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SELF-REGULATORY DRIVING PRACTICES OF OLDER DRIVERS IN THE AUSTRALIAN CAPITAL TERRITORY AND NEW SOUTH WALES

by

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ABSTRACT

This study examined self-regulatory practices adopted by older drivers in two Australian jurisdictions: the Australian Capital Territory (ACT) and New South Wales (NSW). A survey was distributed to a random sample of 6,000 people (3,000 residents of the ACT and 3,000 residents of NSW) aged 60 years and older. Survey responses from 1,697 current drivers (ACT: 1,015 NSW: 682) and 108 former drivers were available for analysis. Approximately two thirds of all current drivers reported that they drove daily or almost daily (ACT: 72%; NSW: 63%) and more than one third drove at least 100 kilometres per week (ACT: 36%; NSW 44%). Males were more likely than females to drive daily and travel greater distances and younger participants (<75 years) were more likely to drive more frequently and further than older participants (75 years and older). One-third of drivers reported that they drove less now than five years ago. Changes in driving distance as well as driving quality and speed were related to overall health status. The majority of drivers reported they were satisfied with their current amount of driving (ACT: 83%; NSW: 81%). Most of the drivers reported being very confident and had no difficulty in driving situations including intersections, busy traffic and other higher risk conditions. Overall, less than one quarter of participants reported that they routinely avoided these situations. The most commonly avoided driving situations were driving at night particularly when wet (15-25%) and driving in busy traffic (approximately 15%). Regression modelling was used to identify key characteristics of self-regulators amongst older drivers. Data for Victorian drivers from an earlier study as well as ACT and NSW drivers were included in these analyses. Those who self-regulated by avoiding *any* of the selected driving situations were more likely to be Victorian drivers (rather than ACT or NSW drivers), aged 75 years and older, female, have lower ratings of overall health and driving confidence, and live in rural areas. More than half of the drivers (ACT: 64%; NSW: 57%) said that they had thought about giving up driving one day while only 17 percent said that they had actually made plans for this. The majority of former drivers who participated in the study were 75 years and older (64%), female (61%), and lived in an urban area (75%). One third indicated that they went out daily or almost daily, while 28 percent went out only once or twice a week. Two-thirds of all former drivers were satisfied with their ability to go places and most said they stopped driving at about the right time, however, about one-quarter said they were not satisfied with their current ability to get places. Almost all of the participants (99%) indicated that they frequently used a private car as a passenger and just under half indicated that they regularly walked or used public transport to get to places. The three most important reasons for stopping driving were having someone available to drive them, availability of other forms of transportation and concern that their driving responses would not be fast enough in an emergency. A number of recommendations arising from this research are made for strategies to enhance the awareness of self-regulatory practices and to encourage older people to drive for as long as it is safe for them to do so.

Key Words:

Older Driver, Safety, Behaviour, Crash Risk, Travel Patterns, Countermeasure

Preface

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EXECUTIVE SUMMARY

BACKGROUND

Driving is of fundamental importance for older people and there is a strong emphasis around the world for older people to maintain their mobility for as long as possible. Older drivers are generally considered to be safe and cautious drivers, however, as people age, there are declines in sensory, cognitive and motor skills that can affect the ability to drive safely. Moreover, crash statistics indicate that older drivers currently face high levels of crash risk. It is frequently claimed that older drivers 'self-regulate' their driving behaviour to minimise the risk of crashing. It remains, however, that there are large gaps in our knowledge about self-regulation among older Australian drivers and about the effectiveness of these practices in reducing crash risk. A recent study provided the first detailed survey of the self-regulation abilities, practices, and limitations of older drivers (Charlton, Oxley, Fildes, Oxley, Newstead, O'Hare & Koppel, 2003). This study, however, was limited to a sample of Victorian drivers and former drivers and there remains a need for a larger survey which includes a broader representation of drivers and former drivers from other jurisdictions in Australia, particularly those with different licensing procedures.

SURVEY OF CURRENT AND FORMER OLDER DRIVERS

The broad aim of the study was to describe the prevalence and types of self-regulatory practices adopted by older drivers and to identify characteristics of those who self-regulate and those who do not amongst a larger and more representative sample of older Australian drivers from the ACT and NSW than the Victorian study. A survey was distributed to 6,000 people (3,000 residents of the ACT and 3,000 residents of NSW) aged 60 years and older. Survey responses from 1,697 current drivers (ACT: 1,015 NSW: 682) and 108 former drivers were available for analysis.

RESULTS FOR CURRENT DRIVERS

Driving Patterns

Approximately two thirds of all current drivers drove daily or almost daily (72% in the ACT and 63% in NSW). Both in the ACT and NSW, males were more likely than females to drive daily or almost daily and drive greater distances. Similarly, drivers under the age of 74 years were more likely to drive daily or almost daily and drive greater weekly distances than those 75 years and older. Overall, the majority of drivers reported they were satisfied with the amount of driving they did (83% and 81% for the ACT and NSW respectively).

Self-rated overall health and functional abilities for safe driving

Drivers in both ACT and NSW who reported that their overall health status was only good, fair or poor were less likely to travel longer distances per week than those who rated their overall health as excellent. In addition, ACT drivers who reported that they had vision problems and arthritis were less likely to drive more than 100 kilometres per week than those without these conditions. However, this relationship was not found in the NSW sample.

Changes in driving

Reduction in driving is one potential means of self-regulation. Just over half of the ACT and NSW drivers, reported no change in driving distance, and approximately one-third of

both samples reported that they drove less now than five years ago. The majority of drivers reported that their quality of driving and speed had not changed compared with five years ago. The relationship between changes in frequency, speed and quality of driving was examined. Drivers who reported that their quality of driving was not as good as five years ago, albeit a small proportion of all drivers, were more likely to drive less and drive slower. A significant relationship was also found between the overall health status and changes in the quality of driving, frequency of driving and changes in driving speed for both ACT and NSW drivers.

Confidence, difficulty and avoidance of driving situations

In general, participants from both ACT and NSW indicated that they were very confident and had no difficulty in the majority of driving situations. This was particularly evident for making right hand turns with signals providing a fully controlled turning phase. In contrast, fewer drivers were very confident when driving at night, and driving at night in the wet. Similarly, more than forty percent of respondents reported a 'little difficulty' with rain, driving at night, and driving at night when wet. Typically, males were more likely to be very confident and report no difficulty in all driving situations, except for making right hand turns at fully controlled traffic signals. Drivers in the oldest age group were less likely than younger drivers to be very confident in the majority of driving situations. There were few age differences found for difficulty ratings for driving situations.

In addition to rating confidence and difficulty in driving situations, participants were asked if they intentionally avoided these situations. Overall, the majority (up to 80%) of participants reported that they did not avoid the various driving situations. The most commonly avoided driving situations were driving at night particularly when wet (15-25%) and driving in busy traffic (approximately 15%). Females were more likely than males to report avoidance behaviour. Drivers aged 75 years and older were more likely than the younger groups to avoid the various driving situations, particularly merging driving at night and driving at night when wet. Drivers most commonly avoided merging due to concerns that other drivers were too fast or aggressive, rain due to safety reasons, busy traffic because it is too stressful, and driving at night and at night in the wet due to visibility issues.

A significant relationship was found between confidence ratings and avoidance behaviours for driving at night, driving at night when wet, and driving in busy traffic. Those who were only moderately confident, or not at all confident, were more likely to avoid these driving situations than those who were very confident. There was also a significant relationship found between overall health and vision problems with all three driving conditions for the ACT sample, but not for driving at night when wet and driving in busy traffic for the NSW sample. This suggests that some older drivers are self-regulating their driving behaviour, however, this was a relatively small proportion of the older drivers surveyed.

Self-regulations, crashes and infringements

Relatively few drivers reported that they had been in a crash in the last two years or had received a traffic infringement notice. There were no significant differences in crash involvement for gender, age or place of residence. However, males were more likely to report that they had received a traffic infringement notice than females. The relationship between health status, self-regulatory behaviours and crash involvements and infringements was examined. It was found that there was no relationship between health, changes in driving behaviour, or avoidance of driving situations and crash involvement or

incursion of infringement notices. Thus, it does not appear that there is a relationship between past crash involvement and infringements and self-regulatory behaviour.

Characteristics of the self-regulating driver and the non-self-regulating driver

Regression modelling was used to identify key characteristics of self-regulators amongst older drivers. Data for Victorian drivers from an earlier study were included in the regression modelling. One variable was considered exemplary of self-regulatory behaviour: avoidance of at least one potentially difficult and risky driving situation.

Those who avoided *any* specific driving situation (e.g. driving at night, in busy traffic etc) were more likely to be:

- **Drivers aged 75 years and older,** compared with those aged 65-74 years;

- **Females**;

- **Drivers who were not confident** compared with confident drivers - the strength of this effect was stronger for rural drivers than country and urban drivers;

- **Drivers who rated their overall health as good/fair/poor** (compared with excellent);

- **Victorian drivers in full time employment** compared with both NSW and ACT drivers of the same employment status; (and the same effect, albeit weaker, was evident for Victorian drivers not in full employment);

- **Drivers living in rural areas (and to a lesser extent, country towns) who were not confident**, compared with those in urban areas.

The finding that Victorian drivers were more likely to avoid potentially risky driving situations compared with ACT and NSW drivers was of considerable interest, given the differences in licensing practices between the three jurisdictions. Self-regulation is central to current international thinking about assessment of fitness-to-drive practices for older drivers. It is claimed, for instance, that if older people are able to adopt safer driving practices, then there is less need for them to have to submit to periodic testing. This would represent a substantial community saving. Indeed, Victoria relies on a community referral system to identify potentially at-risk drivers while ACT and NSW both have mandatory age-based assessments. While some have argued that regular licence re-testing may promote self-checking of driving abilities and self-regulation amongst drivers, evidence from the current study does not support this case. If this were true, then self-regulatory behaviours would be more prevalent in ACT and NSW drivers compared with Victorian drivers. In fact, the reverse was more generally the case.

Driving cessation: the experience of current drivers

Approximately two thirds (64% of ACT drivers and 57% of NSW drivers) of current drivers said that they had thought about giving up driving one day, however, only 17 percent said that they had actually made plans for this. The majority of participants indicated that health related issues would be the primary factors that would make them think about stopping driving. Interestingly, about half of drivers reported using alternative forms of transport other than driving. The most common modes of alternative transport were buses and trains.

RESULTS FOR FORMER DRIVERS

A secondary aim of this study was to explore issues relating to the decision to stop driving, factors that contributed to driving cessation, use of alternative transport options and the process of driving cessation. The majority of former drivers were 75 years and older (64%), female (61%), and lived in a metropolitan area (75%).

Approximately two-thirds of former drivers were very satisfied or somewhat satisfied with their ability to go places, and a third indicated that they went out daily or almost daily. Almost a half of former drivers indicated that it was very important for them to keep driving as long as they could. Almost all of the participants (99%) indicated that they used a private car as a passenger, either often or sometimes. Just under half indicated that they walked or used public transport. Interestingly, 18% of former drivers indicated that it was likely, or somewhat likely that they would drive again.

The three most important reasons given by former drivers for stopping driving were having someone available to drive them places, having other forms of transportation available and being concerned that their reactions would not be fast enough in an emergency. Other common reasons were no longer feeling like a safe driver, no longer enjoying or feeling comfortable when driving, and the cost of driving being too high.

The responses of participants who indicated that they chose not to attend a re-licence test were examined. Common reasons for choosing not to attend a re-licence test were ill health, age and safety concerns. Those who chose not to attend a re-licence test were more likely to be female, 75 years and older and widowed. They were also more likely to indicate that they chose to stop driving at the right time, and that they made the decision to stop driving by themselves than other former drivers.

The majority of former drivers reported that they had stopped driving all at once, and that they stopped driving at the right time. Approximately one third indicated that they stopped driving earlier than they should have. Furthermore, the majority of former drivers indicated that the decision to stop driving was solely theirs.

CONCLUSIONS AND RECOMMENDATIONS

The results of this study confirmed for a sample of Australian drivers, many of the findings from previous research with drivers in other western countries. In general, this study found evidence for age-related differences in changes in the amount of driving as well as avoidance of specific driving situations. A major contribution of this study has been to identify the influence of State/Territory of residence and a range of other characteristics associated with self-regulatory driving practices. The findings showed that self-regulators were more likely to be Victorian, aged 75 years or older, female, with lower overall health ratings, and lower confidence in risky driving situations, particularly rural drivers.

A number of recommendations arising from this research are made for strategies to enhance the awareness of self-regulatory practices and to encourage older people to drive for as long as it is safe for them to do so.

Recommendations include:

- Promote amongst older people better awareness of health and medical conditions and functional abilities that affect driving; and related to this

- Promote through educational materials and programs the adoption of self-regulatory practices consistent with declines in functional ability and presence of medical conditions known to be associated with crash risk;

- Promote early planning for retiring from driving amongst older drivers and their families as well as those agencies who work most closely with seniors in the community; and

- Explore strategies to provide better mobility options for former drivers to help them maintain their independence after driving cessation including access to alternative transport options, proximity to services, family and friends, and improved community infrastructure.

It is also recommended that further research be conducted to address some of the constraints of this study and explore further some of the current findings. Future research should:

- Explore the relationship between self-regulation and functional impairment, using standardised tests of cognition, attention, visual perception etc to assess functional abilities;

- Examine changes in self-regulatory practices in a cohort of drivers, particularly those over aged 75 years, using a longitudinal study method (e.g., over 5 years); and

- Consider further, the influence of mandatory age-based licensing requirements in determining self-regulatory driving practices, preferably using more direct measures of functional abilities and more targeted questions.

SELF-REGULATORY DRIVING PRACTICES OF OLDER DRIVERS

1 INTRODUCTION

Driving is a fundamentally important part of today's society and is influential in determining the quality of life for many older individuals. Many older adults rely on driving to fulfil most of their transportation needs, and to maintain mobility and independence. While there is a strong emphasis around the world for older people to maintain their mobility for as long as possible, it is also important to ensure that they remain safe drivers.

Driving is a complex task that places high demands on functional skills such as cognitive, attention, decision-making, perceptual and motor capacities. As age increases, these skills generally decline and these changes can affect the ability to drive safely. Indeed, current crash data suggests that older drivers are over-represented in serious injury and fatal vehicle crashes per distance travelled. Without appropriate intervention, the older road user safety problem is expected to increase three-fold over the following two decades, given the predicted increase in the proportion of older persons in the population and associated shifts in mobility patterns amongst older drivers (Fildes, Charlton, Fitzharris & Pronk, 2001).

The majority of older drivers are generally considered safe and cautious drivers, and it is frequently claimed that older drivers 'self-regulate' their driving behaviour, in other words, make adjustments in their driving patterns that adequately match their changing functional skills to minimise the risk of crashing (Evans, 1991; Eberhard, 1996; Smiley, 1999). For example, it is claimed that older drivers drive less frequently at night, in poor weather conditions, make fewer right hand turns at unregulated intersections, drive less frequently in busy traffic and on complex roads, and generally drive shorter distances (for a review, see Oxley, Charlton & Fildes, 2003). It remains, however, that there are large gaps in our knowledge about self-regulation among older Australian drivers, how widespread these practices are, which drivers are most likely to self-regulate and which are not, and about the effectiveness of these practices in reducing crash risk. A recent study conducted by the Monash University Accident Research Centre (MUARC), funded jointly by Austroads and MUARC baseline sponsors, provided the first detailed survey of the self-regulation abilities, practices, and limitations of older drivers (Charlton, Oxley, Fildes, Oxley, Newstead, O'Hare & Koppel, 2003). The previous study, however, was limited to a sample of Victorian drivers and former drivers. There is a need for a larger survey which includes a broader representation of drivers and former drivers from other jurisdictions in Australia, particularly those with different licensing procedures.

1.1 PROJECT OBJECTIVES

MUARC was commissioned by the NRMA-ACT Road Safety Trust, to undertake a study that extended and complemented the Victorian sample and address the issues surrounding adoption of self-regulatory practices amongst a larger and more representative sample of older Australian drivers. In this study, detailed information on the driving practices of older residents of the Australian Capital Territory (ACT) and New South Wales (NSW) was collected. The aims of this study were to:

- Provide a comprehensive description of the extent and types of self-regulatory behaviours of older drivers in the ACT and NSW, as well as the key characteristics that define the self-regulating driver, and the relationship between self-regulation and crash risk.

- Provide a larger and more representative sample of Australian drivers to examine the self-regulatory practices amongst older drivers;

- Enable comparisons between respondents in three jurisdictions the ACT, NSW, and VIC[1] that have different re-assessment procedures for determining fitness-to-drive.

- Provide a large sample of former drivers who have recently given up driving in order to better understand the processes leading up to and factors influencing the decision to stop driving.

- Provide recommendations for countermeasures to reduce crash and injury risk amongst older drivers.

This report provides a summary of the literature, highlighting a number of issues surrounding older driver's safe mobility including: the emerging older driver 'problem' in the context of the demographics of the ageing population; the importance of driving for older adults; licensing issues; and an examination of the factors that promote and inhibit the adoption of self-regulatory driving practices. A detailed description of the method and findings of the survey is also documented. Results describe the practice of self-regulation amongst the samples and highlight the profile of the 'self-regulating' older driver. They also describe the characteristics of older drivers who fail to regulate their own driving behaviour. A comparison of the findings of each State is presented and a discussion of the impact of licensing procedures on adoption of self-regulatory behaviours is provided. The information gathered from former drivers are also presented and includes a summary of issues relating to their decision to stop driving, factors that contributed to driving cessation, availability and use of alternative transport options and the impact of driving cessation on aspects of their life. Some conclusions and recommendations are provided, specifically the development of educational materials and programs to raise awareness of factors that affect crash risk and to promote the adoption of appropriate self-regulatory practices, and strategies to help older people maintain their independence. Further research is also recommended to explore some of the outcomes of the current research program.

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[1] The Victorian sample is described in the report by Charlton et al (2003).

2 OLDER DRIVERS, BEHAVIOUR AND CRASH RISK

Driving is a fundamentally important part of today's society and is an essential determinant of the quality of life of older individuals. Many older adults rely on driving to fulfil most of their transportation needs, and to maintain mobility and independence. While current emphasis around the world stresses the need for older people to maintain their mobility for as long as possible, it is also important to ensure that they remain safe drivers.

Most people experience some level of functional decline as they age, particularly in sensory, physical and cognitive areas. Driving, at least in some situations, is a complex task that demands a host of age-sensitive functions such as processing and integration of multiple sources of visual information and quick interpretation of the most important stimuli in fast-moving and busy traffic. Much research has attempted to understand the effect of declining functions and presence of medical conditions on crash risk and travel patterns and some associations have been found. However, there is also evidence to suggest that the majority of drivers can and do adapt or compensate for their (real or perceived) impairment while driving and this will undoubtedly have some bearing on their likelihood of crash involvement. More research is clearly warranted to better understand the links between crash risk, medical conditions and levels of functional impairments and the impact of compensatory strategies in moderating their risk.

2.1 CRASH RISK

The majority of older drivers are generally considered safe and cautious drivers, and in terms of absolute numbers of crashes, they are currently not a large road safety issue in most Western societies, representing a relatively small proportion of crashes. Older drivers constitute approximately 13 percent of fatal crashes and around 10 percent of serious injury crashes in Australia. By comparison, younger drivers aged 17-24 years account for around 29 percent of fatal and 32 percent of serious injury crashes (Australian Transport Safety Bureau, 2001). International figures show similar trends.

However, there are relatively fewer older people in the population, fewer are licensed, they tend to drive less frequently and shorter annual distances, and they are more fragile than younger drivers. Thus, when crash statistics are adjusted to take account of any of these factors, the safety of older drivers is clearly of concern. Current crash rates suggest that older drivers are over-represented in serious injury and fatal crashes per head of population and distance travelled. Figure 1 shows the number of serious injury crashes per billion kilometres travelled by age group for drivers with and without adjustment for differences in physical vulnerability. After controlling for differences in vulnerability and distances travelled, older drivers aged 70 years and older have a higher serious injury crash risk than younger drivers with the exception of the youngest driver age group (under 25 years).

Recent evidence suggests that there may be some bias in the exposure-adjusted rates presented in Figure 1. Comparisons based on annual distances travelled may be too simplistic and may inflate older driver risk, as they are typically compared with other age groups having larger yearly driving exposure (Hakamies-Blomqvist, Raitanen & O'Neill, 2002). This has been termed the 'low-mileage bias'. That is, independent of age, drivers travelling more kilometres will typically demonstrate reduced crash rates per kilometre travelled, compared to those driving fewer kilometres (Janke, 1991). This, it is suggested, is because more experienced drivers may be more proficient in the driving task and so are able to avoid crashes more successfully. 'Low-mileage' drivers may be those who restrict their driving in response to a perceived decline in driving performance, may have more

medical conditions, greater functional difficulties, lack quantitative and qualitative driving experience and lack confidence and intuitively a higher probability of crashing (Eberhard, 1996; Smiley, 1999; Parker, MacDonald, Sutcliffe & Rabbitt., 2001; Charlton et al., 2003; Hakamies-Blomqvist & Sirén, 2003; Stutts et al., 2001). In addition, 'low-mileage' drivers may also be those drivers who do their driving on the urban road network. Particularly for older drivers, urban travel is more likely to result in crashes, due to greater numbers of complex traffic environments and possible traffic conflict points, such as at intersections (Keall & Frith, 2004).
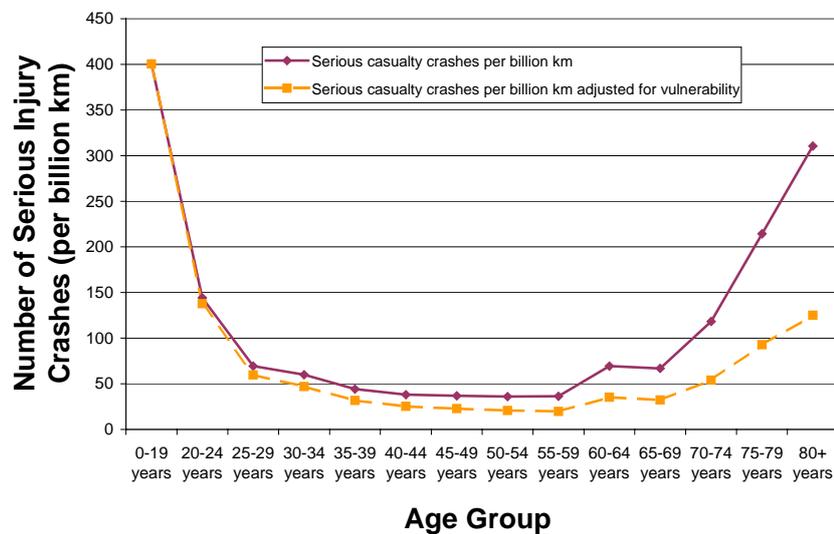
Figure 1: Involvement in serious injury crashes by age adjusting for exposure and vulnerability, Australia, 1996.

More importantly, it is predicted that, with the ageing of the population and significant demographic and socio-economic changes, older driver safety is likely to become a much larger issue in the years ahead, in part, as a consequence of the increased number of older, potentially more mobile drivers in the community. Australia, like most Western societies, predicts substantial changes in the proportion of older persons in the population in the foreseeable future, from approximately 12 percent in 2005 to over 24 percent in 2051. This growth will be most pronounced in the 85 year old and above group, particularly females, with the proportion in this age group expected to increase four-fold (Australian Bureau of Statistics, 1999). In addition, it is likely that changes in licensing rates amongst the elderly will affect crash rates. Currently, in Victoria, 64 percent of 70-79 year olds and only 35 percent of 80+ year olds hold a licence. Similar proportions are noted in other Australian jurisdictions. Given that the next cohort of older people have grown up with the car, it is reasonable to expect that they will be more likely to retain their licences. The Organisation for Economic Co-operation and Development [OECD] (2001) estimated that the proportion of Australia licensed drivers aged 65 years and over would increase from 13 percent in 2000 to 22 percent in 2030. Furthermore, while it is generally noted that, on average, older people travel less than other age groups, there has been an increase in the number of trips and amount of travel undertaken by older drivers over the last 20 or so years (US Department of Transportation, 2001; Land Transport Safety Authority [LTSA], 2000). This trend is likely to continue in the coming decades.

Fildes et al. (2001) established projections of the crash risk for future generations of older road users in Australia, taking into account driving behaviour, population migration, personal wealth and health, infrastructure and technological impacts. Figure 2 shows the projected outcomes from this modelling and shows a predicted overall three-fold increase in fatal crashes involving older drivers without active intervention. In 1995 there were 121 older driver fatalities and this is expected to increase to 341 in 2025, an overall increase of 281 percent above 1995 figures (an increase of 261% for males and 336% for females).
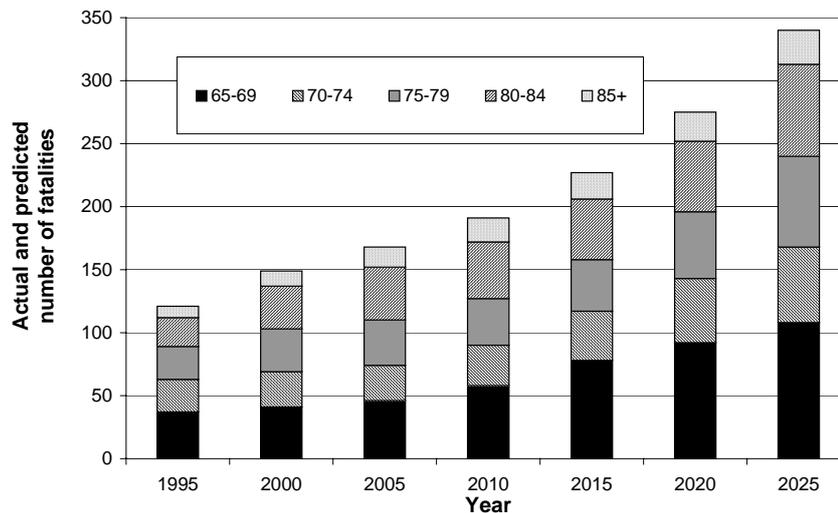
Figure 2: Projected older driver fatalities in Australia, 1995 – 2005

In summary, the greying of society and associated demographic changes will mean that older drivers, particularly those in the oldest age groups, will have a much higher presence on the road and therefore a higher likelihood of crash involvement. Older road users will present a major challenge for road safety over the next 20 to 30 years and will require a better understanding of the driving behaviours, travel patterns and crash risk in order to develop effective strategies and programs to support continued mobility and safety.

2.2   RISK FACTORS

The causes of older road user crashes are undoubtedly complex and poorly understood, however, it is necessary to attempt an understanding of the potential risk factors in order to develop appropriate measures to decrease risk. Several explanations have been offered to account for the over-representation of older drivers in fatal and serious injury crashes including age-related changes in functional performance and health status as well as changes in driving factors. There is widespread agreement that the normal ageing process generally reduces or slows down sensation, perception, cognition, and physical functioning, and that most older adults experience some level of functional decline as they age. Safe and efficient driving requires the adequate functioning of a range of these abilities and loss of efficiency in any function can reduce performance and increase risk on the road. There are a number of excellent reviews of functional and health issues and the relationship with driving, particularly those by Janke (1994) and Marottoli, Richardson, Stowe, Miller, Brass, Conney and Tinetti (1998).

While much research effort in the last decade or so has attempted to establish associations between various skills, medical conditions and crash risk, surprisingly few unequivocal relationships have been found between declines in single functions and crash rates. Indeed, it is argued that moderate functional changes related to normal ageing do not appear to lead to a discernible increase in crash risk. Rather it seems that simultaneous deteriorations of several relevant functional and/or specific functional deficits linked to certain illnesses (especially those that lead to cognitive deterioration such as dementia) increases crash risk considerably (OECD, 2001).

Many researchers now contend that the older driver 'problem' is mainly restricted to certain sub-groups of older people, rather than encompassing all older people and much of the recent research, therefore, has shifted from a general approach of *why* older drivers have high crash risk to focussing on identifying *which* older drivers are most at risk (OECD, 2001).

2.3   SELF-REGULATION

It is clear that not all medical conditions affect crash risk to the same extent and not all individuals will be affected in the same way, and it is not necessarily the medical condition and/or the medical complications per se that affect driving performance and therefore crash risk, but rather the functional impairments that may be associated with these conditions. Indeed, in his discussion on the merits of focusing on impairments in assessing risk, Marottoli points out that functional impairments are '…the common pathway through which medical conditions affect driving capability' (2001, p.11). More relevant to the current study is the extent to which individuals may be able to adapt or compensate for their impairment while driving, which will undoubtedly have some bearing on their likelihood of crash involvement.

One of the widely held assumptions about older drivers is that many individuals learn to compensate for or adapt to medical conditions and functional changes by adjusting their driving behaviour, that is, there is a high level of 'self-regulation' (e.g., Rabbitt, Carmichael, Van Shilling & Sutcliffe, 2002). Examples of self-regulatory behaviour include: driving more slowly; travelling shorter distances; making fewer trips; avoiding driving under more difficult conditions such as at night, peak travel times and other stress-inducing situations; preference for longer time gaps when turning or merging; and avoidance of simultaneous activities while driving. The abilities of older drivers to regulate their driving according to their own abilities, to continue to drive safely, are thought to be important skills in reducing the incidence and severity of crashes.

The processes involved in self-regulation and the factors that influence adoption of self-regulatory behaviour are complicated and not well understood. Some argue that the majority of older drivers can, and do, self-regulate effectively, while other evidence suggests that, at least some, older drivers do not self-regulate adequately. A number of facilitatory and inhibitory factors to the adoption of self-regulatory behaviours have been identified in the literature and are summarised in Table 1.

For the most part, the literature refers to these behavioural changes as 'compensatory', implying that older drivers change their behaviour in response to a loss of function or as a counteracting measure for difficulties experienced. Indeed, a large proportion of the evidence points to caution and conservativeness on behalf of older road users (Rumar, 1986; Winter, 1988; Eberhard, 1996; Smiley, 1999). However, it may not be entirely accurate to label such behavioural adaptations as 'compensation'. While these changes

may reflect a behavioural adaptation to age-related changes in performance levels, other explanations are possible, such as mature judgements about road use, lifestyle choices, and personal preferences brought about by changes in employment status, place of residence and proximity to services. Even younger drivers might avoid driving in darkness or during peak traffic periods if not forced to by their circumstances.

Table 1: Facilitatory and inhibitory factors for adoption of self-regulatory practices amongst older drivers.

FACILITATORY FACTORS	INHIBITORY FACTORS
• Insight/awareness of the impact of declining functional performance and health issues on driving skill	• Lack of insight into one's own physical status and functional ability
• Influence from others (family, friends, general practitioner, other health professionals)	• Lack of awareness of the impact of ageing on driving performance (e.g., presence of dementia
• Concerns for own and others' safety	• Inappropriate risk assessment
• Lifestyle choice and comfort	• Perceptions of loss of independence
• Good access to alternative transport	• Lack of available alternative transport and reluctance to become dependent on others

Those that argue that most older drivers self-regulate point to the differences in travel patterns of older drivers compared to younger drivers. The most common difference that is reported is in terms of distance travelled. Trips tend to be shorter, closer to home, and for different purposes than those of younger drivers (the most common being for shopping for older women and social, recreational and medical visits for older men, as opposed to work-related trips for younger drivers) (Rosenbloom, 1999; Benekohal, Michaels, Shim & Resende, 1994). In addition, as drivers age, they tend to become more conservative in driving habits, limiting when and where they travel. In general, older drivers tend to drive more in daylight and avoid driving at night (Benekohal et al., 1994; Mortimer & Fell, 1988; Stewart, Moore, Marks, May & Hale, 1991; West, Gildengorin, Haegerstrom-Portnoy, Lott, Schneck & Brabyn, 2003).

In contrast, it is also possible that some fail to self-regulate appropriately and, as a consequence, may be at a higher risk of crash involvement. There is some evidence to suggest that older drivers, or at least some older drivers, do not self-regulate adequately. This may be due to a difficulty, particularly for older adults, in making judgements about their own competency to perform everyday tasks. Support for this comes from the work of Stutts (1998) who examined functional abilities and driving habits in a group of drivers aged 65 years and over in North Carolina who were applying for licence renewal. While a clear pattern of reduced driving exposure among this group was found, Stutts also found that a small but significant proportion of drivers with cognitive impairment did *not* limit their driving with around half of the drivers in the lowest quartile of cognitive performance still driving more that 3,000 miles a year. In fact, nearly 20 percent of participants reported

driving more than 10,000 miles a year (a figure well above the average for this age group). Similarly, Dobbs (1996) found that, of 90 older drivers referred to by physicians at the Northern Alberta Regional Geriatric Program, 70 percent were recommended to stop driving altogether and a further 15 percent to restrict their driving. Dobbs, however, did concede that many of these people were diagnosed as having clinically significant memory and cognitive dysfunctions and may not have been necessarily representative of all older drivers. Nevertheless, this finding shows that there were some older people still driving who perhaps should not have been or, at least, should be restricting their driving. Ball and Owsley (1991) also noted that older drivers continued to drive for as long as possible and that, although they may cut down on their frequency of travel, they resisted any change to their preferred mode of travel. They concluded that self-regulation and self-imposed limitations are not a realistic strategy for reducing exposure to potential crashes among the elderly. Recent data confirm the view that the preferred mode of transport for older people is the private car and that older people generally report no problems for driving, but experience substantially more problems using other transport modes, particularly walking or using public transport (Ståhl, Brundell-Freij & Makri, 1993; American Association for Retired Persons [AARP], 2001; OECD, 2001).

It is also important to acknowledge that self-regulation (or the failure to self-regulate) is not the exclusive domain of the older driver. Rothman, Klein and Weinstein (1996) argued that people of all ages are poor at recognising the relationship between their own actions and potential risks and that they perceive themselves as less likely than their peers to suffer harm. They further suggested that this optimism about one's invulnerability could hinder the adoption and maintenance of preventive behaviours. Indeed, many attribute the high crash risk of young drivers to risk-taking behaviour, noting that they are simply more willing to take risks (Macdonald, 1994) and that they have under-developed risk perception and calibration, (i.e., matching one's driving performance with task demands) skills (Regan, Triggs & Godley, 2000). Other reports suggest that older drivers in particular are likely to overestimate their own driving ability and under-estimate the risk of being involved in a crash (Brainin, 1980; Matthews, 1986). Holland and Rabbitt (1992) examined age-related sensory and cognitive deficits and highlighted a lack of awareness of changes in visual ability amongst older adults. They found that older people were unaware of the extent of their declining eyesight and reaction times. They did not perceive complex intersections as posing any particular problem to them, considered their reaction time as good as when aged 50 years, and felt that their ability to cope with intersections and roundabouts was much the same as it had been at younger ages. They argued that older drivers who are unaware of their deteriorating capabilities cannot make appropriate adjustments to their behaviour on the road. However, they also suggested that when people are aware of their declining abilities, they do make sensible changes to their driving behaviour. Indeed, a recent study showed some benefit of educational tools in promoting the avoidance of challenging driving situations and reduction of driving exposure through self-regulation and awareness of the impact of visual impairment on driver safety (Owsley, Stalvey & Phillips, 2003).

Another issue worth considering is that some older drivers who do not self-regulate may be part of a group who have always been unable to self-regulate. For instance, Kruger and Dunning (1999) argued that some people (at any age) tend to over-estimate their abilities in many social and intellectual domains and this is due, in part, to deficits in meta-cognitive skill. It would be interesting to know whether those who are unable to self-regulate appropriately as older drivers differ in some fundamental characteristics from those who have had difficulty self-regulating from youth.

To date, there has been little information from the Australian context, about the self-regulatory behaviour of older road users. A recent Australian study of self-regulatory practices amongst a sample of Victorian drivers provided the first detailed survey of self-regulation practices for a sample of 650 older Victorian drivers and 30 former drivers (Charlton et al., 2003). This study provided a rich source of information about older drivers' self-regulatory practices and found that a relatively small proportion of drivers over aged 55 years adopted self-regulatory practices such as driving shorter distances and avoiding driving in the wet, at night and in busy traffic. In addition, this study highlighted some key driver characteristics that were strongly associated with self-regulatory driving practices (i.e., avoidance of specific driving situations. Self-regulators were more likely to be women, aged 75 years or older, with vision problems, with arthritis, not the principal driver in the household and not married. The study also raised questions about those drivers who arguably should be self-regulating because of declining abilities, but who did not adapt their driving behaviour accordingly.

The current study provided an opportunity to examine whether the findings of the Victorian study were representative of patterns of self-regulation elsewhere in Australia, specifically in the ACT and NSW. Differences in State and Territory-based re-licensing systems, for example, may influence the adoption of self-regulatory practices and decisions about driving cessation. Because of the unique licensing requirements for older drivers in Victoria, it remains unclear whether the findings of Charlton and colleagues (2003) can be generalised to other States and Territories. The ACT and NSW also have different requirements for age-based medical and on-road driver tests while Victoria has no mandatory age-based assessment but uses a community referral system for drivers of all ages.

Self-regulation is central to current international thinking about assessment of fitness-to-drive practices for older drivers. It is claimed, for instance, that if older people are able to adopt safer driving practices, then there is less need for them to have to submit to periodic testing. This would represent a substantial community saving. However, evidence to support such a claim is not yet available. An alternative view is that drivers subjected to regular medical review of fitness to drive may be more likely to give consideration to their health and capacity to drive safely and/or to discuss their fitness to drive with their family doctor at the time of their medical review for driving. This may lead more drivers to make adjustments in their amount and type of driving if appropriate, and to make timely plans and more considered judgements about stopping driving when they consider they are no longer safe to do so. A third possibility is that some older drivers, particularly females, may give up their licence prematurely (and unnecessarily) because they find the re-licensing assessment too daunting/stressful. This is evidenced in recent data from Queensland showing a peak in licences voluntarily surrendered at the age of mandatory re-assessment (MUARC, 2002). There is also evidence from studies in the United States (e.g., Stutts, Wilkins, Reinfurt, Rodgman & van Heusen-Causey, 2001) suggesting that the mobility of many older drivers is compromised by premature cessation.

While a number of studies have been conducted on the travel patterns and driving characteristics of older drivers in the US and Europe, less is known about the prevalence and process of self-regulation among older Australian drivers and about the effectiveness of these practices in reducing crash risk and still much to be learned about these relationships. More research is needed to gain a better understanding of how widespread self-regulatory driving practices are, what kinds of adaptive strategies drivers adopt, and the reasons why they self-regulate. This report describes a study of self-regulatory

behaviours of older drivers in the ACT and NSW. The study will complement and extend the findings of previous research describing self-regulatory patterns of older Victoria drivers.

SURVEY OF CURRENT AND FORMER OLDER DRIVERS

A survey exploring self-regulatory driving behaviours and driving cessation was conducted in the Australian Capital Territory and New South Wales in 2005. The focus was on identifying the characteristics that distinguish those road users who *do* exercise good self-regulatory behaviour from those who arguably *should be* self-regulating, but who *do not*. A detailed description of the recruitment of potential participants and questionnaire development is provided here.

3   METHOD

Information on demographic characteristics, driving and travel patterns, changes in driving and travel patterns and confidence in and avoidance of driving situations was sought from older drivers in the ACT and NSW using a self-administered questionnaire.

3.1   RECRUITMENT OF PARTICIPANTS

Participants for the survey were recruited through the ACT Council on the Ageing (COTA) National Seniors and NSW Seniors Card offices, utilising the respective jurisdiction Senior Card membership databases. In the ACT and NSW, over 90 percent of eligible seniors hold a Seniors Card and the databases contain basic personal information on all ACT and NSW residents who have membership to Seniors Card. To be eligible for an ACT or NSW Seniors Card, individuals must be aged 60 years or over, be a permanent resident of the ACT or NSW, and not be in paid employment for more than 20 hours per week.

Questionnaire packages including a cover letter, the questionnaire, a consent form for follow-up interview and a reply-paid envelope were sent to ACT-COTA National Seniors and NSW Seniors Card and then mailed to a random selection of 3,000 older ACT residents in January, 2005, and 3,000 older NSW residents in February, 2005. In order to target a representative sample of the population of older drivers and former drivers in the ACT and NSW, the selection was stratified according to gender and age groups as follows (age at 31/12/2005):

ACT:

- 441 men aged 60-64 years (birthdate 1/1/1940 - 31/12/1944)

- 315 men aged 65-69 years (birthdate 1/1/1935 - 31/12/1939)

- 250 men aged 70-74 years (birthdate 1/1/1930 - 31/12/1934)

- 195 men aged 75-79 years (birthdate 1/1/1925 - 31/12/1929)

- 119 men aged 80-84 years (birthdate 1/1/1920 - 31/12/1924)

- 64 men aged 85+ years (birthdate before 31/12/1919)

- 441 women aged 60-64 years (birthdate 1/1/1940 - 31/12/1944)

- 335 women aged 65-69 years (birthdate 1/1/1935 - 31/12/1939)

- 268 women aged 70-74 years (birthdate 1/1/1930 - 31/12/1934)

- 248 women aged 75-79 years (birthdate 1/1/1925 - 31/12/1929)

- 178 women aged 80-84 years (birthdate 1/1/1920 - 31/12/1924)

- 146 women aged 85+ years (birthdate before 31/12/1919)

NSW:

- 375 men aged 60-64 years (birthdate 1/1/1940 - 31/12/1944)

- 309 men aged 65-69 years (birthdate 1/1/1935 - 31/12/1939)

- 266 men aged 70-74 years (birthdate 1/1/1930 - 31/12/1934)

- 213 men aged 75-79 years (birthdate 1/1/1925 - 31/12/1929)

- 131 men aged 80-84 years (birthdate 1/1/1920 - 31/12/1924)

- 80 men aged 85+ years (birthdate before 31/12/1919)

- 369 women aged 60-64 years (birthdate 1/1/1940 - 31/12/1944)

- 320 women aged 65-69 years (birthdate 1/1/1935 - 31/12/1939)

- 293 women aged 70-74 years (birthdate 1/1/1930 - 31/12/1934)

- 267 women aged 75-79 years (birthdate 1/1/1925 - 31/12/1929)

- 199 women aged 80-84 years (birthdate 1/1/1920 - 31/12/1924)

- 178 women aged 85+ years (birthdate before 31/12/1919)

All participants were informed that their name had been randomly selected from the Seniors Card membership list and that personal details had not been given to any party. They were invited to complete the questionnaire if they were 60 years or older[2] and either currently drove a car or had recently ceased driving. If they had never driven a car, they were asked to pass on the questionnaire to another older driver or former driver who met the specified criteria.

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[2] Note that the age criterion identified in the survey was 55 years. However, because recruitment was based on Seniors Card holders, only those aged 60 years and older received a direct invitation to participate. A very small number (< 5) responses were received from drivers aged 55-59 years (possibly having surveys passed on to them by original recipients who chose not to do the survey). Their responses were not included in the analyses.

3.2 QUESTIONNAIRE DEVELOPMENT

The questionnaire was similar to that designed for the Victorian sample. It was designed to gather information on the driving practices of older drivers, transportation needs and driving decisions. The project research team developed the survey questions based on national and international literature and with input from a number of sources including:

- University of North Carolina, Highway Safety Research Center,

- Federal Highways Administration, US Department of Transportation,

- Swedish National Road and Transport Research Institute (VTI), and

- University of Michigan, Transportation Research Institute.

The questionnaire comprised three sections. The first section, Section A, was completed by all participants and gathered demographic information and information on general health. Participants were asked to complete one of the following sections, depending on whether they considered themselves current or former drivers. Section B was completed by current drivers only. This section asked for detailed information about travel patterns, driving behaviour, recent changes in driving patterns and reasons for any change, confidence in, difficulty with, and avoidance of driving situations, self-assessment of driving ability, driving cessation and alternative transport options, and general questions on crash and infringement history. Section C was completed by former drivers only. This section asked for detailed information about the process and experiences leading up to stopping driving, the experience of stopping driving, availability and use of alternative transport, and satisfaction with current mobility. A copy of the questionnaire and Letters of Invitation can be found in Appendix 1.

3.3 ANALYSES

Current and former drivers' responses to the questionnaire were summarised using descriptive statistics. Relevant univariate analyses (e.g. chi-squares) were conducted to compare self-regulatory behaviour (i.e. avoidance of certain driving conditions) across variables of interest including confidence and difficulty ratings, overall health ratings and reported medical conditions. In addition, more sophisticated logistic regression modelling was conducted to ascertain the relative importance of these variables in predicting self-regulatory behaviour in older driver. The criterion for significance was set at $p < 0.05$.

4 RESULTS

The findings of the survey are presented here, describing the driving and travel behaviour of participants. Key aspects of the analyses include the adoption of specific self-regulatory behaviours such as changes in driving distances, frequency and speed and behaviours; perceived confidence and difficulty in specific driving situations (at night, in busy traffic, etc.) and avoidance of these situations. Common reasons for self-regulatory driving patterns are also presented. Consideration is given to participant characteristics that are associated with the adoption of (or failure to adopt) self-regulatory behaviour(s). A particular focus is the association between driver characteristics, failure to self-regulate and crash risk. Last, the experiences of former drivers are described, including factors that contributed to their decision to stop driving, those involved in their decision-making and current availability and use of various transport options.

4.1 RESPONSE RATE

Of the 6,000 surveys distributed, a total of 1,830 responses were returned, including 1,722 current drivers and 108 former drivers. One hundred and twenty-three surveys were returned unopened (incorrect name and/or address). In addition, a total of 40 current driver surveys and 38 former driver surveys were returned incomplete (i.e., with no Section A: demographic data); hence these responses could not be included in the analyses presented below. This represented a valid response rate of 27%. The next section describes the results for current drivers, analysed separately by State/Territory of residence. Results for former drivers are presented in the following section (see section 4.3).

4.2 CURRENT DRIVERS

4.2.1 Sample characteristics

Table 2 provides information on age, gender and place of residence of the survey participants presented by State of residence. A total of 1015 respondents who classed themselves as current drivers were from the ACT and 682 were residents of NSW. There were 25 current drivers for whom State of residence was unknown (missing data). Data for these drivers were not included in the State-based analyses presented below. In addition, 11 NSW and 7 ACT current drivers did not provide information on age and 12 NSW and 7 ACT drivers did not indicate their gender. There were also 17 NSW cases and 14 ACT cases who did not provide information on their place of residence (i.e. urban or other area).

Of those ACT participants who indicated that they were a current driver, 40 percent were female. Thirty-two percent of ACT drivers were aged between 60 and 64 years, 47 percent were aged between 65 and 74 years old and 20 percent were aged 75 years and older. The majority of ACT respondents indicated that they were resident in urban areas (95%). This was not unexpected, given the large urban demographic of ACT, predominantly resident in the city of Canberra. The gender distribution for the sample of NSW drivers was similar to that of the ACT. However, the age group and place of residence distributions differed considerably from the ACT pattern; most notably, there was a relatively equal spread of residents in urban areas and country towns (41% and 39%, respectively)

Table 2: Summary of age, gender and place of residence of ACT and NSW participants.

	ACT Proportion of current drivers (%) n=1,015	NSW Proportion of current drivers (%) n=682
Age		
< 64 years	33	17
65 to 74 years	47	53
75+ years	20	29
Unknown / Missing	1	2
Gender		
Male	60	60
Female	40	38
Unknown / Missing	<1	2
Place of Residence		
Urban	95	41
Country Town	3	39
Rural	1	17
Other	0	<1
Unknown / Missing	1	2

Figure 3 shows the distribution of the sample of ACT current drivers by age group and gender in relation to the population of ACT licence holders. Recent data for the overall population of ACT licence holders aged 60 years and older in 2003 (Urban Services, 2003) show that 55 percent are male and 45 percent are female. Of these, 36 percent are aged 60-64 years (36 percent males and 37 percent females), 43 percent are aged 65-74 years (42 percent males and 43 percent females), and 21 percent are aged 75 years and older (21 percent males and 20 percent females). Compared with the overall population of ACT licence holders, the current sample is slightly under representative of both females and males in the 60-64 year age group and slightly over-representative of the 65-74 year old age group.
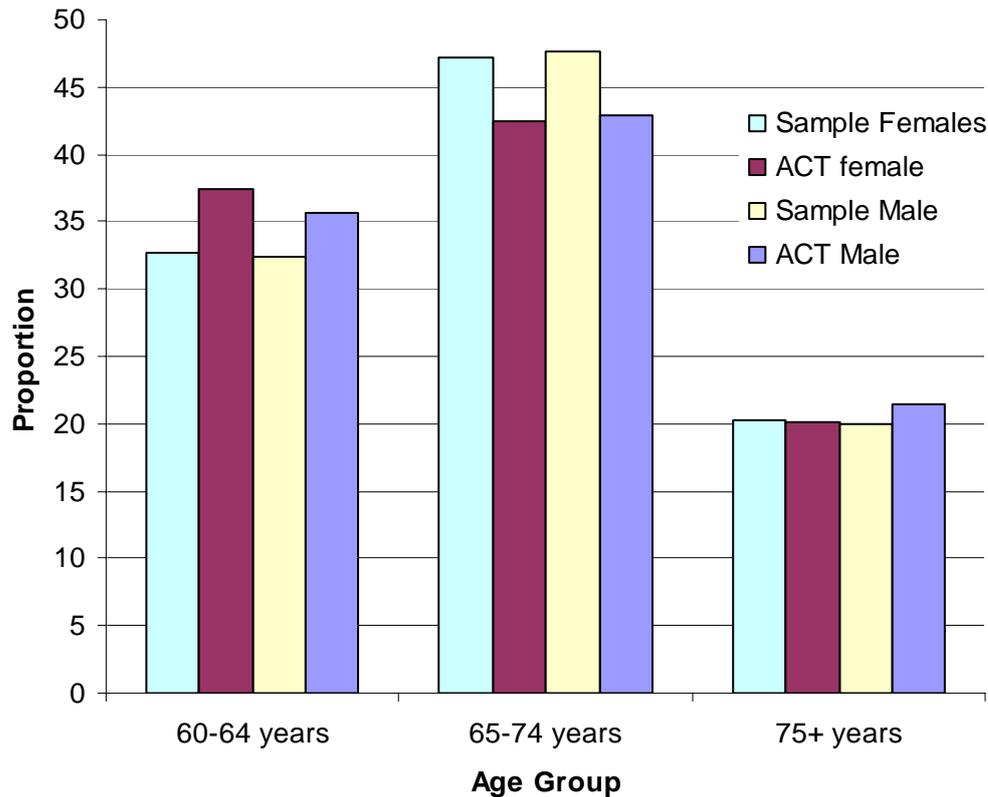
Figure 3: Age and gender distribution of ACT sample and comparison with ACT licence holders

Figure 4 shows the distribution of the sample of current driver participants by age group and gender in relation to the population of NSW licence holders. These data give an indication of the representativeness of the sample. The RTA provided recent data (June 2004) for the overall population of NSW licence holders aged 60 years and older (RTA, 2005) that shows that 56 percent of NSW license holders are male and 44 percent are female. While 31 percent of license holders aged 60 years or older are aged 60-64 years (31 percent males and 32 percent females), 44 percent are aged 65-74 years (44 percent males and 44 percent females), and 25 percent are aged 75 years and older (26 percent males and 23 percent females). A comparison of the NSW current sample with overall population of NSW licence holders shows that the sample is considerably under representative of the population of 60-64 year old male licence holders and over-representative of males in the two older age groups.
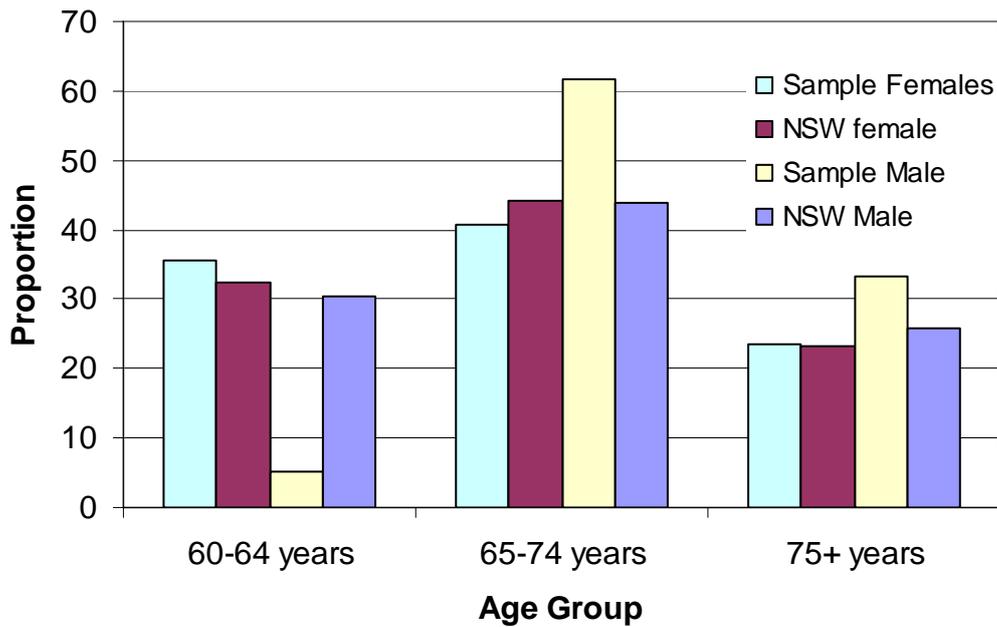
Figure 4: Age and gender distribution of NSW sample and comparison with NSW licence holders

Table 3 provides a summary of other demographic characteristics of the survey participants, including employment and marital status and highest level of education. For the ACT sample, the majority of current drivers indicated that they were not working (74%). Twenty-three percent of drivers were employed on either a fulltime[3], part-time or voluntary basis. Approximately two-thirds (68%) were married while 31 percent were single (divorced/separated, never married or widowed). The majority of drivers had at least 4-6 years of high school education, with a high proportion having a college or university education (56%).

NSW respondents showed a similar pattern for employment status with the majority indicating they were not working (80%). Thirteen percent of drivers were working in paid or voluntary employment. Approximately two-thirds (75%) were married while 23 percent were single (divorced/separated, never married or widowed). The pattern of education level differed considerably from the ACT sample with 50 percent of drivers with 3 years or fewer of high school education compared with just 22% for the ACT sample. Only 27 percent of NSW respondents had a college or university education compared with 56 percent of ACT respondents.

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[3] Interesting to note that 4% of the ACT sample and 2% of the NSW sample indicated that they were in fulltime employment in view of the fact that seniors card status requires that seniors are not in fulltime employment (less than 20 hours per week). It is possible that respondents who were employed fulltime were recruited by the "snowball technique," since the letter of invitation requested prospective respondents to pass on their survey if they were not a current or former driver.

Table 3: Summary of other demographic variables of ACT and NSW participants

	ACT Proportion of current drivers (%) n=1,015	NSW Proportion of current drivers (%) n=682
Employment status		
Not working	74	80
Working part-time	12	7
Working fulltime	4	2
Volunteering	7	4
Unknown / Missing	4	6
Marital status		
Married / De facto	68	75
Divorced / Separated	11	5
Never married	4	4
Widowed	16	14
Unknown / Missing	1	2
Education Level		
Primary school	4	10
Up to 3 yrs of high school	18	40
4 to 6 years of high school	18	16
College / University	56	27
Unknown / Missing	4	7

4.2.2 Licensing and Driving Status

Of the 1,015 respondents from the ACT who reported being a current driver, 978 (96.5%) indicated they had a current driver's licence. One participant did not have a current driver's licence and 35 (3.4%) provided no information about their licence status. Furthermore, 41 ACT drivers did not indicate the age at which they first got their licence. Table 4 shows the distribution of the age at which an ACT driver first received their licence by age and gender. The table shows data for those participants whose age at the time of survey was known and age at which they first received their licence was known (n=972). More older drivers (75+ years) and women acquired their licence over the age of 30 years compared with the three younger age groups.

Table 4: Age at first licensing by age and gender for ACT drivers

Age at first licensing (years)	Overall current drivers (%)	Age of current drivers (%)			Gender of drivers (%)	
	n=972	60-64 years	65-74 years	75+ years	Male	Female
18 or less	46	59	44	28	58	27
19-30	47	38	50	54	39	58
31-40	6	2	5	14	2	10
41-50	1	1	1	2	<1	2
Over 50	1	0	1	2	0	2

For NSW, 640 (93.8%) of the 682 drivers indicated they had a current driver's licence. One driver did not have a driver's licence. There were 41 respondents who did not provide information about licence status and 49 provided no data on the age at which they first got their licence. Table 5 shows the distribution of the age at which NSW drivers first received their licence by age and gender. The table shows data for those participants whose age at the time of survey was known and age at which they first received their licence was known (n=628). Age and gender effects were similar to the ACT sample with drivers aged 75+ years and female drivers more likely to have acquired their licence at age 31 or older.

Table 5: Age at first licensing by age and gender for current NSW drivers

Age at first licensing (years)	Overall current drivers (%)	Age of current drivers (%)			Gender of current drivers (%)	
	n=628	60-64 years	65-74 years	75+ years	Male	Female
18 or less	50	64	55	33	61	34
19-30	38	31	36	47	34	45
31-40	9	4	8	14	4	16
41-50	2	0	1	4	1	3
Over 50	1	1	<1	1	0	2

4.2.3 Driving experience and frequency of driving

Principal driver status

Drivers were asked whether they did most of the driving in the household. These drivers are referred to henceforth as the 'principal driver' for the household. For the ACT, 992 of the 1,015 drivers responded to this question (23 missing responses). Table 6 shows that 810 (82%) of the 992 respondents said they were the principal driver in the household. Principal drivers were more likely to be male. Urban and rural residents were also more likely to be principal drivers than residents in country towns. No clear pattern was evident in principal driver status across age groups.

Table 6: Proportion of current ACT drivers (%) reporting as the principal driver in household by Gender, Age and Place of Residence

	Overall	Gender		Age group (years)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
N*	992	388	597	322	465	198	937	28	13
%	82	72	89	77	86	80	82	71	85

*Totals in gender, age and place categories may not equal total in Overall column due to cases with missing data on gender, age or place variables.

Eight of the 682 NSW drivers did not respond to the question concerning whether they did most of the driving in the household. Table 6 shows that 83% (559) of the remaining 674 current NSW drivers said they were the principal driver in the household. Mirroring the ACT sample, principal drivers in NSW were more likely to be male. Principal driver status did not appear to be strongly influenced by place of residence. However, unlike the ACT sample, principal drivers were more likely to be in the two older age groups while no clear differences were observed for place of residence.

Table 7: Proportion of NSW drivers (%) reporting as the principal driver in household by Gender, Age and Place of Residence[4]

	Overall	Gender		Age Group (years)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rur
N	674	253	410	113	356	195	274	267	114
%	83	68	92	63	88	84	81	85	82

Weekly driving frequency

Drivers were asked about their driving frequency. Table 8 presents driving frequency data for the ACT sample by gender, age and place of residence. Seventy-two percent of the 1014 ACT drivers who responded to this question indicated that they drove daily and 20 percent drove 3-4 times per week.

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[4] In the NSW sample of current drivers, there were three cases in which the participant was categorised as living in an "other" locality. These three cases are omitted from all tables in this section.

Table 8: Driving frequency of ACT drivers by Gender, Age and Place of Residence (numbers in cells are percentages)

	Overall (%)	Gender		Age Group (years)				Place	
		Female	Male	60-64	65-74	75+	Urb	Cntry Twn	Rur
N	1014	403	604	331	475	201	959	28	13
daily	72	66	76	75	74	62	73	57	31
3-4 days a week	20	25	18	18	19	28	20	25	54
1-2 times a week	6	7	5	5	5	9	6	14	8
a few times a month	1	1	1	1	1	1	1	4	8
once a month or less	<1	<1	<1	<1	<1	0	<1	0	0
don't know	<1	<1	0	<1	0	0	<1	0	0

Chi-Square analyses (daily versus less than daily) showed that for the ACT, male drivers were 1.6 times more likely than females to drive daily ($\chi^2(1) = 10.62$, p=0.001). Significant differences were also found between drivers grouped by age (75 years and older versus <74 years). Drivers from the ACT aged <74 years were 1.8 times more likely to drive daily than those 75 years and older ($\chi^2(1) = 13.43$, p<0.001). Significant differences were also found between drivers grouped by place of residence (urban vs country town, rural or other). Drivers from the ACT who lived in an urban area were 1.8 times more likely to drive daily than those from country towns and rural areas ($\chi^2(1) = 11.77$, p=0.001).

For the NSW sample, 63 percent of the 681 drivers who responded to this question indicated that they drove daily and 25 percent drove 3-4 times per week (see Table 9).

Table 9: Driving frequency of NSW drivers by Gender, Age and Place of Residence (numbers in cells are percentages)

	Overall (%)	Gender		Age Group (yrs)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rur
N	681	258	412	115	359	197	278	268	116
daily	63	55	67	70	65	53	68	60	56
3-4 days a week	25	31	22	19	24	31	21	27	32
1-2 times a week	11	12	10	11	9	14	10	11	12
a few times a month	1	1	1	0	1	1	1	1	0
once a month or less	1	1	<1	0	<1	2	1	1	0

Chi-Square analyses (daily versus less than daily) showed that for NSW, male drivers were 1.7 times more likely than females to drive daily ($\chi^2(1) = 9.46$, p=0.002). Significant differences were also found between drivers grouped by age (75 years and older vs <74 years). Drivers from NSW aged <74 years were 1.7 times more likely to drive daily than those 75 years and older ($\chi^2(1) = 10.29$, p=0.002). There was also a significant difference ($\chi^2(1) = 5.24$, p=0.022) for drivers from NSW who lived in an urban area compared with those from country towns, rural areas or other areas. Drivers from urban areas were 1.5 times more likely to drive daily than those from country towns and rural areas.

Driving distance

Table 10 summarises ACT drivers' responses to the question about their average weekly driving distances. Fifty-six percent of the 1,015 current ACT drivers drove less than 100 kilometres per week, 28 percent drove between 100 and 200 kilometres and 16 percent drove more than 200 kilometres weekly. There were ten cases for whom no response was provided for this question.

Chi-square analyses revealed significant gender differences with males 2.4 times more likely to drive more than 100 kilometres per week than females ($\chi^2(1) = 43.06$, p<0.001). Drivers aged <74 years were 3.1 times more likely than older drivers (those aged 75 years or older) to indicated that they drove more than 100 kilometres per week ($\chi^2(1) = 40.50$, p<0.001). Significant differences were not found between drivers grouped by place of residence within the ACT.

Table 10: Driving distance for ACT drivers by Gender, Age and Place of Residence (numbers in cells are percentages)

Distance Driven	Overall (%)	Gender		Age Group (yrs)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rur
N	1005	401	597	330	471	197	952	27	13
less than 20kms	9	15	6	8	7	17	9	19	8
21 to 50kms	21	27	18	16	22	29	21	30	8
51 to 100kms	26	27	25	24	25	31	26	22	31
101 to 200kms	28	22	31	29	31	18	28	26	46
more than 200kms	16	8	20	22	15	5	16	4	8

Table 11 summarises the weekly driving distances reported by NSW drivers. There were three drivers for whom no response was provided. Of the remaining 682 respondents, the majority (64%) reported driving less than 100 kilometres weekly. Twenty-six percent drove between 100 and 200 kilometres while 9 percent reported driving more than 200 kilometres weekly.

Chi-Square analyses revealed significant gender differences for NSW drivers with males 2.1 times more likely to drive more than 100 kilometres per week than females ($\chi^2(1) = 18.45$, p<0.001). Drivers aged <74 years were 2.7 times more likely than those aged 75 years or older to indicate that they drove more than 100 kilometres per week ($\chi^2(1) = 26.07$, p<0.001). Current NSW drivers from rural areas were significantly more likely to report driving more than 100 km per week than drivers who came from either urban areas, country towns or other localities ($\chi^2(1) = 4.63$, p=0.031).

Table 11: Driving distance for NSW drivers by Gender, Age and Place of Residence (numbers in cells are percentages)

Distance Driven	Overall (%)	Gender		Age Group (yrs)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rur
N	679	256	412	114	358	197	277	267	116
less than 20kms	15	22	11	10	13	21	17	18	6
21 to 50kms	23	29	19	26	19	28	22	25	21
51 to 100kms	26	23	28	22	26	29	28	24	29
101 to 200kms	26	21	29	27	30	18	24	25	36
more than 200kms	9	4	12	15	11	3	9	9	8

Figure 5 shows the proportion of ACT drivers who drive more than 100 kilometres per week, where drivers have been grouped by employment status. Not surprisingly, weekly travel distance was also significantly related to employment status ($\chi^2(3) = 21.19$, p<0.001). A higher proportion of drivers who were employed fulltime (64%) reported that they drive more than 100 kilometres per week than either part-time employees (59%), those who did volunteer work (48%) and those who were not working (40%).
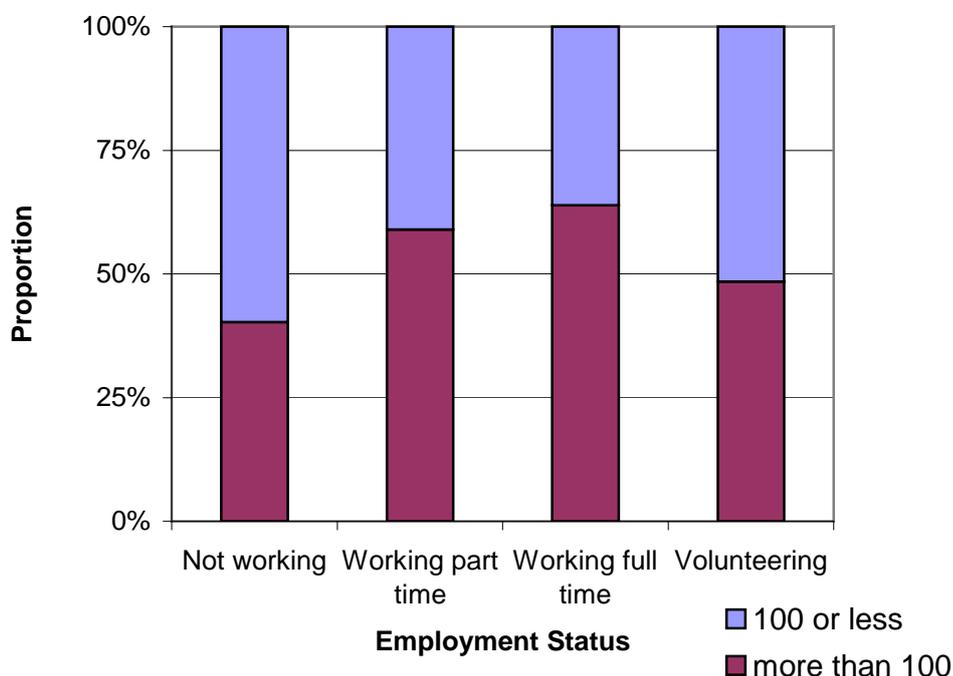
Figure 5: Weekly driving distances by employment status for ACT current drivers

Figure 6 shows the proportion of NSW drivers who drive more than 100 kilometres per week, where drivers have been grouped by employment status. As was the case for ACT drivers, weekly travel distance was also significantly related to employment status ($\chi^2(3) = 17.20$, p=0.001). A higher proportion of drivers who were employed fulltime (69%) reported that they drive more than 100 kilometres per week than either part-time employees (55%), those who did volunteer work (35%) and those who were not working (32%).
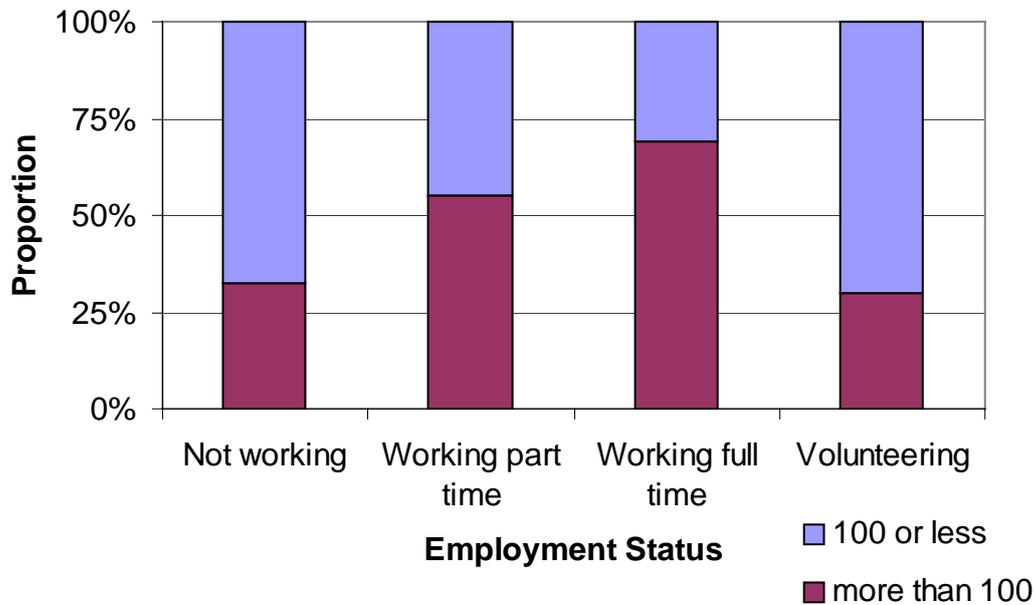
Figure 6: Weekly driving distances (kilometres) by employment status for NSW current drivers

Satisfaction with driving distance

In addition to driving distance, drivers were also asked about their level of satisfaction with the amount of driving they did. Table 12 and Table 13 present summary data for driving satisfaction for ACT and NSW, respectively. Of the 1,015 current ACT drivers, there were 13 cases with a missing value for the variable related to their satisfaction with the amount of driving they do. There were nine missing responses for the 682 NSW current drivers. Overall, the majority of drivers reported that they were driving about as much as they would like to (83% and 81% for ACT and NSW, respectively).

Table 12: Amount of driving (more/less/as much as you would like) by Gender, Age and Place of Residence for ACT current drivers (numbers in cells are percentages)

	Overall (%)	Gender		Age Group (years)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rur
N	1002	398	597	327	471	197	947	28	13
More than you'd like	3	2	4	3	4	1	3	4	0
About as much as you'd like	83	88	81	89	81	80	83	79	92
Less than you would like	11	9	12	6	11	17	11	18	8
Don't know	3	2	4	2	3	2	3	0	0

Table 13: Amount of driving (more/less/as much as you would like) by Gender, Age and Place of Residence for NSW current drivers

	Overall (%)	Gender		Age Group (years)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rur
N	673	257	405	114	355	194	276	263	115
More than you'd like	3	3	3	4	3	3	2	3	7
About as much as you'd like	81	85	79	83	81	80	83	81	80
Less than you would like	13	9	15	11	12	15	13	14	10
Don't know	3	3	3	1	4	3	3	3	3

Driving destinations and trip distance

Typical destinations

Table 14 and Table 15 present summary data for drivers' trip destinations. For both ACT and NSW samples, the two most common driving trip destinations were shops (including banking and post office) (approximately 90%) and visits to family and friends (80% and 73% for ACT and NSW, respectively). Drivers also commonly drove to health care destinations (34% ACT; 50% NSW) and sporting or social outings (approximately 50%).

Table 14: Places driven in a typical week by ACT current drivers

Places driven to	Proportion* of drivers (%)
Post office, bank, shops	91
Work (driving to or from work)	17
Doctor/other health care	34
Sports / Social clubs	52
Church	28
Family and friends	80
Other	22

* Proportion of all responses (including where no response was made) that were affirmative

Table 15: Places driven in a typical week by NSW current drivers

Places driven to	Proportion* of drivers (%)
Post office, bank, shops	90
Work (driving to or from work)	10
Doctor / other health care	50
Sports / Social clubs	48
Church	30
Family and friends	73
Other	17

* Proportion of all responses (including where no response was made) that were affirmative

Trip distances

Participants were asked whether most of their trips were more than 5 kilometres, less than 5 kilometres or less than three kilometres. Overall data for both States showed similar patterns with just over 80 percent of drivers reporting that most of their trips were more than 5 kilometres (see Table 16 and Table 17). For ACT drivers, no differences were found between typical trip distances for males and females ($\chi^2(1) = 2.53$, p=0.112). Younger drivers (<74 years) were 1.9 times more likely than older drivers (75+) to indicate that most of their trips were more than 5 kilometres in distance ($\chi^2(1) = 10.92$, p=0.001). Similarly, drivers <74 years were 1.9 times more likely than drivers 75+ years to indicate that most of their trips were more than 5 km in distance ($\chi^2(1) = 10.54$, p=0.001). Place of residence did not have an affect on the likelihood that most of the trips made were more than 5 kilometres in distance.

Table 16: Proportion of current drivers from the ACT by the distance of most of their trips (numbers in cells are percentages)

Trip distance	Overall (%)	Gender		Age			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
N	1012	402	603	331	473	201	957	28	13
>5km	83	81	85	89	83	76	83	82	100
<5km	16	18	14	11	16	23	16	18	0
<3km	1	1	1	1	1	1	1	0	0

For NSW drivers, males were 1.7 times more likely than females to indicate that most of their trips were more than 5 kilometres ($\chi^2(1) = 6.55$, p=0.011). Younger NSW drivers (<74 years) were 1.5 times more likely than older drivers (75+ years) to indicate that most of their trips were more than 5 kilometres in distance ($\chi^2(1) = 4.09$, p=0.043). In contrast to findings for the ACT drivers, there was a significant relationship between place of residence and the likelihood that most of a driver's trips were greater than 5 kilometres in distance. Drivers living in a country town were 1.6 times less likely than drivers living in other types of localities (metropolitan areas, rural areas or other areas) to respond that most of their trips were more than 5 kilometres in length ($\chi^2(1) = 5.53$, p=0.019). Drivers living in rural areas were 5.7 times more likely than drivers in other areas (metropolitan, country

towns or other) to respond that most of their trips were more than 5 kilometres in distance ($\chi^2(1) = 16.94$, p<0.001).

Table 17: Proportion of current drivers from NSW by the distance of most of their trips (numbers in cells are percentages)

Trip distance	Overall (%)	Gender		Age Group (years)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
N	679	258	410	115	358	196	277	267	116
>5km	83	78	86	83	85	78	81	78	96
<5km	14	17	13	16	12	18	17	16	4
<3km	3	5	1	2	3	4	2	5	0

Preference for passenger

Drivers were asked whether they preferred to have someone accompany them when they were driving. Figure 7 summarises the responses for ACT participants. Of the 1,013 drivers who responded, only 10.2% (106) said they would prefer to have someone accompany them. Age differences in preference for a passenger were minimal, with 9%, 12% and 9% of <64 year olds, 65-74 year olds and people aged 75+ years reporting that they did prefer someone to accompany them while driving, respectively.
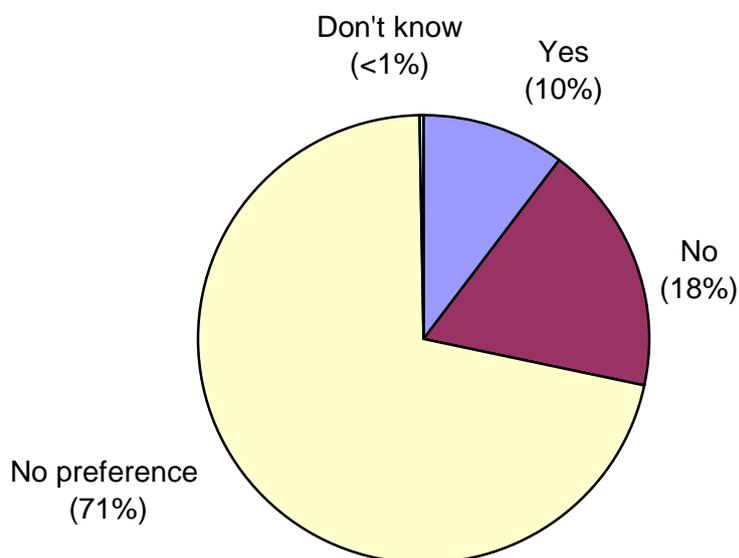
Figure 7: Preference for someone to accompany driver for ACT current drivers

Of the 678 drivers from NSW who responded to this question, only 14.8 percent (101) said they would prefer to have someone accompany them. In contrast to findings for ACT, NSW driver preferences for passengers differed across age groups (8%, 14% and 21% for <64, 65-74 and 75+ year olds, respectively) (see Figure 8). Drivers aged 75+ years were 1.9 times more likely to say they preferred company when they drove than younger (<75 years) drivers ($\chi^2(1) = 8.37$, p=0.004). While drivers aged <65 years were 2.3 times less likely to say they prefer company when driving compared with older (65+ years) drivers ($\chi^2(1) = 5.59$, p=0.018)
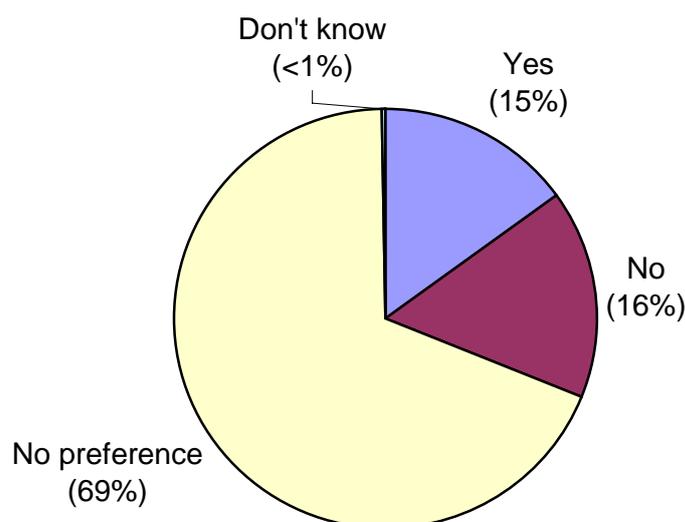
Figure 8: Preference for someone to accompany driver for NSW current drivers

4.2.4   Self-rated health, medical conditions and use of medication

Table 18 summarises the reported medical conditions of ACT drivers. Percentages are of the entire sample of ACT drivers (including those who did not respond) [5]. Further analyses were conducted to explore potential differences across age groups. The proportion of residents indicating they had vision problems did not change notably with age, with 40 percent , 39 percent and 38 percent of <65 year olds, 65-74 year olds and 75+ year olds respectively indicating they had vision problems (treated and untreated). The oldest group was more likely to report heart problems (23% of 75+ year olds reported heart problems,

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[5] Of the 1,015 ACT current drivers, 70 drivers had missing values for the question about whether they had vision problems, 96 had missing responses for heart problems, 113 for diabetes, 134 for respiratory problems, 104 for arthritis and 155 for stroke/mini-stroke.

compared with 17% or 65-74 year olds and 10% of <65 year olds). The oldest group were also more likely to report that they had arthritis (36% of 75+ year olds reported they had arthritis, compared with 28% or 65-74 year olds and 29% of <65 year olds).

Table 18: Medical problems (treated and untreated) for current ACT drivers (N=1,015)

Medical condition	Proportion of current Drivers with condition (%)
Vision	39
Heart problems	16
Diabetes	9
Respiratory problems	6
Arthritis	30
Stroke or min-stroke	4
Other medical conditions	25

Table 19: Medical problems (treated and untreated) for current NSW drivers (N=682)

Medical condition	Proportion of current Drivers with condition (%)
Vision	33
Heart problems	17
Diabetes	11
Respiratory problems	9
Arthritis	35
Stroke or min-stroke	4
Other medical conditions	20

Table 19 summarises the conditions reported for NSW current drivers. Percentages are of the entire sample of NSW current drivers (including those who did not provide a response).[6] Analyses to explore age groups effects revealed that the proportion of residents with self-reported vision problems was 29 percent for 60-64 year olds, 38 percent for 65-74 year olds and 29 percent for 75+ year olds. For NSW current drivers, the youngest group were least likely to report that they had arthritis (30% of 60-64 year olds reported they had arthritis, compared with 36 percent or 65-74 year olds and 35 percent of 75+ year olds).

Drivers were also asked about any medications they may be taking. The majority (72%) of ACT drivers were currently taking prescribed medications, while 11 percent were taking medication available over-the-counter. Older ACT participants were more likely to take prescribed medication than younger participants, with 64 percent of 60-64 year olds, 72 percent of 65-74 year olds and 86 percent of 75+ year olds responding that they took prescribed medication. Only 20% of ACT participants were taking one prescribed

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[6] Of the 682 NSW current drivers, 68 drivers had missing values for vision problems, 96 for heart problems, 108 for diabetes, 117 for respiratory problems, 73 for arthritis and 126 for stroke or mini-stroke.

medication, and 47 percent took between two and five prescribed medications each day, with only 5 percent taking six or more prescribed medications per day. Only 2 percent of all the ACT drivers (19 respondents) felt that some of the medications they were taking had a negative effect on driving and 37 percent (or seven respondents) of these drivers said that they generally avoided driving while they were on medication. Note that there were two ACT drivers who said that they thought their medications did have an effect on their driving but had missing responses for the question of whether they avoid driving when using medication.

Similar medication patterns were observed for the sample of NSW drivers. The majority (79%) of NSW drivers were currently taking medications prescribed by their doctor and 7 percent were taking medication available over-the-counter. Older NSW participants were more likely to take prescribed medication than younger participants, with 58 percent of 60-64 year olds, 82 percent of 65-74 year olds and 84 percent of 75+ year olds responding that they took prescribed medication. Of the 1,015 NSW participants, 16 percent were taking one prescribed medication, and 52% took between two and five prescribed medications each day, with only 11 percent taking six or more prescribed medications per day. Only 2 percent of all the NSW drivers (15 respondents) felt that some of the medications they were taking had a negative effect on driving and 13% (or two respondents) of these drivers said that they generally avoided driving while they were on medication. Note that three of the drivers who said that they thought their medications did have an effect on their driving did not respond to the question of whether they avoided driving when using medication.

4.2.5   Self-rated overall health and functional abilities for safe driving

Drivers were asked to rate their health and functional performance for safe driving. Findings for ACT and NSW drivers are shown in Table 20 and Table 21 respectively. Note that no drivers rated their health as poor, hence, this category is not presented in the tables.

Across both State samples, just over half of the drivers rated their health for safe driving as excellent while just under half indicated that their health was good. Health ratings were not provided for 7 ACT drivers and 5 NSW drivers.

Separate chi-square analyses for each sample were conducted to evaluate differences in ratings (excellent vs good, fair or poor) across gender, age and place of residence. For ACT participants, there was no significant difference between whether males and females rate their overall health status as excellent or otherwise. Age differences for ACT participants were found, with those aged 75 years and older less likely to indicate that their health was excellent compared with the two younger age groups (37% versus 60% and 52%) ($\chi^2(2) = 27.66$, p<0.001). Health ratings did not differ between participants grouped by place of residence.

Table 20: ACT drivers' ratings of overall health for safe driving by Gender, Age and Place of Residence

Self-rated health	Overall (%)	Gender		Age group (years)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
N	1008	401	600	328	473	200	953	28	13
Excellent	51	52	51	60	52	37	51	50	62
Good	46	46	47	39	47	58	47	46	38
Fair	2	2	2	1	1	6	2	4	0

Analyses for NSW participants showed the same pattern of results as the ACT sample for age, gender and place of residence. First, no significant difference was found between whether males and females rate their overall health status as excellent or otherwise. Age differences were evident, with those aged 75 years and older less likely to indicate that their health was excellent compared with the two younger age groups (34% versus 74% and 54%) ($\chi^2(2) = 49.20$, p<0.001). Like the ACT drivers, no significant differences were observed between NSW participants grouped by place of residence.

Table 21: Current NSW drivers' ratings of overall health for safe driving by Gender, Age and Place of Residence

Self-rated health	Overall (%)	Gender		Age group (years)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
N	677	256	410	115	355	197	278	265	115
Excellent	51	54	50	74	54	34	51	49	58
Good	48	45	49	25	46	64	48	49	42
Fair	1	1	1	1	1	2	1	2	0

Functional abilities

Drivers were also asked to rate their specific functional abilities for safe driving. Table 22 summarises responses for ACT drivers. Responses are reported as percentages of all responses (including missing responses). There were a small number of missing responses for each question (5 for vision for day driving, 15 for vision for night driving, 10 for decisions, 5 each for upper and lower body strength, and 6 for head/ neck mobility). Separate chi-square analyses were conducted for each of the functional abilities to evaluate differences in ratings (excellent vs good, fair or poor) across gender, age and place of residence.

Table 22: Distribution of self-ratings (percentage of all responses) of various functional abilities for safe driving for ACT current drivers

Self-ratings	Vision: Day driving	Vision: Night driving	Make decisions quickly	Upper body strength	Lower body strength	Head/neck mobility
Excellent	47	21	34	39	38	30
Good	51	50	58	55	56	55
Fair	2	23	6	6	5	14
Poor	0	4	<1	<1	0	<1

Ninety-eight percent of ACT participants rated their vision for safe driving during the daytime as either excellent (47%) or good (51%). Ratings of vision for daytime driving did not differ across gender ($\chi^2(1) = 1.38$, p=0.241) or place of residence ($\chi^2(3) = 4.62$, p=0.202). However, drivers aged 75 years and older were significantly ($\chi^2(2) = 18.53$, p<0.001) less likely (35%) to rate their vision as excellent than drivers aged 60-64 years (54%) and drivers aged 65-74 years (47%).

For night vision, females (16%) were significantly less likely than males (26%) to rate their abilities as excellent. Ratings were also influenced by age group ($\chi^2(1) = 14.28$, p<0.001). Drivers aged 75 years and older were less likely to rate their night vision as excellent than drivers aged 60-64 and 65-74 years of age (14% compared with 27% and 21% respectively) significantly ($\chi^2(2) = 13.17$, p=0.001). Additionally, ACT drivers who did not live in urban areas were twice as likely to respond that they had excellent vision for safe driving at night time than drivers from urban areas ($\chi^2(1) = 4.36$, p=0.037).

Most ACT drivers rated their ability to make decisions quickly for safe driving as either excellent (34%) or good (58%). For ACT participants, females (29%) were significantly less likely than males (39%) to rate as excellent their ability to make decisions quickly($\chi^2(1) = 10.00$, p=0.002). ACT drivers aged 75 years and older were significantly less likely to rate themselves as excellent compared with those aged 60-64 or 65-74 years (27% compared with 43% and 32 % respectively) ($\chi^2(2) = 16.51$, p<0.001). There were no significant differences in the likelihood of an excellent response to the question regarding quick decision making abilities for ACT drivers grouped by place of residence. Most ACT drivers rated their strength as either excellent (38-39%) or good (55-56%). Females (33%) were significantly less likely than males (43%) to rate as excellent their upper body strength ($\chi^2(1) = 8.70$, p=0.003), and females (34%) were significantly less likely than males (41%) to rate as excellent their lower body strength ($\chi^2(1) = 6.02$, p=0.014).

ACT drivers aged 75 years and older were significantly less likely to rate their upper body strength as excellent compared with those aged 60-64 or 65-74 years (26% compared with 46% and 40 % respectively) ($\chi^2(2) = 19.82$, p<0.001). Similarly, ACT drivers aged 75 years and older were significantly less likely to rate their lower body strength as excellent compared with those aged 60-64 or 65-74 years (27% compared with 45% and 39 % respectively) ($\chi^2(2) = 17.19$, p<0.001). No differences were found in the likelihood of

reporting excellent upper and lower body strength for safe driving between urban, country town or rural drivers.

Eighty-five percent of ACT drivers rated their head and neck mobility as either excellent (30%) or good (55%). Ratings for head and neck mobility did not differ across gender ($\chi^2(1) = 0.10$, p=0.751) or place of residence ($\chi^2(2) = 0.364$, p=0.833). However, drivers aged 75 years and older were significantly less likely (22%) to rate their head and neck mobility as excellent than drivers aged 60-64 years (36%) and drivers aged 65-74 years (30%) ($\chi^2(2) = 11.83$, p=0.003).

Table 23 summarises functional ability ratings for NSW drivers. There were a small number of missing responses for each question (10 vision for day driving, 13 vision for night driving, 6 for decisions, 5 each for upper and lower body strength, and 7 for head/ neck mobility). Separate chi-square analyses were conducted for each of the functional abilities to evaluate differences in ratings across gender, age and place of residence.

Table 23: Distribution of self-ratings (in terms of percentage of all responses) of various functional abilities for safe driving for NSW current drivers

Self Ratings	Vision: Day driving	Vision: Night driving	Make decisions quickly	Upper body strength	Lower body strength	Head/neck mobility
Excellent	51	25	39	42	40	34
Good	46	46	55	54	55	53
Fair	2	22	4	3	4	12
Poor	0	6	<1	0	0	<1

A similar pattern emerged for NSW drivers ratings of vision. Ninety-seven percent of NSW participants rated their vision for safe driving during the daytime as either excellent (51%) or good (46%). Ratings of vision for daytime driving did not differ across gender ($\chi^2(1) = 0.05$, p=0.824) or place of residence ($\chi^2(1) = 2.72$, p=0.099). However, NSW drivers aged 75 years and older were significantly ($\chi^2(2) = 35.82$, p<0.001) less likely (38%) to rate their vision as excellent than drivers aged 60-64 years (73%) and drivers aged 65-74 years (53%).

Ratings of vision for driving at night did not differ across gender ($\chi^2(1) = 1.65$, p=0.199) and place of residence. Differences across age groups were evident ($\chi^2(2) = 31.29$, p<0.001), with drivers aged 75 years and older significantly less likely to rate their night vision as excellent than drivers aged 60-64 and 64-74 (12% compared with 40% and 27% respectively).

Most NSW drivers rated their ability to make decisions quickly for safe driving as either excellent (39%) or good (55%). For NSW participants, females (32%) were significantly less likely than males (44%) to rate as excellent their ability to make decisions quickly ($\chi^2(1) = 9.00$, p=0.003. Drivers aged 75 years and older were significantly less likely to rate themselves as excellent compared with those aged 60-64 or 65-74 years (29% compared with 51% and 42 % respectively) ($\chi^2(2) = 17.28$, p<0.001). There were significant differences among responses by NSW drivers grouped by place of residence to the question concerning their ability to make decisions quickly. NSW drivers who lived in

country towns were 1.6 times less likely to rate their ability to make decisions quickly as excellent than drivers who lived in an urban or rural area ($\chi^2(1) = 7.24$, p=0.007).

Most NSW drivers rated their strength as either excellent (40-42%) or good (54-55%). Females (38%) tended to be less likely than males (43%) to rate as excellent their upper body strength, although this trend failed to reach significance ($\chi^2(1) = 3.16$, p=0.076) and for lower body strength ratings, females (36%) were also significantly less likely than males (44%) to rate their strength as excellent ($\chi^2(1) = 3.89$, p=0.048).

Age effects for body strength were also apparent. NSW drivers aged 75 years and older were significantly less likely to rate their upper body strength as excellent compared with those aged 60-64 or 65-74 years (29% compared with 61% and 44% respectively) ($\chi^2(2) = 31.63$, p<0.001). Similarly, drivers aged 75 years and older were significantly less likely to rate their lower body strength as excellent compared with those aged 60-64 or 65-74 years (27% compared with 60% and 42 % respectively) ($\chi^2(2) = 33.11$, p<0.001).

NSW drivers living in country towns were significantly less likely to rate their upper body strength as excellent compared with those from urban areas or rural areas (35% compared with 47% and 50 % respectively) ($\chi^2(2) = 11.59$, p=0.003). While NSW drivers living in country towns were significantly less likely to rate their lower body strength as excellent compared with those from urban areas or rural areas (34% compared with 45% and 47% respectively) ($\chi^2(2) = 8.04$, p=0.018).

Eighty-seven percent of NSW drivers rated their head and neck mobility as either excellent (34%) or good (53%). Ratings for head and neck mobility did not differ across gender ($\chi^2(1) = 0.244$, p=0.621). NSW drivers aged 60-64 years were significantly more likely (53%) to rate their head and neck mobility as excellent than drivers aged 65-74 years (34%) and drivers aged 75 or more years (34%) ($\chi^2(2) = 26.21$, p<0.001). Drivers living in country towns were also less likely to rate their head and neck mobility as excellent compared with those from urban areas or rural areas (29% compared with 38% and 41% respectively) ($\chi^2(2) = 7.63$, p=0.022).

Travel patterns, medical conditions and health ratings

Analyses were conducted for both ACT and NSW samples to explore the relationship between overall health ratings and driving distance distances in kilometres (categories were grouped as 'more than 100 km' vs. '100 km or less').

For ACT drivers, analyses revealed that there was a significant relationship between overall health ratings (categories were grouped for analyses as 'excellent' vs 'good, fair or poor') and the reported weekly travel ($\chi^2(1) = 18.43$, p<0.001). Drivers who reported their overall health status as 'excellent' were 1.7 times as likely to have travelled more than 100 km per week than drivers who rated their overall health as 'good, fair or poor'. This finding was also true for NSW drivers. NSW drivers who reported their overall health status as 'excellent' were 2.2 times more likely to have travelled more than 100 km per week than NSW drivers who rated their overall health as 'good, fair or poor' ($\chi^2(1) = 24.37$, p<0.001).

The relationship between weekly driving distance and frequency of driving was also compared across medical conditions for each of the three most frequently reported medical conditions: vision problems, heart problems and arthritis.

ACT drivers who reported that they had vision problems were significantly less likely to report that they travelled more than 100 km per week than drivers who reported that they did not have vision problems or had vision problems that were being treated (35% compared with 47% and 52% respectively) ($\chi^2(2) = 13.59$, p=0.001). There was no difference between groups for drivers with heart problem (yes, no or treated) for whether they drove more than 100 km per week ($\chi^2(2) = 2.91$, p=0.234). Forty-four percent of ACT drivers without heart problems stated that they drove more than 100 km per week, compared with 39% of ACT drivers who responded that yes they did have heart problems and 53% of those who had problems that were treated. Drivers from the ACT who reported that they had arthritis tended to be less likely to report that they travelled more than 100 km per week than drivers who did not have arthritis or had arthritis that was being treated, although this effect failed to reach significance ($\chi^2(2) = 5.29$, p=0.071). Of those that reported that they had arthritis, 35% reported that they drove more than 100 km per week, compared with 46% of those who didn't have arthritis and 46% of those who had arthritis that was being treated.

For NSW drivers, there was no significant difference between groups classified by their status of whether they had vision problems or not (yes, no or treated) for whether they drove more than 100 km per week ($\chi^2(2) = 2.33$, p=0.312). Thirty-nine percent of NSW drivers without vision problems stated that they drove more than 100 km per week, compared with 33% of drivers who responded that they did have vision problems and 34% of those who had problems that were treated. There was also no significant ($\chi^2(2) = 0.74$, p=0.690) difference between driving distances of drivers grouped by heart problems (yes, no or treated). Thirty-nine percent of NSW drivers without heart problems stated that they drove more than 100 km per week, compared with 34% of NSW drivers who responded that they did have heart problems and 41% of those who had problems that were treated. Finally, there was a trend ($\chi^2(2) = 5.12$, p=0.077) for NSW drivers who reported that they had arthritis to be less likely to report that they travelled more than 100 km per week than NSW drivers who reported that they did not have arthritis or had arthritis that was being treated. Of those that reported that they had arthritis, 31% reported they drove more than 100 km per week, compared with 41% of those who did not have arthritis and 40% of those who had arthritis that was being treated.

For both ACT and NSW drivers, driving distance was also significantly related to use of prescription medications. ACT drivers who took prescribed medications were 1.6 times less likely to drive 100 km or more each week than those who did not take prescribed medications ($\chi^2(1) = 10.89$, p=0.001). Similarly, NSW drivers on prescribed medications were 1.5 times less likely to drive 100 km or more each week than those who did not take prescribed medications ($\chi^2(1) = 4.18$, p=0.041).

4.2.6   Changes in driving

Changes in driving frequency

Reduction in driving is one means of self-regulation. Drivers were asked how much they drove compared with five years ago. Just over half of the ACT drivers reported no change in driving distances while around 35 percent of ACT drivers indicated that they drove less and 10 percent said they drove more now (see Table 24). No gender differences were apparent ($\chi^2(3) = 1.90$, p=0.593) and no differences across place of residence (Fisher's Exact Test=0.237, p=0.916). However, significant differences were observed across age

groups ($\chi^2(4) = 31.50$, p<0.001). Fifty percent of 75+ year olds responded that they were driving less, compared with 27% of 60-64 year olds and 35% of 65-74 year olds.

Table 24: Change in frequency of driving by Gender, Age and Place of Residence for current ACT drivers

Change in driving frequency	Overall (%)	Gender		Age group (years)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
N	1010	403	600	330	473	200	957	26	13
Drive more	10	12	10	14	10	6	11	15	0
Drive less	35	34	36	27	34	50	35	42	31
Drive the same amount	54	54	54	58	55	45	54	42	69
Don't know	<1	<1	<1	<1	1	0	<1	0	0

Table 25 shows changes in driving frequency for NSW drivers. Overall, the same pattern emerged as for ACT drivers with around half driving the same amount compared with five years ago, 35 percent driving less and 13 percent driving more.

Change in amount of driving was significantly influenced by gender. Females were more likely to report that they travelled more than they did 5 years ago than male drivers (19% compared with 9%) ($\chi^2(3) = 16.58$, p=0.001). There was also a significant relationship observed between age and change in frequency of driving habits ($\chi^2(4) = 31.50$, p<0.001). The relationship between age and changes in driving frequency for NSW drivers was quite complex (see Figure 9). Twenty-two percent of NSW drivers in the 60-64 year olds were travelling more than they did five years ago, compared with 13% of 65-74 year olds and 7% of 75+ year olds. However, 38% of 60-64 year olds were travelling less than they were five years ago compared with 29% of 65-74 year olds and 43% of 75+ year olds. Thus, the fact that a greater proportion of 60-64 year olds were driving more than the two older groups did not mean that a smaller proportion of 60-64 year olds were travelling less than the two older groups. What is occurring for the 60-64 year age group is that fewer are travelling the same amount (40% compared with 58% and 51% for the 65-74 and 75+ year age groups respectively). Thus, it seems that while 60-64 year olds seem to change the amount of driving they do more than the older age groups, they aren't necessarily reducing the amount of driving they are doing.

Table 25: Change in frequency of driving by Gender, Age and Place of Residence for current NSW drivers

	Overall (%)	Gender		Age			Place*		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
N	678	256	411	115	357	196	277	266	116
Drive more	13	19	9	22	13	7	14	8	19
Drive less	35	33	36	38	29	43	40	34	22
Drive the same amount	52	48	56	40	58	51	46	58	59
Don't know	<1	1	<1	0	1	0	<1	1	0

* Three "other" cases omitted from table
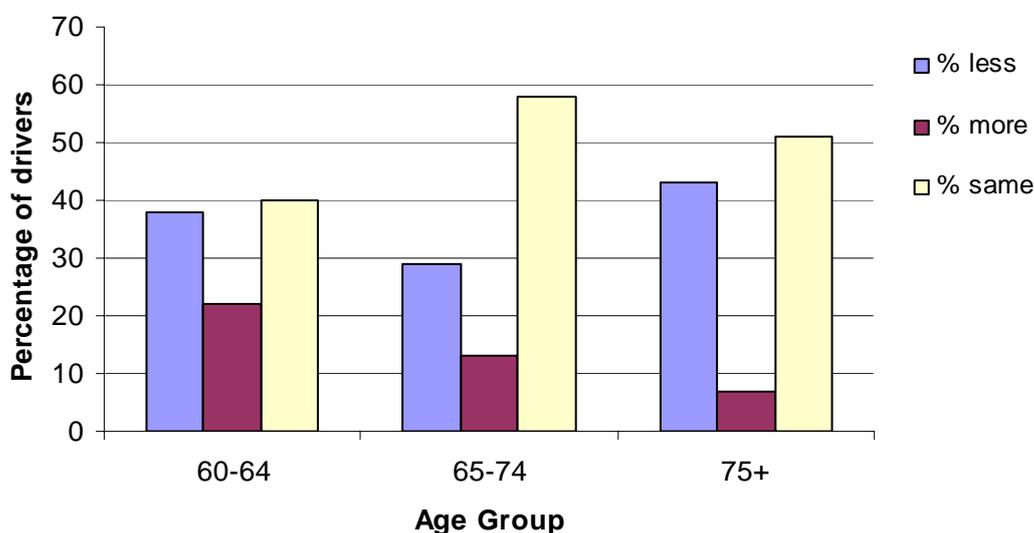
Figure 9: Percentage of NSW drivers driving less, more, or the same amount compared with five years by Age Group

Interestingly, for NSW drivers, there was also a significant relationship observed between place of residence and change in frequency of driving habits ($\chi^2(4) = 20.66$, p<0.001). However, the relationship between place of residence and changes in driving frequency for NSW drivers is again quite complex (see Figure 10). Nineteen percent of NSW drivers from rural areas were travelling more than they did five years ago, compared with 14% of drivers from urban areas and 8% of drivers from country towns. A smaller proportion of drivers from rural NSW were driving less than they did five years ago than drivers from urban areas and country towns (22% compared with 40% and 34% respectively). Thus, while 59% of rural drivers were driving the same amount, there is some indication that they are more likely to be driving more now than five years ago than urban and country drivers. For urban drivers, 40% said they were driving less now than five years ago, compared with 34% for drivers from country towns and 22% for drivers from rural areas.

However, the greater proportion of drivers from urban areas that said they were now driving less didn't mean that a smaller proportion were necessarily driving more than drivers from rural areas or country towns. Fourteen percent of drivers from urban areas were driving more, compared with 8% for drivers from country town and 19% for drivers from rural areas. Only 46% of drivers from urban areas said they hadn't changed the amount of driving they do, compared with 58% for country drivers and 59% for rural drivers. Thus, it seems that drivers from urban areas are less likely to have changed the amount of driving they do than drivers not from urban areas.
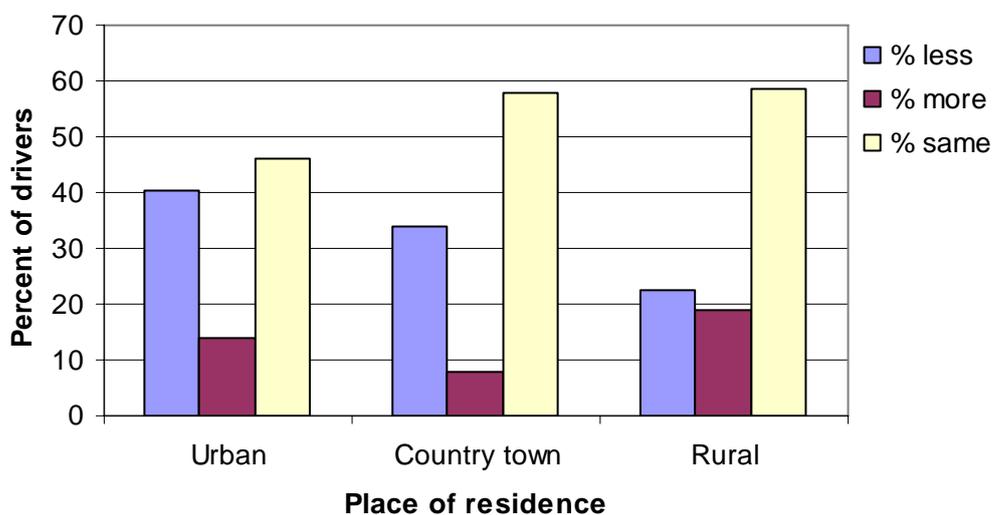
Figure 10: Percentage of NSW drivers driving less, more, or the same amount compared with five years ago by Place of Residence

Reasons for changes in driving frequency

Participants were also asked to indicate reasons why their driving had changed over the last five years. Table 26 and Table 27 summarise these responses. Note that for these analyses responses for ACT and NSW drivers were pooled. A substantial proportion of those who reported an increase in driving (25%) indicated that this was due to their retirement status during this period, allowing them more time for travel. Other reasons included changes in lifestyle, moving house, changes in employment patterns, family commitments, health or their partner/spouse was no longer able to drive. The reasons given for driving more frequently were related to changes in employment situations. Other reasons included a change in availability of another driver in the household, change in place of residence or other family-related circumstances.

Table 26: Reasons for driving more than five years ago

Reason	Frequency (n=193)	%
Changed employment / taken up voluntary work	15	8
Retired / semi-retired – more time for travel	48	25
Spouse no longer able / available to drive	27	14
Moved house	22	11
Family moved / family commitments	15	8
Health related issues	11	6
General lifestyle	39	20
Other	22	11

Multiple response question – total may exceed 100%.

Some of the responses included:

> *"I've got more time to drive about now I'm retired"*

> *"My husband doesn't drive now and I often have to take him to doctors appointments etc"*

> *"I now provide transport for my grandchildren who I care for during the week"*

Similarly, of those who indicated that their driving had decreased over the last five years, about one-third (32%) reported that this was due to changes in employment situations or changes in lifestyle (42%) such as moving house. Nineteen percent identified health or age-related issues, suggestive of appropriate self-regulation, while only 2% reduced their driving because of lack of confidence or avoidance of specific driving situations. Other reasons included changes in activity patterns, changes in family commitments and use of other transport options.

Table 27: Reasons for driving less than five years ago

Reason	Frequency (n=597)	%
General lifestyle changes	**250**	**42**
Cut back on activities / less need	*18*	*3*
Moved house	*24*	*4*
Changed family commitments	*34*	*6*
Lifestyle changes – unspecified	*174*	*29*
Employment changes	**191**	**32**
Retired / Semi-retired	*182*	*30*
Changed job	*9*	*2*
Health / Age (of self or spouse)	**112**	**19**
Use of alternative transport	**51**	**9**
Financial reasons	**9**	**2**
Driving Issues (avoidance, lack of confidence)	**14**	**2**
Other	**24**	**4**

Multiple response question – total may exceed 100% for both categories and subcategories.

Some of the responses included:

"Health related and no longer driving to work"

"Less driving, petrol too expensive"

"Moving from the city to the country and not driving to work any more"

"Getting older and only driving when I need to, not driving at night for security reasons"

"Grandchildren, primary school, different grandmotherly duties"

"I am disciplining myself to use public transport as I have macular degeneration"

Changes in driving speed

Next, drivers were asked if they had noted a change in their driving speed over the last five years (see **Error! Reference source not found.** and Table 29**Error! Reference source not found.** for ACT and NSW responses). Overall, the majority of ACT drivers (82%) and NSW drivers (88%) indicated that their speed had not changed compared with five years ago.

As summarised in Table 28, ACT females were more likely than males to indicate that their driving speed had not changed over the last five years, while males were more likely than females to indicate that they drove slower now compared with five years ago ($\chi^2(2) = 15.15$, p<0.001). No significant age differences were found for changes in driving speeds for ACT drivers (Fisher's Exact Test = 4.47, p=0.306) and no differences were evident across the three places of residence (Fisher's Exact Test = 5.02, p=0.322).

Table 28: Change in driving speed by Gender, Age and Place of Residence for ACT current drivers

	Overall (%)	Gender		Age group (years)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
N	1010	401	602	331	473	199	956	27	13
Faster	<1	<1	<1	1	<1	0	<1	0	0
About the same	82	88	77	82	82	78	82	70	92
Slower	18	12	22	17	17	22	18	30	8

For NSW drivers, there were no significant gender differences for changes in driving speed (Fisher's Exact Test=1.18, p=0.566). Similarly, there were no significant age differences for NSW drivers (Fisher's Exact Test = 3.93, p=0.372) and no difference across place of residence (Fisher's Exact Test = 4.83, p=0.711).

Table 29: Change in driving speed by Gender, Age and Place of Residence for NSW current drivers

	Overall (%)	Gender		Age group (years)			Place*		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
N	676	257	409	115	356	196	278	266	114
Faster	1	1	<1	2	<1	1	1	1	1
About the same	88	88	88	88	89	86	86	89	90
Slower	11	11	11	10	10	13	13	10	9

- Three "other" cases omitted from table

Changes in driving quality

Drivers also rated the quality of their driving now, compared to five years ago. Table 30 and Table 31 summarise the response patterns for ACT and NSW, respectively. For both samples, the majority (approximately 90%) responded that their quality of driving was about the same as it was five years ago.

For ACT current drivers, no gender differences were found in responses to the question regarding each drivers' standard of driving compared with the standard five years ago ($\chi^2(2) = 0.40$, p=0.820). Place of residence was also independent of change in driving standard (Fisher's Exact Test = 5.18, p=0.187). However significant age differences were found across categories of driving quality ($\chi^2(4) = 12.34$, p=0.015). Younger ACT drivers (age 60-64 years) were more likely to rate their driving quality as better than five years ago than both 65-74 year olds and 75+ year olds (10% compared with 6% and 4% respectively).

Table 30: Rating of driving quality by Gender, Age and Place of Residence for ACT current drivers

	Overall (%)	Gender		Age group (years)			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
N	1011	402	602	331	473	200	957	27	13
Better	7	7	7	10	6	4	7	7	23
About the same	88	88	88	86	89	89	88	85	77
Not as good	5	5	5	4	5	8	5	7	0

Table 31: Rating of driving quality by Gender, Age and Place of Residence for NSW current drivers

	Overall (%)	Gender		Age			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
N	679	258	410	115	357	197	278	267	115
Better	5	6	5	4	6	5	6	5	3
About the same	91	91	91	93	91	90	92	90	92
Not as good	4	3	4	3	4	5	2	5	5

* Three "other" cases omitted from table

For NSW current drivers, no gender differences were found in response to the question regarding each drivers' standard of driving compared with the standard five years ago ($\chi^2(2) = 1.93$, p=0.380) and no differences were found across the three places of residence ($\chi^2(4) = 5.14$, p=0.273). Unlike the ACT sample, there were no age group differences in responses for changes in driving quality for NSW drivers ($\chi^2(4) = 1.10$, p=0.894).

4.2.7 Relationship between changes in frequency, speed and quality of driving

Chi-square analyses were conducted to examine the relationships between changes in driving quality, frequency and speed. Figure 11 summarises the relationship between driving frequency and driving quality for ACT drivers. Results showed a significant relationship between changes in driving frequency and quality of driving ($\chi^2(4) = 43.53$, p<0.001). ACT drivers who rated their driving as not as good as five years ago were more than four times more likely to drive less than those who rated their driving as better than five years ago and nearly three times more likely to drive less than those who rated their driving as the same as five years ago. Those who rated their driving as better than five years ago were more than four times more likely to drive more than those who rated their driving standard as unchanged. The drivers who thought they were better than they were five years ago were also nearly four times more likely to drive more than those who rated their driving as worse now than five years ago.
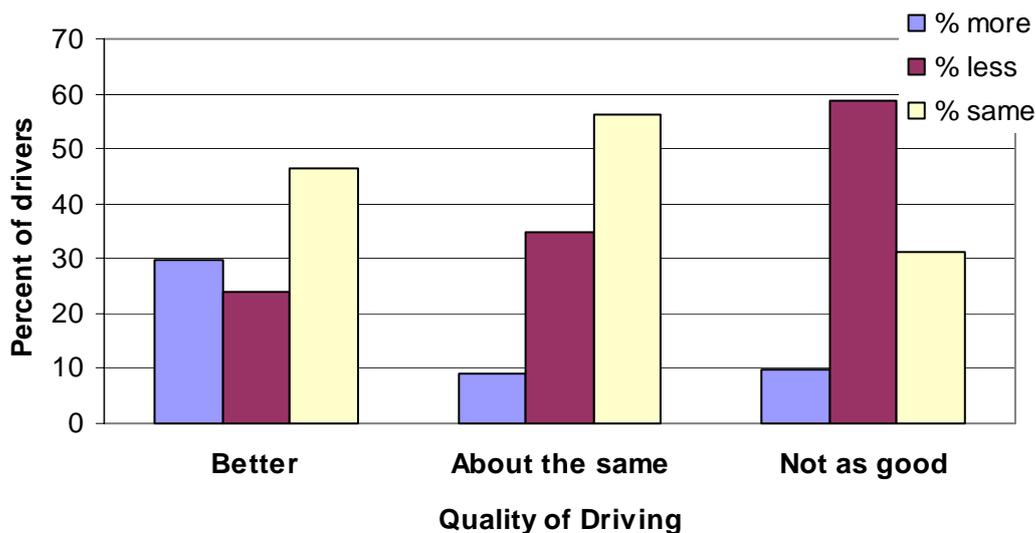
Figure 11: Changes in driving frequency as a function of changes in driving quality for ACT current drivers (percentages are computed within each driving quality category)

For ACT drivers, driving quality and speed were also significantly related (Fisher's Exact Test=53.68, p<0.001) (see Figure 12). ACT drivers who reported that their quality of driving was not as good as five years ago were 7.5 times more likely to say they were driving slower than drivers who said their driving quality was the same as five years ago and 3.4 times as likely to say they were driving slower than drivers who said their driving was better than five years ago.
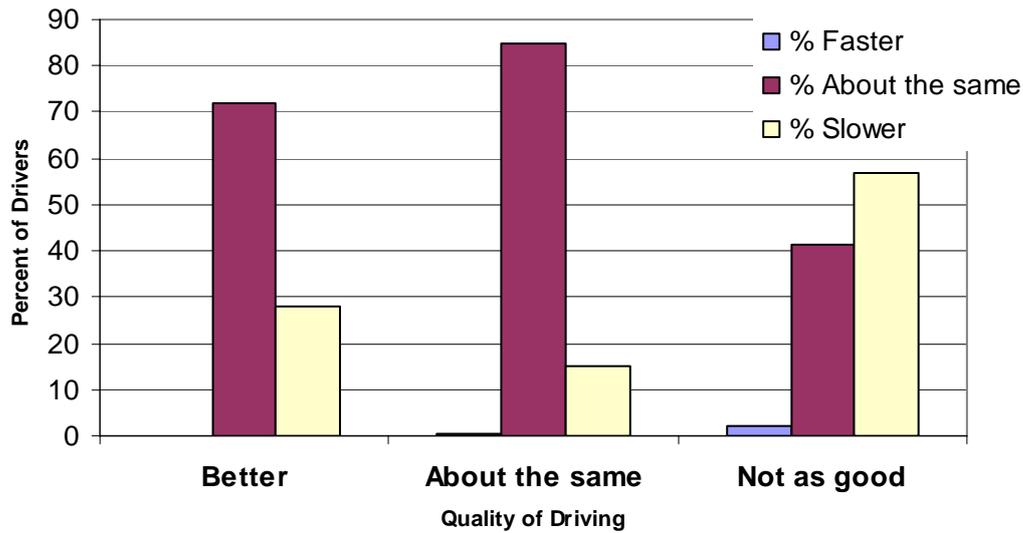
Figure 12: Changes in driving speed as a function of changes in driving quality for ACT current drivers (percentages are computed within each driving quality category)

Results for NSW drivers revealed a significant relationship between changes in driving frequency and quality of driving ($\chi^2(4) = 38.57$, p<0.001; see Figure 13). Analyses revealed that drivers who rated their driving as not as good as five years ago were 4.6 times more likely to drive less than those who rated their driving as better than five years ago and more than three times more likely to drive less than those who rated their driving as the same as five years ago. Those who rated their driving as better than five years ago were nearly six times more likely to drive more than those who rated their driving standard as unchanged. The drivers who thought they were better than they were five years ago were also nine times more likely to drive more than those who rated their driving as worse now than five years ago.
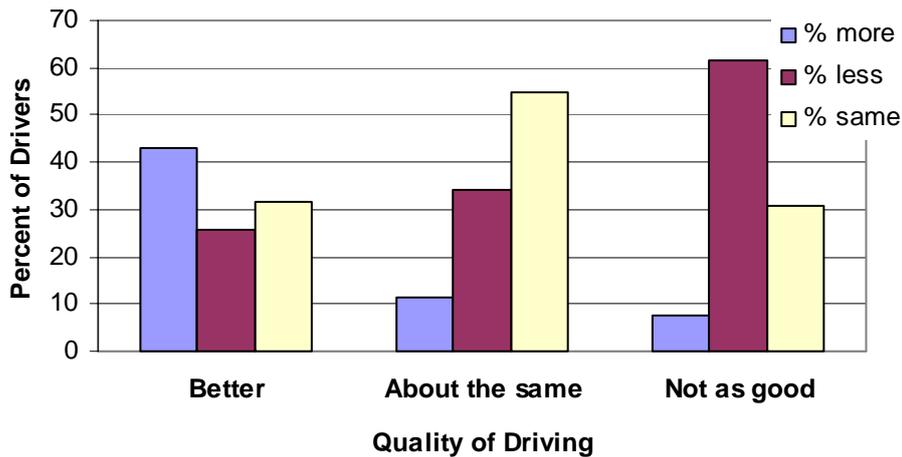
Figure 13: Changes in driving frequency as a function of changes in driving quality for NSW current drivers (percentages are computed within each driving quality category)

Driving quality and speed were also significantly related for NSW drivers (see Figure 14) (Fisher's Exact Test=30.24, p<0.001). NSW drivers who reported that their quality of driving was not as good as five years ago were 4.9 times more likely to say they were driving slower than drivers who said their driving quality was the same as five years ago and 1.8 times as likely to say they were driving slower than drivers who said their driving was better than five years ago. NSW drivers who rated their driving as better than five years previous were almost 29 times more likely than those who said their driving standard had not changed to say they drove faster now than before. However, the reader should bear in mind that only five NSW participants claimed they drove faster now than five years before, so odds ratios involving the likelihood that a respondent is driving faster now than before are likely to have large confidence intervals.
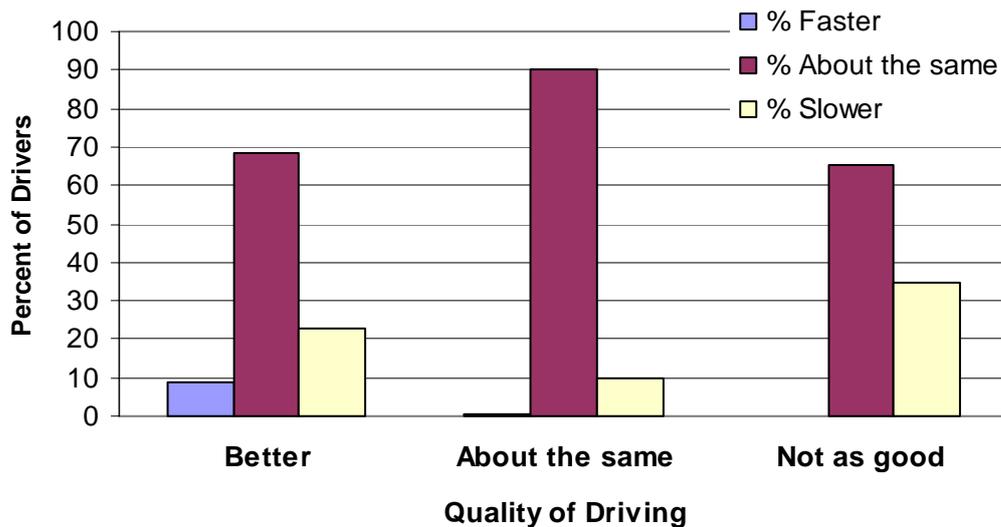
Figure 14: Changes in driving speed as a function of changes in driving quality for NSW current drivers (percentages are computed within each driving quality category)

4.2.8 Changes in driving, health status and medical conditions

The relationships between overall health status and medical conditions (vision and health problems and arthritis) and changes in driving quality, frequency and speed were explored using Chi-square analyses.

Changes in driving and overall health status

Table 32 summarises the relationship for ACT drivers between overall health ratings and driving **quality, frequency** and **speed**. A significant relationship was found between overall health status and changes in the **quality** of driving ($\chi^2(2) = 26.41$, p<0.001; see Table 32). Of the ACT drivers who rated their current standard of driving as not as good as five years ago, only 18 percent rated their health as excellent, compared with 61 percent of those who felt their driving had improved and 53 percent who felt that the standard of their driving had remained about the same.

Overall health status was also related to changes in the **frequency** of driving ($\chi^2(2) = 31.39$, p<0.001). Of those drivers who responded that they were driving less than they were five years ago, only 39 percent rated their health as excellent, compared with 58 percent of those who said they were driving more and 58 percent who said they were driving about the same amount.

Analyses for ACT drivers also showed a significant relationship between overall health status and changes in driving **speed** (Fisher's Exact Test = 42.59, p<0.001; see Table 31). Of the ACT drivers who responded that they were driving slower than they were five years ago, only 30 percent rated their health as excellent, compared with 50 percent of those who said they were driving faster and 57 percent who said they were driving at about the same speed.

Table 32: Change in *quality*, *frequency* and *speed* of driving by overall health rating for ACT drivers (numbers refer to percentages within each driving category)

	Overall Health	
	Excellent	**Good/Fair/Poor**
Quality		
Better	61	39
About the same	53	47
Not as good	18	82
TOTAL	*52*	*48*
Frequency		
More	58	42
About the same	58	42
Less	39	61
TOTAL	*52*	*49*
Speed		
Faster	50	50
About the same	57	43
Slower	30	70
TOTAL	*52*	*48*

Table 33 summarises the results for NSW drivers of analyses of the relationships between overall health ratings and driving *quality, frequency* and *speed*.

Firstly, overall health status was found to be significantly related to changes in the ***quality*** of driving ($\chi^2(2) = 13.63$, p<0.001). Of the NSW drivers who rated their current standard of driving as not as good as five years ago, only 19 percent rated their health as excellent, compared with 66 percent of those who felt their driving had improved and 52 percent who felt the standard of their driving had remained about the same.

Overall health status was also related to changes in the ***frequency*** of driving ($\chi^2(2) = 18.43$, p<0.001). Of the NSW drivers who responded that they were driving less than they were five years ago, 40 percent rated their health as excellent, compared with 64% of those who said they were driving more and 55 percent who said they were driving about the same amount.

Similarly, a significant relationship was found between overall health status and changes in driving ***speed*** (Fisher's Exact Test = 11.55, p=0.002). Of the NSW drivers who responded that they were driving slower than they were five years ago, only 34 percent rated their health as excellent, compared with 80 percent of those who said they were driving faster and 53 percent who said they were driving at about the same speed. The reader should note that there were only four NSW cases in which the person claimed they drove faster now than five years ago.

Table 33: Change in *quality*, *frequency* and *speed* of driving by overall health rating for NSW drivers (numbers refer to percentages within each driving category)

	Overall Health	
	Excellent	Good/Fair/Poor
Quality		
Better	66	34
About the same	52	48
Not as good	19	81
TOTAL	*51*	*49*
Frequency		
More	64	36
About the same	55	45
Less	40	60
TOTAL	*51*	*49*
Speed		
Faster	80	20
About the same	53	47
Slower	34	66
TOTAL	*51*	*49*

Changes in driving and vision problems

Table 34 shows the relationship between vision conditions and driving changes for ACT drivers. Results of the chi square analyses revealed that vision status was significantly related to changes in the ***quality*** of driving over the last five years ($\chi^2(4) = 11.39$, p=0.023). Of the ACT drivers who responded that their quality of driving wasn't as good as it was five years ago, 51 percent stated they had vision problems, compared with 28 percent of those who said their driving was of a better quality and 29 percent who said their standard of driving was about the same as five years ago.

Vision status was also related to changes in ***frequency*** of driving over the last five years ($\chi^2(4) = 18.28$, p=0.001). Of the ACT drivers who responded that they were driving more than they were five years ago, only 19 percent stated they had vision problems, compared with 38 percent of those who said they were driving less and 28 percent who said they were driving at about the same amount.

In addition, a significant relationship between vision status and changes in driving ***speed*** over the last five years was found (Fisher's Exact Test = 10.81, p=0.017). Of the ACT drivers who responded that they were driving slower than they did five years ago, 40 percent claimed they had vision problems, compared with 28 percent of those who said they were driving at about the same speed. There were only four NSW current drivers who said they were driving faster now than five years ago, two of these drivers claimed to have vision problems.

Table 34: ACT driver change in quality, frequency and speed of driving by vision rating (numbers refer to percentages within each driving frequency category)

	Vision Problems		
	Yes	**No**	**Treated**
Quality			
Better	28	57	16
About the same	29	59	11
Not as good	51	38	11
TOTAL	*30*	*58*	*12*
Frequency			
More	19	70	11
About the same	28	59	13
Less	38	53	9
TOTAL	*31*	*58*	*12*
Speed			
Faster	50	50	0
About the same	28	60	12
Slower	40	48	13
TOTAL	*30*	*58*	*12*

Table 35 shows the relationship between vision and changes in driving *frequency* for NSW drivers. Vision status for NSW drivers was found to be significantly related to changes in the frequency of driving over the last five years ($\chi^2(4) = 18.18$, p=0.001). Forty-two percent of those drivers who reported driving more now than they were five years ago claimed they had no vision problems, compared with 65 percent of those who said they were driving less and 66 percent who said they were driving at about the same amount. However 38% of NSW drivers who claimed they were driving more now than five years ago claimed they had vision problems, compared with 27 percent of those who were driving less and 26% of those who were driving the same amount. Nineteen percent of those who drove more had been treated for their vision problems, compared with people who drove less or the same amount as five years previous (both 8%).

Table 35: NSW driver changes in frequency of driving by vision rating (numbers refer to percentages within each driving frequency category)

	Vision Problems		
	Yes	**No**	**Treated**
Frequency			
More	38	42	19
About the same	26	66	8
Less	27	65	8
TOTAL	*28*	*63*	*10*

No significant relationships were found between vision status and changes in the *quality* of driving ($\chi^2(4) = 5.79$, p=0.215) or between vision and changes in driving *speed* (Fisher's Exact Test = 2.92, p=0.530).

Changes in driving and heart problems

Table 36 shows data for ACT driver changes in driving by heart problems. Reported presence of heart problems was significantly related to changes in driving *frequency* over the last five years ($\chi^2(4) = 22.42$, p<0.001). Of the ACT drivers who responded that the were driving less than they did five years ago, 20 percent claimed they had heart problems, compared with 9 percent of those who said they were driving about the same amount and 9 percent who said they were driving more.

There was also a significant relationship between heart problem status and changes in driving *speed* over the last five years (Fisher's Exact Test = 9.36, p=0.044). Twenty percent of ACT drivers who responded that they were driving slower than they did five years ago claimed they had heart problems, compared with 12 percent of those who said they were driving at about the speed. Note that there were only four ACT drivers who said they were driving faster now compared with five years ago, and three of these cases did not have heart problems. There was no significant relationship between heart problem status and changes in the *quality* of driving for ACT drivers now, compared with five years ago (Fisher's Exact Test = 7.74, p=0.086).

Table 36: ACT driver change in frequency and speed of driving by heart problems (numbers refer to percentages within each driving frequency category)

	Heart Problems		
	Yes	**No**	**Treated**
Frequency			
More	9	86	4
About the same	9	86	5
Less	20	75	5
TOTAL	*13*	*82*	*5*
Speed			
Faster	25	75	0
About the same	12	84	5
Slower	20	75	5
TOTAL	*13*	*82*	*5*

For NSW drivers, there was no significant relationship between heart problem status and changes in the *frequency* of driving ($\chi^2(4) = 8.13$, p=0.087), changes in the *quality* of driving (Fisher's Exact Test = 5.06, p=0.230) and changes in the *speed* of driving (Fisher's Exact Test = 4.63, p=0.300) now, compared with five years ago.

Changes in driving and arthritis

For ACT drivers there was a significant relationship between whether the driver had arthritis and changes in driving *frequency* over the last five years ($\chi^2(4) = 10.70$, p=0.030; see Table 37). Of the ACT drivers who responded that they were driving less than they did

five years ago, 37% claimed they had arthritis, compared with 26% of those who said they were driving about the same amount and 29% who said they were driving more. No significant relationship was found between arthritis and changes in the *quality* of driving (Fisher's Exact Test = 1.64, p=0.789) and between arthritis and changes in the *speed* of driving now, compared with five years ago (Fisher's Exact Test = 1.71, p=0.880).

Table 37: Change in frequency of driving by arthritis status for ACT drivers (numbers refer to percentages within each driving frequency category)

	Arthritis		
	Yes	**No**	**Treated**
Frequency			
More	29	68	3
About the same	26	71	3
Less	37	60	3
TOTAL	*30*	*67*	*3*

For NSW drivers, there were no significant relationships found between arthritis problem status and changes in the *frequency* of driving ($\chi^2(4) = 5.17$, p=0.270), the *quality* of driving (Fisher's Exact Test = 4.21, p=0.315) or the *speed* of driving (Fisher's Exact Test = 3.17, p=0.530), now, compared with how they were driving five years ago.

4.2.9 Driving situations: Confidence, difficulty and avoidance

Drivers were asked a series of questions about their driving in the last six months. These questions were designed to examine confidence, difficulty and avoidance of driving situations that are thought to cause problems for older drivers. These driving situations included:

- Driving in the rain
- Driving in busy traffic
- Driving at night and when wet
- Making a right-hand turn at intersections without lights
- Driving through roundabouts
- Making a right-hand turn at intersections with lights but without a right-turn arrow

- Merging into traffic
- Driving at night
- Changing lanes
- Driving through intersections without lights
- Making a right-hand turn at intersections with lights and with a right-turn arrow

For each of these driving situations, drivers were asked first to rate their level of confidence, second to rate how difficult they find this driving situation, and third, to indicate whether they intentionally avoided driving in this situation and if so, why. In addition, drivers were asked to identify any other situations in which they experienced difficulty or intentionally avoided.

Confidence in driving situations

Table 38 shows the percentage of valid responses for each scenario in which the driver felt very confident, moderately confident or not at all confident for ACT drivers. In general, participants indicated that they were very confident in the majority of driving situations. This was particularly evident for making right hand turns with signals providing a fully controlled turning phase (89%). In contrast, fewer drivers (38%) were very confident when driving at night and only 25 percent of drivers were very confident when driving at night in the wet.

Table 38: Summary of confidence ratings for all driving situations for current ACT drivers

Driving Situation	Confidence Level (%)		
	Very	**Moderate**	**Not at all**
Merging into traffic (N=1,011)	55	44	1
Rain (N=1,009)	42	57	2
Busy traffic (N=1,006)	47	51	2
Roundabouts (N=1,010)	64	35	1
Intersections with no traffic lights (N=1,005)	54	45	1
RH turns with no traffic lights (N=1,006)	62	37	1
RH turns with traffic lights & no r-turn arrow (N=1,007)	64	36	<1
RH turns with traffic lights with r-turn arrow (N=1,009)	89	11	0
Night (N=999)	38	56	6
Night when wet (N=990)	25	63	12
Changing lanes (N=1,011)	62	37	1

Odds ratios were also calculated for gender differences, age differences (comparing responses of those aged 75 years and older with responses of the two younger groups combined) and place of residence (comparing urban areas with country town and rural areas) (see Table 39). These analyses revealed that males were more likely to be very confident in all driving situations, except for making right-hand turns at fully controlled traffic signals (those with right-hand turn arrows). Moreover, the oldest age group was less likely than younger drivers to be very confident in the majority of driving situations. No differences were observed in confidence ratings across places of residence.

Table 39: Odds ratios* for 'very confident' ratings for all driving situations by gender, age and place of residence for ACT drivers

Driving Situation	Gender M : F	Age group (years) 60-64 : 75+	Age group (years) 65-74 : 75+	Place CT: Urb	Place Rural : Urb
Merging into traffic	2.4	2.8	2.1	0.8 NS	0.7 NS
Rain	2.2	2.1	1.7	0.8 NS	0.9 NS
Busy traffic	1.9	2.7	2.3	0.7 NS	0.3 NS
Roundabouts	1.6	2.8	1.7	0.6 NS	0.9 NS
Intersections/ no traffic lights	1.9	2.4	1.9	1.2 NS	0.5 NS
Right turns at intersections with no traffic lights	1.9	2.7	2.5	1.1 NS	0.7 NS
Right turns where traffic lights have no r-turn arrow	1.5	2.8	2.5	1.0 NS	0.7 NS
Right turns where traffic lights have r-turn arrow	0.8 NS	2.8	2.5	0.5 NS	1.4 NS
Night	2.3	3.1	2.1	0.8 NS	0.5 NS
Night when wet	2.9	2.5	2.6	1.0 NS	0.9 NS
Changing lanes	1.8	2.6	1.9	0.9 NS	0.7 NS

Note: Differences are significant at p<.01 unless otherwise indicated (NS).
* ORs are defined as Odds of first group divided by odds of second group

Confidence ratings for NSW drivers are summarised in Table 40. The highest frequency of very confident ratings were observed for right hand turns with signals (90%) while fewer drivers were very confident when driving at night (38%) and at night in the wet (30%).

Table 40: Summary of confidence ratings for all driving situations for NSW drivers

Driving Situation	Confidence Level (%) Very	Confidence Level (%) Moderate	Confidence Level (%) Not at all
Merging into traffic (N=673)	60	40	1
Rain (N=669)	49	50	1
Busy traffic (N=671)	48	49	3
Roundabouts (N=672)	73	26	1
Intersections/ no traffic lights (N=672)	58	41	1
RH turns with no traffic lights (N=673)	65	34	1
RH turns with traffic lights & no r-turn arrow (N=666)	68	31	1
RH turns with traffic lights with r-turn arrow (N=667)	90	10	<1
Night (N=666)	38	55	7
Night when wet (N=659)	30	59	12
Changing lanes (N=661)	62	38	1

As shown in Figure 15, a comparison of 'very confident' ratings for NSW and ACT drivers reveals a remarkably similar pattern across the different driving scenarios.
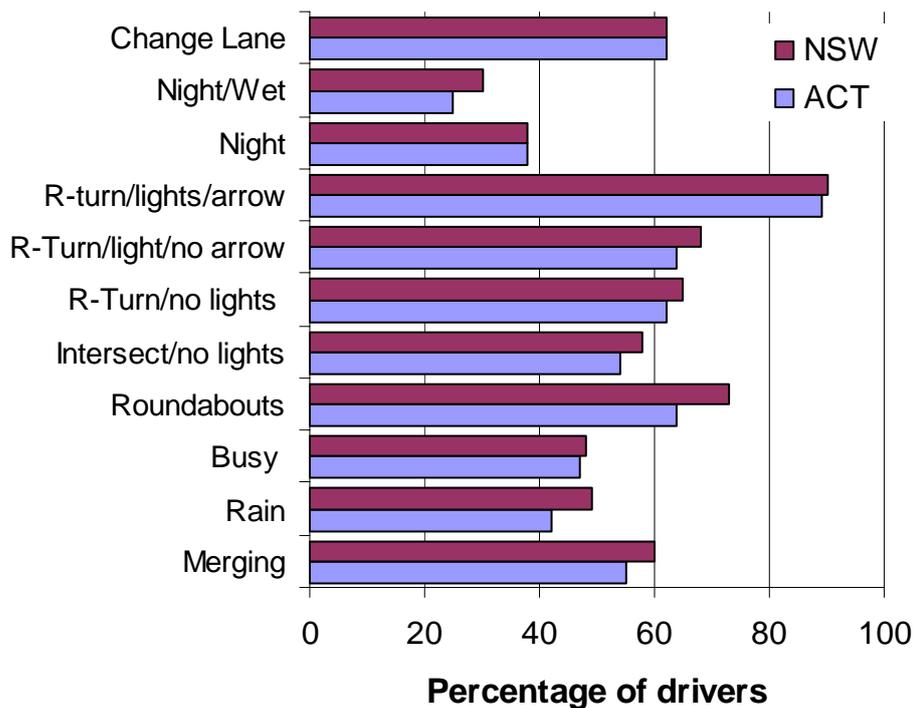
Figure 15: Comparison of 'very confident' ratings for NSW and ACT drivers

Odds ratios for NSW drivers for very confident ratings by gender, age group and place of residence are shown in Table 41. Gender effects mirrored those for ACT sample, that is, NSW male drivers were more likely to be very confident in all driving situations compared with females. Age effects were not consistently significant across the different driving scenarios although, generally, the oldest NSW drivers were less likely than younger drivers to be very confident. In particular drivers aged 75 years and older were less likely than the youngest group to report being very confident in busy traffic, making right turns without a turn arrow and when driving at night. In addition, the oldest drivers were more likely than middle aged drivers (65-74 years) to report being very confident at night and at night when wet. For majority of driving situations, no differences were observed in the confidence ratings across places of residence. The one exception was for busy traffic, where urban drivers were found to be more likely to be very confident in busy traffic compared with drivers in country towns.

Table 41: Odds ratios* for 'very confident' ratings for all driving situations by gender, age and place of residence for NSW current drivers

Driving Situation	Gender M : F	Age 60-64 : 75+	Age 65-74 : 75+	Place CT: Urb	Place Rural : Urb
Merging into traffic	3.0	1.1 NS	1.3 NS	1.0 NS	1.2 NS
Rain	3.6	1.0 NS	1.3 NS	1.1 NS	1.2 NS
Busy traffic	2.5	1.8	1.4 NS	0.6	0.7 NS
Roundabouts	1.8	1.6 NS	1.3 NS	0.9 NS	1.2 NS
Intersections with no traffic lights	2.1	1.4 NS	1.2 NS	1.1 NS	1.5 NS
Right turns at intersections with no traffic lights	2.2	1.4 NS	1.1 NS	1.0 NS	1.4 NS
Right turns where traffic lights have no r-turn arrow	1.6	2.0	1.2 NS	0.8 NS	1.1 NS
Right turns where traffic lights have r-turn arrow	1.7	1.6 NS	1.4 NS	0.8 NS	1.2 NS
Night	3.3	2.1	1.7	0.8 NS	1.0 NS
Night when wet	3.4	1.6 NS	1.6	1.0 NS	1.0 NS
Changing lanes	2.6	1.5 NS	1.3 NS	1.0 NS	1.0 NS

Note: Differences are significant at p<.05 unless otherwise indicated (NS)

* Odds Ratios are defined as Odds of first group divided by Odds of second group

Difficulty in driving situations

Participants were asked if driving situations caused them difficulty or not. Table 42 shows for each driving situation, the proportion of participants that reported that the situation was not difficult, a little difficult or very difficult for them. The majority of participants (70-97%) reported no difficulty in most of the driving situations involving merging, roundabouts and intersections of all types, and lane changes. However, there were several situations where more than 40 percent of drivers reported 'a little difficulty' (rain, busy, at night) and in the case of driving at night when wet, 63 percent of all ACT drivers indicated they had a little difficulty and 10 percent indicated that they found this a very difficult driving situation.

Table 42: Summary of difficulty ratings for all driving situations for current ACT drivers

Driving Situation	Difficulty Level (%) Not	A little	Very
Merging into traffic (N=996)	70	29	1
Rain (N=991)	51	48	1
Busy traffic (N=988)	55	44	1
Roundabouts (N=995)	79	21	<1
Intersections/ no traffic lights (N=997)	73	26	1
RH turns with no traffic lights (N=992)	78	22	1
RH turns with traffic lights & no RH arrow (N=997)	77	23	<1
RH turns with traffic lights & RH arrow (N=997)	97	3	0
Night (N=987)	47	49	4
Night when wet (N=978)	27	63	10
Changing lanes (N=998)	73	26	1

Odds ratios of difficulty ratings by age, gender and place of residence are presented in Table 43. In general, males were less likely than females to indicate difficulty in all driving situations except for making a right-hand turn at intersections with traffic signals (with or without right-turn arrows). In contrast, however, few age differences were found. The youngest group of drivers was less likely to report difficulty with merging, busy traffic, at night and at night when wet than the oldest group of drivers. The middle-age group were less likely to report difficulty than older drivers with intersections with no traffic lights, right turns at intersections with no traffic lights, and at night. Only driving at night showed significant differences across place of residence, with urban drivers from ACT more likely to report difficulty compared with drivers from country towns.

Table 43: Odds ratios* for 'Difficulty' ratings for all driving situations by gender, age and place of residence for ACT current drivers

Driving Situation	Gender	Age		Place	
	F : M	75+ : 60-64	75+ : 65-74	Urb : CT	Urb : Rural
Merging into traffic	2.3	1.6	1.5	1.0 NS	0.7 NS
Rain	1.5	1.4 NS	1.2 NS	1.0 NS	1.1 NS
Busy traffic	1.5	1.8	1.4	0.5 NS	1.0 NS
Roundabouts	1.5	1.1 NS	0.9 NS	0.6 NS	0.9 NS
Intersections/ no traffic lights	1.6	1.3 NS	1.6	0.8 NS	0.8 NS
Right turns at intersections with no traffic lights	2.0	1.5 NS	1.9	0.7 NS	0.6 NS
Right turns where traffic lights have no r-turn arrow	1.3 NS	1.3 NS	1.3 NS	1.1 NS	1.7 NS
Right turns where traffic lights have r-turn arrow	1.2 NS	1.5 NS	1.5 NS	0.8 NS	N/A**
Night	2.2	1.9	1.5	1.7 NS	1.0 NS
Night when wet	2.5	1.7	1.4 NS	2.3	1.8 NS
Changing lanes	1.9	1.6	1.5	1.3 NS	1.2 NS

Note: Differences are significant at p<.05 unless otherwise indicated (NS).
* Odds Ratios are defined as Odds of first group divided by Odds of second group
** Odds Ratio could not be calculated for there were no Rural cases that had difficulty making right turns where traffic lights have r-turn arrow

Table 44 summarises the NSW sample percentage of valid responses for each scenario in which the driver felt the scenario was very difficult, a little difficult or not at all difficult. Like ACT drivers, the majority of NSW participants (70-97%) reported no difficulty in most of the driving situations, particularly those involving merging, roundabouts and intersections of all types, and lane changes. Again, there were several situations where a

considerable proportion of NSW drivers reported a little difficulty (rain, busy, at night). Like ACT drivers, the highest proportions of NSW drivers reporting difficulty were observed for driving at night when wet.

Table 44: Summary of difficulty ratings for all driving situations for current NSW drivers

	Difficulty Level (%)		
Driving Situation	Not	A little	Very
Merging into traffic (N=647)	79	20	1
Rain (N=650)	58	42	<1
Busy traffic (N=654)	60	38	2
Roundabouts (N=647)	85	14	1
Intersections with no traffic lights (N=654)	73	26	1
RH turns with no traffic lights (N=650)	79	21	1
RH turns with traffic lights & no RH arrow (N=641)	81	18	<1
RH turns with traffic lights & RH arrow (N=643)	97	3	0
Night (N=646)	51	45	4
Night when wet (N=644)	35	56	9
Changing lanes (N=641)	76	24	<1

Odds ratios of difficulty ratings for NSW drivers by age, gender and place of residence are presented in Table 45. In general, as with the ACT drivers, male drivers in NSW were less likely than females to indicate difficulty in the majority of driving situations. In contrast to ACT sample, few age differences were found. The oldest group of drivers was less likely to report difficulty than the younger groups for driving at night; and for merging the reverse was true (compared to the youngest group only). Only driving in busy traffic showed significant differences across place of residence, with urban drivers from NSW less likely to report difficulty compared with drivers from country towns and rural areas.

Table 45: Odds ratios* for 'Difficulty' ratings for all driving situations by gender, age and place of residence for NSW current drivers

Driving Situation	Gender	Age		Place	
	F : M	75+ : 60-64	75+ : 65-74	Urb : CT	Urb : Rural
Merging into traffic	2.9	0.6	1.4 NS	1.4 NS	1.2 NS
Rain	2.0	0.9 NS	1.0 NS	1.2 NS	1.5 NS
Busy traffic	1.6	1.1 NS	1.1 NS	0.6	0.6
Roundabouts	1.2 NS	0.9 NS	0.7 NS	1.0 NS	1.3 NS
Intersections with no traffic lights	1.6	1.0 NS	0.9 NS	1.2 NS	1.3 NS
Right turns at intersections with no traffic lights	1.8	1.0 NS	0.9 NS	1.1 NS	1.8 NS
Right turns where traffic lights have no r-turn arrow	1.4 NS	1.1 NS	1.0 NS	0.9 NS	1.1 NS
Right turns where traffic lights have r-turn arrow	3.4	0.5 NS	0.8 NS	0.7 NS	1.5 NS
Night	2.2	1.6	1.6	1.0 NS	0.9 NS
Night when wet	2.3	1.0 NS	1.0 NS	1.1 NS	0.8 NS
Changing lanes	1.9	1.0 NS	1.4 NS	1.4 NS	0.9 NS

Note: Differences are significant at $p<.05$ unless otherwise indicated (NS)

* Odds Ratios are defined as Odds of first group divided by Odds of second group

Avoidance of driving situations

In addition to rating confidence and difficulty in driving situations, participants were asked if they intentionally avoided these situations (yes/no response). Avoidance responses for ACT and NSW drivers are presented in Figure 16. Overall, the majority of participants indicated that they did not avoid the various driving situations. This is not surprising, given that the majority of participants indicated high confidence and no difficulty in most driving situations. The most commonly avoided driving situations were driving at night, particularly when wet and driving in busy traffic.
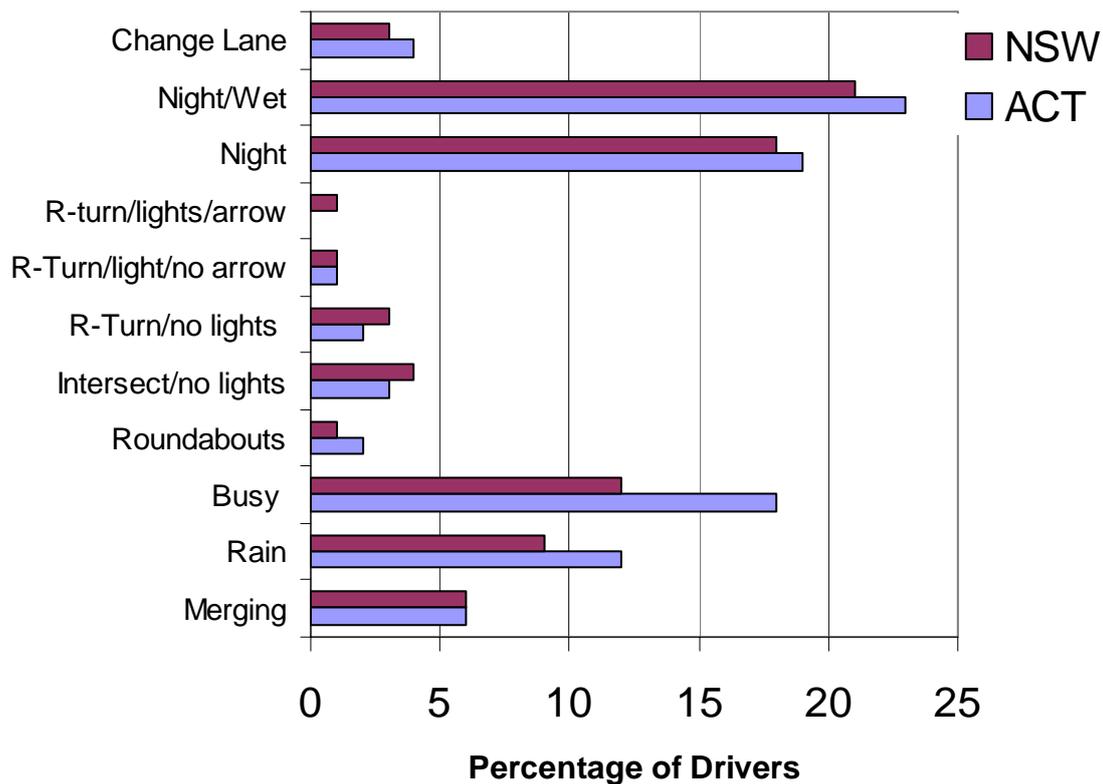
Figure 16: Avoidance of driving situations for ACT and NSW drivers

Odds ratios were computed for driving avoidance for all driving scenarios for ACT drivers (see Table 46) and NSW drivers (see Table 47). In general, females were more likely than males to report avoidance behaviour. Some notable differences were evident across the two samples. For example, in the ACT, females were much more likely to avoid roundabouts (3.7 times) and merging (2.6 times) and somewhat more likely to avoid driving in the rain (1.6 times) and driving at night (1.4 times) than males. In NSW, females were 4.7 times more likely to avoid right turns at intersections with no traffic lights compared with males. Other driving situations more likely to be avoided by NSW females were merging, busy traffic, driving at night and particularly at night when wet. Age effects were also evident across the two samples of drivers. Generally, the oldest groups (75+ years) were more likely than the younger groups to avoid the various driving situations, particularly merging, driving at night and driving at night when wet. Place of residence had little effect on avoidance behaviours with the one exception that in the ACT, drivers resident in urban areas were less likely to avoid roundabouts than those from country towns. This seems intuitive given the high number of roundabouts in the Canberra area (ACT urban). ACT urban drivers may generally be more familiar with roundabouts and thus, less likely (and perhaps less able) to avoid them. NSW urban drivers were also less likely to avoid busy traffic and night driving than drivers from rural NSW.

Table 46: Odds ratios for driving avoidance for all driving situations by gender, age and place of residence for ACT current drivers

Driving Situation	Gender F : M	Age group (years) 75+ : 60-64	Age group (years) 75+ : 65-74	Place Urb : CT	Place Urb : Rural
Merging into traffic	2.6**	3.8**	2.8**	0.5	0.7
Rain	1.6*	1.5	1.7*	0.5	0.7
Busy traffic	1.2	1.5	1.4	1.0	2.5
Roundabouts	3.7*	2.7	2.2	0.2*	N/A
Intersections with no traffic lights	1.8	0.8	1.0	0.7	0.3
Right turns at intersections with no traffic lights	1.9	1.3	1.6	N/A	N/A
Right turns where traffic lights have no r-turn arrow	2.5	0.9	2.4	N/A	N/A
Right turns where traffic Lights have r-turn arrow	0.5	N/A	N/A	N/A	N/A
Night	1.4*	2.6**	2.4**	1.4	0.4
Night when wet	1.7	1.8**	2.3**	1.7	0.5
Changing lanes	1.0	2.0	2.3*	N/A	N/A

Note: Differences are not significant unless otherwise indicated (** $p<.01$, * $p<.05$)
Note: Odds Ratios are defined as Odds of first group divided by Odds of second group
N/A: Some odds ratios could not be calculated as there were no cases in one or more of the covariate groups for the confounding variable being examined.

Table 47: Odds ratios for driving avoidance for all driving situations by gender, age and place of residence for NSW current drivers

Driving Situation	Gender	Age group (years)		Place	
	F : M	75+ : 60-64	75+ : 65-74	Urb : CT	Urb : Rural
Merging into traffic	2.4**	1.6	2.8**	1.3	0.7
Rain	1.8*	1.4	1.2	1.0	0.5
Busy traffic	2.0**	2.5*	1.5	0.6	0.5*
Roundabouts	2.5	1.2	1.9	0.9	0.8
Intersections with no traffic lights	2.5	0.4	0.4	1.6	2.5
Right turns at intersections with no traffic lights	4.7**	0.5	0.7	0.9	0.7
Right turns where traffic lights have no r-turn arr	5.0	N/A	1.9	0.4	0.4
Right turns where traffic lights have r-turn arrow	N/A	0.6	0.9	0.4	0.4
Night	2.5**	2.7**	2.0**	0.8	0.5*
Night when wet	2.2**	2.2*	1.9**	0.8	0.6
Changing lanes	2.7	0.6	0.9	1.2	0.7

Note: Differences are not significant unless otherwise indicated (** p<.01, * p<.05)
Note: Odds Ratios are defined as Odds of first group divided by Odds of second group
N/A: Some odds ratios could not be calculated as there were no cases in one or more of the covariate groups for the confounding variable being examined.

Strategies and Reasons for Avoidance of Driving Situations

Participants were asked to describe how they avoided specific driving situations. Responses for ACT and NSW drivers were pooled. Strategies for the five most commonly avoided driving situations are summarised in Table 48.

Table 48: Summary of avoidance of driving situations

Situation and avoidance strategy	Number and Proportion (%) of Cases	
	Frequency	%
Merging (n=94)		
Take alternative route / avoid merging situations or busy intersections	63	67
Avoid driving in peak time traffic	13	14
Slow down	8	9
Other	10	11
Rain (n=173)		
Delay trip until rain has stopped / eased	67	39
Avoid non-essential trips	50	29
Pull over and wait for rain to stop	19	11
Choose alternative transport	9	5
Other	26	15
Busy traffic (n=256)		
Avoid peak hour driving	149	58
Choose an alternative route	36	14
No major city driving (Melbourne or Sydney)	23	9
Alternative transport / driver	26	10
Other	11	4
Night (n=298)		
Stay at home / don't drive at night	125	42
Avoid unnecessary trips	21	7
Choose well lit or well known roads only	15	5
Choose alternative transport or an alternative driver	63	21
Plan to be home before dark / activities during day time only	55	18
Other	12	4
Night/wet (n=362)		
Only go out if it is necessary	42	12
Change plans / stay home / refuse to drive	105	29
Wait until rain stops	25	7
Choose times of travel carefully to avoid these situations	22	6
Choose alternative transport or an alternative driver	53	15
Other	9	2

Multiple response question – total for each situation may exceed 100%.

Participants were also asked to describe reasons why they avoided difficult driving situations. The most frequently reported reasons[7] cited by respondents for avoiding each of the above situations were:

Merging (n=94)

	(%)
Other drivers too fast or aggressive / don't trust them	27
Safety reasons	19
Stressful / don't like it	19
Lack of confidence	8
Other	18

Some responses included:

"To avoid fast and impatient drivers"

"Safety first"

"To avoid wear and tear on the nervous system"

Rain (n=173)

Safety reasons / dangerous road conditions	36
Concerned by other road user behaviour	24
Reduced Visibility	21
Lack of confidence / uncomfortable driving in rain	8
Previous accident / bad experience	2
Other	8

Some of the responses included:

"Too many drivers on the road fail to slow down in wet weather"

"All around visibility is diminished"

"Driving in wet weather is always more hazardous"

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[7] Values are computed as a percentage of those who responded positively to avoidance behaviours in Table 48 above. Some drivers did not respond while others gave multiple reasons, hence totals do not add to 100%.

Busy Traffic (n=256)

Too stressful / difficult to drive in heavy traffic	34
Other drivers too aggressive	12
Safety reasons	10
Lack of confidence	6
Waste of time / money	12
Unused to conditions	4
Other	2

Some of the responses included:

"Frustrating and probably not necessary these days"

"My reflex ability may have slowed, and too many idiots on the road"

"I don't drive if I feel it's too difficult, why cause problems"

Driving at night (n=298)

Visibility problems / dazzle and glare	45
Lack of confidence	4
Fear of other drivers	5
Safety concerns / wildlife on road	16
Other	12

Some of the responses included:

"Harder to avoid wildlife like kangaroos on some roads"

"Night vision not good" and *"An apparent increase in irresponsible drivers after dark"*

Driving at night when it is wet (n=362)

No need to go out / too stressful	10
Poor visibility	27
Safety concerns	23
Fear of other road users	9
Lack of confidence	2
Other	3

Some of the responses included:

"Visibility is less, roads are slippery"

"A wet road and reflection of lights is confusing"

"I have no reason to be out when it is raining"

Detailed examination of driving situations that are commonly avoided by older drivers

In this section, the driving situations that resulted in the highest levels of avoidance behaviours are examined in more detail. These include driving at night, driving at night when wet, and driving in busy traffic. Some key variables were considered, including confidence and difficulty ratings, overall health ratings and the presence of vision problems, which was the most commonly reported medical condition. Of interest was whether drivers with lower ratings of confidence and higher ratings of difficulty were more likely to avoid these driving situations. Similarly, the analyses explored whether drivers with lower health ratings or the presence of any of these medical conditions were more likely to avoid these driving situations than those with higher health ratings or vision conditions. More detailed multivariate analyses of potential variables influencing self-regulatory behaviours are presented in a following section.

Avoidance of driving at night

Confidence

As described in the previous sections, 62 percent of ACT drivers and 62 percent of NSW drivers said they were only moderately confident or not at all confident about driving at night. However, a considerably smaller proportion of drivers indicated that they avoided driving at night (19% for ACT and 18% for NSW). Of interest was the relationship between confidence ratings and avoidance behaviours. That is, do drivers who have lower confidence avoid driving at night?

To address this question, avoidance rates were examined to determine whether or not those who were not at all confident or those who found this particular driving situation very difficult, tended to avoid driving at night (see Table 49).

Significant relationships were found between confidence ratings and avoidance behaviour for both ACT drivers ($\chi^2(1) = 94.63$, p<0.001) and NSW drivers ($\chi^2(1) = 65.36$, p<0.001). ACT drivers who were only moderately confident or not at all confident were 13.6 times more likely to say they avoided driving at night, while NSW drivers who were only moderately confident or not at all confident were nearly 18 times more likely to say they avoided driving at night than those who said they were very confident driving at night. Interestingly, for both ACT and NSW drivers, of those who said they were only moderately or not at all confident driving at night, only 28 percent reported that they avoid this driving situation as a general rule. This suggests that just over one quarter of drivers who are less confident are self-regulating appropriately.

Table 49: ACT and NSW drivers' confidence ratings by avoidance of driving at night (percentages of participants grouped by confidence level).

	Avoidance			
	ACT		NSW	
Confidence Level	Yes	No	Yes	No
Very confident	3	97	2	98
Moderate / Not at all confident	28	72	28	72
Total	*18*	*82*	*18*	*82*

Overall health

Avoidance rates were examined to determine whether or not ACT drivers who rated their overall health as *excellent* tended to avoid driving at night, compared with those rating their health as *poor, fair or good* (see Table 50). A significant relationship was found between overall health ratings and avoidance behaviour for both ACT (χ^2 (1) = 23.55, p<0.001) and NSW drivers (χ^2 (1) = 16.89, p<0.001). ACT drivers who rated their health as only good/fair/poor were 2.3 times more likely and NSW drivers were 2.4 times more likely to say they avoided driving at night than those who said they had excellent health. For both ACT and NSW drivers, of those who said they had good/fair or poor health, only 25 percent reported that they avoid driving at night. This suggests that only one quarter of drivers who are have lower health ratings are self-regulating appropriately.

Table 50: ACT and NSW drivers' overall health ratings by avoidance of driving at night (percentages of participants grouped by health rating).

| | Avoidance | | | |
| | ACT | | NSW | |
Overall Health Rating	Yes	No	Yes	No
Excellent	13	87	12	88
Good/Fair/Poor	25	75	25	75
Total (N)	18	82	18	82

Ratings of vision for night driving

A significant relationship was found between ratings of vision for night driving and avoidance behaviour for both ACT (χ^2 (1) = 38.414, p<0.001) and NSW drivers (χ^2 (1) = 36.429, p<0.001). Approximately one quarter of drivers who rated their vision for night driving as only good/fair/poor avoided driving at night (ACT: 23%; NSW: 24%) compared with less than 5 percent with excellent night vision ratings (ACT: 4%; NSW: 2%). This suggests that around one quarter of drivers who have lower ratings of vision for night driving are self-regulating appropriately.

Vision problems

For ACT drivers, a significant relationship was found between avoidance of driving at night and vision problems ($\chi^2 (2) = 27.32$, p<0.001). This relationship was also found to be significant for NSW drivers ($\chi^2 (2) = 9.79$, p=0.007. As shown in Table 51, 29 percent of ACT drivers and 26 percent of NSW drivers with vision problems avoided driving at night. Hence, around one quarter of those who arguably should be self-regulating were indeed avoiding night driving. In addition, 15 percent of ACT drivers (NSW: 20%) with treated conditions avoided night driving, while 14 percent (NSW: 15%) of those with no vision problems, who arguably have less need to self-regulate, were indeed avoiding night driving.

Table 51: ACT and NSW drivers' avoidance of driving at night by presence of vision problems by (percentages of participants grouped by vision status).

| | Avoidance | | | |
| | ACT | | NSW | |
Vision Problems	Yes	No	Yes	No
Yes	29	71	26	74
No	14	86	15	85
Treated	15	85	20	80
Total (N)	19	81	18	82

Driving at night when wet

Confidence

Avoidance rates were examined to determine whether or not ACT drivers who were *not at all confident* or only *moderately confident* (as opposed to *very confident*) about driving at night in the wet, tended to avoid driving at night when wet (see Table 52). A significant relationship was found between confidence ratings for this scenario and avoidance behaviour for both ACT drivers ($\chi^2(1) = 60.64$, p<0.001) and NSW drivers ($\chi^2(1) = 44.54$, p<0.001). ACT drivers who were only moderately confident or not at all confident were 8.5 times more likely, and NSW drivers 10 times more likely, to say they avoided driving at night when wet than those who said they were very confident driving at night when wet. For both groups, just under 30 percent of those who were less confident in driving at night when wet, who arguably should have been self-regulating, were indeed avoiding this particular driving situation.

Table 52: ACT and NSW drivers' confidence ratings by avoidance of driving at night (percentages of participants grouped by confidence level).

| | Avoidance | | | |
| | ACT | | NSW | |
Confidence Level	Yes	No	Yes	No
Very confident	5	95	4	96
Moderate / Not at all confident	29	71	28	72
Total	23	77	21	79

Overall health

Avoidance rates were examined to determine whether or not ACT drivers who rated their overall health as *poor, fair or good* (as opposed to *excellent*), tended to avoid driving at night when wet (see Table 53). A significant relationship was found between overall health ratings and avoidance behaviour ($\chi^2(1) = 36.28$, p<0.001). A significant relationship was also found between overall health ratings and avoidance behaviour for NSW drivers ($\chi^2(1) = 17.59$, p<0.001). ACT drivers who rated their health as good/fair/poor were 2.6 times more likely, and NSW drivers were 2.3 times more likely, to say they avoided driving at night when wet than those who said they had excellent health. Of those who rated their health as less than excellent, around 30 percent were self-regulating appropriately.

Table 53: ACT and NSW drivers' overall health ratings by avoidance of driving at night when wet (percentages of participants grouped by health rating).

| | Avoidance | | | |
| | ACT | | NSW | |
Overall Health Rating	Yes	No	Yes	No
Excellent	15	85	15	85
Good/Fair/Poor	31	69	29	71
Total (N)	23	77	21	79

Ratings of vision for night driving

A significant relationship was found between ratings of vision for night driving and avoidance behaviour for both ACT, (χ^2 (1) = 37.468, p<0.001) and NSW drivers (χ^2(1) = 32.319, p<0.001). Just over one quarter of drivers who rated their vision for night driving as only good/fair/poor avoided driving at night when wet (ACT: 27%; NSW: 27%) compared with around 5 percent who rated their night vision as excellent (ACT: 7%; NSW: 5%). This suggests that around one quarter of drivers who have lower rating of vision for night driving are self-regulating appropriately.

Vision Problems

For ACT drivers, a significant relationship was found between avoidance of driving at night when wet and whether the participant had vision problems ($\chi^2(2) = 21.99$, p<0.001). However, while the pattern of findings was quite similar to ACT drivers, no significant relationship was found between vision problems and avoidance of night driving in the wet for NSW drivers ($\chi^2(2) = 5.68$, p=0.058). As shown in Table 54, 33% of ACT drivers with vision problems avoided driving at night in the wet, and 21% with vision problems that were treated also self-regulated in this way. For NSW drivers, 27 percent of those with vision problems and similar proportions (26%) of those with treated vision problems were self-regulating by not driving at night when wet.

Table 54: ACT and NSW drivers' avoidance of driving at night when wet by presence of vision problems by (percentages of participants grouped by vision status).

| | Avoidance | | | |
| | ACT | | NSW | |
Vision Problems	Yes	No	Yes	No
Yes	33	67	27	73
No	18	82	19	81
Treated	21	79	26	74
Total (N)	23	77	22	78

Driving in busy traffic

Confidence

Avoidance rates were examined to determine whether or not ACT drivers who were *not at all confident* or only *moderately confident* (as opposed to *very confident*) about driving in busy traffic, tended to avoid driving in busy traffic (see Table 55). A significant

relationship was found between confidence ratings for this scenario and avoidance behaviour ($\chi^2(1) = 23.20$, p<0.001). ACT drivers who were only moderately confident or not at all confident were 3.2 times more likely to say they avoided driving in busy traffic than those who said they were very confident driving in busy traffic.

Avoidance rates were examined to determine whether or not NSW drivers who were *not at all confident* or only *moderately confident* (as opposed to *very confident*) about driving in busy traffic, tended to avoid driving in busy traffic (see Table 55). A significant relationship was found between confidence ratings for this scenario and avoidance behaviour ($\chi^2(1) = 8.43$, p=0.004). NSW drivers who were only moderately confident or not at all confident were 2.6 times more likely to say they avoided driving in busy traffic than those who said they were very confident driving in busy traffic.

Table 55: ACT and NSW drivers' confidence ratings by avoidance of driving in busy traffic (percentages of participants grouped by confidence level).

| | Avoidance | | | |
| | ACT | | NSW | |
Confidence Level	Yes	No	Yes	No
Very confident	8	92	6	94
Moderate / Not at all confident	22	78	15	85
Total	18	82	12	88

Overall Health

Avoidance rates were examined to determine whether or not ACT drivers who rated their overall health as *poor, fair or good* (as opposed to *excellent*), tended to avoid driving in busy traffic (see Table 56). For both ACT and NSW samples, avoidance of busy traffic was associated with overall health status ($\chi^2(1) = 24.53$, p<0.001 for ACT and $\chi^2(1) = 4.10$, p=0.043 for NSW samples). ACT drivers who rated their health as only good/fair/poor were 2.3 times more likely to say they avoided driving in busy traffic, while NSW drivers with less than excellent health ratings were 1.6 times more likely to avoid busy traffic compared with those who said they had excellent health.

Table 56: ACT and NSW drivers' overall health ratings by avoidance of driving in busy traffic (percentages of participants grouped by health rating).

| | Avoidance | | | |
| | ACT | | NSW | |
Overall Health Rating	Yes	No	Yes	No
Excellent	12	88	10	90
Good/Fair/Poor	24	76	15	85
Total (N)	18	82	12	88

Ratings of vision for daytime driving

ACT drivers who rated their vision for day-time driving as good/fair/poor (24%) were also found to be significantly more likely to avoid busy traffic compared with those who rated

their vision for daytime driving as excellent (12%) ($\chi^2(1) = 26.073$, p<0.001). The same effect was evident in NSW (good/fair/poor, 15%; excellent, 9%)($\chi^2(1) = 4.609$, p=0.032).

Decision making

ACT drivers who rated their speed of decision-making as good/fair/poor (23%) were also found to be significantly more likely to avoid busy traffic compared with those who rated their decision-making abilities as excellent (10%), $\chi^2(1) = 22.028$, p<0.001. The same effect was evident in NSW (good/fair/poor, 15%; excellent, 8%) $\chi^2(1) = (8.456$, p=0.004).

Vision problems

For ACT drivers, a significant relationship was found between avoidance of driving in busy traffic and whether the participant had vision problems ($\chi^2(2) = 10.41$, p=0.005). In contrast, for NSW drivers, there was no significant relationship between avoidance of driving in busy traffic and vision problems ($\chi^2(2) = 2.75$, p=0.253). Hence, for the NSW sample, driver vision status did not affect avoidance of busy traffic. As shown in Table 57 compared with ACT drivers, a considerably smaller proportion of NSW drivers with vision problems avoided driving in busy traffic (13% vs. 24% for NSW and ACT, respectively). Indeed, amongst NSW drivers, the same proportion (13%) of those who arguably had less need to self-regulate (no vision problems) were avoiding busy traffic, compared with those who had vision problems. Of those with treated vision problems, only 5 percent of the NSW drivers were avoiding busy traffic compared while 12 percent of the ACT drivers were self-regulating in this way. Overall, the NSW sample showed lower rates of self-regulation in relation to busy traffic.

Table 57: ACT and NSW drivers' avoidance of driving in busy traffic by presence of vision problems by (percentages of participants grouped by vision status).

	Avoidance			
	ACT		NSW	
Vision Problems	Yes	No	Yes	No
Yes	24	76	13	87
No	16	84	13	87
Treated	12	88	5	95
Total (N)	18	82	12	88

4.2.10 Crash involvement and infringements

Drivers were asked some questions regarding crashes and infringements over the past two years (see Table 58 and Table 59). In relation to crashes, the questionnaire emphasised that the study was only interested in the numbers of crashes when they were driving, and when and where they occurred, and not interested in who was at fault.

Overall, 10 percent of ACT drivers reported that they had been in a crash over the last two years. No gender difference in crash involvement was evident ($\chi^2(1) = 0.25$, p=0.620) and similarly, there were no significant differences across age ($\chi^2(2) = 0.60$, p=0.742) or place of residence ($\chi^2(2) = 0.098$, p=0.952).

Fourteen percent of ACT drivers reported having received an infringement notice and of these, the majority (79%) had only received one such notice. There was a significant relationship between traffic infringements and gender ($\chi^2(1) = 12.30$, p<0.001), with ACT males twice as likely as females to report that they had received a traffic infringement in the last two years. There was no significant relationship between traffic infringement and age ($\chi^2(2) = 1.36$, p=0.506) and traffic infringement and place of residence ($\chi^2(2) = 0.86$, p=0.650).

Table 58: Frequency of involvement in crashes and infringements in the last 2 years by Gender, Age and Place of Residence for ACT drivers

	Overall (%)	Gender		Age group (years)				Place	
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
Crashes									
N	1006	397	602	329	472	198	951	28	13
%	10	10	9	10	10	8	9	11	8
Infringements									
N	1003	400	597	330	469	198	950	27	13
%	14	10	17	16	14	12	14	19	8

Overall, only 7 percent of the NSW sample reported being involved in a crash in the last 2 years. No gender difference in crash involvement was evident for NSW drivers ($\chi^2(1) = 1.22$, p=0.269) and similarly, there was no significant differences across age ($\chi^2(2) = 2.34$, p=0.310) or place of residence ($\chi^2(2) = 0.72$, p=0.697).

In relation to traffic infringements, for NSW drivers, 11 percent of drivers and infringement in the last 2 years and of these, 85 percent had only received one such notice. Like the ACT sample, traffic infringements were influenced by gender ($\chi^2(1) = 5.02$, p=0.025), with NSW males nearly twice as likely as females to report that they had received a traffic infringement in the last two years. Traffic infringements did not differ significantly across age groups ($\chi^2(2) = 1.42$, p=0.493) and place of residence ($\chi^2(2) = 2.24$, p=0.327).

Table 59: Frequency of involvement in crashes and infringements in the last 2 years by Gender, Age and Place of Residence for NSW drivers

	Overall (%)	Gender		Age group (years)				Place	
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
Crashes									
N	673	254	408	115	356	192	276	263	115
%	7	9	6	10	6	7	8	6	7
Infringements									
N	673	255	407	115	356	192	276	263	115
%	11	7	13	13	11	9	12	11	7

4.2.11 Relationships between crashes, infringements and self-reported health status and self-regulatory behaviours

The relationships between self-reported health and medical problems, adoption of self-regulatory behaviours and crash involvement were examined using chi-square analyses (and Fisher Exact tests where appropriate) (Table 60).

Firstly, crash involvement and infringements for those who reported that their overall health was excellent compared with those who reported good, fair or poor health was examined. No significant differences were found for ACT and NSW drivers for either crashes or infringements (p's ranged from 0.27 to 0.42). This suggests that crash involvement and infringements are unrelated to self-rated health status for these groups of drivers.

Similarly, no significant relationships were found between crashes and changes in driving behaviours over the last five years (amount, quality or speed of driving) for either ACT or NSW drivers. Again, these findings suggest that crash involvement is not influenced by these reported changes in particular driving behaviours.

Driving distance (> 100 kilometres or ≤100 kilometres per week) was not significantly related to crash involvement for both ACT and NSW drivers. However, there was a significant relationship between infringements and weekly driving distance for ACT drivers ($\chi^2(1) = 9.85$, p=0.002), with 18% of those that drove more than 100 kilometres per week having received an infringement notice compared with 11% of those who drove 100 kilometres or less per week. The same pattern was evident for NSW drivers, ($\chi^2(1) = 7.54$, p=0.006), with 15% of those that drove more than 100 kilometres per week having received an infringement notice compared with 8% of those who drove 100 kilometres or less per week.

Interestingly, avoidance of difficult driving situations was not related to crash involvement or incursion of infringements.

Table 60: Summary statistics for Chi-Square analyses (Fisher's exact test) for ACT and NSW drivers for relationships between crashes, infringements, health status and self-regulatory behaviours

	Overall Health	Changes in Driving Frequency	Changes in Driving Quality	Changes in Driving Speed	Driving Distance	Avoidance
ACT						
Crashes	p=0.274	p=0.943	p=0.106[1]	p=0.398	p=0.242	p=0.736
Infringements	p=0.288	-	-	-	p=0.002	p=0.502
NSW						
Crashes	p=0.422	p=0.437	p=0.774	p=0.639	p=0.390	p=0.552
Infringements	p=0.268	-	-	-	p=0.006	p=0.685

- test not conducted
[1] Fisher's exact test used for this analysis

4.2.12 Predictors of self-regulation: Identifying the characteristics of self-regulators

A regression model for predicting self-regulation

Logistic regression techniques were used to model the self-regulatory behaviour of older drivers. The aim of the modelling was to determine which characteristics are indicative of self-regulatory behaviour in older drivers. Analyses were conducted with just one dependent variable considered exemplary of self-regulatory behaviour:

- Avoidance of *at least one* of the driving situations (rain; merging; busy traffic; any intersection or roundabout; at night; at night when wet; other situations identified by the driver) (Yes / No);

Although many other self-regulatory practices were examined in this study, it was not practical or statistically desirable to explore all of these options using regression modelling. For the purpose of the study, it was considered that this variable would provide useful insights into the characteristics of drivers who reduce their exposure to risk by avoidance of driving situations that have been identified in the literature as potentially difficult for older drivers.

The result of the model building exercise was a model that estimates the odds ratios that a person is a self-regulator (avoids difficult driving situations) for each of the selected predictor variables (see next section) included in the model. These odds ratios are adjusted according to the confounding effects of other predictors included in the model

Selection of potential predictors of self-regulation

State-based variations in self-regulatory behaviour

The modelling procedures included participants from both ACT and NSW in the same analyses. In addition, data for Victorian drivers (aged 60 years and older) from an earlier study of self-regulatory driving behaviours were included in the regression modelling (see Charlton et al., 2003 for details of the sample characteristics and survey methods). State/Territory of Residence was considered as one of the predictor variables for self-regulatory behaviour. This allowed us to explore the relative importance of State or Territory of residence (with different re-licensing requirements) in explaining self-regulatory practices. The pooled sample provided a total of 2,081 valid cases.

Other predictor variables

In addition to the 'State' variable, the researchers compiled a list of potential predictors that could be included in the model. The initial criteria for inclusion were based on a priori knowledge (previous literature) of potential relationships between these variables and self-regulatory behaviour. A total of 15 independent variables (including State) were identified as being potential predictor variables. These variables are presented in Table 61 together with the results of a univariate logistic regression analysis carried out for each potential predictor (significant effects are highlighted).

Table 61: Potential variables for regression models and results of univariate analyses

VARIABLE	Levels	Reference	Signif χ^2 for Avoidance
State	3	Victoria	<.001
Age	3	75+	<.001
Sex	2	Male	<.001
Married or De facto	2	No	<.001
Place of residence	3	Metro	=.057
Employment status	4	Retired	=.009
Principle Driver	2	No	=.003
Vision Problems	2	No	<.001
Heart Problems	2	No	=.349
Arthritis Problems	2	No	=.003
Overall health rating	2	Good/fair/poor	<.001
Ability to make decisions quickly	2	Good/fair/poor	<.001
Been involved in a crash	2	No	=.335
Had infringement	2	No	=.783
Confident in all driving situations	2	No	<.001

Building the model

From the collection of potential predictors listed in Table 61 above, a purposeful selection model building process was used to select variables to include in the logistic regression model. This method allows researchers to control every step of the model building process. In general, variables were included in the model if their inclusion meant that the new model was significantly different from a model in which they were not included. In the case of main effects variables, significance was judged to occur for p-values less than 0.1, while p-values less than 0.05 were used to judge whether interaction terms should be included in the model. Models controlling for different confounding variables were compared using the Likelihood Ratio test.

The goal of the logistic regression modelling was to find the **best fitting** and **simplest** model that describes the relationships between self-regulatory (avoidance) driving behaviour and the independent variables identified above.

A series of univariate logistic regression analyses were conducted for each of the potential predictors, as presented above in Table 61. Those found to be related to the dependent variable, based on the significance of their Wald Statistic (p<.25), were included in a preliminary logistic regression model. Likelihood Ratio tests were used to determine which collection of predictors could be removed from the preliminary model without significantly affecting the accuracy of the model.

Prior to beginning the model building process, a number of preliminary analyses were conducted in order to determine the selection of predictor variables for the regression models. First, a matrix of all potential predictors was constructed and Chi square tests were

used to determine significant relationships among these variables. These analyses revealed a number of significant inter-relationships between potential predictors. A systematic process was then conducted to explore further the effect that these inter-correlations might have on the prediction of avoidance behaviour. First, each of the variables that were initially excluded from the model (based on results of preliminary Chi square tests), were subsequently added to the model, while each of the variables already in the model were excluded (one at a time). This enabled the identification of any variable that was wrongly excluded from the model because it was highly correlated with another variable that was already in the model.

This preliminary screening process identified that the variable related to subjects' ability to *make decisions quickly* and the variable related to subjects' *confidence* in all driving situations could not be included in the same model because of their high level of correlation with each other. Therefore, two separate models, one controlling for confidence and one for decision-making ability were created. It was later shown that all models derived from the model controlling for decision-making ability showed poor discrimination of self-regulators, so the decision-making variable was excluded from all models in favour of the confidence variable. However, it is important to bear in mind in interpreting the final model, that these two variables are highly related to each other.

Interaction variables

The next step in the model building process was to consider how the inclusion of interaction terms might significantly improve the model. Each possible combination of pairs of variables already in the model was tested as a possible interaction term. Interaction terms were only included in the model if their inclusion resulted in a model that was significantly different from the model without the interaction term (using the Likelihood Ratio test, p-value of 0.05). Including interactions terms may result in an overly-complicated model and may unnecessarily inflate standard errors.

The final model

This logistic regression modelling process resulted in a final model which contained the set of variables which best predicts the outcome variable (avoidance behaviour). Table 62 shows the model and the adjusted odds ratio of each of the predictors. It can be seen that the model contains two sets of interaction variables (see highlighted text).

Table 62: The Final Model for predicting avoidance behaviour among older drivers (Log Likelihood= -1107.7614)

	Reference Group	Odds Ratio	SE	Walf Statistic (z)	p-value	95% Confidence Interval	
NSW	Vic	0.335	0.055	-6.62	<0.001	0.242	0.463
ACT	Vic	0.599	0.093	-3.29	0.001	0.442	0.813
Employed fulltime	Employed Not fulltime	1.541	0.774	0.86	0.389	0.576	4.122
NSW and Fulltime	VIC or Not Fulltime	0.441	0.389	-0.93	0.354	0.078	2.491
ACT and Fulltime	VIC or Not Fulltime	0.157	0.112	-2.6	0.009	0.039	0.633
60-64	75+	0.772	0.116	-1.72	0.086	0.574	1.037
65-74	75+	0.752	0.095	-2.26	0.024	0.587	0.962
Female	Male	1.385	0.148	3.04	0.002	1.123	1.709
Confident	Not Confident	0.194	0.036	-8.8	<0.001	0.135	0.279
Vision Problems	No vision problems	1.220	0.130	1.87	0.062	0.990	1.504
Excellent Health	Not Excellent Health	0.717	0.076	-3.15	0.002	0.582	0.882
Country Town	Metro	1.294	0.214	1.56	0.118	0.937	1.789
Rural	Metro	1.835	0.384	2.9	0.004	1.218	2.7649
Country Town and Confident	Metro or Not Confident	0.397	0.185	-1.98	0.048	0.160	0.991
Rural and Confident	Metro or Not Confident	0.21235	0.14238	-2.31	0.021	0.057	0.790

Two different methods were used to test for the goodness of fit of the model. The first method was the Hosmer-Lemeshow goodness of fit test. The Hosmer-Lemeshow test confirms that the model shown in Table 62 achieves a reasonably good score in terms of goodness of fit. That is, the Hosmer-Lemeshow statistic (when the sample has been divided into deciles of risk) is $\chi^2(8) = 13.34$, p= 0.1007. As each decile of risk had more than 20 total observations, the Hosmer-Lemeshow should produce a reliable measure of the goodness of fit of the model.

Another method of testing goodness-of-fit is to measure the area under the ROC curve. The ROC curve plots two measures that can be applied to any logistic regression model. The first measure is the model's *sensitivity*, which is the likelihood of a correct prediction that a driver is a self-regulator. Second, the *specificity* of the model is a measure of the likelihood of correctly predicting that a driver is not a self-regulator. The area under an ROC curve is a measure of the discrimination of the model (i.e. that a driver who is truly a self regulator

is more likely to have a higher probability of being identified as a self-regulator than a driver who is not a self regulator). The greater the value for the area under an ROC curve, the better the discrimination of the model. The area under the ROC curve for the model in Table 62 was equal to 0.7325. By convention values greater than 0.7 are considered acceptable levels of discrimination for a logistic regression model.

Based on the results of the tests involving the ROC curve and the Hosmer-Lemeshaw statistic, it was decided that the model presented in Table 62 had an acceptable goodness of fit and is the model that best predicts avoidance behaviour among older drivers.

Interpreting the Model for Predicting Avoidance of Difficult Driving Situations

This section presents the calculated odds ratios for engaging in self-regulatory behaviour (avoidance of difficult driving situations) for each variable in the final model (see Table 62). The right-most column shows the adjusted odds ratios (OR) (and 95% confidence intervals) derived from the final model in Table 62 presented above. These ORs are adjusted for other confounding variables in the final model. The column to the left of the Adjusted OR gives the odds ratios for each category if the adjustments made by the final model were not made. These are referred to as the Unadjusted Odds Ratios. For each row of the table, the value to the right of the colon is the "comparison value" of the odds ratio. This forms the denominator of the odds ratio. In the final model, the covariates State of Residence (NSW/VIC/ACT) and Residential Status (Urban / Country Town / Rural) interacted with Employment Status and Confidence in all driving situations, respectively. Therefore, for each of these two variables, odds ratios are presented separately for each value of the interacting variable. Significant odds ratios are shown in highlighted text (p<.05). The large confidence intervals for the fulltime employed groups are due to the very few numbers of fulltime employed drivers from the ACT and NSW.

Table 63: Adjusted and Unadjusted Odds Ratios* of the presence of avoidance behaviours based on the Final Model from Table 62

Comparison Groups		Unadjusted OR (95% Conf)	Adjusted OR (95% Conf)
State of Residence	Fulltime Employed		
	- Victoria : NSW	2.32 (0.65-8.27)	6.78 (1.22-37.63)
	- Victoria : ACT	5.49 (2.03-14.86)	10.62 (2.70-41.78)
	Not Fulltime Employed		
	- Victoria : NSW	2.56 (2.03-3.23)	2.99 (2.16-4.13)
	- Victoria : ACT	1.71 (1.39-2.11)	1.67 (1.23-2.26)
Employment	Fulltime : Not Fulltime (VIC Only)	0.62 (0.37-1.03)	1.54 (0.58-4.12)
	Not Fulltime : Fulltime (NSW Only)	1.46 (0.44-4.79)	1.47 (0.35-6.16)
	Not Fulltime : Fulltime (ACT Only)	5.18 (2.14-12.50)	4.13 (0.75-22.77)
Age	75+ : 60-64	1.50 (1.18-1.91)	1.30 (0.96-1.74)
	75+ : 65-74	1.65 (1.34-2.03)	1.33 (1.04-1.70)
Gender	Female:Male	1.76 (1.49-2.08)	1.39 (1.12-1.71)
Confidence in all situations	Not Confident : Confident (Metro only)	5.56 (4.13-7.49)	5.26 (3.57-7.69)
	Not Confident : Confident (CT only)	9.00 (4.74-17.09)	12.50 (5.56-33.33)
	Not Confident : Confident (Rural only)	11.98 (5.39-26.64)	25.00 (6.67-100.00)
Vision	Vision problems : No problems	1.68 (1.42-1.98)	1.22 (0.99-1.50)
Health status	Not excellent : Excellent health	1.72 (1.46-2.02)	1.39 (1.14-1.72)
Place of Residence	Confident in all situations		
	- Metro : Country Town	1.73 (0.89-3.36)	1.94 (0.81-4.65)
	- Metro : Rural	1.55 (0.70-3.43)	2.57 (0.73-9.05)
	Not Confident in all situations		
	- Country Town : Metro	0.94 (0.73-1.19)	1.29 (0.94-1.79)
	- Rural : Metro	1.39 (1.02-1.89)	1.83 (1.22-2.76)

* Note: The adjusted ORs are the same as those for the final model (Table 62). Those ORs with values < 1.0 have been inverted for ease of interpretation.

State of Residence

As described in Table 62, the final model includes an interaction between State and employment status. Therefore, the odds ratios for State are presented separately for those drivers who worked fulltime and those who were not in fulltime employment. Furthermore, since there are three possible 'States' of residence, two different odds ratios must be presented for each value of the employment status variable: the first comparing NSW residents with Victorian residents and the second comparing ACT residents with Victorian residents (see Table 63). The following conclusions can be made:

For drivers who were fulltime employed:

- if the person was from Victoria, the odds that they avoided difficult driving situations were 6.78 times greater than if they were from NSW.

- if the person was from Victoria, the odds that they avoided difficult driving situations were 10.62 times greater than if they were from ACT.

Confidence intervals for these odds ratios were large. This may be explained, at least in part, to the small numbers of fulltime employed drivers from the ACT and NSW.

For drivers who were not employed fulltime:

- if the person was from Victoria, the odds that they avoided difficult driving situations were 2.99 times greater than if they were from NSW.

- if the person was from Victoria, the odds that they avoided difficult driving situations were 1.67 times greater than if they were from ACT.

Age

In the model represented by Table 63, the odds of avoiding difficult driving situations for each of the younger groups (60-64 and 65-74 years) were compared against the odds of the older age group (75+ years). Age did not interact with other variables; hence, the following conclusions can be drawn:

- The odds of avoiding difficult driving situations was 1.33 times greater for a person aged 75+ years than a person aged 65-74 years.

- The odds of avoiding difficult driving situations was 1.3 times greater for a person aged 75+ years than a person aged 60-64 years; however, it should be noted that this effect just failed to reach significance at the $p<0.05$ level.

Gender

As there were no interactions between the gender and other covariates in the model, the following conclusion can be made:

- The odds of avoiding difficult driving situations were 1.39 times greater for females than males.

Confidence in all driving situations

The model included an interaction between Confidence and Place of Residence (urban area, country town or a rural area). Overall, those who were not confident in all driving situations were more likely to self-regulate than those who were confident; however, the strength of this effect differed across different places of residence. Examining Table 63, the following three conclusions can be made about avoidance behaviour with respect to confidence:

For people living in country towns:

- if the person was not confident in all driving situations the odds of avoiding difficult driving situations were 12.5 times greater than if they were confident in all driving situations.

For people living in rural areas:

- if the person was not confident in all driving situations the odds of avoiding difficult driving situations were 25 times greater than if they were confident in all driving situations.

For people living in urban areas:

- if the person was not confident in all driving situations the odds of avoiding difficult driving situations were 5.26 times greater than if they were a confident driver.

Vision problems

The model contained no interactions between self-reported vision problems and other covariates. The results for the main effect of vision showed that:

- The odds of avoidance behaviour was 1.22 times greater for people who had vision problems than people who did not have vision problems. However, it should be noted that this effect failed to reach significance.

Overall Health for Safe Driving

Health status did not interact with any other variables in predicting self-regulatory behaviour. Therefore, the following conclusion can be made:

- The odds of avoiding difficult driving situations was 1.39 times greater for people who did not have excellent health than those who reported having excellent health.

Place of Residence

The model contained an interaction variable involving Place of Residence (urban, country town, rural) and Confidence. Therefore, odds ratios for place of residence are presented separately for those were confident in all driving situations and those who were not confident in all driving situations. Furthermore, since there are three possible responses to place of residence, two different odds ratios are presented for each value of the confidence variable: the first comparing people living in country town with urban dwellers and the second comparing rural residents with urban residents. Table 63 shows that the adjusted odds ratios for people who were confident in all driving situations were not significant. However, one of the odds ratios for people who were not confident in all driving situations was significant, and the other was of borderline significance. Hence, the following conclusions can be drawn:

Of the drivers who were not confident in all driving situations:

- For those who lived in a country town, the odds that they avoided difficult driving situations were 1.29 times greater than those living in urban areas. However, this effect was only marginally significant.

- For those who lived in a rural area, the odds that they avoided difficult driving situations were 1.83 times greater than if lived in urban areas.

Summary of the Regression Analyses

Logistic regression modelling was used to provide a clearer understanding of driver characteristics and behaviours that predict the adoption of self-regulatory (avoidance) driving behaviour.

In sum, the analyses revealed that those drivers who were *most likely to self-regulate* were:

- **Victorian drivers in full time employment** compared with both NSW and ACT drivers of the same employment status (the effect, albeit weaker, was also evident for Victorian drivers not in full employment);

- **Drivers aged 75 years,** compared with those aged 65-74 years;

- **Females**;

- **Drivers who were not confident** compared with confident drivers - the strength of this effect was stronger for rural drivers than country and urban drivers;

- **Drivers who rated their overall health as good/fair/poor** (compared with excellent)

- **Drivers living in rural areas (and to a lesser extent, country towns) who were not confident**, compared with those in urban areas.

Limitations of the modelling procedure

It is important to note that not all of the potential explanatory variables were included in the final model. For example, preliminary correlation analyses showed that principal driver status, arthritis and marital status were significantly related to avoidance behaviour and yet they do not appear in the final model. These three variables were all highly correlated with variables such as age and sex. Hence, their relationship to the dependent variable was overwhelmed by the predictive power of drivers' age and sex. The strong correlation between the variable related to confidence in all driving situations and the ability to make decisions quickly is another example of one variable that is probably significantly related to the dependent variable but was not included in the final model at the expense of the inclusion of another highly-correlated covariate. As described in the body of the analysis, it was decided that the *confidence* variable should be included in the model instead of the decision-making variable as this resulted in the best-fitting model.

Finally, this model does not attempt to show all the significant relationships between the dependent variable and the possible covariates. Rather it describes the set of covariates (and their associated odds ratios) that result in the simplest and most accurate (best-fitting) model for predicting avoidance behaviour.

4.2.13 Current Drivers – Driving Cessation

Current drivers were asked a series of questions addressing the issues of driving cessation. First, they were asked if, over the last two years, anyone had suggested that they should limit or stop driving. For the ACT sample, only 30 (3%) of the 1,011 drivers who responded said that the topic of driving cessation had been raised with them. Similarly, only 11 (2%) of the 669 NSW respondents said that this issue had been raised with them.

Participants were also asked to indicate who made the suggestion to limit or stop driving (see Table 64). In the majority of cases, family members, including spouse or partners or son or daughter (ACT: 64% and NSW: 63%), were the ones who suggested that drivers should limit or stop driving. Others reported that medical doctors (ACT: 17% and NSW: 18%) and vision specialists (ACT: 13% and NSW: 18%) had suggested they should limit their driving or give up driving altogether.

Table 64: Person who suggested drivers should limit or cease driving for ACT and NSW drivers who had had someone suggest they stop driving

Person Making Suggestion	ACT Proportion of Current Drivers (%) N=30	NSW Proportion of Current Drivers (%) N=11
Spouse/partner	27	36
Son or daughter	37	27
Friend	7	9
Doctor/medical person	17	18
Eye doctor	13	18
Other	7	18

An important factor in successfully retiring from driving is planning ahead. Participants were asked some questions about planning for stopping driving. First, they were asked if they had thought about the possibility of not driving one day (see Table 65). Sixty-four

percent of ACT respondents and 57 percent of NSW respondents indicated that they had given some thought to this. Generally, older drivers were more likely to indicate that they had thought about this issue than younger drivers. No systematic effects of gender or place of residence were evident across the ACT and NSW samples. For the ACT, females and those in rural areas were more likely to have thought about stopping driving. However, in NSW, those in urban areas and country towns were slightly more likely to have considered the possibility of not driving one day.

Table 65: ACT and NSW drivers who had 'Thought about the possibility of not driving one day' by Gender, Age and Place of Residence

Thought about possibility of not driving one day	Overall	Gender		Age			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
ACT									
N	*1009*	*399*	*603*	*331*	*471*	*200*	*956*	*26*	*13*
%	64	68	61	54	65	78	64	50	77
NSW									
N	*666*	*252*	*403*	*115*	*351*	*190*	*274*	*263*	*110*
%	57	58	57	41	57	68	60	57	49

While 64% of ACT drivers had thought about the possibility of not driving one day, only 17% (173) indicated that they had actually planned for this. Similarly, for NSW drivers, while 57% had thought about the possibility of not driving one day, only 17% (113) indicated that they had actually planned for this.

Table 66 shows the types of plans drivers had made. The most common plans included becoming familiar with public transport and alternative transport options, sharing the driving and moving nearer to family or services.

Table 66: Type of plans for driving cessation made by ACT and NSW drivers who indicated they had made plans

Plan	ACT Proportion of Current Drivers (%) (N=173)	NSW Proportion of Current Drivers (%) (N=113)
Moved House	21	35
Familiar with public transport	62	50
Explored alternative transport	54	49
Moved near family/social/medical	17	20
Sought advice from doctor	5	7
Shared driving	27	28
Changed holiday travel	21	23
Other	21	25

Past research has identified a number of reasons why drivers think about stopping driving. Participants were asked to indicate whether any of these factors would make them think about stopping driving (see). The majority of drivers indicated that health-related issues would make them think about stopping driving, for example, declining eyesight (ACT: 91% and NSW: 87%) and a decline in health (ACT: 83% and NSW:82%). Most drivers indicated that they would think about giving up driving upon doctor's advice (ACT: 90%; NSW: 84%) or if their family and friends raised concerns (86%) and also out of a sense of responsibility for the safety of other road users (ACT: 81%; NSW: 77%). Driving-related concerns, including crashes or close calls and difficulty in driving were also cited as factors for considering stopping driving for more than half of the drivers. Interestingly, only 24 percent of drivers said that they would think about giving up driving if the cost of owning or running a motor car was too high.

Table 67: Factors that would make ACT and NSW drivers consider driving cessation

Factor	ACT Proportion of Current Drivers (%) N=1015	NSW Proportion of Current Drivers (%) N=682
Decline in health	83	82
Declining eyesight	91	87
Close calls or minor crashes	72	61
Difficulty in driving situations	63	58
Responsibility for safety of others	81	77
Concerns of family and friends	74	63
Doctor's advice	90	84
Loss of confidence / Nervousness behind wheel	83	78
Having to do vision / medical test to renew licence	14	19
Having to attend re-licensing driving test	17	18
Cost of running a car	23	27

Stopping driving has often been described as a 'devastating' or 'life-changing' event in later life and has been associated with reduced mobility, independence, and social activity. Participants were asked to describe how not being able to drive might affect them personally. The four most important response categories cited by drivers in both NSW and ACT were:

- Restriction of activities (loss of freedom / convenience)

- Would have to use public transport (more time consuming / more difficulties)

- Would have to move house (no access to services where they currently live)

- Would have to rely on family members for transportation

Some responses were:

"I would feel a great loss of freedom"

"I would have to leave my home of 40 years, I have trouble boarding buses so public transport would be very difficult"

"It would be very difficult for me, I'm a very independent minded person"

"It would be catastrophic, my wife is wheelchair bound so it is imperative that I drive"

"It would be like losing an arm or a leg"

4.2.14 Use of Other Transport Options

Past research suggests that many older people do not like to use forms of transport other than driving themselves. Participants were asked if other forms of transport were an option for them. Twelve ACT current drivers and 22 NSW drivers had missing responses for this question. Of the remaining 1,003 ACT drivers, 62% said that they would use other forms of transport and 24% said that this was not an option (13% weren't sure). For NSW drivers, of the 660 that gave a response to this question, 50% said that using other forms of transport was an option, while 36% said it was not an option, with 11% saying they weren't sure.

Participants were also asked if they *currently* used other forms of transport apart from driving (see Table 68 and Table 69). About half of current drivers (48% and 47% of ACT and NSW drivers, respectively) indicated that they do use other forms of transport. For ACT drivers there was no significant difference between current use of other transport and age and place of residence. However, the use of other transport by males was significantly greater than that of females (χ^2(1)=8.78, p=0.003).

Table 68: Current use of other forms of transport by Gender, Age and Place of Residence for ACT drivers

	Overall (%)	Gender		Age			Place		
		Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
N	*1,006*	*399*	*601*	*330*	*474*	*196*	*952*	*28*	*13*
Currently use other transport	48	42	52	50	49	43	49	32	38

For NSW drivers, use of other transport did not differ significantly across age groups. However, the same gender effect was evident as that described for the ACT sample with males showing a greater use of other than females (χ^2(1)=4.01, p=0.045). Similarly there was a significant relationship between place of residence use of other forms of transport (χ^2(3)=48.11, p<0.001). Sixty-two percent of NSW drivers from urban areas currently used other forms of transport compared with 37% from country towns and 30% from rural areas.

Table 69: Current use of other forms of transport by Gender, Age and Place of Residence for NSW drivers

		Overall (%)	Gender		Age			Place		
			Female	Male	60-64	65-74	75+	Urb	Cntry Town	Rural
	N	*666*	*250*	*405*	*113*	*355*	*188*	*273*	*260*	*114*
Currently use other transport		47	42	50	48	48	43	62	37	30

Of the 485 ACT drivers who reported using other forms of transport, the most common form was bus (69%). Of the 312 NSW drivers who reported using other forms of transport, the most common types were train (73%) and bus (58%) (see Table 70).

Table 70: Types of transport currently used by ACT and NSW drivers

Mode of transport	ACT (N=485)		NSW (N=312)	
	Frequency	%	Frequency	%
Train	111	23	228	73
Tram	4	1	4	1
Bus	335	69	181	58
Taxi	74	15	32	10
Aeroplane	108	22	30	10
Pushbike	60	12	17	5
Other people	52	11	18	6
Public transport	40	8	25	8
Scooter	3	1	0	0
Motor cycle	5	1	5	2
Walking	47	10	15	5
Other	5	1	-	-
Ferry	-	-	28	9
No Response	4	1	0	0

4.3   FORMER DRIVERS

4.3.1   Sample Characteristics

One hundred and eight respondents considered themselves to be former drivers. This represented 6 percent of all survey respondents. The majority of former drivers were aged 75 years and older (64%), thirty percent were aged between 65-74 years and only six percent were aged between 60-64 years. There were more female (61%) former drivers than male (39%). The majority of former drivers resided in a metropolitan area (75%) while 18 percent resided in a country town and 5 percent in rural areas. Table 71 provides information on age, gender and place of residence of the former drivers. Three former drivers did not provide answers to these demographic questions.

Table 71: Age, gender and place of residence of former drivers

	Proportion of former drivers (n=105)
Age	
60-64 years	6
65-74 years	30
75+ years	64
Gender	
Male	39
Female	61
Place of residence	
Metropolitan	75
Country town	18
Rural	5
Other	2

Table 72 provides a summary of other demographic characteristics of the former drivers, including employment and marital status and highest level of education. There are some participants who did not respond to these questions (seven missing responses for employment status, three for marital status, and six for education level).

Table 72: Employment status, marital status and education level of former drivers

	Percentage of former drivers
Employment status (n=101)	
Not working	97
Working part-time	2
Volunteering	1
Marital Status (n=105)	
Married/De facto	40
Divorced/Separated	15
Widowed	39
Never married	6
Education Level (n=102)	
Primary school	20
Up to 3 years of high school	36
4-6 years of high school	20
Tertiary	24

The vast majority of former drivers were not working (97%), and no former drivers worked fulltime. Forty percent of former drivers were married or in a de facto relationship and 39 percent were widowed. Fifteen percent were divorced or separated and a minority never married (6%). The majority of former drivers completed up to 3 years of high school (36%). Twenty-four percent completed college, university or tertiary education, and twenty percent each completed primary school, or 4-6 years of high school education

Participants were asked about their licence status and car ownership. Twenty percent (n=22) of the former drivers still owned a car and 32 percent still held a current driver's licence (n=35). Of those that still held a licence, approximately half (51%) indicated there was some kind of restriction on their licence, with the vast majority reporting that restriction was a requirement to wear glasses (89%).

Table 73 summarises details of participant age at first licensing by age and gender for former drivers. One hundred participants had complete data for these answers and the data from these participants are included in the table. Overall, the majority of former drivers obtained their licence between 19 and 30 years of age. Drivers aged 75 years and older were slightly more likely than the drivers in the two younger groups to have obtained their licence at age 31 years or older (38% compared with 24% and 17%). More males obtained their licence under the age of 30 than females (72% versus 63%).

Table 73: Age at first licensing for former drivers by age and gender

Age (years)	Overall former drivers	Age of former drivers			Gender of former drivers	
		60-64	65-74	75+	Male	Female
18 or less	22	33	17	23	31	16
19-30	45	50	59	39	41	47
31-40	21	17	17	23	23	20
41-50	10	0	7	12	3	15
Over 50	2	0	0	3	3	2

4.3.2 Mobility

Former drivers were asked general questions relating to their mobility, satisfaction with mobility, transportation options, reasons why they stopped driving, the importance of driving (when they were driving), the likelihood of driving again, and the process of reducing and eventually stopping driving.

Thirty-two percent of former drivers indicated that they went out daily or almost daily and approximately one-quarter (26%) reported that they went out 3-4 times per week, or once or twice a week (28%) (see Figure 17).
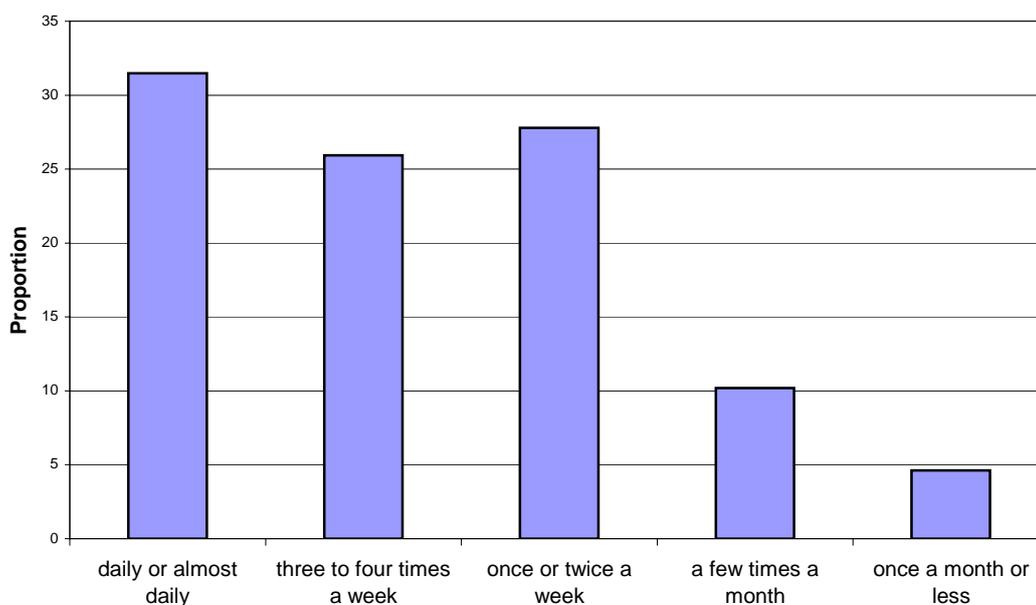
Figure 17: Frequency of going out of former drivers

Figure 18 shows the level satisfaction of former drivers with their current mobility. Twenty-five of the 108 former drivers (39%) reported that they were somewhat satisfied with their ability to go places. Thirty-six percent were very satisfied and 23 percent were not very satisfied with their current mobility.
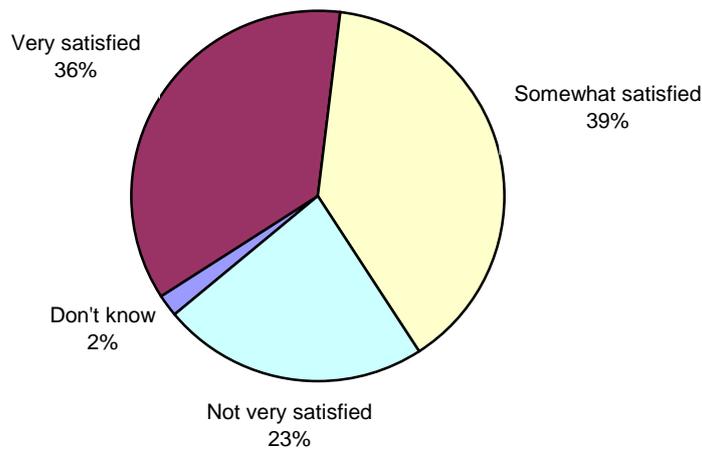
Figure 18: Former drivers' satisfaction with ability to get places

Forty-one percent of former drivers indicated that it was very important for them to keep driving as long as they could. Only 26 percent said that this was not very important and a further 33 percent said that it was somewhat important for them to keep driving for as long as possible (see Table 74).

Table 74: Level of importance of driving as long as possible for former drivers

Level of Importance	Proportion of Former Drivers (n=108)
Very important	41
Somewhat important	33
Not very important	26
TOTAL	100

In addition, participants were asked if they thought it was likely that one day they would drive again. As expected, the majority of former drivers (80%) indicated that it was unlikely that they would drive again (see Figure 19). Interestingly, 18 percent of former drivers indicated that it was very or somewhat likely that they would drive again. Seven participants did not respond to this question.
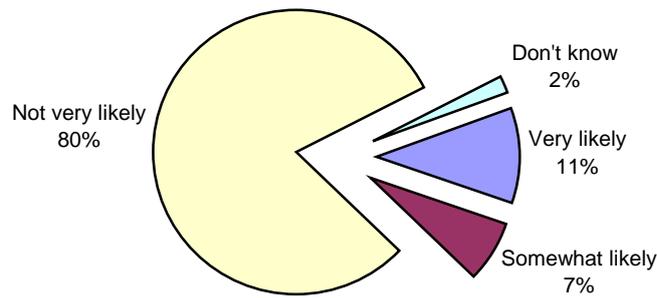
Figure 19: Likelihood of driving again

4.3.3 Alternative transport options

Former drivers were asked a series of questions about the modes of transportation they used to go places. Responses are summarised in Table 75. Overall, 99 percent of former drivers reported that they used a private car, as a passenger, either often (40%) or sometimes (59%). Just under half of the former drivers (43%) reported that they often walked places that were 2 blocks or more away and just under half (43%) also indicated that they often used public transport. Seventeen percent of the former drivers said they often took taxis to go places and approximately half (48%) said they took taxis sometimes. There were some missing responses for each transport mode. It is not possible to determine if these modes of transport were never used, or whether respondents chose not to provide an answer.

Table 75: Frequency of use of transportation options

Transport Mode	Proportion of Respondents		
	Often	Sometimes	Never
Passenger in a car (n=104)	40	59	1
Specialised transportation (n=71)	7	17	76
Taxi (n=89)	17	48	35
Public transport (n=89)	43	32	25
Walk (n=87)	43	33	24
Bicycle (n=80)	5	3	92

4.3.4 The decision to stop driving

There are many reasons why people stop driving. Former drivers in this study were asked about their decision to stop driving. A list of commonly cited factors for stopping driving was presented and participants were asked to indicate whether any of these applied to them (see Table 76).

Table 76: Reasons for driving cessation

Reason	Proportion of Former Drivers
Someone else available to drive you places	37
Other forms of transportation	37
Did not enjoy driving or feel comfortable driving	32
Did not feel a safe driver	33
Concern reactions not fast enough in emergency	35
Advised by doctor	23
Vision problems	21
Dizziness or blackout problem	6
Problems with use of arms or legs or turning head	22
Family or friends encouraged to stop	16
Accident or 'near miss'	10
Cost too high	32
Could not renew licence (when assessed for fitness to drive)	7
Chose not to attend a re-licence medical/vision test	17
Chose not to attend a re-licence driving test	18
Other reasons	20

Thirty-seven percent of former drivers indicated that their decision had to do with other forms of transportation being available to them, and 37 percent reported that there was someone else available to drive them places. Approximately a third of participants reported that they were concerned that their reactions would not be fast enough in emergency (35%), that they did not feel like a safe driver (33%), that they did not enjoy driving or feel comfortable driving (32%), or that the cost of owning and operating a car was too high (32%). Of the 20 participants who responded that there were 'other' reasons in their decision to stop driving, health and age were the most common reasons described.

"At 94 I thought I was too old, although I was quite capable of driving"

Former drivers who indicated they chose not to attend any re-licence test were asked to explain their reasons for making this decision. Around one-quarter (n=23) of the former drivers indicated that they chose not to attend a re-licence medical/vision test, or a re-licence driving test, or both. In addition, there were 39 responses for reasons why people chose not to attend a re-licence test. Only the responses from the twenty-three people who chose not to attend a re-licence test were examined, three of whom did not provide a

reason. Of the 20 valid responses, 40% reported ill health as the reason not to attend a re-licence test, 20% stated that their age was the main reason and 15% reported safety concerns. Other reasons included previous crash involvement and less need for a licence.

Listed below are some examples of the reasons former drivers chose not to attend a re-licence test.

> *"Did not want to undergo the test due to the attitude of some examiners to older drivers"*

> *"I have reached the age of 63 years. I thought it was time to stay off the road."*

> *"Due to an accident at work and having major surgery on my neck and spine, I felt that my response in an emergency would not be quick enough if an accident was possible. My doctor agreed."*

> *"Because I felt that I was not able to keep up with the faster drivers and that I would not be a safe driver anymore."*

The responses of the former drivers who decided not to attend a re-licence test were examined to see if these former drivers differed from those who did not report this as a reason in the decision to stop driving. Those who decided not to be re-tested were more likely to be 75 years or older, widowed and not working than those who had not reported this as a reason in the decision to stop driving (73% versus 62%; 50% versus 36% and 100% versus 96%, respectively). More females chose not to be re-tested than males (64% versus 36%). Interestingly, 57 percent of those who chose not to be retested reported that it was very important to keep driving as long as they could, compared to 37% of those who did not indicate not attending a re-test as a reason in the decision to stop driving. In addition, more former drivers who chose not to be re-tested reported that they stopped driving at the right time than those who did not report this as a reason in the decision to stop driving (75% versus 57%). However, fewer former drivers who chose not to be re-tested reported that they made the decision themselves than those who did not report this as a reason in the decision to stop driving (52% versus 74%).

It was also of interest to know whether driving cessation was a gradual process or whether this happened suddenly. The majority of former drivers who responded to this question (n=105) indicated that they stopped 'all at once' (64%), while 35 percent indicated that they stopped driving gradually. One participant indicated that they did not know whether they stopped gradually or all at once. In addition, as shown in Figure 20, the majority of former drivers (60%) thought that they had stopped at about the right time. Interestingly, 33 of the 101 former drivers who answered this question (33%) said that they felt they had stopped driving earlier than they should have.
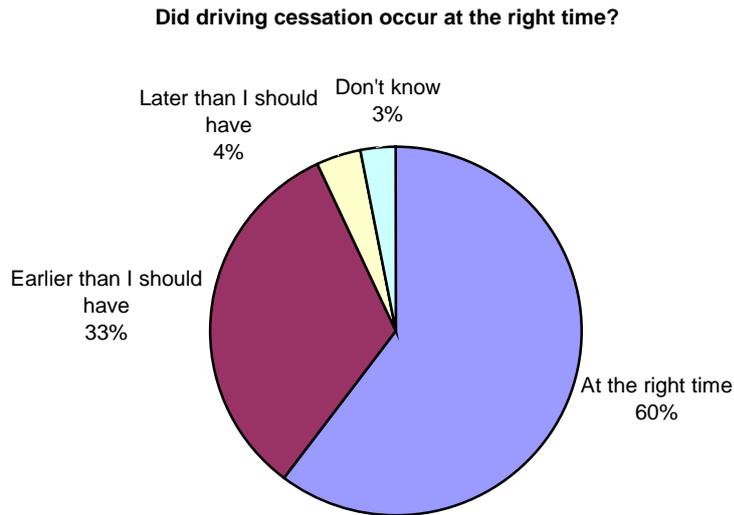
Did driving cessation occur at the right time?

Figure 20: Did driving cessation occur at the right time?

Former drivers in this study were asked if they made the decision to stop driving themselves, or if others were involved in the decision-making process. Of the 105 responses, the majority of former drivers (70%) indicated that the decision was solely theirs. Only 15 reported that others had made the decision for them (15%) and 14 said that they made the decision along with other people (14%). Two people responded with "don't know."

5 SUMMARY AND RECOMMENDATIONS

The broad aim of the study was to gain a detailed understanding of older drivers' self-regulatory practices. A survey was distributed to 6000 people (3000 residents of the ACT and 3000 residents of NSW). A total of 1,830 responses were returned, including 1,722 current drivers (1,015 from the ACT and 682 NSW) and 108 former drivers. The sample comprised male and female drivers aged 60 years and older from urban areas, country towns and rural areas. The study aimed to determine the extent and effectiveness of self-regulation practices of drivers in order to develop road safety initiatives aimed at improving this practice. Key objectives of this study were:

- Provide a comprehensive description of the extent and types of self-regulatory behaviours of older drivers in the Australian Capital Territory and New South Wales, as well as the key characteristics that define the self-regulating drivers, and the relationship between self-regulation and crash risk.

- Provide a larger and more representative sample of Australian drivers (including drivers from three jurisdictions: ACT, NSW and Victoria) to examine the self-regulatory practices amongst older drivers;

- Enable comparisons between respondents in the three jurisdictions which have different re-assessment procedures for determining fitness-to-drive.

- Provide a large sample of former drivers who have recently given up driving in order to better understand the processes leading up to and factors influencing the decision to stop driving.

- Provide recommendations for countermeasures to reduce crash and injury risk amongst older drivers.

In the following discussion, comparisons are made between drivers' responses across the ACT and NSW samples and, where findings are most relevant, with Victorian drivers. All references to Victorian drivers in this context relate to results reported in our previous study (Charlton et al., 2003).

5.1 CURRENT DRIVERS

Respondents who considered themselves current drivers in this study were generally active and experienced drivers. The majority of drivers in both States (ACT: 82%; NSW: 83%) considered themselves to be the principal driver in the household with males and those 75 years more likely to be the main driver. Around two-thirds of all current drivers (ACT: 72%; NSW: 63%) reported driving daily and the majority were satisfied with the amount of driving they were driving. The most common weekly trips were made to the post office, bank and shops; friends and family; and sports and social clubs. Males, drivers younger than 75 years, and those who were urban residents were more likely to drive daily. Around 44 percent of ACT drivers and 35 percent of NSW drivers drove more than 100 kilometres weekly. Employment status was also strongly related to weekly travel distance. The majority (around 80%) were satisfied with their current amount of driving. These findings were not notably different from those reported for Victorian drivers.

Although it is a popular belief that many older drivers like to have a front seat passenger to assist them when driving, only 10 % of ACT drivers and 15% of NSW drivers interviewed

in this study said that they preferred to have someone with them. More than two-thirds of all drivers indicated that they had no preference for a passenger and fewer than 20 percent said they actually preferred not to have anyone with them when driving. In contrast, previous figures for Victorian drivers showed 19 percent preferred a passenger while only 11 percent explicitly preferred not to have a front seat passenger.

5.1.1 Characteristics of the self-regulating driver

Information about changes in driving, confidence in driving and avoidance of driving situations, self-reported health, functional and medical status, and crash risk were examined to identify the kinds of self-regulatory practices that older drivers adopt and to determine the characteristics of those who are exercising self-regulation compared to those who are not.

Changes in driving

The majority of drivers in both ACT and NSW (almost 90%) said that their quality of driving was about the same as it was 5 years ago while as few as 5 percent said that their driving was not as good now. Despite the general perception of stability in driving quality, about one-third of drivers in both States said that they were driving less than they were five years ago. Reasons for reductions in the amount of driving included general lifestyle changes, and employment changes (retirement). About 20 percent said they reduced their amount of driving because of health issues. Furthermore, even fewer drivers indicated that they were driving slower now (ACT: 18%; NSW: 11%) than they were five years ago. Interestingly, these changes in driving differed somewhat from those of Victorian drivers (Charlton et al., 2003), particularly in terms of speed. Again, while the majority indicated their quality of driving was about the same, approximately 40 percent of Victorian drivers reported driving slower than they were five years ago. This reported reduction in driving speed may not be unique to older drivers, but may be more general effects across drivers of all ages. This may be attributable to various speed reduction campaigns in the past five years.

While it might be reasonable to expect that drivers' recognition of a decline in their driving quality could be addressed by driving less and/or by reducing driving speed, the findings revealed only partial support for this. Of the relatively few drivers (approximately 5%) who said their driving was not as good now, about 60 percent of ACT drivers (and 30% of NSW drivers) were driving slower and approximately 60 percent of drivers in both States reported that they were driving less than they were five years ago. This pattern of self-regulation differed from that previously reported for Victorian drivers. With respect to changes in *amount* of driving, only about one-quarter of Victorian drivers who recognised a decline in driving quality were driving less and 60% were driving slower now compared with 5 years ago. Notwithstanding the very small number of drivers who appeared to be self regulating speed and distance commensurate with perceived declines in driving ability, other findings suggested that self-regulatory behaviours may have been more prevalent. For example, around 20 percent of drivers in all States (ACT, NSW and Victoria) indicated that they had reduced their amount of driving because of health related reasons.

Confidence, difficulty and avoidance of driving situations

Drivers were asked a series of questions about their confidence and difficulty with, and avoidance of selected driving situations which were identified as those most commonly associated with older driver crashes. Overall, drivers reported being very confident and had no difficulty in the majority of driving situations. Not unexpectedly, highest levels of

confidence and lowest levels of difficulty were reported for making right-hand turns at fully-controlled intersections; however, around one-third said they were only moderately or not at all confident making right-turns at intersections without lights and without right-turn arrows. The greatest numbers of drivers (around half or more) reporting lower confidence ratings were observed for driving at night, especially when wet, busy traffic and when raining. Generally, males were more likely than females to report being very confident and were also less likely to say they had difficulty with the various driving situations. Drivers aged 75 years and older were less likely than younger drivers to be very confident in most driving situations. Few differences were observed for confidence ratings across place of residence. One notable exception for the NSW sample, but not the ACT sample, was that drivers living in country towns were less likely than those from urban areas to report being very confident in busy traffic. The overall pattern of findings for confidence ratings was very similar to those for the Victorian drivers.

In addition to rating confidence and difficulty in specific driving situations, drivers were asked if they intentionally avoided these situations. Such avoidance behaviours were proposed to be indicative of self-regulation. For most of the driving situations, a small minority (as few as 5 percent) of drivers in both ACT and NSW reported avoiding driving situations. Highest avoidance levels (approximately 15-20%) were seen for busy traffic, night driving and driving at night when wet. The pattern of avoidance for Victorian drivers was quite similar across these three different driving situations. Importantly, however, avoidance rates were considerably higher in Victoria, (ranging from 22-26%).

In general, females were more likely than males to avoid various driving situations compared with males and older drivers were more likely to avoid the selected driving situations than younger drivers. Some notable differences were evident in gender-related patterns of avoidance between States. Interestingly, the highest odds ratios for the ACT sample were for avoidance of roundabouts. Females ACT drivers were nearly 5 times more likely than males to avoid roundabouts. While the same effect was evident in NSW, the likelihood was much lower (OR: 2.5). In NSW highest odds ratios were observed for making right turns at intersections without traffic lights. Females were nearly 5 times more likely to avoid these turns than males. Again, the effect was evident for ACT drivers, but the likelihood of ACT females avoiding uncontrolled intersections was only around twice that of males. The findings for roundabouts seem intuitive in the context of the specific driving contexts of the two jurisdictions. That is, roundabouts are a more prevalent type of intersection in the ACT than in NSW. Differences were also evident across the jurisdictions for age-related avoidance behaviours. In the ACT, strongest effects were observed for higher levels of avoidance by drivers aged 75 years and older for merging, driving at night and at night when wet and changing lanes. In NSW, the ageing effects were also strongest for merging, driving at night, and at night when wet, however, like Victorian drivers, the likelihood of lane changing did not differ significantly across age groups amongst NSW drivers

Reasons for avoiding night driving and wet night driving were predominantly related to vision problems (including glare from lights) and general concerns about their safety. The most common reasons for avoiding busy traffic were that drivers found this stressful or difficult.

Do drivers with lower ratings of confidence avoid specific driving situations?

For the three most commonly avoided situations, a more detailed analysis was conducted to explore the relationship between avoidance behaviour and confidence. This was of

particular interest because it was thought that drivers' avoidance of situations in which they lacked confidence represented an appropriate self-regulatory practice.

Driving confidence was found to be associated with avoidance behaviours. Just over one-quarter of those who rated themselves as moderately or not at all confident avoided driving at night and at night when wet. This finding was consistent across ACT and NSW drivers. Less confident drivers were also more likely to avoid driving in busy traffic, although the effect was not as strong, particularly for NSW drivers. On the other hand, as might be expected, the majority who reported that they were very confident, or had no difficulty with driving at night, at night when wet and in busy traffic also reported that they did not intentionally avoid these situations. It would seem logical that drivers who report being very confident may indeed have a lower risk and therefore have less need to self regulate. By comparison, in Victoria, at least half of those drivers who rated their confidence lower intentionally avoided driving at night, on wet nights and in busy traffic. This suggests a considerably higher rate of self-regulation by Victorian drivers compared with ACT and NSW drivers, who arguably *should* avoid driving situations in which, by their own report, they lack confidence.

Do drivers with lower ratings of functional abilities and medical conditions avoid specific driving situations?

In this study, just under half of drivers in both ACT and NSW rated their overall health for driving as good, rather than excellent. Overall health ratings were affected by age so that those aged 75 years and older were much more likely to rate their health lower than younger drivers. The same pattern of age differences was also found for each of the areas of functional ability related to driving: vision for day driving, vision for night driving, speed of decision-making, upper and lower body strength and head and neck mobility. In addition, females were more likely than males to rate their vision for night driving lower. Amongst this group of drivers, the three most commonly reported medical conditions were vision problems (approximately one-third) arthritis (approximately one third) and heart problems (around 16-17%). Interestingly, rates for vision conditions were considerably lower than those reported by Victorian drivers (77%).

Also of interest was the relationship between self-regulation and self-reported medical conditions and functional abilities. Previous studies have identified vision impairment and cognitive impairment as a significant predictor of both amount of driving and avoidance of driving in certain situations (Ball et al., 1998; Stutts, 1998; Lyman et al., 2001). Findings of the current study also showed significant relationships between health-related factors and avoidance of potentially risky driving situations. In general, drivers' self-ratings of overall health status were related to avoidance of night driving, driving at night when wet and busy traffic. The effect was similar across the two jurisdictions; however, as noted above, avoidance rates were weakest for avoidance of busy traffic amongst NSW drivers with lower health ratings. Lower self-ratings of vision for night driving were associated with avoidance of driving at night, at night when wet and busy traffic. Similarly, those with vision problems were more likely to avoid night driving, wet night driving and busy traffic. Self-rated speed of decision-making was also predictive of avoidance of busy traffic amongst ACT and NSW drivers. Those who rated their decision-making as less than excellent were more likely to avoid driving in busy traffic conditions which could be expected to place high load on drivers' information processing capacities. Similar relationships were reported amongst Victorian drivers for avoidance and most health-related variables. However, two interesting points of difference were observed. Amongst

Victorian drivers, no relationship was found between vision problems and avoidance of night and wet night driving. Further, Victorian drivers' ratings of their decision-making were not predictive of their avoidance of busy traffic.

Overall, the findings suggested that not all drivers with lower ratings of health and functional ability and vision problems were adopting appropriate self-regulatory practices. Approximately one-quarter to one-third of those who arguably should avoid these driving situations (e.g., because they rated their health or functional abilities lower or had vision problems) were indeed self-regulating appropriately.

In addition to the associations with avoidance of risky driving situations described above, some health-related variables were also found to be predictive of weekly driving distance. Drivers in both ACT and NSW with poorer health ratings tended to drive shorter weekly distances. In addition, those on prescribed medications tended to drive shorter distances per week. This pattern was also evident for Victorian drivers. However, with respect to medical conditions, only vision problems were predictive of driving shorter distances. This effect was observed in ACT drivers but not NSW drivers.

These patterns are suggestive of appropriate self-regulatory practices amongst those who were aware of declines in health and those who take medications. In contrast, presence of medical conditions such as arthritis and heart conditions were not predictive of restrictions of driving distance. Interestingly, only ACT drivers and not NSW drivers with vision problems were more likely to drive less. Reasons for these differences are not immediately obvious, however, differences in the age of mandatory vision and medical testing may have some bearing on the findings. ACT medical and vision testing occurs first at age 75 years and annually thereafter, while in NSW, the assessments begin at age 80 years. The older age of initial licence re-testing in the NSW sample effectively means that fewer drivers in the NSW sample would have been re-assessed compared with the ACT sample. If it can be assumed that the re-licensing process motivates drivers to reflect on their own abilities and self-regulate accordingly, then it stands to reason that self-regulation might be less evident amongst NSW drivers compared with ACT drivers. The fact that this effect was observed only for self-regulating vision conditions and only for limiting distance travelled and not avoidance behaviours is not easily explained, but suggests that factors other than re-licensing may also be involved.

Crash and infringement history

Fewer than 10 percent of drivers reported having had a crash in the last 2 years and between 11-15 percent reported having received an infringement notice. Reduction in driving exposure (driving distance) was related to infringements but not crash involvement. Interestingly, avoidance of driving situations was not related to crash involvement or infringements. These patterns were relatively consistent for ACT and NSW. Previous research showed that Victorian drivers who were involved in a crash were more likely to avoid difficult driving situations, albeit a reasonably weak effect. Overall, there was no evidence that self-regulation was an effective means of reducing crash risk in ACT and NSW drivers. This finding may be due to the fact that crashes are a relatively rare event, so a much larger sample size may be required to have sufficient power to detect a true effect.

5.1.2 Key characteristics of self-regulators

Regression modelling was used to identify key characteristics of self-regulators amongst older drivers. Together the combination of variables in the models enhanced the probability of predicting self-regulatory behaviour. The logistic regression analyses also provided a measure of the relative contribution of each of the selected variables in predicting self-

regulatory behaviour, with all other variables held constant. Avoidance of potentially difficult and risky driving situations was selected to exemplify self-regulation.

The modelling procedures included participants from both ACT and NSW in the same analyses. In addition, data for Victorian drivers (aged 60 years and older) from an earlier study of self-regulatory driving behaviours were included in the regression modelling (see Charlton et al., 2003 for details of the sample characteristics and survey methods). State/Territory of Residence was considered as one of the predictor variables for self-regulatory behaviour. This allowed us to explore the relative importance of State or Territory (with different re-licensing requirements) in explaining self-regulatory practices. The pooled samples provided a very large, robust dataset of 2081 cases for the regression analyses.

Drivers who were *most likely to self-regulate* by avoiding driving in difficult driving situations were:

- **Drivers aged 75 years and older,** compared with those aged 65-74 years;

- **Female**;

- **Drivers who were not confident** compared with confident drivers - the strength of this effect was stronger for rural drivers than country and urban drivers;

- **Drivers who rated their overall health as good/fair/poor** (compared with excellent);

- **Victorian drivers who were in full employment** (and, to a lesser extent, Victorians not in full employment) compared with both NSW and ACT drivers of the same employment status;

- **Drivers living in rural areas (and to a lesser extent, country towns) who were not confident**, compared with those in urban areas.

The finding that Victorian drivers were more likely to avoid potentially risky driving situations was of considerable interest, given the differences in licensing practices between the three jurisdictions. Self-regulation is central to current international thinking about assessment of fitness-to-drive practices for older drivers. It is claimed, for instance, that if older people are able to adopt safer driving practices, then there is less need for them to have to submit to periodic testing. This would represent a substantial community saving. Indeed, Victoria relies on a community referral system to identify potentially at-risk drivers while ACT and NSW both have mandatory age-based assessments. While some have argued that regular licence re-testing may promote self-checking of driving abilities and self-regulation amongst drivers, evidence from the current study does not support this case. If this were true, then self-regulatory behaviours would be more prevalent in ACT and NSW drivers compared with Victorian drivers. In fact, the reverse was more generally the case. However it is important to note that in addition to avoidance of risk driving situations, there are other kinds of self-regulatory practices, including voluntarily surrendering a licence. It is possible that mandatory re-licensing assessments prompt more older drivers to hand in their licence. As noted in previous discussion some of these voluntary decisions may be unnecessarily premature, but some may be appropriate self-regulatory action. These self-regulators are not captured in this analysis.

5.1.3   Driving cessation: the experience of current drivers

Just under two-thirds of ACT and NSW drivers indicated that they had thought about the possibility of not driving one day. These drivers were more likely to be aged 75 years and older. By comparison, more Victorian drivers (around three-quarters) had given consideration to stopping driving sometime in the future. In all three jurisdictions, fewer than 5 percent of current drivers said that someone had suggested they should limit their driving or stop driving altogether. Fewer than 20 percent said they had actually made some plans for this. The most common ways of planning for ACT drivers were familiarisation with public transport and exploring alternative transport and sharing the driving. Similar plans were observed for NSW drivers. In addition, compared with ACT drivers, NSW drivers were more likely to report that they planned for stopping driving by moving house.

Predominantly, drivers said that the one thing that would concern them most about not being able to drive was a restriction in their activities, a loss of freedom and inconvenience. Many expressed concern that this would mean a loss of independence and they were apprehensive about the prospect of having to use public transport, which they perceived would be difficult.

Just under half of drivers in ACT and NSW reported using alternative forms of transport, other than driving. In comparison, more than two-thirds of Victorian drivers reported using alternative means of transport. Amongst those who use alternative transport the most frequent modes were buses, and for NSW respondents, trains were used by three-quarters of the group. Taxis were used by relatively few (15 percent or less) as was being driven by other people (less than 10%). As expected, in NSW alternative transport was used by fewer respondents from country towns and rural areas, compared with urban residents.

Not unexpectedly, drivers placed a very great importance on their ability to drive. This was reflected in their concern that stopping driving would represent a major loss of independence and would, for some, have a devastating effect on their life.

5.2   FORMER DRIVERS

A secondary aim of this study was to explore issues relating to the decision to stop driving, factors that contributed to driving cessation, use of alternative transport options and the impact of driving cessation on various life areas for former drivers. Because of the relatively low response rate for former drivers, datasets for the ACT and NSW were pooled, providing a total of 108 responses for analysis. The majority (approximately two-thirds) were aged 75 years or older; about 60 percent were females. About two-thirds said they stopped driving abruptly while the remainder said that stopping driving was a gradual process.

Interestingly, 20 percent of the former drivers still owned a car and 32 percent held a current licence. This finding supports the common perception that drivers retain their licenses for reasons other than driving. For example (e.g. it may be considered by some to be a symbol of independence or, more practically, it provides an accepted form of identification (ID).

Around 40 percent of former drivers indicated that it was very important for them to keep driving for as long as they could. Seventy percent of former drivers said they made the decision to stop driving themselves, while about 15 percent indicated they made the decision together with others and a similar proportion said that others made the decision

for them. Most (60%) said they stopped driving at about the right time, however, one-third reported that they felt they gave up driving too soon.

Over 55 percent of former drivers went out either daily or 3-4 times per week and about one quarter went out once or twice a week. However, almost 15 percent went out only a few times each month or less, indicating extremely low levels of community access and mobility. Approximately one-quarter said they were not very satisfied with their ability to get to places that they wanted to go to.

The most commonly used transport options by former drivers were as a car passenger, public transport and walking. Taxis were used 'often' by fewer than 20 percent of former drivers while about a half said they used taxis sometimes.

The most commonly cited reasons given for stopping driving were availability of others to do the driving, availability of other transport modes, and high costs associated with driving. Many also reported that their decision was influenced by the fact that they no longer enjoyed driving or no longer felt safe driving, or were concerned about their vision or their ability to react quickly in emergencies. The influence of doctors' advice and family and friends' advice was also a factor for some. The majority of these reasons for stopping driving would appear to be generally indicative of appropriate self-regulatory behaviour.

Related to this finding, it was of interest to explore voluntary driving cessation patterns in other jurisdictions where licensing requirements differ. Elsewhere, we have reported that high rates of voluntary licence surrenders particularly amongst older women seen in Queensland, may be linked to mandatory age-based licensing in that State, (Oxley et al., 2003). Although it was not possible to directly evaluate this issue in the current study, there was clear evidence that a substantial proportion of ACT and NSW former drivers had chosen not to attend their re-licence test. Just fewer than 20 percent of former drivers reported that they chose not to attend a medical test and similar numbers chose not to sit their on-road test. Those who declined re-tests were more likely to be 75 years or older, widowed and not working than those who had not reported this as a reason in the decision to stop driving. About twice as many females chose not to be re-tested than males. Interestingly, fewer former drivers who chose not to be re-tested reported that they made the decision themselves compared with those who gave up for other reasons.

5.3   LIMITATIONS OF THE STUDY

Ideally, changes in self-regulatory behaviours are best studied using longitudinal studies, following a cohort of drivers across a number of years. However, this approach was outside the scope of the present study. Notwithstanding this limitation, this study was able to identify some important differences in self-regulatory behaviours across the three age groups studied. What is more difficult to ascertain is whether these effects are cohort-specific or whether they are truly reflective of changes that occur with the ageing process.

One of the important limitations about sampling behaviours at one particular time is that it is not known whether those who avoided certain driving situations had done so only recently or whether they had avoided these situations all their driving life. While some survey questions addressed the issue of *changes* in driving behaviour across the previous five years, as noted above, this issue is much more appropriately explored using a longitudinal study design. It was not possible, simply because of constraints on the size of the self-administered survey, to explore these changes in self-regulatory practice in more detail.

In this study, it was not possible to assess directly the various functional abilities related to driving. Rather, vision, decision-making and other abilities required for safe driving were assessed by self-report. Ideally, functional impairment should be measured by performance on standardised assessments tests of cognition, vision, perception, attention and physical abilities related to driving. However, an equally plausible case can been made that if drivers *perceive* their abilities in these areas to be less than optimal for safe driving, then this indeed may be sufficient justification for self-regulation. One of the major problems with self-ratings of this kind is that people with poor cognitive capacity or memory impairment are unlikely to provide accurate information about health status or driving patterns. Moreover, those who lack insight cannot, by definition, provide reliable information about their functional abilities.

The data provided in this survey made it difficult to ascertain the relationship between crash risk and self-regulation and in particular, whether self-regulatory practices were effective in reducing crash risk. Part of the reason for this may have to do with the fact that crashes are a relatively rare event amongst older drivers. More research is needed with very large cohorts of drivers to better identify the effectiveness of self-regulatory driving practices in reducing crash risk.

Last, the sample size for former drivers was relatively small (n=108). Nevertheless, recruitment through the Seniors' Card lists was considerably more successful than in the Victorian survey where volunteers were sought through seniors' newsletters and magazines (Charlton et al., 2003). It is reasonable to expect that many of those who have recently given up driving will have serious health problems which might result in their hospitalisation or placement in residential care. The likelihood that former drivers with such severe health problems would volunteer for this study is relatively low. An alternative or supplementary approach to understanding issues related to former drivers may be to interview with adult children of former drivers.

5.4 CONCLUSION

The results of this study confirmed for a sample of Australian drivers, many of the findings from previous research with drivers in other western countries (e.g., see Benekohal et al., 1994; Hakamies-Blomqvist, 1994; Land Transport Safety Authority, 2000; Rosenbloom, 1999). In general, this study found evidence for age-related differences in changes in the amount of driving as well as avoidance of specific driving situations. For a proportion of drivers, these changes in driving behaviour were suggestive of compensation for (real or perceived) changes in driving performance and declines in various health-related measures. However, it is also possible that some self-regulatory behaviours, particularly reduction in *amount* of driving may also be counter-productive from the viewpoint of crash risk since low mileage has been found to be associated with higher crash involvement (Hakemies-Blomqvist et al., 2002; Janke, 1991).

A major contribution of this study has been to identify a range of driver characteristics associated with self-regulatory driving practices and to provide insights into differences in self-regulation across different States/Territory of residence. Self-regulators were more likely to be Victorian, aged 75 years or older, female, with lower overall health ratings, and lower confidence in risky driving situations, particularly rural drivers.

5.5 RECOMMENDATIONS

This study has provided a rich source of information about drivers' self-regulatory practices. Based on the findings of this study a number of recommendations are made for future research and for strategies to enhance the awareness of self-regulatory practices and to encourage older people to drive for as long as it is safe for them to do so.

Recommendations include:

- Promote amongst older people better awareness of health and medical conditions and functional abilities that affect driving; and related to this

- Promote through educational materials and programs the adoption of self-regulatory practices consistent with declines in functional ability and presence of medical conditions known to be associated with crash risk;

- Promote early planning for retiring from driving amongst older drivers and their families as well those agencies who work most closely with seniors in the community; and

- Explore strategies to provide better mobility options for former drivers to help them maintain their independence after driving cessation including access to alternative transport options, proximity to services, family and friends, and improved community infrastructure.

It is also recommended that further research be conducted to address some of the constraints of this study and explore further some of the current findings. Future research should:

- Explore the relationship between self-regulation and functional impairment, using standardised tests of cognition, attention, visual perception etc to assess functional abilities;

- Examine changes in self-regulatory practices in a cohort of drivers, particularly those over aged 75 years, using a longitudinal study method (e.g., over 5 years); and

- Consider further, the influence of mandatory age-based licensing requirements in determining self-regulatory driving practices.

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MONASH University
Accident Research Centre

Driving behaviours, travel patterns and crash risk: A comparison of older drivers in the ACT, NSW and VIC

Letter of Invitation/Explanatory Statement

December 2004

Dear Driver,

Older drivers are generally cautious and relatively safe on the roads. Many choose to modify their driving habits to match their lifestyle in retirement as well as to fit their changing capabilities. We have conducted a study of Victorian older drivers but we do not know about the driving habits of older drivers in the ACT and NSW. It is important to determine whether the findings of the Victorian study reflect the driving patterns of older road users elsewhere in Australia.

The Monash University Accident Research Centre is carrying out a project for the NRMA-ACT Road Safety Trust to examine the travel patterns of older road users in the ACT and NSW, particularly relating to drivers' experiences and reasons why drivers may change their behaviour on the road as they age. This study will extend the Victorian-based study to include drivers from the ACT and NSW and will compare these with the Victorian sample. It is hoped that this study will identify important issues surrounding older driver safety and mobility and help develop valuable safety initiatives for older drivers in the ACT and NSW.

With the assistance of the Council On The Ageing (COTA) and the NSW Seniors Card Office, your name has been randomly selected from the Seniors Card membership list and we extend an invitation to you to participate in this study. This letter has been sent out directly from COTA or the Seniors Card Office and your personal details have not been given to any other party.

What is involved?

If you agree to take part in the project, you will be asked to complete the enclosed survey. The survey will ask about your health, driving experiences, changes in driving patterns, reason for change, your driving confidence and your thoughts on reducing or stopping driving. This will take approximately 15 to 20 minutes to complete. Please complete the survey and post it back to us in the reply paid envelope.

At the end of the survey you will also be asked if you would like to be contacted to be invited to participate in future research. Participants will be invited to participate based on the specific responses that are provided in this Survey such as gender, age group or previous involvement in a crash. If you agree to be contacted, we would like to emphasise that you are not obligated to participate in any future research. If you would like to be contacted and invited to take part in other research projects being conducted by the Monash University Accident Research Centre, please complete the Expression of Interest Form and return it with the completed survey using the reply paid envelope provided. A member of our research team will contact you at a convenient time via telephone and provide you with more information about the research project.

Confidentiality

The information we will collect is for research purposes only and will be treated in the strictest confidence. If you agree to be contacted to participate in future research, we will need to be able to link your responses in the current survey to your contact details from the expression of interest form. Therefore, your responses will be coded with a unique code to enable us to link the two data sets. The two sets of information will be kept separately and in the case of electronic versions, on separate computers. This will ensure that identifying details cannot easily be connected with potentially sensitive information such as crash history. Participants who agree to be followed up can withdraw from that study at any stage without any negative consequences. No identifying information will be reported or published. Only staff members directly involved in the research will have access to the data, which will be stored securely for a minimum period of seven years in accordance with Monash University regulations.

Findings

It will not be possible to inform you of the outcomes of the study on an individual basis. However, at the conclusion of the study, you may obtain group findings from Monash University Accident Research Centre website. The findings will be made available to the sponsors of the project (MUARC) in the form of a report, while conference papers and journal articles may also arise from this research project.

Contacts

If you have any queries or would like to be informed of the findings of the study, please contact **Dr Judith Charlton** at Monash University.

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Should you have any complaint concerning the manner in which this research is conducted, please do not hesitate to contact The Standing Committee on Ethics in Research on Humans at the following address:
The Secretary
The Standing Committee on Ethics in Research on Humans
P.O. Box 3A, Monash University, Victoria 3800
Telephone: (03) 9905 2052   Fax: (03) 9905 1420

MONASH University
Accident Research Centre

<u>Driving behaviours, travel patterns and crash risk:</u>
<u>A comparison of older drivers in the ACT, NSW and VIC</u>

Expression of Interest for future research

❑   Yes, I would like the Monash University Accident Research Centre to contact me about participation in future research.

We are planning on investigating in more detail some of the issues raised in this Survey. You may be invited to participate in future research based on your specific responses to questions related to gender, age group or previous involvement in a crash, for example. If you agree to be contacted, we would like to emphasise that you are not obligated to participate in any future research. If you would like to be invited to take part in other research projects being conducted by the Monash University Accident Research Centre, please complete the details below and post it back to Monash University with your completed survey in the reply paid envelope provided. A member of our research team will then contact you at the convenient time via telephone and provide you with more information about any future research project.

Name: ……………………………………………………………………………

Contact phone number ……………………………………………………………

The best time to call me on the above number is:

Morning/ Afternoon/ Evening (please circle)

Thank you for your participation ☺

Driving behaviours, travel patterns and crash risk:
A comparison of older drivers in the ACT, NSW and VIC

This questionnaire is for 2 groups of drivers:

- Drivers who currently drive, and

- Drivers who recently ceased driving.

If you have never driven a car, please pass this questionnaire onto another driver (aged 55 years or older) who is either driving or who recently ceased driving.

Section A   Personal Information

This section of the questionnaire asks questions about you. Read each question carefully and place a tick in the box that best describes you. If you make a mistake, just cross it out and place a tick in the correct box.

A.1   What age group do you fit into?

- ❑   55-64 years
- ❑   65-74 years
- ❑   75 years or older

A.2   What is your gender?

- ❑   Female
- ❑   Male

A.3   What is your current marital status?

- ❑ Married/De facto
- ❑ Divorced/Separated
- ❑ Widowed
- ❑ Never married
- ❑ Other (please specify): _____

A.4 Where do you reside?

- ❑ Metropolitan
- ❑ Country town, within walking distance (not more than 1km) from the town centre
- ❑ Rural area (i.e., not a country town)
- ❑ Other (please specify): _____

A.5   What is the highest level of education you have reached?

- ❑   Primary school (elementary, state school, up to grade 6)
- ❑   Up to 3 years of High school or technical school (forms 1 - 3)
- ❑   4 - 6 years of High school or technical school (forms 4 - 6)
- ❑   College/university/other tertiary education

A.6   What is your current employment status? Are you

- ❑   Not working (retired or unemployed)
- ❑   Working part time
- ❑   Working fulltime
- ❑   Volunteering

A.7   Do you own a car?

- ❑   Yes
- ❑   No

A.8   Do you hold a current driver's licence?

- ❑   Yes
- ❑   No   *(Please go to question A.10)*

A.9   If you do hold a current driver's licence, are there any conditions or restrictions on your licence? (e.g., wearing glasses)

- ❑   Yes - Please specify_____
- ❑   No

A.10 How old were you when you got your first licence?

_____ **years**

A.11 Do you still drive?

❑   Yes   *If **YES**, please turn to the **YELLOW** pages and continue*

❑   No   *If **NO**, please turn to the **BLUE** pages and continue*

Section B   Current Drivers

This section of the questionnaire is for **CURRENT DRIVERS ONLY**. It asks questions about how you get around and what you think about driving. Please place a tick in the box next to the response that best describes you. If you make a mistake, just cross it out and place a tick in the correct box. All answers are acceptable and there are no wrong answers.

B.1   Are you usually the one who does most of the driving in your household?

❑   Yes
❑   No

B.2   How many days a week do you typically drive?

❑   Daily or almost daily
❑   3-4 days a week
❑   Once or twice a week
❑   A few times a month
❑   Once a month or less
❑   Don't know

B.3   How far do you normally drive each week?

❑   20 km or less (12 miles)
❑   21-50 km (13-31 miles)
❑   51-100 km (32-62 miles)
❑   101-200 km (63-124 miles)
❑   More than 200km (124 miles)

B.4   Would you say that most of your trips are:

- ❑   More than 5km
- ❑   Less than 5km
- ❑   Less than 3km

B.5   Roughly how many kilometres did you drive on your very last trip?

_____km

B.6   Where did you start this trip?

Street:_____

Suburb:_____

B.7   Where did you end this trip?

Street:_____

Suburb:_____

B.8   Would you say that you are driving…

- ❑   More than you would like?
- ❑   About as much as you would like?
- ❑   Less than you would like?
- ❑   Don't know

B.9   In a typical week, would you drive to the …

	Yes	No
Post office, bank, shops	❑	❑
Work	❑	❑
Doctor, Chiropractor, Physio etc	❑	❑
Sports/social club	❑	❑
Church	❑	❑
Family/friends	❑	❑

Other   -   please   specify:

_____

B.10   Compared to 5 years ago, would you say you…

❑   Are driving more
❑   Are driving less
❑   Are driving the same amount (Go to question B.12)
❑   Don't know (Go to question B.12)

B.11   Why do you think your amount of driving has changed? (e.g., health related issues, lifestyle changes, other transport options, advice from others)

_____

_____

_____

_____

_____

B.12   Some drivers like to have someone with them when they drive. How about you?

❑   Yes
❑   No
❑   No preference
❑   Don't know

B.13   Do you suffer from any of the following medical problems?

	Yes	No	Treated
Vision problems	❑	❑	❑
Problems with your heart	❑	❑	❑
Diabetes	❑	❑	❑
Respiratory problems	❑	❑	❑
Arthritis	❑	❑	❑
Stroke or mini-stroke	❑	❑	❑

Other medical conditions – please specify: _____

B.14   Are you currently taking any medication for any medical condition?

- ❑   No
- ❑   Yes (prescribed by my doctor)
- ❑   Yes (over-the-counter medication)
- ❑   Yes (prescribed by my doctor AND over-the-counter medication)

B.15   How many different types of prescription medication do you take each day?

_____

B.16   Do you think any of these medications have a negative effect on your driving?

- ❑   Yes (Go to question B.17)
- ❑   No (Go to question B.18)

B.17   If you do think that your medication has a negative effect on your driving, as a general rule do you avoid driving while you are on medication?

- ❑   Yes
- ❑   No

B.18   In the next group of questions, we would like you to rate your ability to drive safely.

	Excellent	Good	Fair	Poor
How would you rate your overall health for safe driving?				
How would you rate your vision for safe driving during the day?				
How would you rate your vision for safe driving at night?				
How would you rate your ability to make decisions quickly while driving?				
How would you rate your upper body strength and flexibility for safe driving?				
How would you rate your lower body strength and flexibility for safe driving?				
How would you rate your head and neck movement for safe driving?				

B.19   Compared to 5 years ago, how fast do you drive now? Would you say you drive…

- ❑ Faster
- ❑ About the same
- ❑ Slower

B.20   Compared to 5 years ago, how would you rate the standard of your driving now?

- ❑ Better
- ❑ About the same
- ❑ Not as good

The next set of questions asks about how you feel in different driving situations. We would like you to think about how you have felt in these driving situations in the last 6 months.

B.21   How do you feel about merging into traffic?

I am:	*Merging into traffic is:*	*Do you avoid it?*
❑ *Very confident* ❑ *Moderately confident* ❑ *Not at all confident*	❑ *Not difficult* ❑ *A little difficult* ❑ *Very difficult*	❑ *Yes* ❑ *No*

If you avoid it, please describe HOW...

_____

If you avoid it, please describe WHY...

_____

B.22   How do you feel about driving in the rain?

I am:	*Driving in the rain is:*	*Do you avoid it?*
❑ *Very confident* ❑ *Moderately confident* ❑ *Not at all confident*	❑ *Not difficult* ❑ *A little difficult* ❑ *Very difficult*	❑ *Yes* ❑ *No*

If you avoid it, please describe HOW...

_____

If you avoid it, please describe WHY...

_____

B.23   How do you feel about driving in busy traffic?

I am:	Driving in busy traffic is:	Do you avoid it?
❑ Very confident ❑ Moderately confident ❑ Not at all confident	❑ Not difficult ❑ A little difficult ❑ Very difficult	❑ Yes ❑ No

If you avoid it, please describe HOW...

_____

If you avoid it, please describe WHY...

_____

B.24   How do you feel about driving through roundabouts?

I am:	Driving through roundabouts is:	Do you avoid it?
❑ Very confident ❑ Moderately confident ❑ Not at all confident	❑ Not difficult ❑ A little difficult ❑ Very difficult	❑ Yes ❑ No

If you avoid it, please describe HOW...

_____

If you avoid it, please describe WHY...

_____

B.25 How do you feel about driving through intersections WITHOUT traffic lights?

I am:	Driving through these intersections is:	Do you avoid it?
❑ Very confident ❑ Moderately confident ❑ Not at all confident	❑ Not difficult ❑ A little difficult ❑ Very difficult	❑ Yes ❑ No

If you avoid it, please describe HOW…

_____

If you avoid it, please describe WHY…

_____

B.26 How do you feel about making right-hand turns at intersections WITHOUT traffic lights?

I am:	Making turns at theses intersections is:	Do you avoid it?
❑ Very confident ❑ Moderately confident ❑ Not at all confident	❑ Not difficult ❑ A little difficult ❑ Very difficult	❑ Yes ❑ No

If you avoid it, please describe HOW…

_____

If you avoid it, please describe WHY…

_____

B.27   How do you feel about making right-hand turns at intersections WITH traffic lights but WITHOUT a right-hand turn arrow?

I am:	**Making turns at theses intersections is**:	*Do you avoid it?*
❑ *Very confident* ❑ *Moderately confident* ❑ *Not at all confident*	❑ *Not difficult* ❑ *A little difficult* ❑ Very difficult	❑ Yes ❑ No

If you avoid it, please describe HOW...

_____

If you avoid it, please describe WHY...

_____

B.28   How do you feel about making right-hand turns at intersections WITH traffic lights and WITH right-turn arrows?

I am:	**Making turns at theses intersections is**:	*Do you avoid it?*
❑ *Very confident* ❑ *Moderately confident* ❑ *Not at all confident*	❑ *Not difficult* ❑ *A little difficult* ❑ *Very difficult*	❑ *Yes* ❑ *No*

If you avoid it, please describe HOW...

_____

If you avoid it, please describe WHY...

_____

B.29 How do you feel about driving at night?

I am:	Driving at night is:	Do you avoid it?
❑ Very confident ❑ Moderately confident ❑ Not at all confident	❑ Not difficult ❑ A little difficult ❑ Very difficult	❑ Yes ❑ No

If you avoid it, please describe HOW...

_____

If you avoid it, please describe WHY...

_____

B.30 How do you feel about driving at night when it is wet?

I am:	Driving at night when it is wet is:	Do you avoid it?
❑ Very confident ❑ Moderately confident ❑ Not at all confident	❑ Not difficult ❑ A little difficult ❑ Very difficult	❑ Yes ❑ No

If you avoid it, please describe HOW...

_____

If you avoid it, please describe WHY...

_____

B.31   How do you feel about changing lanes while driving?

I am:	Changing lanes is:	Do you avoid it?
❑ Very confident	❑ Not difficult	❑ Yes
❑ Moderately confident	❑ A little difficult	❑ No
❑ Not at all confident	❑ Very difficult	

If you avoid it, please describe HOW...

_____

If you avoid it, please describe WHY...

_____

B.32   Is there another particular driving situation that you are not confident in, find difficult or try to avoid?

Driving situation: _____

In this driving situation, I am:	I find this driving situation:	Do you avoid it?
❑ *Very confident* ❑ *Moderately confident* ❑ *Not at all confident*	❑ *Not difficult* ❑ *A little difficult* ❑ *Very difficult*	❑ *Yes* ❑ *No*
If you avoid it, please describe HOW... _____		
If you avoid it, please describe WHY... _____		

B.33 Over the last two years, has anyone suggested that you should limit your driving or suggested that you stop driving?

❑ Yes
❑ No

B.34 If yes, who made this suggestion? Was it your …

	Yes	No
Spouse/partner	❑	❑
Son or daughter	❑	❑
Friend	❑	❑
Your doctor or other medical person	❑	❑
Eye doctor (optometrist or ophthalmologist)	❑	❑

Other – please specify:
_____

B.35 Have you thought about the possibility of not driving one day?

❑ Yes
❑ No

B.36   Have you made any plans for the possibility of not driving one day?

    ❑   Yes (Go to next question)
    ❑   No (Go to question B.38)
    ❑   Not sure (Go to question B.38)

B.37   If yes, have you

	Yes	**No**
Moved house to be closer to public transport	❑	❑
Became familiar with public transport	❑	❑
Explored alternative transport options	❑	❑
Moved near family, social networks and medical services	❑	❑
Got some advice from doctor	❑	❑
Shared the driving	❑	❑
Changed holiday travel	❑	❑

Other – please specify:

_____

B.38   Have you approached your family doctor about stopping driving one day?

    ❑   Yes
    ❑   No
    ❑   Not sure

B.39   Please describe how not being able to drive might affect you personally.

_____

_____

_____

_____

B.40   Would any of the following make you think about stopping driving? (Please tick as many as apply to you)

	Yes	**No**
A decline in your health	❑	❑
Declining eyesight	❑	❑
A number of 'close calls' or minor crashes	❑	❑
Increased difficulty in some driving situations	❑	❑
A feeling of responsibility for the safety of others	❑	❑
Family and friends raising concerns	❑	❑
Advice from doctor	❑	❑
Loss of confidence or nervousness behind the wheel	❑	❑
Having to attend the medical/vision test for renewing your licence	❑	❑
Having to attend a re-licensing driving test	❑	❑
Cost of running a car	❑	❑

Other – please specify: _____

B.41   Do you feel that using other forms of transport (such as friend, family, taxi or bus) is an option for you?

❑   Yes
❑   No
❑   Not sure

B.42   Apart from driving, do you currently use any other forms of transport?

❑   Yes
❑   No

B.43   If yes, please specify the other forms of transport that you currently use.

_____

_____

Crash Involvement and Infringements

We would now like to ask you some questions regarding crashes and we hope that you will be comfortable answering them. We are not interested who was at fault and we would like you to think about only the crashes where YOU were the driver.

C.1   Thinking back over the last 2 years, have you been involved in a crash?

❑   Yes
❑   No

C.2   If yes, how many crashes have you had?

_____

C.3   Thinking back over the last 2 years again, have you had any traffic infringements besides parking fines?

❑   Yes
❑   No

C.4   If yes, how many infringements have you had?

_____

Thank you for completing the survey - Your participation has been very valuable to us. We are planning on investigating in more detail some of the issues raised in this survey. If you would like to take part in other research projects being conducted by the Monash University Accident Research Centre, please complete the form provided and post it back to Monash University with your completed survey in the reply paid envelope provided. Thank you.

Section C   Former Drivers

This section of the questionnaire is for **FORMER DRIVERS ONLY**. It asks questions about when you used to drive as well as how you get around since you stopped driving. Please place a tick in the box next to the response that best describes you. If you make a mistake, just cross it out and place a tick in the correct box. All answers are acceptable and there are no wrong answers.

C.1   How often do you go out?

- ❑   Daily or almost daily
- ❑   3-4 days a week
- ❑   Once or twice a week
- ❑   A few times a month
- ❑   Once a month or less
- ❑   Don't know

C.2   Overall, how satisfied are you with your ability to get to places you want to go?

- ❑   Very satisfied
- ❑   Somewhat satisfied
- ❑   Not very satisfied
- ❑   Don't know

C.3   How important was it for you to keep driving for as long as you could? Was it

- ❑   Very important
- ❑   Somewhat important
- ❑   Not very important
- ❑   Don't know

C.4   Now we have a few questions about the mode of transportation you use to get to different places. How often do you

	Often	Sometimes	Never	Don't know
Ride as a passenger in a car?				
Use specialised transportation services for seniors, such as dial-a-ride or special van service?				
Take a taxi?				
Take a bus, train, tram or other form of public transport?				
Walk to a destination 2 blocks or more away?				
Ride a bicycle to get somewhere specific?				

C.5   Below is a list of reasons why some people stop driving. You may agree with several of them, or none at all, please tick any that applied to you. Did you stop driving because:

	Yes	No
Someone else was available to drive you places	❑	❑
Other forms of transportation were available to you so that you no longer needed to drive	❑	❑
You did not enjoy driving or feel comfortable driving	❑	❑
You did not feel that you were a safe driver	❑	❑
You were afraid that you might not be able to react fast enough in an emergency situation	❑	❑
You were advised by your doctor not to drive	❑	❑
You had problems with your vision (cataracts, difficulty at night etc)	❑	❑
You had problems with dizziness, blackouts or feeling light-headed	❑	❑
You had problems with the use of your arms or legs, or with turning your head	❑	❑
Family members or friends encouraged you to stop driving	❑	❑
You were in a crash, or almost in a crash	❑	❑
You felt the cost of owning and operating a car was too high	❑	❑
The licence examiner did not renew your licence	❑	❑
You chose not to attend a re-licence medical/vision test	❑	❑
You chose not to go and attend a re-licence driving test	❑	❑

Other – please specify: _____

C.6   If you chose not to attend any re-licence test, can you please explain why?

_____

_____

_____

_____

C.7   How likely is it that you will drive again? Would you say it is

❑   Very likely
❑   Somewhat likely
❑   Not very likely
❑   Don't know

C.8   Did you stop driving all at once or was it a gradual process?

❑   Stopped gradually
❑   Stopped all at once
❑   Don't know

C.9   Looking back, would you say that you stopped driving at about the right time, earlier than you should have, or later than you should have?

❑   At about the right time
❑   Earlier than I should have
❑   Later than I should have
❑   Don't know

C.10 Do you feel that you made the decision to stop driving yourself, that others made the decision for you, or you made it along with others?

- ❑ Made decision myself
- ❑ Others made the decision
- ❑ Made decision along with others
- ❑ Don't know

Thank you for completing the survey.

Thanks you for your time and input. Your participation has been very valuable to us. We are planning on investigating in more detail some of the issues raised in this survey. If you would like to take part in other research projects being conducted by the Monash University Accident Research Centre, please complete the form provided and post it back to Monash University with your completed survey in the reply paid envelope provided. Thank you.