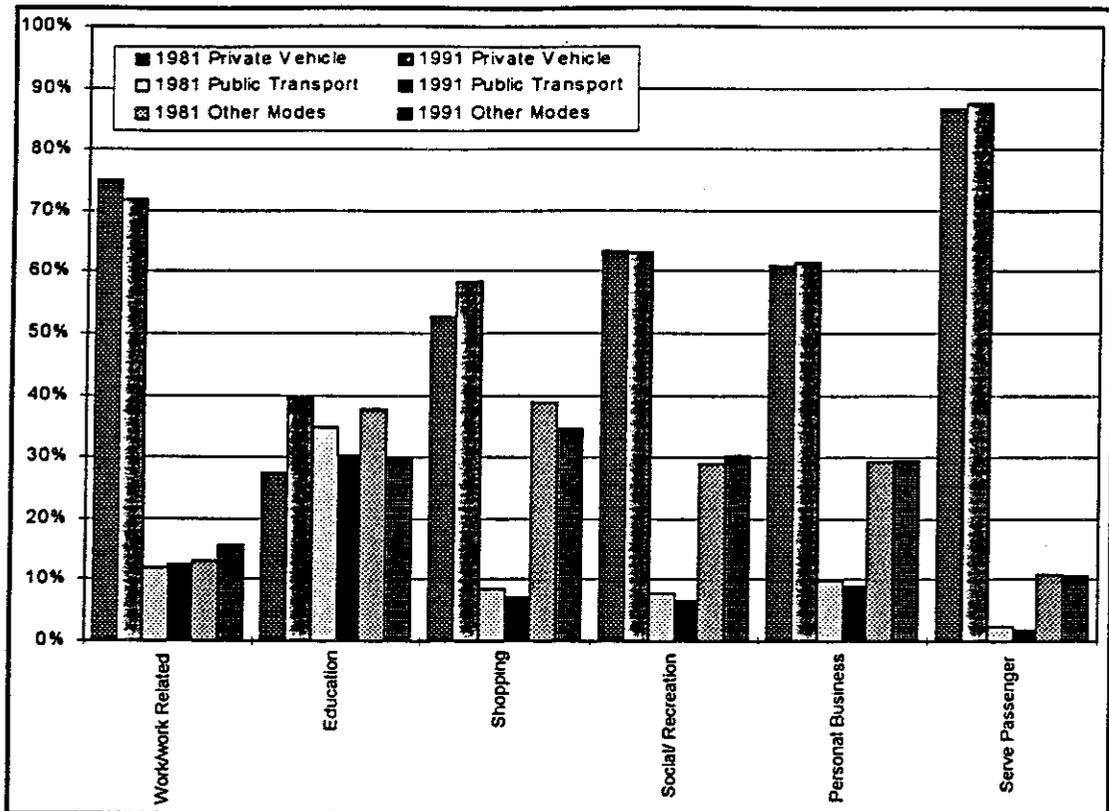
Figure 3 shows that while the number of trips for work/work related reasons decreased, there appears to have been a slight increase in the proportion of these trips undertaken by bus and train and other modes, and a corresponding decrease in the percentage undertaken by private vehicle.

Trips to education in 1991 decreased by approximately 145,000 from 1981. The analysis of mode share in Figure 3 shows that the proportion of education trips by private vehicle increased while those by public transport and other modes decreased. This is in line with the increase in the proportion of trips by people aged 19 and under by private vehicle, presented in section 2.2.2.

Relative 9/81 unemployment rates?

serve passenger + return home = 111,600 (of all serve pass are out return) out of total weekend of 1,457,012

Figure 3: Trip Purpose by Mode, 1981 & 1991



The decline in personal business trips between 1981 and 1991 may reflect changes in the financial sector during the 1980's which made conducting transactions easier. The introduction of EFTPOS, telephone banking, and bill paying by mail and phone have all reduced the need to make these personal business trips. A breakdown of the personal business category into its component parts also seems to support this explanation, with trips to banks, libraries, and solicitors declining, while social welfare and medical/dental trips increased. Despite the decrease in the number of personal business trips, the mode share in 1981 and 1991 is similar.

As shown in Table 4, there was an increase in shopping trips on weekdays in 1991 compared with 1981, however the proportion of trips which were for shopping remained constant in both years. The increase in the number of shopping trips was also associated with a change in mode share, with a greater proportion of shopping trips made by private vehicle in 1991 and less by public transport and other modes. This is not surprising given that shopping is much more conveniently carried out by private vehicle, if available, than by public transport.

For social/recreation trips the increase in the number of trips resulted in very little change to mode share. A similar pattern is also apparent for serve passenger trips, with the mode share remaining stable along with the increase in the number of trips (Figure 3).

The rise in serve passenger trips is reflected in the increase in vehicle occupancy rates for non-work purposes, as discussed in Section 3.1. The growth of serve passenger trips may

be related to increasing female work force participation, especially for married women (ABS 1992), and the greater need to use child care services (ABS 1994). Children are more likely to be dropped off at school and child care on the way to work. Both the convenience of vehicle travel and perceptions of safety are also likely to have contributed to the growth in trips where children are accompanied by another person (Tranter 1994).

The growth of serve passenger trips would also seem to suggest an increase in multi-purpose trips which are more easily accommodated in private vehicles. This is in line with overseas evidence which has found that there has been a larger increase in home/other activity/work trips than direct home to work trips. This means that trips to take children to child care on the way to work, or shopping trips on the way home from work have increased (Smith 1994).

Overall, the mode shares for most trip purposes are quite similar in 1981 and 1991. The most noticeable shifts in mode share are for education and shopping trips, which showed a decline in public transport use (Figure 3).

3.2.2 Weekend Trips by Purpose

While weekday work/work related trips decreased, the number increased on weekends, though work/work related trips as a proportion of weekend trips remained constant.

Although work/work related trips comprise a relatively small proportion of weekend trips, the increase of 8 per cent reflects the growth in part-time and casual work relative to full-time employment during the 1980's. The expansion of weekend trading hours of retail and other businesses is also likely to have increased the incidence of weekend work for full-time workers.

One of the most notable features of Table 4 is the marked increase in the number of weekend shopping trips, with an additional 500,000 shopping trips being made in 1991, a substantial 43 per cent increase. Shopping trips accounted for two thirds of the growth in total weekend trips which occurred from 1981 to 1991. As we have seen above on weekdays there has been an increase in these trips by private vehicle reflecting the convenience provided by this mode.

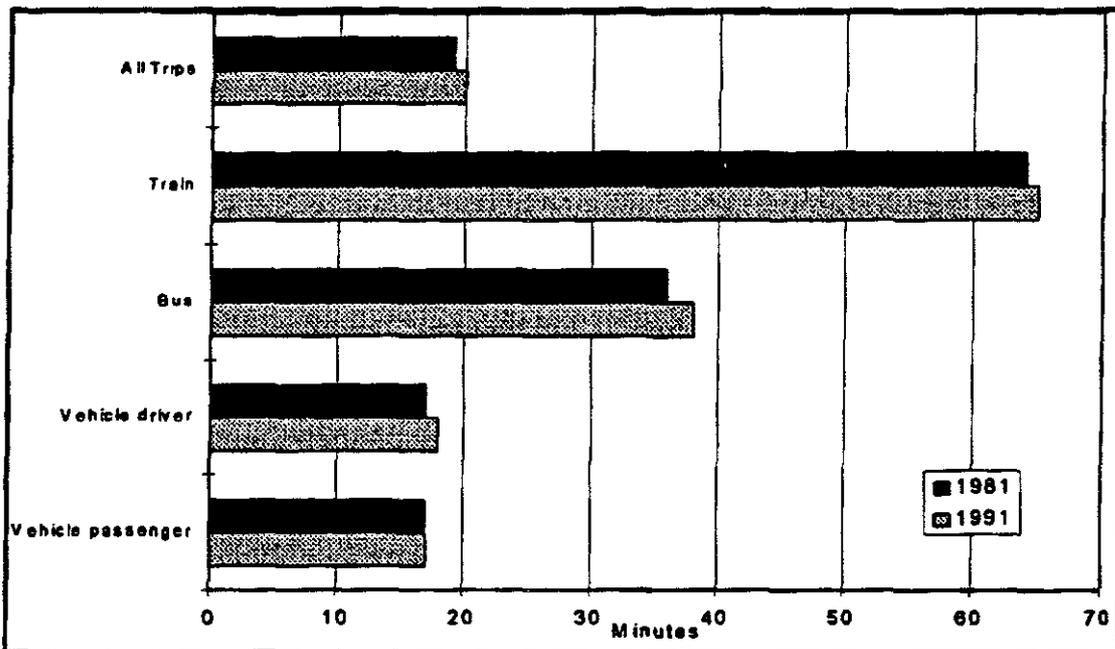
During the 1980s a number of changes occurred in the retail sector which contributed to the growth in weekend shopping trips. Most significantly, there was an expansion in retail trading hours, with the introduction of full day Saturday and Sunday trading providing increased opportunities for shopping trips. There was also a growth in the recreational facilities available at large suburban shopping centres, such as community centres, libraries, cinemas and food courts, increasing the attraction of shopping centres as entertainment venues for all ages.

There was also an increase in serve passenger trips on weekends which most likely reflects the reasons in relation to weekday trips for this purpose, as discussed in the previous section.

3.3 Trip Duration

A breakdown of trip duration by mode for weekdays in 1981 and 1991 is presented in Figure 4. In this figure the average duration of trips is the "door to door" journey time. For bus and train trips duration includes time to access the mode, time waiting for the service, travel time, and egress time from the mode. Trip duration for vehicle trips consists of access, egress and travel time in the vehicle.

Figure 4: Average Duration of Weekday Trips in Sydney by Main Mode, 1981 & 1991



In both survey years the average duration of trips by public transport was much longer than the average duration of private vehicle trips. Train trips on average were more than three times longer than vehicle driver and passenger trips, while bus trips were about twice as long on average as vehicle trips. This highlights the dependence on the private vehicle for the flexibility it provides for short trips and the role of public transport in servicing long haul journeys.

There was only a slight increase in the average duration of trips by all modes on weekdays in 1991 compared with 1981. The average duration for all modes on weekdays increased from 19 to 20 minutes. Over the period train trips increased on average by 1 minute from 64 to 65 minutes. Bus trips also increased on average by 2 minutes, from 36 to 38 minutes.

Vehicle driver also slightly increased in duration on average from 17 minutes in 1981 to 18 minutes in 1991. Vehicle passenger trips remained constant at 17 minutes on average in both survey years.

Analysis of the trip duration for all modes on weekends found that average duration remained constant at 19 minutes.

The patterns of trip duration also remained fairly constant across trip purposes over the survey years, with most weekday trips growing in length by only 1 minute on average. Work/work related trips were the longest on average in both 1981 and 1991, being 23 minutes and 24 minutes respectively.

The relatively minor increase overall in average trip duration for work/work related trips has been found in other research in Australia, as well as overseas. Brotchie (1995) and Levinson et al (1994) have found that commuting travel times have remained fairly constant, despite increasing trip distances and worsening traffic congestion, as people choose to substitute a faster mode, a closer work location (or home location), and/or a less congested route to optimise travel times. The influence of location on mode share is discussed in the following Section.

3.4 Population Growth in Outer Areas

The locational distribution of trips by different modes reflects both the transport infrastructure and population characteristics, such as rates of growth, density, age structure and life cycle stage of each region (*Regions are described in Appendix C*). This section discusses the influence of location on mode share. Figure 5 illustrates the percentage change in vehicle and public transport trips by region between 1981 and 1991.

The decline in both public transport and vehicle trips evident in Figure 5 occurred in regions which experienced an overall decrease in trips, such as the Inner West, the Eastern Suburbs, the Central West, Manly-Warringah, the Lower North and Canterbury-Bankstown. This reflects the changes in population structure in these regions during the 1980's such as decreasing household sizes and ageing populations.

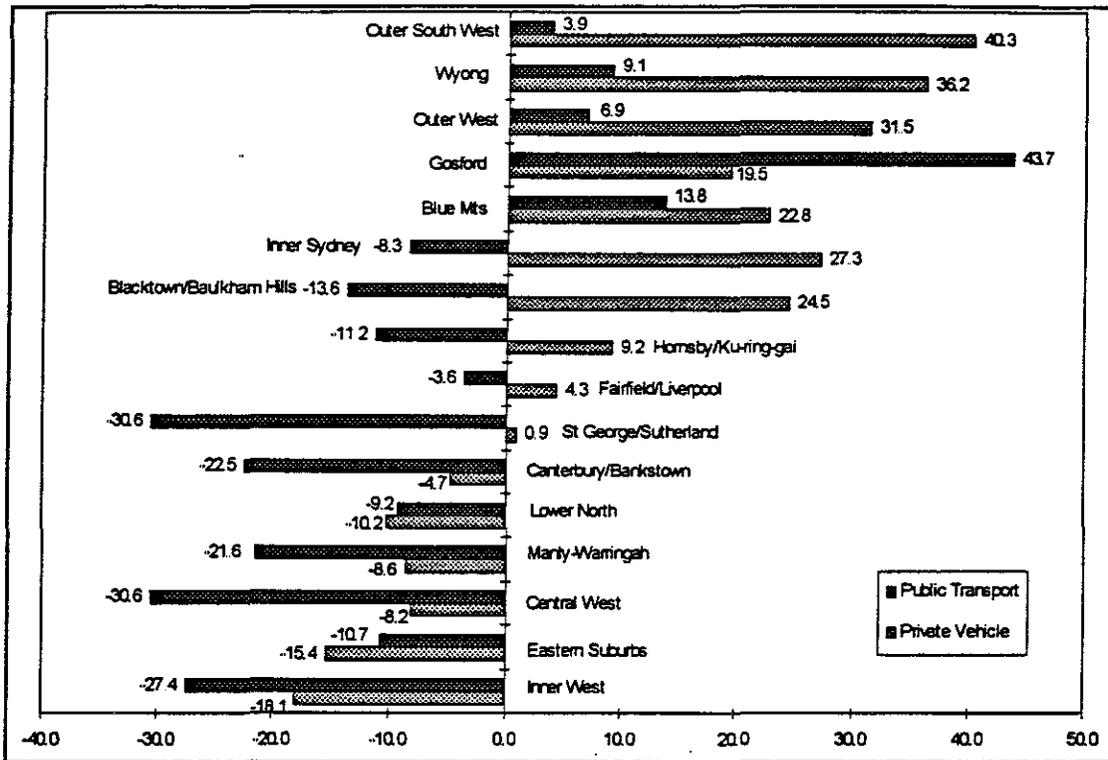
There were some regions such as Inner Sydney, Blacktown/Baulkham Hills, Hornsby/Kuring-gai, Fairfield/Liverpool and St George/Sutherland, where there was an increase in the use of private vehicle and a decrease in public transport use.

The fastest rate of increase in private vehicle usage occurred in the outer regions of Sydney, namely the Outer South West, Outer West and Wyong, all of which experienced a growth of over 30 per cent in these trips. These outer regions are low density, car dependent areas, which are less accessible by public transport. They have also experienced significant population growth during the 1980's, especially an increase in households with young families. Part of this increase in private vehicle travel can be accounted for by increased trips of children. From the data presented earlier we know that children in 1991 were travelling more by private vehicle and less by public transport than they had in 1981.

The outer regions of Sydney also experienced an increase in public transport trips from 1981 to 1991 which again reflects population growth during the 1980's. The most notable increase was the increase in public transport trips in Gosford which greatly exceeded the rate of increase in private vehicle trips. This may be due to the relocation of Sydney households to the Gosford area whilst maintaining employment locations in Sydney. The proportion of trips by Gosford residents to work by public transport in 1991 was the third highest of all

the regions (28.2 per cent), after Inner Sydney (29.2 per cent) and the Inner West (28.7 per cent). The proportion was also much greater than for other outer regions such as the Outer West (17.6 per cent) and the Blue Mountains (17.9 per cent).

Figure 5: Percentage Change in Private Vehicle and Public Transport Trips by Region, 1981 & 1991



Regions that experienced an increase in public transport trips also showed an increase in private vehicle trips. In the regions which experienced a growth in both vehicle and public transport trips it is interesting to note the differences in rates of growth by mode, reflecting public transport accessibility. For example, in Gosford, which has good rail access, there was a large increase in public transport trips relative to the increase in private vehicle trips. By comparison, the Outer South Western region of Sydney experienced a much larger increase in vehicle trips than public transport trips due to limited public transport infrastructure, particularly in Camden and Wollondilly.

4. OTHER FACTORS

The 1991 Home Interview Survey, in addition to the trip diary component of the survey, included some attitudinal questions regarding the respondent's choice of mode. People who travelled to work were asked to give reasons why they chose to travel by car or by public transport. Although it is not possible to compare the results with data from the 1981 Home Interview Survey, it is presented here in Tables 5 and 6 to give further insight into the factors influencing mode choice.

For Sydney residents who travelled to work by car in 1991, nearly 40 per cent said they did so because they perceived public transport to be unavailable or inaccessible. In addition, almost 30 per cent said car was faster than the alternative, and another 27 per cent simply preferred to travel by car. Interestingly 20 per cent of people said they needed the vehicle for other trips indicating the complex nature of trip patterns in 1991, which are not easily achieved by public transport.

Table 5: Reason for choosing car to travel to Work

Reason	Percentage of People
Bus/Train unavailable/inaccessible	37.5
Faster	29.7
Prefer car	26.9
Required vehicle for other trips	19.8
Able to make trip when convenient, not tied to a timetable	18.2
Arrives closer to destination	14.1
More comfortable	11.4
Lift/ride available	7.5
More reliable	7.2
Cheaper	6.8
Safer	2.9
Seating not always available on public transport	0.7
Weather conditions	0.4
Other	13.6

Note: Respondents could give more than one reason.

Apart from those people who were captive to public transport because they did not have a car (35 per cent) or because the car was not available as it was being used by someone else (15 per cent), the most important motivation for using public transport was that it avoided parking problems (35 per cent) (see Table 6). Public transport was also considered to be less expensive than car travel by 23 per cent of respondents.

Table 6: Reason for choosing Bus/Train to travel to Work

Reason	Percentage of People
Don't have a car	34.6
Avoids parking problems	34.6
Cheaper	23.4
Car used by someone else	15.2
Faster	14.4
Arrives closer to destination	10.2
More comfortable	6.7
Environmental reasons	4.0
Safer	3.0
More reliable	1.6
Other	22.0

Note: Respondents could give more than one reason

5. CONCLUSIONS

The data from the 1981 and 1991 Home Interview Surveys show that there was an overall decline of 12.8 per cent in the number of trips by public transport from 1981 to 1991. This paper has sought to identify some of the factors influencing the overall decline in public transport and the corresponding increase in vehicle trips. Some of the factors suggested by the data include the greater availability of private vehicles; increased car usage by women, youth and people aged 60 and over; the growth in travel for purposes more conveniently undertaken by car; and population and employment growth in outer areas less well serviced by public transport.

Despite the overall decline in public transport use there were some instances where public transport increased its mode share for the period. Most significantly there was a small increase in the proportion of work and work related trips by public transport. Other instances identified where public transport usage increased from 1981 to 1991 were for travel on weekends and for travel by people aged between 20 and 39 years.

Since the 1991 survey the impact of increasing urban development on Sydney's fringe has been addressed in government policies, namely the 1994 Metropolitan Strategy and the Integrated Transport Strategy. These policies aim to integrate land use, economic and transport planning to achieve more efficient patterns of urban settlement and increased public transport usage. In particular, these policies seek to encourage a concentration of employment in designated commercial centres well serviced by public transport infrastructure. The increase in public transport's share of work and work related trips identified in this paper suggests that these policies are addressing the area with the greatest growth potential for public transport.

REFERENCES

- Australian Bureau of Statistics (1992). *Social Indicators* Cat. No. 4101.0 (AGPS: Canberra)
- Australian Bureau of Statistics (1994). *Child Care, Australia* Cat No. 4402.0 (AGPS: Canberra).
- Brotchie, J (1995). "Urban land use, transport and the information economy: Metropolitan employment, journey to work trends and the implications for transport". *Urban Futures*, 17 pp 37-49.
- Levinson, D and Kumar, A (1994). "The Rational Factor: Why Travel Times Have Remained Stable". *APA Journal*, Summer 1994 pp 319-332.
- Pucher, J (1995). "Urban Passenger Transport in the USA and Europe". *Transport Review*, 15:2 pp 99-117.
- Sydney Area Transport Study (1974). *Summary Report: Passenger Transport Systems*.
- Smith, N (1994). "Women's Travel Needs & Patterns". *Women on the Move Conference*, Adelaide 1994, pp 6-9.
- State Transport Study Group (1985). *Trends in Morning Peak Travel in Sydney, 1971-1981*.
- Tranter, P (1994). Behind Closed Doors, *On the Move Conference*, Adelaide, pp 25-30.

APPENDIX A - Definition of Main Travel Modes

In order to simplify the reporting of trips involving a series of changes of travel modes, a 'main mode' is assigned based on the following ranking of the priority of travel modes:

HIGHEST	Ferry Train Bus Vehicle driver Vehicle passenger Taxi Bicycle Walk
LOWEST	Other

APPENDIX B - Definition of Trip Purposes

Education	Trips <u>by students</u> to kindergarten, school, colleges and universities
Employers Business	Work related trips away from work address
Home	Return to home
Personal business	Transact personal business not involving 'goods'
Serve passenger	Drop off, pick up or accompany another person
Shopping	To shops ie. premises selling 'goods'
Social/recreation	Social visits, entertainment, sporting activities, hobbies, holidays
Work	Go to/ return to place of work
Work related	'Work' & 'employer's business'
Other	Purposes not elsewhere identified

APPENDIX C - Definition of Regions

The regions referred to in this paper are based on the combinations of ABS Statistical Local Areas (SLA's) as listed below:

Region	SLA
Inner Sydney	Botany, Leichhardt, Marrickville, South Sydney, Sydney
Eastern Suburbs	Randwick, Waverley, Woollahra
St George-Sutherland	Hurstville, Kogarah, Rockdale, Sutherland
Canterbury-Bankstown	Bankstown, Canterbury
Fairfield-Liverpool	Fairfield, Liverpool
Outer South Western	Camden, Campbelltown, Wollondilly
Inner West	Ashfield, Burwood, Concord, Drummoyne, Strathfield
Central Western	Auburn, Holroyd, Parramatta
Outer Western Sydney	Hawkesbury, Penrith
Blacktown-Baulkham Hills	Baulkham Hills, Blacktown
Lower Northern	Hunters Hill, Lane Cove, Mosman, North Sydney, Ryde, Willoughby
Hornsby/Ku-ring-gai	Hornsby, Ku-ring-gai
Manly-Warringah	Manly, Warringah
Gosford	Gosford
Wyang	Wyang
Blue Mountains	Blue Mountains