



**Implications of household form, gender and parenting cultures for car use
and urban transport policy: a Sydney study**

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Abstract

Studies of urban travel – where people travel to, how they get there, for what purpose and for how long – have become increasingly sophisticated in their recognition of the complexity of urban travel. This includes, but is not limited to, the differences between work and non-journeys, gender differences, income and racial differences, and the different sorts of journeys undertaken by car versus public transport. There remains, however, a need to investigate urban travel by household because, firstly, the importance of household form has been suggested, but not elaborated on, by researchers concerned with gender and transport; and second, our previous work identified the importance of not only children in influencing women's travel, but also of parenting cultures on travel behaviour and patterns.

This paper thus reports findings from a research investigation into differentiations in car-use in the Sydney Metropolitan region. In this investigation we ask: how do travel mode, travel purpose by car and travel time by car vary, firstly by household type, and secondly by gender? The research is based on an analysis of the pooled results of the Household Travel Survey conducted by the NSW Department of Transport between 1991 and 1998. We find that both men and women in households with children more commonly travel by car, and especially for serve passenger trips. We also find that gender differences in travel by car may not be as significant as commonly thought. The study has a number of implications. One is that further research on 'serve passenger' trips is sorely needed. A second implication is that recognising the geographic and social specificity of car use may produce more appropriate and effective strategies for both reducing the growth in Sydney's car-use and meeting transport needs of the Sydney community.

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Introduction

The socio-demographic complexity of urban travel has been an important focus of recent transport research (see Pucher, Evans and Wenger 1998), while the differentiation in travel patterns based on socio-economic and locational distinction has been long recognised (Black 1977). In the context of such literature, gender differentiation of urban travel is now well-recognised and comparatively well understood. Both international and Sydney-based research has consistently found that women, in comparison to men, travel shorter distances, make more cross suburban trips, have more complex journeys to work, make more non-work trips and travel out of peak, and are more likely to use public transport, particularly buses (Dowling, Gollner and O'Dwyer 1997; Law 1999). This paper extends these understandings in three directions: takes into account travel differences among women, principally in terms of household form; explicitly considers the travel patterns of men; and concentrates on journeys undertaken by car. In the first section of the paper we justify our focus through a discussion of the policy and research imperatives that the analysis addresses. In the second section we introduce the method and data source of the analysis. The third section presents the analysis and we end with some considerations for policy makers and researchers.

Research and Policy Background

The research novelty of this analysis lies in the ways it brings together understandings of firstly, the influence of household form on travel, and secondly, gender and car use. There is now a long tradition of research into gender differences in urban travel. As we have outlined elsewhere (Dowling, Gollner and O'Dwyer 1999; Dowling 2000) much of the early attention focused on the transport disadvantage experienced by many women. Lower incomes, lower rates of car ownership and the difficulties of using public transport have historically confined women to public transport, a mode which is difficult to use with children and is less likely to cater to cross-suburban and out-of-peak travel. These descriptions, however, have become somewhat dated because of what Root and Schintler (1999) term "the increasing motorization of women". Women's increased participation in the labour force, higher rates of car ownership and increasingly complex journeys have led to an increasing share of women's journeys being undertaken by car, as well as an increase in distance traveled by car.

At the same time, the limited research on women's car use has identified household form and domestic responsibilities as important determinants. In the United States, Rosenbloom and Burns (1994) have suggested that working women use cars to make up for deficiencies in public transport provision, childcare provision and flexible employment. More recent research has highlighted the relative importance of the needs of children in women's car use. In the United States, Mauch and Taylor (1997) illustrate that women do far more trips whose primary purpose is to 'serve' their household or children than do

men. Moreover, ninety-six per cent of child-serving travel was made using a private car. In Australia, Dowling (2000) has shown that suburban women with children use the car to enact their ideals of mothering, and in particular provide a range of extra-curricular activities for their children. In this sense, then, it is women's domestic or household responsibilities that have underlain understandings of their car use.

Alongside this interest in gender runs a strain of research that addresses the ways in which travel mode, purpose and time varies according to the type of household in which an individual lives – for example, living alone, married, married with children, or single parents. We learn most about households and urban travel from a recent and comprehensive study of travel in the Netherlands (Dieleman et.al. 2002). The study looks at the influence of household type on three types of journeys: work, shopping and leisure. The authors find, familiarly, that car use is highest for families with children and in suburbs rather than central cities. They also find that the presence of children seems to be more important to mode choice than whether members of the household are in the labour force. Interestingly, they find that the relative importance of household type and the presence of children varies according to the type of journey. For work and shopping trips, car ownership is a more important determinant of car use than household type, whereas for leisure trips household type is more important.

The two strains of research have, however, not been brought together. As far as we are aware, gender and household have not been considered simultaneously. To what extent, for example, do women with children and women without children exhibit different travel patterns, and in particular car use. Thus in the rest of the paper we consider car use, gender and household simultaneously.

There are also important policy imperatives for such an analysis. With much of the Australian debate on urban transport focused on how to reduce travel demand, specifically motor vehicle travel demand, and mainstream community recognition that Australian's have become increasingly dependent on their cars, it is pertinent that we should need to know more about car use. Yet contemporary policy responses have not effectively addressed the complexity of urban car use. For example, we know that contemporary social and urban structural change, including changes in household structure, formation and location, are influencing car use, yet much of the policy discussion of car use as reflected in the literature has revolved around the physical land use and infrastructural influences on travel demand and thereby behaviour (Gollner 1996; Newman & Kenworthy 1999). Similarly, policy responses have been far less reflective of non-structural influences on travel, including social and cultural attitudes and lifestyles. The contemporary transport debate recognizes the need for a more balanced approach with both physical structural and socio-demographic understanding reflected in policy and planning decisions. Essentially, the differences according to gender, household type and purpose deem a "blanket" approach to travel demand analysis and thereby policy development inappropriate if policy is going to address: firstly, urban travel

needs (which vary according to a range of variables); and secondly, tackle the challenge to reduce the growth in motor vehicle travel. It is no wonder that there is frustration in the travel demand management debate when we talk about how to reduce non-work related travel demand and consider the promotion of modes other than the motor vehicle for such trips based on our knowledge of journeys to work.

Second, there are policy imperatives behind a concern with difference and complexity. In particular, different household forms tend to congregate in different parts of the city. Thus in planning new and redeveloped residential sites, awareness of the potentially different travel patterns of residents is necessary. Moreover, the household composition of western populations is changing. In Sydney, for example, there are now more one person households, more households without children and fewer couples with more than two children, while these changes in household structure, size and formation coupled with physical planning trends are also resulting in changing locations of urban households. Future trends in travel demand, therefore, may be influenced by these different household types and their location.

Method and Data Source

The following discussion analyses the results of a recent and comprehensive travel survey to answer these questions about the household differences in travel behaviour for non journey to work trips. This Household Travel Survey (HTS) is an ongoing survey carried out in Sydney by the NSW Department of Transport. Because the survey is continuous the quality of data continues to improve in terms of sample size, demographic, socio-economic and geographical breakdown. This analysis uses the data available when this project commenced, namely the pooled 1997 and 1998 samples. This sample is comprised of 9,880 individuals and is designed to be representative of the Sydney population (NSW Department of Transport 1999). In the HTS detailed socio-demographic information was collected, and participants were asked to fill in a detailed travel diary for a nominated 24 hour period. Data for all individuals over the age of 15 were analysed, and each individual was allocated to one of nine household forms shown in Table 1. In the analysis, each of these households is further broken down in terms of gender, thus for example married women with children are separate from married men with children. As a result, eighteen household forms are used. These data are first analysed broadly for general trends on household and travel mode, then the focus is narrowed to car usage patterns. In terms of method, this part of the paper presents simple tabulations and graphs of differences, a method deemed appropriate because of the preliminary nature of the investigation. Further analysis involving geographical analysis is also presented.

Table 1: Household Types used in the Analysis

Household Description	Abbreviation on Table
Person Living Alone	Person Living Alone
Unrelated People Sharing Dwelling	Other Households
Married Couple	Married Couple
Married couple with one or more Children under 15	Married couple chiln <14
Married couple with one or more children Over 15	Married with chiln >15
Married couple with children Under and over 15	Married with chiln <and>14
Sole parent with one or more children under 15	Sole parent <14
Sole parent with one or more children Over 15	Sole parent >15
Sole parent with children under and over 15	Sole parent <and>14

Results and Discussion

Household Form, Gender and Travel

We begin with general differences and progressively move to more specific types of car journeys. Figure 1 shows that for individuals across all household types, motor vehicles are the most common transport mode used for all trips. Within this generalization lie some interesting patterns by gender and household.

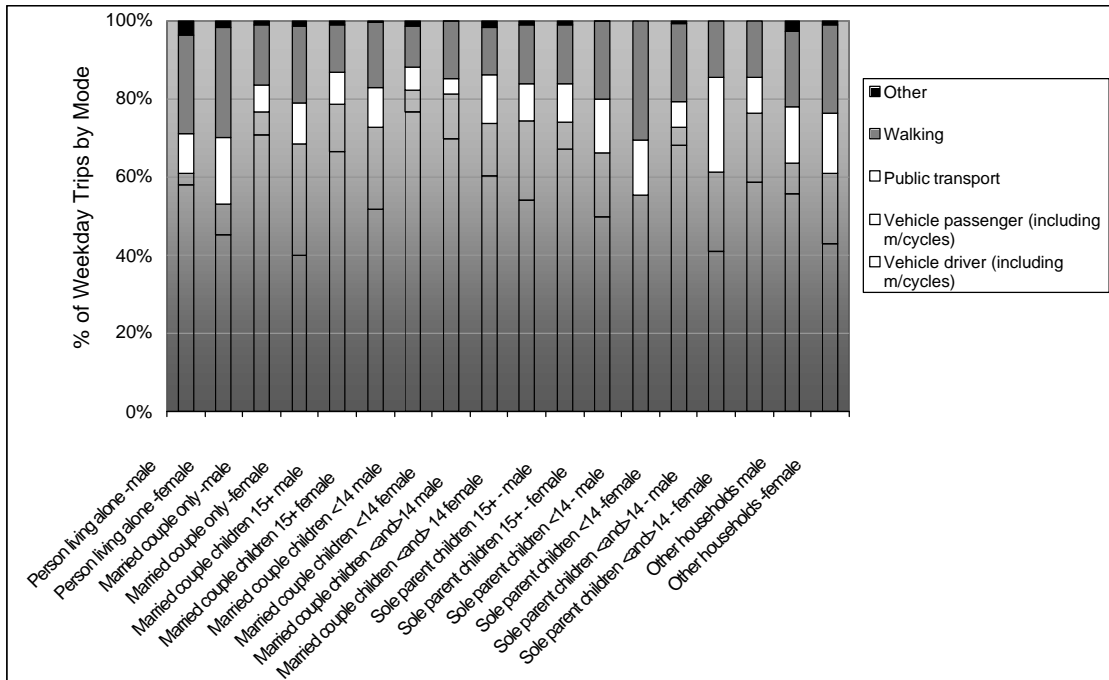
Car use by gender and household: Men living alone and in other households have much lower proportions of car usage than men in other household types, partly because of the age (old or young) structure of these household types. In contrast, car usage is highest (almost eighty per cent) for men with young children. For women, car usage is generally lower, and peaks for both women living alone and women with young children.

Public transport & walking trips: For men, public transport use is highest for those living alone, in other households, and for single parents, but for women it is most important for single parents and those living alone. Walking trips are highest for men or women living alone, but also for sole parents with younger children, although the proportion of walking trips drops significantly for sole parents with older children.

Vehicle passenger trips: Being a vehicle passenger is far less significant for men than women, whether married with children or without. For women married

without children almost 30 per cent of trips are as car passenger. The proportion remains around 20 per cent for married women with older children, but is not as high as for those with younger children. This is possibly an indicator of women's older teenage children taking over the role as car driver for some trips in addition to their partner.

Figure 1 Share of Weekday Trips by Mode – by Households

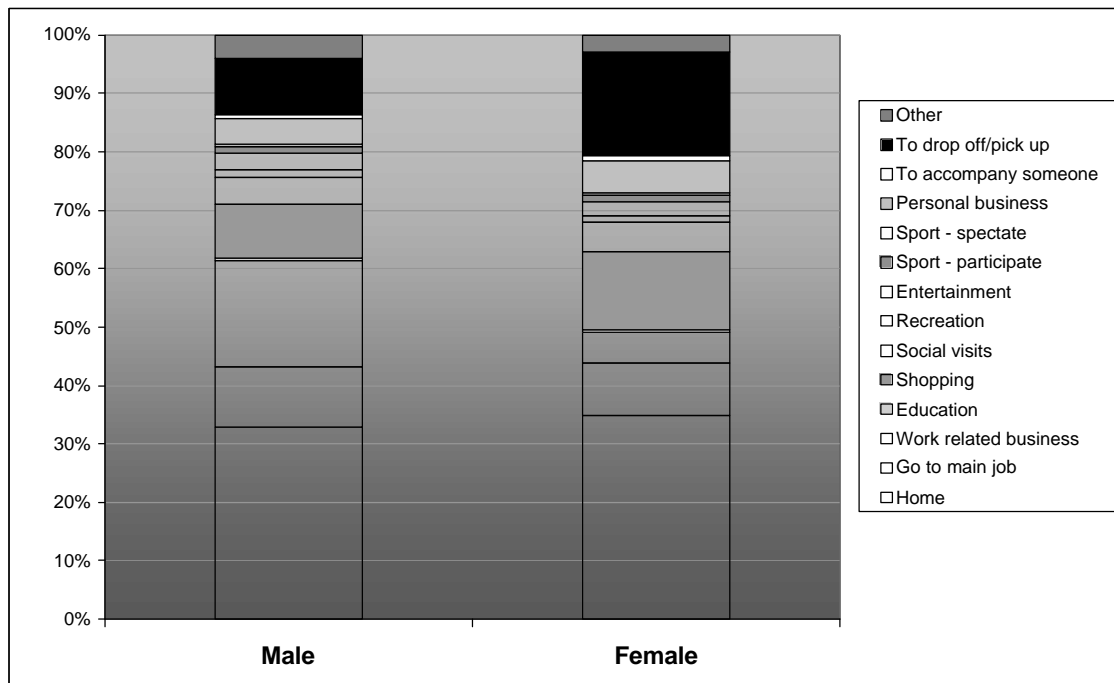


Source: NSW Department of Transport Household Travel Survey

Car Driver Trips and their Differentiation by Household and Gender

Figures 2 and 3 focus specifically on the purpose of car driver trips for men and women. Trip purpose provides us with insight beyond consideration of the origin and destination of a trip by considering additional variables which are likely to influence the transport mode of choice. Men made 4.2 million trips as car drivers on an average weekday, whilst women made 3.2 million trips as car driver. In terms of purpose, this study identified a number of factors of gender difference in car use. As depicted in Figure 2, trip purposes of particular distinction involved those for shopping, work related business and serve passenger (dropping off and picking up).

Figure 2 Purpose of Weekday Car Driver Trips – by Gender



Source: NSW Department of Transport Household Travel Survey

Car use women and shopping: Women also use the car more frequently for shopping than men, perhaps a reflection of the differing shopping tasks often carried out by men and women (e.g. women doing groceries) and the often recreational character of shopping for many women which would skew the proportion of shopping trips for women compared to men.

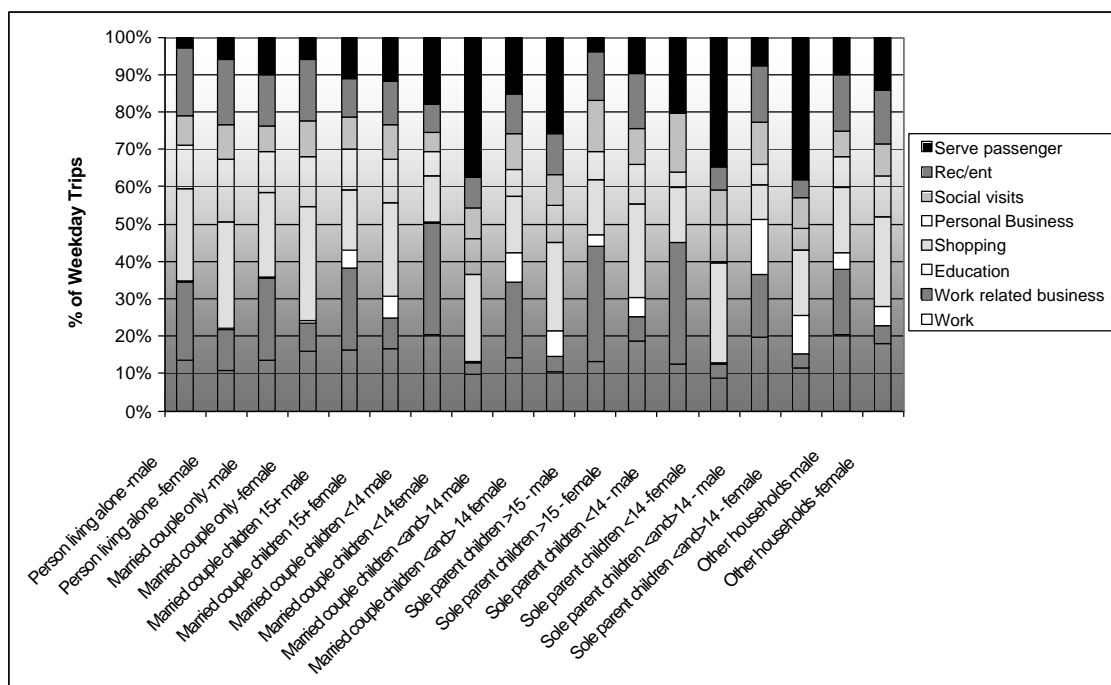
Car use, men and work related business: Another point of difference is the evident importance of work-related business for men as compared to women. Issues surrounding work related travel will not be specifically dealt with in this paper, except to say that there is very little understood about these trips and that it is an area in need of further investigation. The significance of work related travel for men is likely related to a number of trends including; the character of contemporary work practices, occupational structure, intra-urban freight demand and the provision of company cars.

Car use, parenting & chauffeuring: Serve passenger trips (defined as dropping off or picking up someone) have increased as a share of total trips in Sydney, up from 11.7 per cent in 1991 to 12.9 per cent in 1997 (TDC 1999a). As suggested in our earlier study (Dowling, Gollner and O'Dwyer 1999), women are traditionally responsibly for domestic or family-related tasks and this clearly translates to travel behaviour in their role as parents. For women, serve

passenger trips constitute a much greater proportion of their car trips (18 per cent) compared to 10 per cent of men's car trips.

It is useful to further breakdown this analysis in terms of household type. As Figure 3 shows, men with children do significantly more dropping off and picking up (or 'chauffeuring') than those without (more than six per cent compared to two per cent of trips), but they still do substantially less than women in similar household arrangements. Whereas a woman with children under 14 travels about 35 per cent of the time to pick up or drop off someone, the figures for a man in the same situation are around half this, as depicted in Figure 3. In this case persons living alone and those in other households are not similar, with other households doing a fair bit of chauffeuring.

Figure 3 Weekday Car Driver Trip Purpose - by Household Type



Source: NSW Department of Transport Household Travel Survey

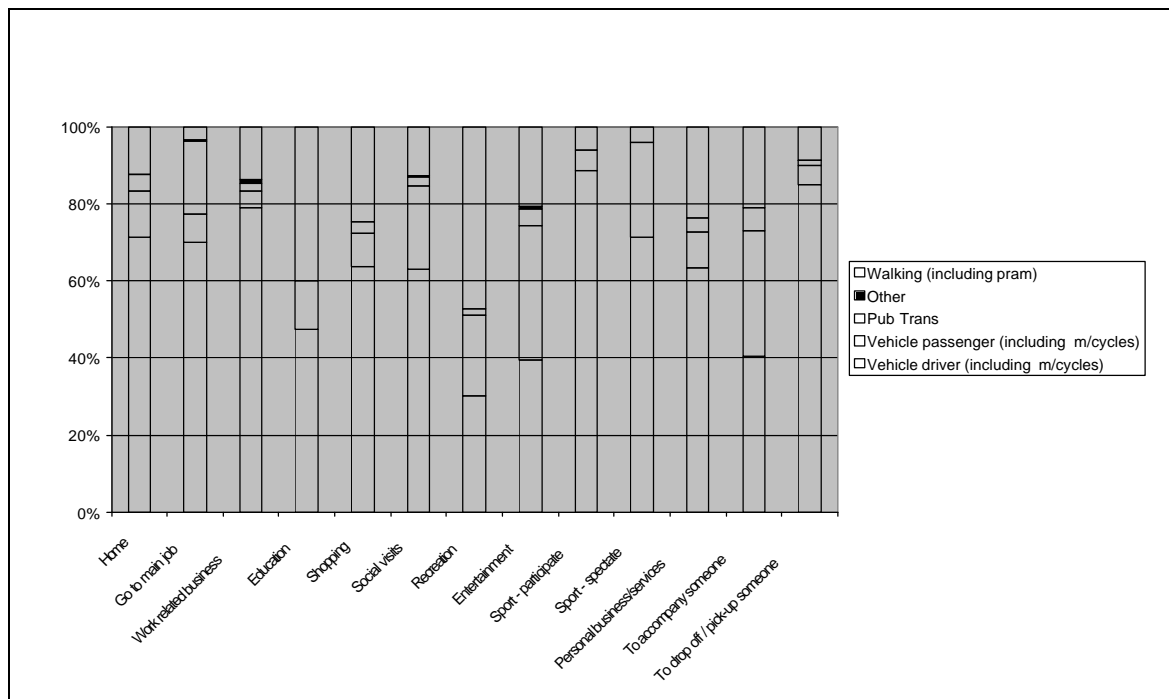
Children and Car Trips

Another question is the importance of children in generating car trips. For this paper, we give an indicator of this importance through a descriptive comparison of women with and without children, depicted in Figures 4 and 5. These show that for married women without children in their household, for most purposes car use is less than 50 per cent, though they do undertake a variety of trips as vehicle passengers. For married women with children under 14 the opposite is

the case: car driver accounts for more than 50 per cent of trips across all modes, for serve passenger it is over 80 per cent.

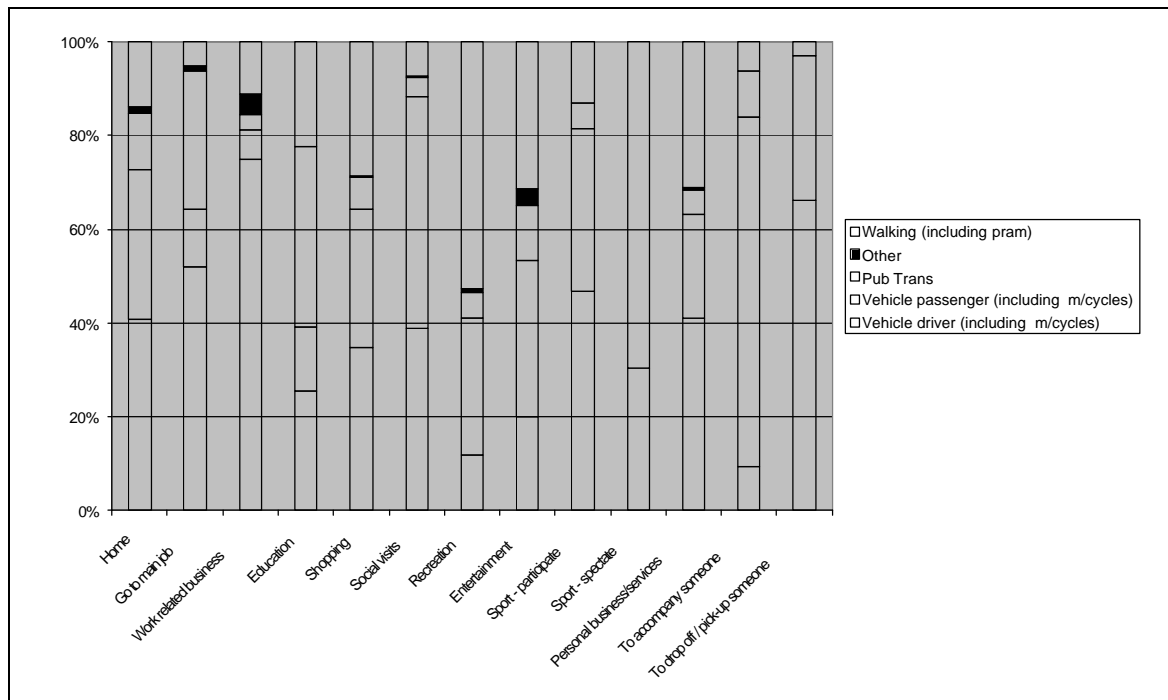
Non work related travel by motor vehicle is a considerable share of total urban travel demand. Of all weekday trips the fastest growing reasons for travel between 1991 and 1997 were social/recreational trips, up from 12.9 per cent in 1991 to 13.9 per cent in 1997, and serve passenger trips (defined as dropping off or picking up someone), up from 11.7 per cent in 1991 to 12.9 per cent in 1997 (TDC 1999). In 1997 the motor vehicle was the primary mode of travel for 64 per cent and 88.2 per cent per of these trips respectively (TDC 1999).

**Figure 4 Purpose of Trip by Mode
Female Married with Children < 14**



Source: NSW Department of Transport Household Travel Survey

**Figure 5 Purpose of Trip by Mode
Female Married with no Children (weekday)**

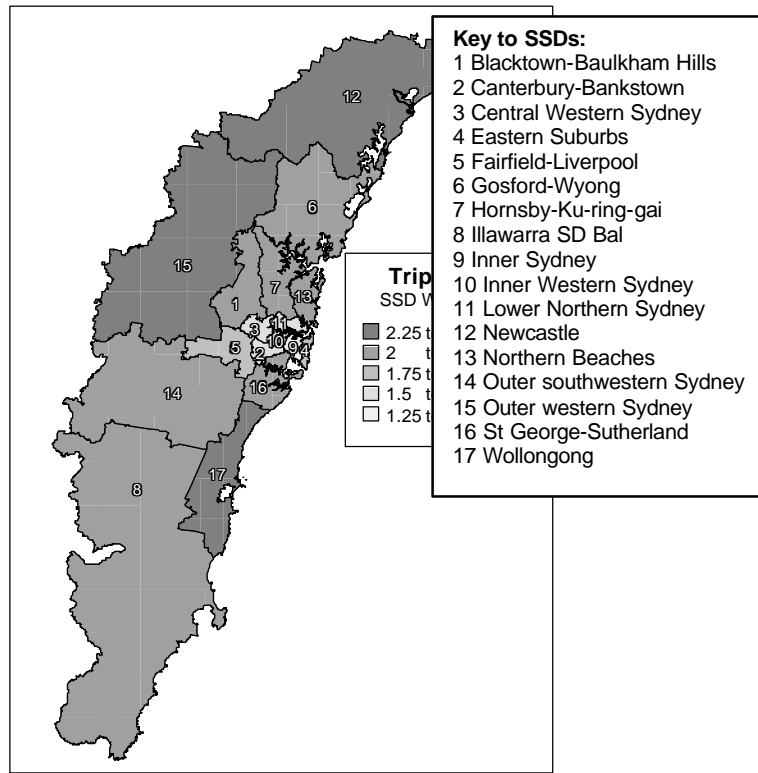


Source: NSW Department of Transport Household Travel Survey

Geographical Differentiation of Car Driver Trips

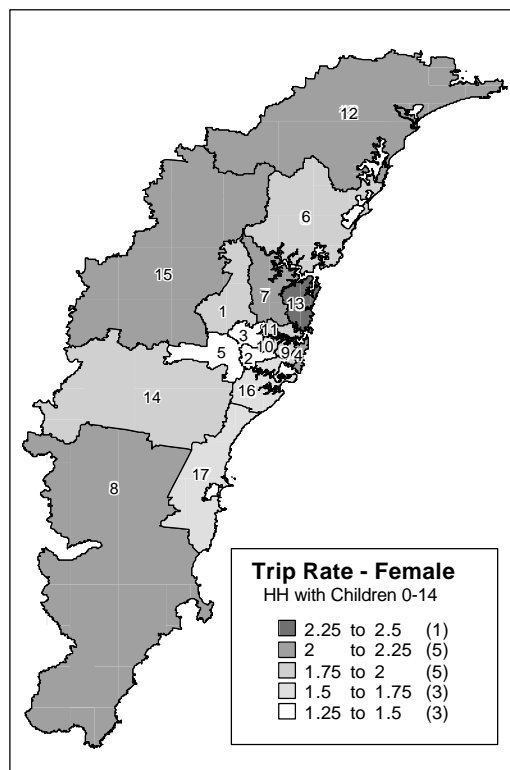
Having investigated broad differences in travel behaviour by household and gender we believe that further understanding should focus on geographical analysis in order to expose any differences in travel behaviour that may be more locationally specific. It is well understood that access to good public transport, jobs and other urban activities can yield lower levels of car use (Gollner 1996). However, there is also a recognized correlation between car use and economic wealth (Dieleman et.al. 2002; Pucher et.al. 1998). It may be, then, that in some places accessibility is over-ridden by other economic and lifestyle factors. Thus better understanding of what is influencing car use based on unique locational characteristics (socio-economic, demographic and accessibility indices) can assist more effective planning and policy responses.

Figure 6 Weekday Motor Vehicle Trip Rate by Statistical Sub-division – All Households



Source: NSW Department of Transport Household Travel Survey

Figure 7 Weekday Motor Vehicle Trip Rate by Statistical Sub-division - Female Households with Children



This research project has initiated early work on geographical differences in order to investigate the value of further geographical inquiry. Figures 6 and 7 map average weekday motor vehicle trip rates for: firstly, all households by Statistical sub-division; and secondly for all female households with children (all ages). Figure 6 indicates that motor vehicle trip rates are generally highest in the outer fringe areas, something that would generally be expected given lower levels of accessibility to alternative modes of transport as well as the more family-oriented demographics of these areas. This relationship between high car dependence and Australian fringe suburbs has long been acknowledged by authors such as Black (1977) and Faulkner & Rimmer (1982). Figure 7 maps motor vehicle trip rates for women with children 0-14 and shows a very different picture: some inner and middle areas have higher trip rates than outer areas. This may be the influence of higher income and higher car ownership levels and thereby usage in some areas like the Northern Beaches, Hornsby-Ku-ring-gai and the Eastern Suburbs. At the opposite end of the spectrum the lowest motor vehicle trip rates for women occur in the central and south-western suburbs (Fairfield-Liverpool, Canterbury Bankstown). These may be due to lower income or lower levels of car ownership, or may also be due to cultural attitudes towards women driving, given that these areas also have large concentrations of migrants from non-English speaking backgrounds.

Conclusions & Further Research

Some preliminary conclusions from this study on gender and household differences in travel behaviour, and to car use specifically, revolve around the significance of both household type and gender roles on car use trends. In summary, the following were some most significant differences identified in this investigation:

- Car use was highest for women and men in households with children, although it declined with the age of children;
- Women with children, whether married or lone parents, tended not to differ greatly in their car use (as a driver);
- Women with children did differ in their car use compared to men in the same situation (women were car passengers more often than men).

Additionally this research confirms the importance of analysis by socio-demographic and geographic detail. Urban regions like Sydney are spatially heterogeneous, with many of its sub-regions having unique demographic and cultural characteristics and therefore unique travel patterns. Consequently investigation of intra-urban travel behaviour by geographical and multivariate analyses (accessibility indices, household income, household type, gender, trip purpose) seems a rational idea. With this sort of understanding it may be possible to improve the way we model future travel patterns and thereby plan more effectively for both urban transport needs and travel demand management according to a more holistic understanding of the influences on travel behaviour.

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