MONASH University

Accident Research Centre

USE OF MANUAL SPEED ALERTING AND CRUISE CONTROL DEVICES BY DRIVERS IN NEW SOUTH WALES

MOTOR ACCIDENTS AUTHORITY

USE OF MANUAL SPEED ALERTING AND CRUISE CONTROL DEVICES BY DRIVERS IN NEW SOUTH WALES

MICHAEL A. REGAN

KRISTIE L. YOUNG

MAY 2004

REPORT NO. 219

Monash University Accident Research Centre Report Documentation Page

Report No.	Date	ISBN	Pages
219	February 2004	0 7326 1729 4	144

Title and sub-title:

Use of manual Speed Alerting and Cruise Control Devices by Drivers in New South Wales.

Authors:

Michael A. Regan and Kristie L. Young

Type of Report & Period Covered:

General, 2004

Sponsoring Organisation(s):

Motor Accidents Authority (MAA) of New South Wales

Abstract:

This report describes the outcomes of a study funded by the Motor Accidents Authority (MAA) of New South Wales (NSW) to assess the use, acceptability and effectiveness in reducing speeding of manual speed alerting and cruise control devices to a sample of drivers from metropolitan and rural NSW. Four focus groups were conducted, two in Sydney (metropolitan) and two in Wagga Wagga (rural), involving 31 drivers aged 25 to 49 years, who were either users or non-users of the systems discussed. Overall, the participants held positive attitudes towards manual speed alerting devices and, in particular, cruise control systems and felt that these devices are generally effective in helping them to control and maintain their speed. However, differences in the use and acceptability of these devices were observed across drivers from metropolitan and rural areas. Recommendations for refining the functional and ergonomic design of existing manual speed alerting and cruise control devices are provided. The report concludes with recommendations for further research.

Key Words:

Cruise Control, Manual Speed Alert, Speeding, Technology, Ergonomics.

Disclaimer

This report is disseminated in the interest of information exchange. The views expressed here are those of the authors, and not necessarily those of Monash University

Reproduction of this page is authorised

Monash University Accident Research Centre,
Wellington Road, Clayton, Victoria, 3800, Australia.
Telephone: +61 3 9905 4371, Fax: +61 3 9905 4363

TABLE OF CONTENTS

List of Tables

LIST OF FIGURES

EXECUTIVE SUMMARY

Introduction

Speeding constitutes a significant road safety problem in Australia (ATSB, 2002). Speeding, both exceeding the posted speed limit and driving at inappropriate speeds for the prevailing conditions, increases the incidence and severity of crashes. Even small reductions in excessive and average traffic speeds will significantly increase safety for all road users. Road authorities have therefore introduced numerous speed countermeasures including advertising campaigns, fixed speed cameras and the introduction of double demerit points over holiday periods (RTA, 2002).

Countermeasures also include several in-vehicle technologies including manual speed alert systems, Intelligent Speed Adaptation (ISA) systems, conventional cruise control and Adaptive Cruise Control (ACC). To date, the most widely implemented are the conventional cruise control and manual speed alerting devices. One or both are currently a standard feature in most new vehicles sold in Australia. However, almost nothing is known about the extent to which they are used by drivers, under what circumstances they are used, and whether they are effective in helping drivers reduce their speeding (Regan, Oxley, Godley & Tingvall, 2001). This is surprising given that, if properly designed, used and promoted, these devices have significant potential to reduce the incidence and severity of speed-related injury to all road user groups.

The current report documents the results of a preliminary study which aimed to examine, using focus groups, the extent to which cruise control and manual speed alerting devices are used by drivers in NSW, how these devices are used, the circumstances under which they are used, any barriers to their use, and their effectiveness in helping drivers maintain the posted speed limit.

Four focus groups were conducted involving 31 participants aged 25 to 49 years, who were either users of cruise control and/or manual speed alert, or had one or both of these systems fitted to their car but did not use them. Two of the focus groups were held in the rural city of Wagga Wagga and two in inner Sydney. Participants were recruited through a random number telephone survey. During each focus group, participants completed a questionnaire that obtained demographic information, information about experience with in-vehicle and other everyday technologies and information on attitudes towards speeding and speeding countermeasures. A video demonstrating the functionality and operation of each system was shown to participants to refresh their memory on how each system operated before they completed a checklist about which functions of the system they use. Finally, a discussion guide was used to facilitate the group discussions.

Results

The key issues are described for the cruise control and manual speed alert systems separately.

Cruise Control

The participants, particularly the rural participants, held very positive attitudes towards cruise control systems. While the participants stated that their main motivation for using the cruise control system is to help them avoid speeding fines, they did mention a number of safety-related reasons why they use the system, including to avoid tiredness in their legs and to maintain a safe speed around school zones. Participants stated that they mainly use the cruise control system during the day and on open-roads (e.g., highways and freeways) which are relatively flat and straight, and rarely use it on urban roads where there are many other road users and regular traffic lights and speed zone changes.

While the participants claimed that the system is very effective in helping them maintain a particular speed, they did not feel that it is necessarily effective in helping them maintain the posted speed limit, as they tend to set the cruise speed several kilometres above the local limit. How many kilometres above the limit they set it at directly depends on locally tolerated speeds above the limit that Police allow before booking a driver for speeding. Participants stated that the system is particularly useful when driving long distances on open roads. Typically the participants find cruise control reliable, but state that it is less reliable when travelling in hilly areas, as it tends to surge up hills and overshoot when travelling downhill.

The non-users mentioned a number of reasons why they do not use the cruise control system fitted to their car, including forgetting that it is there, not feeling in control of the car when using it and finding it difficult to use while driving. Finally, the participants suggested a number of changes that could be made to current cruise control systems to make them more appealing, such as having steering wheel mounted button controls and making the system capable of detecting speed limit changes and automatically changing the cruise speed to match.

A number of general problems with existing cruise control systems were identified by participants. In particular, participants were concerned that many cruise control systems surge up hills and then exceed the set cruise speed when travelling downhill. Another concern was that drivers are not typically shown how to use the cruise control system or told how they can expect it to change their driving experience when they first purchase a car with this system. Finally, participants were also aware of the potential dangers associated with allowing inexperienced drivers to use a cruise control system, and suggested that learner drivers should not use this system until they have mastered the driving task.

A number of differences were observed between the rural and metropolitan participants in their use and acceptability of cruise control systems. Rural participants appeared to use their cruise control system more regularly than the metropolitan participants because they tend to be out on the open roads more frequently. The rural participants also appeared on average to find the system easier to use and were more aware of the system's functionality than the metropolitan participants.

Manual Speed Alert

The metropolitan participants held more positive attitudes towards the manual speed alerting system than the rural participants. Many participants stated that they use the speed alerting system to avoid speeding fines, but also mentioned a number of other safety-related reasons, including helping them to travel at safe speeds through school zones and for teaching learner drivers to judge and monitor their speed. The metropolitan participants stated that they use their speed alert systems most of the time, but use it particularly when there is a greater police presence around. The rural participants tend to use their speed alerter less frequently and stated that they mainly use it around town and on long weekends when there is a greater Police presence.

The participants felt that the speed alerting system is generally effective in helping them reduce their speed, but they tend to make a judgement at the time, based on the road and traffic conditions regarding whether to ignore the warnings or slow down. The rural participants stated that they do not find the speed alerter personally very useful, but acknowledged that it may be useful for learners drivers who have difficulty judging their speed. In contrast, the metropolitan participants find the speed alerter very useful, particularly when there is an increased police presence. Rural participants also find the system harder and more distracting to use than the metropolitan participants and, in particular, were concerned that on many speed alerting systems, that there is no labelling to indicate what the system is or how to use it.

The non-users of the system mentioned a number of reasons why they do not use manual speed alert, including: not knowing how to use it, finding it difficult or tedious to program, finding the warnings annoying or feeling that they can monitor their own speed. A number of changes to current speed alerting systems were also recommended by participants such as having steering wheel mounted controls, designing the system as a stand-alone system and allowing drivers to increase and decrease the speed settings in 1 kilometre intervals.

A general problem with current manual speed alerters identified by participants was the lack of identifying labelling of the system, making many drivers unaware that the car is equipped with the system. Also, the participants felt that the way in which they have to program the speed alerting system is tedious (e.g., having to toggle through various menus on the trip computer to reach the system) and not user-friendly.

Several differences between the rural and metropolitan participants in their use and acceptability of the speed alerting system were obvious. In particular, the rural participants appear to use their speed alerting system far less than the metropolitan participants and tend to find it less useful and harder to use.

Participants in the current study highlighted a number of problems they experience with current cruise control and manual speed alerting systems. These are summarised in Table E.1, along with those changes to the systems that were suggested by the participants to resolve or improve each problem.

Table E.1. Problems identified with cruise control and manual speed alert systems and suggested solutions.

System	Problem	Suggested Solution
Cruise Control	• System surges up hills and overshoots the set cruise speed down hill. • Drivers not shown how to use system properly or how to adjust their driving style when they purchase the system. • Programming the system using the existing controls can be difficult. • Constantly readjusting the cruise speed when moving across different speed zones can be tedious.	• Design the system so that it alerts drivers if the car overshoots the set cruise speed. • Drivers informed when purchasing the system of how to use it and how it may change their driving behaviour. • Have steering wheel mounted controls. • Design the system so that it automatically detects speed zone changes and adjusts the cruise speed accordingly.
Manual Speed Alert	• Only being able to increase/decrease the alert speed in 5 km/h increments is annoying. • Having to toggle through the trip computer menu to access the system is tedious and hides the function. • The location of the system's controls in some vehicles makes the system difficult to access. • The system has no identifying labels to indicate its presence. • The auditory warning issued by the system is annoying.	• Design all systems to increase/decrease alert speed in 1-km/h increments. • Design the system as a stand-alone system. • Place the system controls on the steering wheel or in a more accessible location on the dashboard. • Include identifying labelling on the system. • Decrease the volume or change the sound of the warning.

The Future

As the sample of drivers interviewed in this study was small and drivers in favour of speed control measures were over-represented, the conclusions are necessarily tentative. A more comprehensive study, involving a larger sample of drivers in each region, is needed to verify the findings deriving from this preliminary study.

The themes, however, which emerged from the two focus groups conducted in each of the rural and metropolitan locations were highly consistent. On this basis, the following, tentative, recommendations can be made.

General Recommendations

- The preliminary findings emerging from this study suggest that both cruise control and speed alerters might be more effective in reducing mean and peak speeds in NSW, and elsewhere, if:
    - Police-enforced over- speed-limit tolerances were reduced;
    - Police enforcement of speeding laws was increased;

    - the devices, particularly the speed alert, were better designed, ergonomically and functionally; and
    - if drivers were better educated and trained in how to use the devices.

- There is evidence that drivers are equally inclined to use cruise control for private and work purposes - provided that in both cases they are liable for any fines incurred for speeding. This knowledge could be brought to the attention of corporate car fleet owners. It may be useful for fleet owners to provide information about cruise control and its potential use in avoiding fines when they are passing on speed-related infringement notices to drivers.

- Drivers in this study do not always use the most efficient method of programming the cruise control and speed alert functions. Less efficient methods may result in greater visual and cognitive distraction whilst the vehicle is in motion and are more likely to compromise safety. On this basis:

    - the ergonomic design of the Human Machine Interface (HMI) for each system could be improved so that it is intuitively obvious to drivers how to program the systems most efficiently;
    - drivers could be told when they purchase a new vehicle how to use these devices most ergonomically; and
    - in addition, user manuals provided by suppliers and vehicle manufacturers could explicitly state the most ergonomic means by which the system should be programmed.

- The cruise control and manual speed alert systems in the different vehicles considered in this study were different in design and operation. As a result, it would not be immediately obvious to a driver how to locate and operate comparable systems when swapping between unfamiliar vehicles, for example at work. This may discourage drivers from using these functions in those vehicles. Vehicle manufacturers and suppliers should be encouraged, or mandated through changes in legislation, to standardise the design of the HMI for these systems to ensure interoperability of the systems across vehicles.

- The usage patterns of manual speed alerters by rural and metropolitan drivers appear to differ markedly in NSW. Rural drivers use it mainly around town (and even then, not that often) whereas Sydney drivers use it often around town and on the open road. The preliminary findings from this study suggest that any campaigns promoting the use of speed alerters and cruise control devices should be sensitive to the differing usage patterns of rural and metropolitan drivers.

- A number of participants commented that the manual speed alert threshold can be reduced or increased only in 5 km/hr increments, even though they would prefer that the system allow them to set the threshold only 2 or three kilometers above the posted speed limit. Manufacturers and suppliers of speed alerters could be encouraged to re-design their systems such that they are programmable in increments of 1 km/hr given the known significant decreases in road trauma associated with small reductions in mean travel speeds.

Research

As noted previously, this was an exploratory study and the following recommendations for further research are made:

- A survey of motorists should be conducted to establish how many vehicles are equipped with manual speed alerting and cruise control devices and to more accurately estimate the extent to which these systems are used by drivers, and driver subgroups (e.g., young drivers).
- Research is necessary to assess the actual effectiveness of cruise control and manual speed alerting devices in reducing speeding. This could involve a survey of motorists and/or an on-road evaluation study.
- A formal ergonomic assessment of existing cruise control and manual speed alerting systems should be conducted to derive information that could be used to refine the design and operation of existing devices.
- The current study only focused on 25 to 49 year old drivers. Further research is needed with drivers from a wider range of age groups to examine any differences in the use, acceptability and effectiveness in reducing speeding, of these devices in younger and older drivers. In particular, research should focus on the acceptability of these devices to NSW drivers who are likely to derive the most benefit from them (i.e., those user groups who engage most in speeding).
- The present study only focused on drivers from NSW. Further research should be conducted with drivers from other Australian states, such as Victoria, who appear to have more conservative attitudes towards speeding than NSW drivers and who are more likely to believe that speed enforcement has increased over the past two years (Mitchell-Tavener, Zipparo & Goldsworthy, 2003), in order to establish if the use and effectiveness of these devices differs across drivers from different states with varying attitudes towards speed enforcement.
- Different drivers appear to use different strategies to negotiate corners when their cruise control is engaged. Some participants use the decrease button on the steering wheel or stalk to slow down around bends (rather than disengaging the system) and the increase button to increase speed once they have cleared the bend. It is not known to what extent such control movements interfere with steering control when negotiating bends. Research is needed to determine whether such control actions interfere significantly with steering control and, if so, what technological solutions might be available to prevent drivers from using cruise control in this manner when negotiating corners.
- The findings of the current study suggest that a number of drivers make use of manual speed alerting devices when teaching learner drivers to drive. Further research on manual speed alerting and cruise control devices should be conducted to establish the benefits and disbenefits of these devices for young novice drivers and to establish if the manual speed alerter, in particular, can be used to help young drivers calibrate their choice of speed.
- There is evidence from this study that speed alerters are being used as a driver support system to warn drivers that they are exceeding the speed limit (or some other speed threshold) when they are engaged in distracting activities such as conversing with passengers. Further research is warranted to determine to what extent drivers engage in this activity and to what extent it hinders or enhances their overall level of safety.

ACKNOWLEDGEMENTS

The authors wish to thank the Motor Accidents Authority of NSW for funding the project.

The authors also wish to thank Dr Narelle Haworth from the Monash University Accident Research Centre for her valuable input into the design of the focus groups and the analysis of the vehicle sales data.

The authors also thank Nebojsa Tomasevic from the Monash University Accident Research Centre for filming, editing and preparing the PowerPoint video segments used during the focus groups.

The authors also thank Miriam Shrimski, Narelle Hayes and Mary O'Hare for their assistance in administering the rural telephone recruitment survey.

The authors are grateful to professor Ian Johnston from the Monash University Accident Research Centre for peer-reviewing this report.

Our gratitude also extends to Woolcott Research and Daniel Pentony in particular, for recruiting the Sydney participants and moderating the Sydney focus groups.

The authors would also like to thank Holden Australia, Ford Australia, Mitsubishi Australia, Toyota Australia and the Federal Chamber of Automotive Industries for supplying vehicle sales data and information on the cruise control and manual speed alerting devices equipped to their vehicles.

Finally, the authors wish to thank the telephone survey respondents and focus group participants for taking the time to participate in the study and for providing interesting insights and comments on their use of cruise control and manual speed alerting systems.

Chapter 1. CRUISE CONTROL AND MANUAL SPEED ALERT: INTRODUCTION

1.1 Background

Speeding constitutes a significant road safety problem in Australia. Each year, over 1,700 people die on Australian roads and over 60,000 are injured (ATSB, 2002). In NSW alone, approximately 600 people have died on the roads each year over the last decade, and speeding accounts for approximately 40% of these fatal crashes (ATSB, 2002; RTA, 2002). Speeding, both exceeding the posted speed limit and driving at inappropriate speeds for the prevailing conditions, increases the incidence and severity of crashes. Even small reductions in prevailing traffic speeds will significantly increase safety for all road users. Road authorities have therefore introduced numerous countermeasures designed to reduce both excessive and average travel speeds. These countermeasures include advertising campaigns, fixed and mobile speed cameras, the introduction of double demerit points over holiday periods and the introduction of 50 km/h speed limits in residential areas (RTA, 2002).

In recent years, various on-board vehicle technologies have also been developed in an attempt to reduce road vehicle travel speeds. These include speed governors, for limiting the top speed of heavy vehicles, and other devices, known generically as Intelligent Speed Adaptation (ISA) systems, which alert the driver automatically when the posted speed limit has been exceeded and/or limit the vehicle to the posted speed limit or some other pre-defined speed threshold (Regan, Young & Haworth, 2003; Regan, Oxley, Godley & Tingvall, 2001).

Two devices in current use which have potential to reduce road vehicle travel speeds are the manual speed alerter and conventional cruise control. One or both are currently a standard feature in the majority of new vehicles sold in Australia and have been for many years. Surprisingly, however, almost nothing is known about the extent to which these systems are used by drivers, how they are used, under what circumstances they are used and, most importantly, how effective they are in helping drivers reduce speed (Regan et al., 2001). The aim of this preliminary study was to understand, using focus groups, the use by NSW drivers of these two relatively common in-vehicle devices.

This chapter reviews what little is known about the operation and effectiveness of cruise control and speed alerting devices, examines the prevalence of these devices in NSW, looks at differences in their operation across vehicle types and models, and examines trends in their fitment in NSW vehicles. The process used to recruit focus group participants is described in Chapter 2. In Chapter 3, the methods used in conducting the focus groups are discussed. The findings from the focus groups are discussed in Chapter 4. Finally, in Chapter 5, the results of the study are discussed and recommendations are made for future action and research.

1.2 Conventional Cruise Control: Operation and Effectiveness

Conventional cruise control systems are a popular feature on cars, particularly in countries where the roads are generally longer and straighter and destinations are farther apart, such as in Australia and North America. Conventional cruise control systems allow drivers to set the maximum speed at which they wish to travel and the system then controls the throttle and maintains the speed of the vehicle even on steep gradients (Patterson, 1998). Cruise control also has additional functions: many systems accelerate or decelerate the car at the touch of a button and can resume control over the vehicle's speed at the last set speed if the system has been disengaged. Cruise control systems also have a number of safety features: they will not allow the system to be engaged when the car is travelling below approximately 40 km/h and they automatically disengage as soon as the brake pedal is touched (Patterson, 1998).

A typical cruise control system has five buttons mounted on the centre of the steering wheel: On, Off, Set/Accel, Resume and Coast. The On and Off buttons activate and deactivate the system. Some cruise control systems do not have On or Off buttons: instead the system is activated by pressing the Set button and deactivated by pressing the brake pedal. The driver sets the speed at which they wish to travel by accelerating to the desired speed and then pressing the Set button. Pressing the Set button while the cruise control system is active will increase the speed of the vehicle by 1 km/h each time the button is pressed. The Coast button decreases the speed of the vehicle by 1 km/h each time it is pressed when the system is active. The Resume button instructs the vehicle to accelerate to the most recent speed setting if the system was recently disengaged by the driver pressing the brake pedal (Patterson, 1998; Shaout & Jarrah, 1997).

Cruise control systems have changed dramatically since they were first introduced in the 1950s. The earliest models of cruise control systems did not offer much functionality. They provided proportional feedback, providing full throttle whenever the vehicle dropped 6-10 mph under the set cruising speed. Typically these systems had a dash-mounted dial which the driver set to the desired cruising speed (Shaout & Jarrah, 1997). During the 1970s, this cruise setting dial was replaced by more user-friendly switches which were integrated in the indicator stalk or the steering wheel. However, most of the major improvements to the system occurred during the 1980s with the advent of microprocessor technology. Modern cruise control systems are capable of maintaining the set cruising speed of the vehicle even when travelling up hills by sensing the gradient of the road and commanding the automatic transmission to downshift or up-shift depending on the gradient of the road. They also offer greater functionality, allowing drivers to increase or decrease the set cruising speed by simply pressing a button (Shaout & Jarrah, 1997). More recently, adaptive or intelligent cruise control systems have been introduced. Adaptive cruise control systems are an extension of conventional cruise control systems and are designed not only to maintain a predetermined speed but, also, a particular time or distance headway from the vehicle in front. While there is no surrounding traffic, adaptive cruise control systems operate like a conventional cruise control system. However, in traffic the system automatically maintains a selected distance from the vehicle ahead without the need for the driver to touch the brake (Patterson, 1998).

There is a large body of literature on the safety benefits and acceptance by drivers of *adaptive* cruise control systems. However, there are very few studies that have examined the safety benefits/disbenefits and acceptance by drivers of *conventional* cruise control systems. This is surprising given that conventional cruise control is a standard feature on almost every new car and can be easily purchased and installed as an aftermarket product. Most of the studies that have examined conventional cruise control systems have compared driving performance while using these systems with driving performance while using adaptive cruise control. Very few studies have exclusively examined driving performance and behaviour while using conventional cruise control.

A review of the available literature on the safety effects of cruise control conducted by SWOV found very few studies that have examined the road safety effects of cruise control systems (van Kampen, 1996). The studies reviewed found lower average travel speeds, reduced speed variability and more stable traffic flow with the use of cruise control. They also estimated that with the widespread introduction of cruise control in vehicles, there would be a 50 percent decrease in crashes involving passenger vehicles resulting from a reduction in lane changes, overtaking manoeuvres and braking.

More recently, Christ and colleagues have examined the effects of using conventional cruise control on driving behaviour in real traffic situations (Christ, Smuc, Gatscha, Schmotzer, & Otzelberger, 2000). The main aim of this project was to evaluate the Mobile Observation of Vehicle-manoeuvring (MOVE) tool developed by the Austrian Road Safety Board to record and analyse driver behaviour. However, the study also provided important information on drivers' attention to the roadway, braking patterns, speed choice and following behaviour while using and not using a conventional cruise control system. A total of 50 experienced drivers drove a 150-kilometre test route consisting of mainly rural roads and motorways. Twenty-five of the drivers were assigned to the experimental group, while the other 25 drivers formed the control group. Drivers in the experimental group had their driving behaviour observed on two occasions along the test route, once when not using the cruise control and once when using the cruise control system. The drivers in the control group did not interact with the cruise control system at all. A combination of instrumented data collection and observations made by a trained observer and a video recorder was used to obtain driving behaviour data. Drivers also completed various psychological tests, designed to obtain information on their visual structuring ability, attention under monotony and their physical, social and financial risk willingness. Several performance tests designed to assess their concentration, reactions to stressful conditions, reaction times, co-ordination and peripheral vision were also administered. A virtual observer (artificial neural network) was used to categorise two braking patterns: the un-adapted or sudden braking pattern (categorised by high negative longitudinal acceleration and a distinct decrease in speed) and adapted braking (categorised by normal decelerations and a more anticipatory driving style).

There was no evidence that drivers observed the driving task less attentively (e.g., were 'out of the loop') when using the cruise control system than when not using the system. Nor did drivers engage in more un-adapted or sudden braking when using the cruise control. Overall, use of the cruise control system had a positive effect on drivers' choice of speeds, however there was evidence that drivers who had less experience using cruise control systems tended to use the cruise control more frequently at excessive speeds on rural roads than the more experienced drivers (Christ et al., 2000).

Several other studies have compared the effects on driving behaviour of conventional cruise control and adaptive cruise control systems (Koziol et al., 1999; Watanabe, Kishimoto, Hayafune, & Yamada, 1995; Youngbin, 1997). Koziol and colleagues examined the safety benefits, acceptability and effects on driving performance of an adaptive cruise control system and compared this to conventional cruise control and no cruise control. The findings were based on a Field Operational Test conducted by the National Highway Traffic Safety Administration (NHSTA) and the University of

Michigan Transport Research Institute. A total of 108 drivers participated in the study and drove vehicles equipped with adaptive cruise control along freeways and arterial roads. Results revealed that drivers chose to use the adaptive cruise control 50 percent more than the conventional cruise control system and rated the adaptive cruise control system as safer, more comfortable, convenient and enjoyable than conventional cruise control. Compared to driving with no cruise control, when using the conventional cruise control system drivers spent less time closing in on vehicles in front when on the freeway and made fewer risky lane changes when in slow traffic. Vehicles with conventional cruise control also had longer average headway times on freeways and the least velocity variability compared to vehicles with adaptive or no cruise control, however they did have a higher average speed and a longer response time to a lead vehicle's brake lights (Koziol et al., 1999). Another study by Youngbin (1997) used focus groups to examine drivers' attitudes towards cruise control systems. While the focus of this study was on adaptive cruise control, the participants raised some interesting issues regarding conventional cruise control. In particular, participants mentioned that having to constantly set and reset the cruise control systems when they are on long drives or encounter traffic travelling at different speeds becomes annoying and tiresome. Many of the participants felt that adaptive cruise control would be much easier and enjoyable to use than the conventional cruise control as it reduces the need to reset the cruise speed.

Overall, very few studies have examined the effects of conventional cruise control on driver behaviour (both in terms of speeding and in general) and the acceptability of these systems to drivers. The few studies that have been conducted have generally revealed that the use of conventional cruise control does not have any major adverse affect on driver behaviour or safety and, for some aspects of driving such as following distance, may even have a positive influence. However, there is evidence that drivers who are less experienced with cruise control tend to use this system more frequently at excessive speeds on rural roads than do more experienced drivers. In terms of acceptability, drivers generally find cruise control systems annoying and inconvenient, as they have to constantly set and reset the cruise speed.

1.3 Manual Speed Alert: Operation and Effectiveness

Manual speed alerting systems warn the driver, using visual and/or auditory warnings, when the vehicle has exceeded a preset speed threshold. Manual speed alerting systems are preset by the driver to a desired speed, such as the posted speed limit. Once this preset speed has been exceeded, the system will typically issue the driver with an auditory warning, usually a beep, and a static or flashing visual warning displayed on the dashboard that remains displayed until the vehicle slows to under the speed threshold.

To the knowledge of the authors, no research has been conducted on the safety benefits or the acceptability to drivers of manual speed alerting systems. However, there is a growing body of research that has been conducted on the effects on driving performance and behaviour of intelligent or variable speed alerting devices. Intelligent speed alerting devices, commonly referred to as Intelligent Speed Adaptation (ISA) alerting systems, are similar to manual speed alerting systems, except that the speed threshold that the vehicle should not exceed (the posted speed limit) is set automatically. Information regarding the speed limit that applies to a given location can be obtained in one of two ways. One way is by means of electronic signals transmitted to the vehicle from beacons attached to speed signs or other roadside infrastructure in the vicinity of speed signs, such as lampposts. These beacons transmit information regarding the posted speed limit to the vehicle and an on-board computer triggers a visual and/or auditory warning if the vehicle exceeds this limit. An alternative approach, being adopted most widely in ISA trials around the world, utilises global positioning system (GPS) technology. With this approach, information regarding the road network and the posted speed limits within it are stored in a digital map database within the vehicle. A GPS receiver fitted to the vehicle locates the position of the vehicle. Based on data derived from the GPS, an on-board computer program continuously analyses the location of the vehicle and compares the posted speed limit for that location with the current (speedometer or GPS-derived) speed of the vehicle. A warning is triggered when the GPS/digital map system recognises that the vehicle is travelling faster than the maximum speed limit for the current location (van Boxtel, 1999).

A number of overseas studies have examined the effects on driver behaviour of ISA alerting systems. Based on the research conducted to date, ISA speed alerting systems appear to have a number of road safety benefits, including a reduction of approximately 5 km/h in mean speeds, as well as a reduction in speed variance and speed violations (Brookhuis & de Waard, 1999; Lahrmann, Madsen, & Boroch, 2001; Sundberg, 2001). It is estimated that such reductions in speeding will lead to a substantial decrease in the incidence and severity of road accidents, as well as a reduction in fuel consumption (Carsten & Tate, 2001; Regan et al., 2001). Feedback obtained from test drivers in a number of trials also revealed that driving a vehicle equipped with a speed alerting system leads to an increased awareness of current speed limits and makes it easier to adhere to these speed limits, particularly on low-speed roads (e.g., 30 km/h) (Sundberg, 2001). Moreover, despite the lower average speeds, there is little evidence that drivers engage in compensatory behaviours such as running red lights and inappropriate speeds at intersections and around bends. Driver acceptance of ISA speed alerting systems is generally quite high, with 70% to 80% of test drivers reporting a favourable attitude towards the system. Continuous visual feedback of the current speed limit on the in-vehicle display appears to be consistently well received by test drivers. There is also no evidence to suggest that use of speed alerting systems increases cognitive workload or distracts the driver. However, although not found in all studies, there is evidence that informative systems lead to a decrease in driving pleasure, increased frustration at the lower overall speeds and increases in travel times (Sundberg, 2001).

Overall, there has been no research conducted to date on the safety benefits of manual speed alerting systems. Research examining the effects on driving performance and behaviour of intelligent or variable speed alerting devices however, has found that these systems lead to reductions in mean speed and speed variability and tend to be viewed favourably by drivers.

1.4 The Prevalence of Cruise Control and Manual Speed Alert Devices in New South Wales

The design and functionality of cruise control and manual speed alerting systems can vary widely across vehicle makes and models. Appendix A provides information regarding the different types of cruise control and manual speed alerting systems fitted to cars and how they differ across the various vehicle makes and models, discusses trends across time in terms of the fitment of these devices to vehicles (e.g., standard, optional and aftermarket fitment) and provides estimates of the proportion of vehicles sold in NSW that have either or both of these devices fitted. As there are literally thousands of different vehicle models and model variants in the Australian vehicle market, it would be an enormous task, beyond the scope of this report, to examine the cruise control and manual speed alerting systems fitted to every vehicle make and model sold in NSW. Thus, only a range of the top selling light passenger vehicle models from Toyota, Mitsubishi, Ford and Holden are examined in Appendix A. These four vehicle makes were chosen for examination as they are the four top selling makes in Australia (VFACTS, 2002). Information regarding the design and functionality of the cruise control and manual speed alerting systems equipped to various Toyota, Mitsubishi, Ford and Holden models and the number of vehicles equipped with either or both of these systems that were sold in NSW over the past decade was obtained from the vehicle manufacturers. In Appendix A, the cruise control and manual speed alerting systems fitted to these four vehicle makes are compared and contrasted. Trends in the fitment of these devices to the four vehicle makes and estimates of the proportion of these vehicles sold in NSW that have either or both of these devices fitted are then presented and discussed.

1.4.1 Summary of Appendix A

The cruise control systems fitted to Ford, Toyota, Mitsubishi and Holden vehicles all have the same basic functionality. That is, they all allow the driver to turn the system on and off, set the desired cruise speed, increase and decrease the desired cruise speed, deactivate the system and resume the system to cruise at its last set cruise speed. The main difference across the vehicle makes is their physical design, such as the location and form (e.g., buttons or stalk controls) of the controls, and the specific procedure, or procedures, that are followed to execute each of the functions.

Cruise control and manual speed alerting devices have been fitted to a range of vehicle models. As the proportion of vehicles fitted with cruise control and manual speed alert devices differs significantly across vehicle makes and models, it is difficult to draw conclusions as to what proportion of vehicles in NSW are fitted with cruise control and manual speed alerting systems based on the information examined. As discussed in Appendix A, this information could be more accurately obtained through a survey of NSW motorists. Based on the data examined however, it is possible to draw conclusions regarding some of the general trends in the fitment of these devices to vehicles over the last decade. In general, cruise control systems appear to be a more common feature on vehicles (e.g., it is fitted to a wider range of models) than manual speed alerting systems. However, when speed alerting systems are fitted to vehicles, they are typically fitted as a standard feature. Cruise control, on the other hand, is often only fitted as a standard feature to the more expensive models and model variants, and is fitted as an optional feature to the less expensive models, although there is a general trend towards cruise control being equipped as a standard feature to new model cars spanning the entire price range. Moreover, the proportion of vehicles fitted with cruise control and manual speed alerting systems in NSW appears to have increased over the last 5 to 6 years. The type of fitment of these devices to vehicles may have implications for whether drivers use the devices properly or at all and on their acceptance of these systems. For example, if these devices are simply fitted as a standard feature to a vehicle and are not sought after or requested, then drivers may be less inclined to use them, or may not use them properly or in the manner intended.

The fitment of cruise control as an aftermarket product is also popular among motorists. Aftermarket cruise control systems can be purchased from and installed by car dealers, or as fully installed units that are fitted by a professional installer, or they can be purchased off the shelf as D.I.Y. kits at automotive suppliers such as Autobarn or Repco and either installed by a mechanic or by the driver. The aftermarket fitment of manual speed alerting systems is not as popular as the fitment of aftermarket cruise control systems, most likely because these systems are often a standard feature on new cars.

Chapter 2. DESIGN, DEVELOPMENT AND ADMINISTRATION OF THE TELEPHONE RECRUITMENT SURVEY

2.1 Introduction

A telephone survey was utilised to recruit participants for the four focus groups. This chapter outlines the design and development of the telephone survey and also provides a detailed description of the administration procedure and the outcomes of the survey. First, however, information on the focus group composition, which was used to inform decisions regarding the target participant sample and recruitment procedure, is discussed.

2.2 Focus Group Composition

It was decided to run four focus groups, two in rural and two in metropolitan NSW, to assess drivers' use and acceptability of cruise control and manual speed alert systems. Both the speed alert and cruise control devices were discussed together in each of the four groups for several reasons. First, it was believed that by discussing the speed alert and cruise control devices together, any interactions between the uses of these systems and their relative benefits and disbenefits could be identified. Second, as all of the focus group participants discussed both systems, there would be a greater amount of data when conducting the analyses, hence increasing the reliability of the data. Third, there would be greater flexibility when booking participants into the groups, as each participant would have the choice of coming along to one of two groups, instead of just one group. Finally, discussing both systems together would give the non-users of one or both systems more opportunity to participate in the groups and provide greater input.

2.2.1 Eligibility Criteria

The purpose of the telephone survey was to serve as a tool for recruiting eligible respondents for focus group participation. One telephone survey was developed by the Monash University Accident Research Centre (MUARC) to recruit participants for the rural focus groups. Participants for the metropolitan focus groups were recruited by a professional recruitment and research company in Sydney, Woolcott Research, in order to increase the recruitment response rates. Woolcott Research recruited participants via their fortnightly omnibus telephone survey, however they used the same eligibility criteria to screen potential participants as were used for rural participants.

To be eligible for focus group participation, all respondents had to satisfy the following criteria:

- ***be aged between 25 and 49 years.*** This age range was deemed the most suitable for the study, as younger drivers (under 25) are less likely to drive cars with cruise control or manual speed alert systems fitted (younger drivers tend to drive older cars (Haworth & Rechnitzer, 1993; Williams, Preusser, Lund, & Rasmussen, 1987) and drivers above this age range are less likely to speed and thus are less likely to benefit from the devices. Having a relatively small age range also meant that the focus group participants were likely to engage in more conversation and thus facilitate the discussion process;

- ***hold a current car driver's licence;***
- ***currently drive a car;***
- ***have cruise control and/or a manual speed alerter fitted to their current vehicle;***
- ***be aware that their current vehicle has either or both of these devices fitted; and***
- ***drive either a Holden, Ford, Toyota or Mitsubishi (any model).*** Only these vehicle makes were selected for examination because developing the focus group materials for each cruise control system equipped to all of the vehicle makes would be extremely time consuming. These makes were selected because they are the top four selling makes in Australia (VFACTS, 2002).

In addition to the above criteria, the authors aimed to recruit a mixture of users and non-users of the cruise control and/or speed alert systems. It was intended that approximately half the participants in each focus group would be users of the systems (e.g., they have the system(s) in their car and they actually use it) and half would be non-users of the systems under discussion (e.g., have the system(s) in their car, but do not actually use it). This ensured that information on why drivers use these systems and why they do not was obtained during the groups.

It was also decided to run focus groups that involved both males and females in the same group. The vast literature on conducting focus groups generally states that mixed gender focus groups are acceptable as long as the topic under discussion is not gender specific (e.g., birth control) (Greenbaum, 1988). The authors aimed to have a balance of genders in each group. The final focus group composition is provided in Table 2.1.

Table 2.1. Final Focus Group Composition

Focus Group	Systems to be discussed	No. of participants			
		Users (Metro)	Non-users (Metro)	Users (Rural)	Non-users (Rural)
1	Cruise Control & Speed Alert	5	5		
2	Cruise Control & Speed Alert	5	5		
3	Cruise Control & Speed Alert			5	5
4	Cruise Control & Speed Alert			5	5

Note. Approximately half the participants were female and half male.

2.3 Design and Development of the Rural Telephone Survey

The metropolitan participants were recruited by a professional recruitment company using their fortnightly omnibus survey. These surveys are carried out fortnightly with 1,000 adults 18 years of age and over throughout Australia using Computer Assisted Telephone Interviewing (CATI). The recruitment company used the eligibility criteria developed by MUARC to screen potential participants for the focus groups. As the metropolitan participants were recruited by the recruitment company, only the design, development and administration of the rural telephone survey, developed and administered by Monash University Accident Research Centre (MUARC), is reported here.

The rural telephone survey followed a similar format to that used by Young, Regan, Mitsopoulos and Haworth (2003) in their previous study. The survey comprised four sections:

Section A – Introduction. In the first section of the survey, the interviewer introduced himself or herself to the respondent and asked the respondent whether he/she would be interested in attending a discussion group on cruise control and manual speed alert technologies. If the respondent indicated that he/she did not wish to participate, the survey ended at this stage. Respondents who indicated that they would be interested in attending a group were then asked questions regarding their age, gender, whether they held a current car driver's licence and currently drive a car, and what make and model of car they currently drive. Respondents who did not hold a current driver's licence or who did not currently drive a car were informed that the interviewer was only looking to interview people who held a licence and currently drove a car. For these respondents, the survey ended at this stage.

Section B – Technologies. The second section comprised questions regarding whether the respondent's current car had cruise control and/or a manual speed alert system fitted and whether they used these systems. The survey was discontinued for those respondents who indicated that their current car had neither of these systems fitted.

Section C – Focus Group Recruitment. In this section, the respondents were invited to attend a focus group discussion on cruise control and manual speed alert systems. Given that the recruitment phase was expected to take several weeks, the authors felt that it was not appropriate to book participants into focus groups at the time of the survey. This was because it was likely that the participants recruited at the beginning of the recruitment period might forget about the groups over the following weeks. Rather, the authors decided to ask participants for their contact details and told them that they would be contacted in a few weeks to be booked into a focus group. In order to determine the most suitable time to conduct the groups, participants were also asked whether they would prefer the groups to be held on the weekend or during the week, and at what time. The authors felt that this recruitment strategy would maximise focus group attendance.

Section D – Result of Call. In the final section, the survey administrators were instructed to specify the outcome of the call for each respondent - for example, if the respondent was recruited for a focus group, if they completed the survey but were not recruited for a focus group, if the respondent refused to participate in the survey, or if the phone line was engaged.

Appendix B contains a copy of the computerised telephone survey.

2.3.1 Generation of Random Telephone Numbers

Calls to the rural participants were made using telephone numbers that were randomly selected from the Telstra White Pages. The phone numbers were selected manually from the phone books, as privacy laws prohibit the generation of lists of random telephone numbers from the White Pages on-line or on CD-ROM.

2.4 Survey Administration

The rural survey was prepared and administered in Microsoft Access 2000. Three trained research assistants conducted the surveys over 3 weeks. Calls were made on Monday and Tuesday from 5.30pm to 8.30pm in order to maximise the chance of contacting potential participants. Each survey took a maximum of 5 minutes to complete and interviewers entered the respondents' details and answers directly into the Access database.

2.4.1 Sampling Area

The selection of metropolitan and rural areas from which to recruit focus group participants was guided by a number of criteria: the metropolitan and rural areas had to have a relatively large number of residents in the 25 to 49 year age group (estimated using the Year 2000 Estimated Resident Population Data (Australian Bureau of Statistics, 2000)), be in close proximity to each other and to the focus group venue, and have a wide socio-economic spread. Using these criteria ensured that the participants sampled were representative of the wider population and also maximised the chance of contacting the target population and the chance that they would attend a focus group. Based on these criteria, the metropolitan areas from which to recruit participants and run focus groups were Inner Sydney and the Eastern and Inner Western suburbs of Sydney. The rural area selected for the focus groups was Wagga Wagga.

2.4.2 Target Participant Sample

Ten participants were required for each focus group, with approximately 5 users and 5 non-users of cruise control and/or manual speed alerters in each discussion group. As two focus groups were being conducted in Sydney and two in Wagga Wagga, the target sample size was 20 participants for the metropolitan focus groups and 20 participants for the rural groups. However, as it was likely that a number of participants would be unable to attend a focus group when they were contacted the second time, it was desirable to recruit several extra people than were actually required for each group.

2.4.3 Rural Survey Response Rates

The metropolitan focus group participants were recruited through a recruitment company in Sydney via a fortnightly omnibus survey and the response rates were not available to the authors. Therefore, only the response rates for the rural, Wagga Wagga, telephone survey conducted by MUARC will be reported here.

During the recruitment phase, 614 calls were initiated of which 408 resulted in contact with a potential respondent. Of the calls where contact was made, 24 (3.9%) resulted in a participant being recruited for a focus group; 1 call (0.2%) resulted in a completed interview with a respondent; 101 (16.4%) were refusals; 238 (38.7%) were cases where the respondent was not in the required age group; 4 (0.7%) were instances where the respondent did not hold a current car driver's licence; 8 (1.3%) were cases where the respondent did not currently drive a car; 24 (3.9%) were cases where the respondent indicated that their car did not have cruise control or manual speed alert fitted; and 8 calls (1.3%) were terminated by the respondent during the survey. No contact with a respondent was made for the remaining 206 calls. Of these calls, 73 (11.9%) were unanswered; 28 (4.6%) were calls to an answering machine; 20 (3.3%) were to an engaged line; 79 (12.8%) were to a line that was disconnected; and 6 (1.0%) calls were to wrong numbers, such as fax machines.

2.4.4 Recruitment Outcomes

A total of 24 telephone survey respondents (15 females and 9 males; mean age 36.4 years) indicated that they would be interested in attending a focus group. A couple of weeks before the focus groups, the participants were contacted again and asked if they were still interested in attending a focus group. If they were, they were booked into a focus group session that suited them. Of the 24 respondents who indicated that they were interested, a total of 21 participants were booked into focus groups.

The participants who had been booked into a focus group were sent a confirmation letter detailing the location and time of their focus group session. Participants were also sent an explanatory statement and consent form (see Appendix C for copies of the explanatory statement and consent form).

Chapter 3. FOCUS GROUP DISCUSSION – METHOD

3.1 Introduction

Four focus groups, two in Sydney and two in Wagga Wagga, were conducted to obtain information on drivers' use and acceptability of manual speed alerting and cruise control devices and, in particular, how useful and effective these devices are in assisting drivers to control their speed when driving. This chapter describes the focus group methodology used in the current study. It includes details of the final composition of the focus group sample, a description of the materials used and outlines the procedure followed when conducting the focus groups. The results of the focus groups are presented and discussed in Chapter 4.

3.2 Participants

A total of 31 drivers, 16 females and 15 males, participated in the four focus groups. The composition of the participant sample is described separately for Sydney and Wagga Wagga in the following sections.

3.2.1 Sydney Participants

Nineteen participants, 9 females and 10 males, participated in the two metropolitan focus groups conducted in Sydney. Each participant attended one focus group only. Participants ranged in age from 28 to 49 years, with a mean age of 40.95 years (SD = 6.67 years). The final composition of each Sydney focus group is illustrated in the top half of Table 4.1.

3.2.2 Wagga Wagga Participants

A total of 12 drivers, 7 females and 5 males, participated in the two rural focus groups held in Wagga Wagga. Each participant attended one focus group only. The participants ranged in age from 25 to 48 years, with an overall mean age of 36.42 years (SD = 7.60). The final composition of the Wagga Wagga focus group sample is displayed in the bottom half of table 4.1.

Table 4.1. Focus group composition

Focus Group	Systems Discussed	Sub-groups	n	Mean age*
Sydney				
1	Cruise Control & Manual Speed Alert	Males & Females 25 to 49 years	10	41.60 (7.03)
2	Cruise Control & Manual Speed Alert	Males & Females 25 to 49 years	9	40.22 (6.59)
Wagga Wagga				
1	Cruise Control & Manual Speed Alert	Males & Females 25 to 49 years	8	33.63 (7.61)
2	Cruise Control & Manual Speed Alert	Males & Females 25 to 49 years	4	42.00 (3.74)

* Standard deviation in parentheses

Participants were recruited through a telephone survey (refer to Chapter 2 for a detailed description of the recruitment method). In order to ensure that the participants did have experience as a driver and drove a car with at least one of the systems under discussion, the following inclusionary criteria were applied to screen potential participants:

- be aged between 25 and 49 years;
- hold a current car driver's licence;
- currently drive a car;
- have cruise control and/or manual speed alert fitted to their current vehicle;
- be aware that their current vehicle has either or both of these devices fitted; and
- drive either a Holden, Ford, Toyota or Mitsubishi (any model).

Of the 12 participants in the rural focus groups who indicated that their car was fitted with cruise control, 10 said that they used it and 2 said that they did not use it. Of the 10 rural participants who have a manual speed alerter on their car, 7 indicated that they use it (although they do not use it regularly) and 3 indicated that they do not use it at all. A total of 15 metropolitan participants indicated that they had cruise control fitted to their car and, of these, 13 actually use it, while 2 indicated that they do not use it. Of the 12 metropolitan participants who had a manual speed alerter fitted to their car, 9 said that they use it and 3 said that they do not.

The vast majority of the cruise control and speed alert systems fitted to the participants' cars were fitted as a standard feature. Of the 12 rural participants who indicated that their car was fitted with cruise control, 10 indicated that the system was a standard feature on the car, 1 indicated that it was purchased as an optional feature and 1 said that they were unsure of the system's fitment as they had purchased the vehicle second-hand. Of the 10 rural participants who indicated that their car had a manual speed alerter, 9 said that it was a standard feature and 1 said that they were unsure of its fitment as the car had been purchased second-hand. Of the 15 metropolitan participants who indicated that they had cruise control, 12 indicated that it was a standard feature, 2 said that they purchased it as an option and 1 had it retro-fitted by a mechanic. Eleven of the 12 metropolitan participants with a manual speed alerter on their car said that it was a standard feature, while one said that it was an optional feature.

3.3 Materials

3.3.1 Discussion Guide

A list of open-ended questions was developed to guide the focus group discussions (see Appendix D for a copy of the moderator's discussion guide).

The key issues covered in the guide were:

- why, when, where and how drivers use the cruise control and speed alerting systems;
- what passengers think of the systems and how they react to them;
- whether drivers feel that these systems are effective in helping them control their speed; whether they serve a purpose and, if so, under what conditions;
- whether the systems are easy to use; and whether they are reliable;
- how much drivers are willing to pay for each of the systems if they are an optional feature;

- what, if any, are the conditions under which users of the systems do not use them;
- why non-users of the systems do not use them; and
- what features they would change on existing systems to design the ideal cruise control and speed alerting system.

3.3.2 Questionnaire

A questionnaire was also developed and administered as part of the focus groups (see Appendix E). The purpose of the questionnaire was to obtain information regarding the composition of the focus groups in terms of the participants' experience as drivers, travel patterns, experiences with in-vehicle and other technologies (e.g. mobile phones), awareness of road safety issues and drivers' attitudes towards speeding, and speeding countermeasures. The questionnaire comprised seven parts, as follows.

a) The first section consisted of questions for gathering information on participants' demographic characteristics, including age, education level, and occupation.
b) The second section comprised questions for gathering information about participants' driving experience, travel patterns, and history of speed-related traffic infringements and crash history. Driving experience, travel patterns and history of traffic infringements and crashes are all factors that are likely to influence an individual's use and acceptability of a given technology. It was imperative, therefore, to collect information on these factors to determine whether there were differences on any of these factors across the focus groups that might affect the outcomes of the discussions.
c) The third section of the questionnaire gathered information regarding the participants' exposure to various technologies, including in-vehicle technologies such as route navigation systems, and other everyday technologies, such as mobile phones and the Internet. It is possible that people who are less likely to use everyday technologies may also be less likely to purchase or use in-vehicle technologies such as cruise control and manual speed alert. It was therefore important to ascertain whether there were any differences between users and non-users of the cruise control and speed alerting systems in their use of everyday technologies, in order to determine if the non-use of cruise control and speed alert is related to non-use of technologies in general, or is particular to cruise control and speed alerting devices.
d) The fourth section consisted of questions designed to assess respondents' attitudes towards speeding.
e) The fifth section contained questions regarding respondents' attitudes towards ISA and other Intelligent Transport System (ITS) technologies.
f) The sixth section was designed to obtain information on participants' awareness of road safety issues, including their awareness of the role of speeding road crashes, the laws relating to speeding and speed-related road safety campaigns.
g) The final section of the questionnaire contained questions regarding respondents' attitudes to various road safety countermeasures such as speeding fines, speed cameras, roundabouts and advertisements.

3.3.3 Video Presentations

Brief video segments demonstrating the various functions of the cruise control and speed alerting systems were also developed. These were implemented as Microsoft PowerPoint presentations and ran for approximately 30 seconds to 1.5 minutes each. The purpose of the videos was to remind those participants, who were unfamiliar with the functionality of the systems equipped to their car, of the exact procedure or sequence followed to execute the various functions of each system. Participants were then asked to complete a functionality checklist that listed the different functions of each system (e.g., increasing cruise speed by rotating the control stalk or resuming the previous set cruise speed after disengaging the system) by indicating whether or not they perform the various functions. The checklist provided information regarding those functions of the cruise control and speed alerting systems that are most or least commonly used by drivers. A copy of the functionality checklist is provided in Appendix F.

A total of eight separate video segments was produced, four for the cruise control and four for the speed alerting systems. For the four cruise control and the four speed alerting videos, one was filmed in a Holden (Commodore), one in a Ford (Falcon), one in a Toyota (Camry) and one in a Mitsubishi (Magna), representing the four vehicle makes that the focus group participants owned. As the functionality of the cruise control and speed alert systems differs slightly across vehicle makes, it was necessary to film the systems in each of the makes to ensure that the systems depicted in the videos resembled the systems fitted to the participants' cars as closely as possible.

A decision was made during each focus group as to whether the participants were familiar enough with the functioning of their cruise control and/or speed alert systems to be able to fill in the functionality checklist without having to view the videos. If they were deemed to be familiar with the systems then the videos were not shown. The participants in both Wagga Wagga groups were very familiar with the functioning of the systems equipped to their cars and thus it was not deemed necessary to show them the video segments. The Sydney participants, however, were less familiar with the systems and hence they viewed the videos before completing the functionality checklist. A description of the video segments is provided in the following sections.

3.3.3.a Cruise Control Segments

Although the cruise control segments were filmed in four different car makes, the sequence followed was identical for each cruise control videos. The cruise control videos first depict a car driving along a road and then focus on the speedometer, which is rising to 50 km/h. At the point where the speedometer reaches 50 km/h, the driver is shown turning on and setting the cruise control and removing their foot from the accelerator. The speedometer is then shown staying at 50 km/h. The driver is then filmed increasing the cruise speed (using the relevant controls for each vehicle type) and the speedometer is shown increasing to 55km/h. The driver then decreases the cruise speed (using the relevant controls for each vehicle type) and the speedometer is shown decreasing to 50 km/h. The driver then deactivates the cruise control system by pressing the brake pedal and the speedometer is shown decreasing to 40km/h. Another method of deactivating the cruise control system is then demonstrated with the driver pressing the cancel button. The speedometer is again shown decreasing from 50 to 40 km/h. Finally, the driver is filmed resuming the previous set cruise speed (using the relevant controls for each vehicle type) and the speedometer is filmed increasing to 50 km/h. Figure 4.1 displays a segment from one of the cruise control videos.

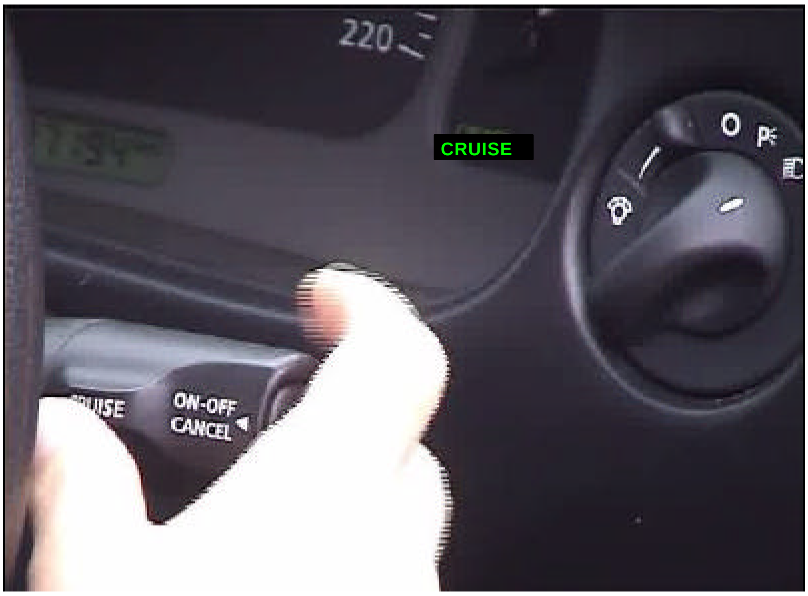


Figure 4.1. Cruise control video segment.

3.3.3.b Manual Speed Alert Segments

As with the cruise control videos, the four manual speed alert videos all followed an identical sequence. The manual speed alert video segments first focus on a driver programming the speed alert system to issue a speed warning at 30 km/h. The driver is then filmed driving the car and the speedometer is shown rising to 30 km/h. At the point when the speedometer exceeds 30 km/h, the full speed alert warning sequence, including any auditory warnings, is shown. The speedometer is then filmed decreasing below 30 km/h again and all speed alert warnings cease. A segment from one of the manual speed alert videos is displayed in Figure 4.2.

Figure 4.2. Manual speed alert video segment.

3.3.4 Data collection

In order to facilitate the accuracy of the data collection and transcription process, a digital video camera was used to record each of the focus groups.

3.4 Procedure

The metropolitan focus groups were held at an inner city location in Sydney, while the rural focus groups were held at the Country Comfort Wagga Wagga Motel Boardroom.

The participants were informed of the time and location of the focus groups at the time of recruitment. The Wagga Wagga participants were also contacted on the morning of their focus group to remind them of their engagement and to confirm that they had received the information about the focus groups sent to them at the time of recruitment. Each focus group was approximately 1.5 to 2 hours in duration and proceeded in the following manner:

- *Introduction:* The focus group facilitator introduced him or her self and provided a brief description of the project, including the funding body, the researchers involved in the project and the aim of the focus group discussions.
- *Ethical requirements:* Prior to participating in the focus groups, participants read the explanatory statement and signed the consent form, which they returned to the facilitator. Participants were reminded of the ethical issues raised in the explanatory statement, such as the purpose of the consent form and the need to maintain confidentiality by not discussing the views of individual participants outside of the focus group. All participants wore nametags containing their first name and participant code. Participants were informed that the purpose of the codes was to ensure that none of the participants could be identified by name in the report and that, as such, they should not hesitate to express their honest opinion when completing the questionnaire and during the discussion. The need to videotape the sessions for data collection purposes was also explained and participants were informed that all tapes would be destroyed at the end of the project.
- *Project description:* Participants in each focus group were read an identical description of the project to ensure that the information provided about the purpose of the project was standard across all groups.
- *Questionnaire:* Participants were then asked to complete the questionnaire.
- *Guided discussion:* The discussion followed the format set out in the moderator's discussion guide. However due to the different issues raised during each group there was some variation across focus groups with regard to the order in which the issues were discussed and the formation of additional questions.
- *Video Segments and Functionality Checklist:* The video segments were shown to the participants if deemed necessary, and the participants then completed the relevant functionality checklist.

A transcription of each focus group discussion was prepared from the videotapes. The aim of this process was to preserve the content of any comments made, rather than provide a verbatim transcription of each focus group. These transcriptions were used to categorise the focus group discussions into the different themes covered in the discussion guide. The results of the focus groups discussions are presented and discussed in Chapter 4.

Chapter 4. FOCUS GROUP RESULTS AND DISCUSSION

4.1 Introduction

In this chapter, the results of the four focus group discussions are presented and discussed. The first section presents a summary of the results of the questionnaire that was completed by participants during the focus groups. In the second half, the findings from the focus groups are documented.

4.2 Focus Group Questionnaire – Summary of Results

Overall, the questionnaire results revealed that the participants from both the metropolitan and rural groups were employed in a range of occupations, however the metropolitan participants were employed in a wider range of occupations than the rural participants. In particular, a greater proportion of the metropolitan participants were employed in professional positions or as a tradesperson. In terms of highest education level completed, the metropolitan participants had completed a slightly higher level of education than the rural participants.

The metropolitan and rural focus group samples were similar in terms of the age at which they obtained their driver's licence, their driving experience and the number of hours spent driving for work purposes. The metropolitan participants, however, do spend a greater number of hours driving for private purposes than the rural participants. In addition, a greater proportion of metropolitan participants had been booked for speeding than the rural participants.

In regard to their use of in-vehicle technologies, several of the metropolitan and rural participants indicated that they had driven a car equipped with daytime running lights, while very few participants had used in-vehicle Route Navigation, Adaptive Cruise Control or a reverse parking aid. The most commonly used technology-based facilities were email and the Internet and this was similar across the metropolitan and rural participants. There were also no differences found between the users and non-users of cruise control and/or manual speed alert technologies in the likelihood of having driven a car equipped with ITS technologies, accessing facilities such as email and the Internet, or owning fewer everyday technologies such as personal computers or mobile phones.

Both the metropolitan and rural participants held negative attitudes towards speeding. The participants also held very positive attitudes towards Intelligent Speed Adaptation (ISA) and other countermeasures designed to prevent speeding (e.g., speed cameras), although their attitudes towards technologies that would *limit* them to the speed limit were less positive. Finally, participants from both groups were aware of very similar issues with regard to road safety and the dangers associated with speeding. More specifically, the metropolitan and rural participants agreed that speeding often contributes to road crashes, that the likelihood of getting caught for speeding increased as the number of kilometres over the speed limit increases and that the current fines issued for speeding are about right. Overall, the current participants are generally biased towards holding negative attitudes to speeding and positive attitudes towards speeding countermeasures. These biases could lead the current sample of participants to hold more positive attitudes to cruise control and manual speed alerting systems and use them more frequently than the general driving population and this issue should be taken into consideration when interpreting the focus group results.

A more detailed discussion of the results deriving from the questionnaire can be found in Appendix G.

4.3 System Functionality Checklist – Summary of Results

During the focus groups those participants who were users of cruise control and/or manual speed alert systems completed a functionality checklist. These checklists listed all of the different functions of each system (e.g., increasing cruise speed by rotating the control stalk or resuming the previous set cruise speed after disengaging the system) and participants indicated whether or not they perform each of the various functions. The information obtained from the checklist gave information regarding those functions of the cruise control and speed alert systems that are most or least commonly used by drivers and whether they use the most efficient methods (where more than one method exists to execute a function) to operate the systems.

For the various cruise control systems the participants were asked to indicate, by ticking checkboxes, the precise procedure they use to turn on the system, set the cruise speed, increase and decrease the cruise speed, deactivate the cruise control system and reset the previously set cruise speed. For the various speed alert systems, participants were asked to indicate the precise procedure they used to program the speed alert system to the speed at which they want the system to issue speed warnings. A copy of the functionality checklist is contained in Appendix F.

Overall, the majority of the participants appeared to be very familiar with the functionality of their cruise control and manual speed alert systems. A greater proportion of the rural participants, however, appeared to use the more efficient methods of operating their cruise control and speed alert systems compared to the metropolitan participants. In particular, the metropolitan participants had a greater tendency to increase, decrease and reset cruise speed by deactivating the cruise control system and reprogramming it from the beginning, rather than using the increase, decrease and resume functions of the system. A more detailed discussion of the results of the functionality checklists is presented in Appendix H.

4.4 Results of the Focus Group Discussions

The results of the focus groups are presented separately for the cruise control and manual speed alert technologies, under the main headings that were contained in the focus group discussion guide.

4.4.1 Cruise Control

4.4.1.a Why Do Drivers Use Cruise Control?

Both the rural and metropolitan participants stated that their main motivation for using a cruise control system is to avoid speeding fines. In particular, the participants stated that they often find that their speed fluctuates when on the highway or on a long trip and hence they use the cruise control to help them maintain a constant speed at which they are unlikely to be fined for speeding.

> *"I got caught speeding - doing 71km/h in a 60 km/h zone. Now I use my cruise control all the time, in town and out of town." – Wagga Wagga*

> *"I use it because I am a lead foot. Often when I get in the car I step on the accelerator and I am away and I can be in a 60 km/h zone and I look down and I am doing 80km/h." – Wagga Wagga*

> *"I use it so I don't get booked for speeding. It helps me maintain a consistent speed." – Sydney*

> *"I tend to speed on the open road, so I use it to stay at the limit." – Sydney*

A number of participants did mention, however, that they cannot rely completely on the cruise control system to maintain a constant speed, especially in hilly areas, as some systems have the tendency to surge (i.e., increase power) up hills and then 'overshoot' the set cruise speed when travelling downhill.

The participants, particularly the rural participants, also mentioned a number of safety-related reasons why they use a cruise control system. A number of participants from both areas claimed that they use the cruise control to avoid 'tiredness' or pain in their lower limbs when on long trips, as they no longer have to maintain pressure on the accelerator pedal. However, the participants were also aware that this aspect of the system might cause them to become fatigued, as they tend to relax and start daydreaming or drift off to sleep.

> *"I think you get more tired by using it. The temptation is there not to think, you don't even have to look at the Speedo." – Wagga Wagga*

> *"My wife won't use it because she feels that when it is on she does not have to concentrate and she tends to nod off." - Sydney*

A couple of rural participants mentioned that they use the cruise control to help them maintain a slower speed around school zones, particularly at times of the day when the speed limit reduces to 40 kilometres per hour. By using the cruise control around these areas, the participants feel that they can devote more attention to looking out for children and potential hazards, rather than having to concentrate on maintaining the speed limit. The rural participants also stated that they use the cruise control system to help them maintain slower speeds when they come into a town from the open road. In these situations they find it particularly difficult to adhere to the lower speed limits, as they are accustomed to travelling at the higher speeds. Another rural participant stated that they use the cruise control system to maintain a safe speed when they are towing a dog trailer.

> *"Going through the school zones, I set it to 40km/h. The car doesn't like it because it is just in the wrong gear, but its good because I can't speed through the school zone. I find it great in all situations. It gives you more time to look out for the kids in school zones instead of concentrating on staying at 40km/h." – Wagga Wagga*

> *"But I live out of town so coming in off the highway, when you hit town you still are used to travelling fast, so I put my cruise on and take my foot off the accelerator." – Wagga Wagga*

A number of rural participants mentioned that the cruise control is very helpful when they are focusing their attention on other activities, such as children, the radio, or a phone conversation and their speed tends to fluctuate.

> *"You put a CD in and if you like the song your foot can go down unconsciously." – Wagga Wagga*

> *"Also if you are talking on the phone, you can lose focus and not monitor your speed and soon you look down and you are doing 120km/h. So I put the cruise on and continue to talk." – Wagga Wagga*

> *"Having the cruise on means that you can focus on other things, instead of trying to drive, talk and constantly look at your speedo to monitor your speed." – Wagga Wagga*

> *"It makes me far less stressed, because when you don't have it on, you are constantly looking at your speedo to check your speed, whereas if you have your cruise on you don't have to worry about your speed. I have five kids and you find them a big enough distraction without having to constantly check your speed as well." – Wagga Wagga*

One rural participant mentioned that using a cruise control system is often recommended for drivers who have recently undergone a lower limb operation or who have back or lower limb pain, so that they can stretch their legs regularly and do not have to maintain them in the one position for extended periods of time. Finally, greater fuel economy, particularly when on freeways or highways, was also mentioned by rural and metropolitan participants as a reason why they use cruise control.

4.4.1.b When Do Drivers Use Cruise Control?

All participants agreed that they mainly use their cruise control system during the day, as this is when they do the majority of their driving. However, there were mixed responses among participants as to whether they use the cruise control at night. Most of the rural participants agreed that they do not use their cruise control at night unless they are very familiar with the roads they are travelling on. This is primarily because they tend to find that they have restricted vision at night, particularly around bends, and they are not confident that they have full control of the vehicle in these situations. Other rural participants stated that they do use the cruise control at night, but only on the open roads (e.g., freeways or highways). A number of metropolitan participants stated that they use the cruise control system at night, although not in areas where there is a lot of wildlife. One metropolitan participant stated that he/she never uses the cruise control at night because having less to do makes him/her drowsy.

> *"I do most of my driving during the day, so that's when I use it." – Wagga Wagga*

> *"I don't use my cruise control at night time, unless I am on a road that I know, because I don't feel that I can control the car." – Wagga Wagga*

> *"If there is a kangaroo sign then I won't use it at night because you want the extra control." – Sydney*

> *"If using it at night you may be more likely to nod off because you have less to do. Also, as it is night you are probably more tired anyway." - Sydney*

The metropolitan and rural participants also stated that they tend to use the cruise control only on roads that are fairly straight and flat. When the road they are travelling on is hilly or winding the participants tend to deactivate the cruise control, as they do not feel that they have full control of the vehicle. In addition, the rural participants said that they tend to deactivate the system if they approach a sharp curve, but whether they do this or not depends on how familiar they are with the road.

> *"If the road is twisty then I don't use it." – Wagga Wagga*

> *"Whenever you have a straight stretch of road in front of you or you are going on a long trip. Even on short trips I use it." – Wagga Wagga*

> *"I would not use it anywhere that is hilly, because of the surging and slowing down and the fuel consumption." – Wagga Wagga*

> *"I only use it on flat areas, because the fuel economy is bad on hilly roads." – Sydney*

> *"I don't use it on windy roads (all agree). It is dangerous and you have to deactivate it." – Sydney*

The participants use the cruise control system equally as much for work and private purposes, as they have to pay for their speeding fines in both of these situations. They also mentioned that they only use the system when there is not a lot of other traffic around, hence they rarely use it during peak hour traffic. With regard to the influence of passengers on cruise control use, the rural participants claimed that they use the cruise control just as often with passengers in the car, as when driving alone. A number of metropolitan participants however, stated that they tend not to use the cruise control system when they have passengers, as they feel that they allow themselves to become more distracted by their passengers when the system is activated because they have less to do to drive the car. Alternatively, other metropolitan participants stated that they prefer to have the cruise control system on when carrying passengers, because they know that they can stay within the speed limit, if they happen to be distracted by their passengers.

> *"I don't use cruise control when there are other people in the car because you can be more easily distracted by the conversation as all you are doing is steering." – Sydney*

> *"I feel safer when I have passengers in the car and I am using cruise, because I know that I am staying within the speed limits." – Sydney*

> *"There are positive safety benefits for using it, because you can be distracted by a conversation and then you look down and you're speeding." – Sydney*

4.4.1.c Where Do Drivers Use Cruise Control?

Participants from both rural and metropolitan areas stated that they mainly use their cruise control systems on open roads, such as highways or freeways, or on any flat, straight stretch of road. The rural participants say that they typically activate their cruise control on roads with speed limits of 100 kilometres per hour or over, while the metropolitan participants said that they usually only activate the cruise control on roads with speed limits over 80 kilometres per hour.

> *"I use it on highways, freeways or any long straight stretch of road." – Wagga Wagga*

> *"I set it on the open roads and on the highways out of town." – Sydney*

> *"It depends on the type of road. If it has lots of traffic then you would not use it even if it were a 100 km/h road." - Sydney*

Most of the participants from both groups stated that they do not use their cruise control system around the city or suburbs, as there is too much traffic and the traffic lights and speed zone changes mean that they have to constantly reset the system. However, a number of the rural participants stated that they regularly use the system around town, particularly when approaching school crossings, as the knowledge that they are not exceeding the speed limit outweighs the effort associated with having to regularly reset the system.

> *"It is so impractical for around town because you are constantly resetting it at roundabouts and traffic lights." – Wagga Wagga*

> *"There are so many inconsistencies in speed limits as well, so you have 50, 60, 70 km/h zones and you need to reset the cruise speed as well as resume the system." – Wagga Wagga*

> *"I think it is good to use it around town. I can't afford to be booked for speeding. And you just have to resume the system." – Wagga Wagga*

> *"Nobody uses it in the city or suburbs because you have to stop and start all the time." – Sydney*

"I never use it in the city." - Sydney

The rural participants also claimed that they often use cruise control when they are travelling in Victoria because of their stricter restrictions on speeding and because the Victorian police do not advise drivers when a speed camera or radar is ahead.

"I use it in Victoria because they have such strict speed limits."- Wagga Wagga

"When driving in Victoria I am more aware that I have to slow down or set the cruise lower because I am more likely to get booked." – Wagga Wagga

Participants stated, however, that the overriding factors determining whether they think it is suitable to use the cruise control system are the traffic and road conditions and the topography of the road.

4.4.1.d How Do Drivers Use Cruise Control?

The rural and metropolitan participants stated that they typically learnt to use their cruise control system through trial and error and practice while driving or by having a friend or spouse demonstrate the operation of the system. If these strategies failed, however, the participants would then read the vehicle's user manual to learn how to operate the system.

The majority of participants from both groups set the cruise control speed to above the posted speed limit, particularly when they are travelling on freeways. The rural participants stated that they typically set the cruise speed 5 to 13 kilometres per hour above the posted speed limit, but stated that the road, traffic and weather conditions will dictate how far over the speed limit they set it. One reason mentioned by the rural participant as to why they set the cruise control up to 13 kilometres per hour above the speed limit is because they know that the fine in NSW for travelling 15 kilometres per hour over the limit is the same as that for travelling 5 kilometres per hour over the limit, so there is little incentive to set the cruise control at a lower speed if they have decided that they will take the risk and speed. Only two of the twelve rural participants stated that they set their cruise control on or below the posted speed limit.

"I usually have mine set at about 13km/h over the speed limit, but only in the 100 and 110 km/h zones. Because the fine for being 5km/h over the limit and being 15km/h over is the same amount, so if you are going to get done for speeding you might as well make it worth your while." – Wagga Wagga

"If I am on the freeway I put it at 118km/h in a 110 zone, but on country roads I set it at 100km/h because of the bends." – Wagga Wagga

Compared to rural participants, a smaller proportion of the metropolitan participants stated that they set their cruise control above the speed limit, although there were some who stated that they set their system up to 15 kilometres per hour above the posted speed limit. Similar to the rural participants, metropolitan participants stated that the road and weather conditions and the local speed limit dictate how far above the speed limit they set their cruise control. In particular, the participants will generally set the cruise control system above the speed limit when in higher speed zones (e.g., 100 and 110 km/h zones), but will not do so in lower speed zones (e.g. 50 and 60 km/h zones). For example:

"It depends on the speed zone. If you are in a 50 zone, you are not going to do 70km/h, but in a 100km/h zone, you will do 120km/h." – Sydney

"You set it over the limit a bit because you are not going to get booked doing 5km over the limit." – Sydney

"I set mine 10% over. They are not looking for someone doing 120km/h in a 110 zone, they are looking for the people doing 140km." – Sydney

The rural and metropolitan participants tend to follow the same procedure to program and use their cruise control systems. Typically, the participants will first turn the system on and set the cruise speed by accelerating to the desired speed and then activating the cruise control. They typically use the increase and decrease functions of the system to increase and decrease their cruise speed as required and use the brake or the 'Cancel' button to deactivated the cruise system. Finally, a number of participants stated that reset their previous cruise speed by pressing the 'Resume' button. The metropolitan participants, however, stated that the exact method they use to increase or decrease speed is dependent on the particular driving conditions. For example:

"What buttons you press depends on how much you want to vary your speed. If I come up behind a car that is also doing the speed limit, I will use the stalk or the buttons to increase/decrease speed, but if I came to a new speed zone, I would just cancel and reset the system." – Sydney

"The conditions dictate how you use it sometimes. If there were no traffic around I would use the stalk to control my speed, but if something happens I would decrease speed using the brake. If I want to pass someone I will accelerate and then reset it, otherwise I will just rotate the stalk to increase my speed a few kilometres." - Sydney

Only two of the rural participants and one metropolitan participant claimed that they did not know how to increase and decrease their cruise speed using the increase/decrease function. Instead, these participants disengage the system by braking, then accelerate or brake to their desired speed and reset the system. These participants were also not aware that they could resume their previous cruise speed after deactivating the system by simply pressing the Resume button.

One interesting finding that emerged from the discussions was the different strategies that participants use to negotiate corners when their cruise control is engaged. The majority of the participants from rural and metropolitan areas either brake or press the 'Cancel' button to deactivate the cruise control when approaching a bend in the road. Other participants use the decrease button on the steering wheel or stalk to slow down around bends and the increase button to increase speed once they have cleared the bend, in order to save them constantly deactivating and reactivating the system. Only one metropolitan participant stated that they sometimes take a risk and try to get around a bend without having to deactivate the cruise system or decrease their speed.

4.4.1.e Who Uses Cruise Control?

All participants from both areas agreed that their passengers do not interact with the cruise control system at any time and most of the time their passengers are not even aware that the system is engaged. Participants mentioned, however, that their passengers do sometimes comment that they find the ride much smoother when the cruise control is activated and some passengers have even told the driver to use the cruise control to avoid speeding fines. As passengers, the participants stated that they encourage the driver to use the cruise control, as they do not want the driver to speed while they are in the car and they find the ride much smoother when the cruise is activated. All of the participants were adamant that passengers should not be allowed to interact with cruise control systems, as they believe that drivers should have full and sole control over the vehicle and its speed at all times.

The rural participants raised an important issue regarding the use of cruise control systems by inexperienced or learner drivers. All rural participants agreed that learner and inexperienced drivers should not be allowed to use cruise control systems, as they need to learn to judge, maintain and adjust their speed appropriately. They were also concerned that interacting with cruise control would be particularly distracting for inexperienced drivers who have many other aspects of the driving task on which they need to focus their attention. Finally, concern was raised that inexperienced drivers would be less capable of controlling the vehicle in situations where the cruise control system may surge up hills and overshoot when travelling downhill.

> *"I don't think inexperienced drivers should use cruise control. It is something extra they have to focus on." – Wagga Wagga*
>
> *"If the car overshoots they don't have the experience to control it." – Wagga Wagga*
>
> *"When my daughter was learning to driver, I would not let her use the cruise control at all, because I thought that it was really important for her to be able to learn to adjust and judge her speed. It is so easy to just set it and not have to learn how to sit a certain speed." – Wagga Wagga*

4.4.1.f How Acceptable is Cruise Control to Drivers?

In order to assess the acceptability of cruise control to participants they were asked a number of questions, including: how effective they think the system is in helping them travel at the speed limit; how useful they find the system; whether they find the system easy to use; how reliable they find the system; how affordable they find the system and how much they are willing to pay for it if they were purchasing a new car.

All participants said that they find their cruise control very effective in helping them maintain a particular speed, but stated it is up to them whether they set this speed below, at, or above the posted speed limit. Thus, the system is only effective in helping them maintain the speed limit if they actually set the cruise speed at or below this limit. The participants also mentioned that the system is not always effective at helping them maintain a set speed in hilly areas, as many cruise control systems tend to exceed the set cruise speed when travelling down hills, and is less effective around town, where the speed limit is constantly changing.

In terms of the reliability of the cruise control system, all participants claimed that their system is very reliable, except in hilly areas where it tends to overshoot when travelling down hill.

When asked whether they drive any differently when driving another car without cruise control, many of the participants said that their speed fluctuates more and one metropolitan participant said that they also find that they are more likely to exceed the speed limit. However, the participants also said that they are also more aware that they have to monitor their speed for themselves in this situation, so they tend to pay more attention to their speed.

All participants find cruise control very useful, particularly on highways and freeways and for reducing leg tiredness on long trips. The rural participants also stated that the cruise control is very useful for preventing them speeding when they are in a hurry.

> *"It is one of those features that you look for in a car, like air-conditioning. It has got to be there." – Wagga Wagga*

> *"Very useful to stop you speeding when you are in a hurry. It removes that temptation to speed." – Wagga Wagga*

> *"It is useful, particularly on highways and on long trips." – Wagga Wagga*

> *"I think it is effective due to the fact that it does let you maintain a set speed, but I don't like how it speeds over the cruise speed down hills." – Sydney*

> *"I find it very effective for me because I tend to speed up on the highways and it keeps me on track." – Sydney*

The rural participants stated that they find their cruise control systems easy to use; although they do find the cruise control systems on newer cars easier to use than the systems on older cars and that the systems with steering wheel mounted button controls are easier to use than those with the controls on a stalk. The metropolitan participants in contrast, tended to state that they had more difficulty using cruise control. Although the majority of these participants stated that they find it easy to use the basic functions of the system, such as turning it on and off and setting the cruise speed, they do find some of the other functions, such as increasing and decreasing cruise speed, difficult. Two of the metropolitan participants said that they find their cruise system complicated to use, mainly because they do not use it regularly. Similar to the rural participants, the metropolitan participants stated that they find that cruise control systems with steering wheel mounted buttons are easier to use than systems with the controls on a stalk.

Both rural and metropolitan participants mentioned that it did take some time to adjust to the cruise control system when they first started to use it, as they felt that they had less control of the car and they had to become accustomed to the car surging up hills and overshooting downhill. The participants also mentioned that, although many cars have cruise control as a standard feature, very few drivers are informed that their driving experience while using cruise control is likely to differ from their normal driving experience. The participants felt like drivers are given the system, but they are then left to their own devices regarding how to operate it correctly and how they should adjust their driving appropriately.

> *"When you first get in the car and set the cruise it does feel like it is taking over and feel like you have no control." – Wagga Wagga*

> *"It is like learning how to drive all over again when you first use it, it was really nerve racking. I thought that it was great until I came to my first corner and you think I am not slowing down. It was a bit scary." – Wagga Wagga*

> *"A lot of people just buy a car with cruise control and they are not told that it will be a different driving experience and they will need to adjust their driving and get used to it." – Wagga Wagga*

> *"The first few times I used it I found it a bit nerve racking until I became accustomed to it." - Sydney*

Many of the participants said that they would pay extra for a car equipped with cruise control, but the metropolitan participants were only willing to do so if they regularly travel out of the city on long trips. The rural participants were prepared to pay between $500 and $1000 to purchase a cruise control system, while the metropolitan participants were also willing to pay up to $1000 to purchase the system. Many of the participants, particularly the rural participants, stated that they would now only purchase a car that is fitted with cruise control, as they would be "lost without it".

4.4.1.g In What Situations Do Users Not Use Cruise Control?

There are a number of situations in which the users of cruise control do not typically use their system. These include areas of the city or roads where there is a lot of traffic and where there are regular traffic lights and speed zone changes. The users also stated that they do not use cruise control when travelling on winding or hilly roads as the system tends to overshoot downhill and they have to constantly disengaged the cruise control system or adjust the cruise speed around corners. Most users do not use their cruise control at night due to the reduced visibility, particularly around bends. Finally, a number of the metropolitan users stated that they do not use their system when it is raining or when travelling in areas where there is a high population of wildlife.

4.4.1.h Why Don't Some Drivers Use Cruise Control?

The non-users who participated in the focus groups mentioned a number of reasons why they do not use the cruise control system fitted to their car. One rural participant said that they do not use their cruise control system because they simply forget that it is there. Another rural participant stated that they do not use their system because they do not feel that they have full control of the car when the system is engaged. Yet another rural participant stated that they no longer feel confident using the cruise control system because they had a bad experience with it when they failed to disengage the system or decrease the cruise speed when going around a sharp bend.

A number of the metropolitan non-users claimed that they do not use their cruise control systems because they simply do not get the opportunity to use it, as they drive on highways or other open roads very infrequently and they do not use the system in the city as they find it impractical. One metropolitan participant said that they do not use their system because they simply do not like it, while another said that they find the system difficult and complicated to use while driving.

4.4.1.i What Changes Would Drivers Make to Current Cruise Control Systems to make them More Appealing?

As a final question in the focus groups, the participants were asked how they would design the ideal cruise control system. The participants suggested several changes that they would make to current cruise control systems to make them ideal. The most frequently mentioned change was to mount the system controls on the steering wheel as buttons, rather than have them on a stalk. The participants also mentioned that having a system which automatically detects speed zone changes and adjusts the cruise speed accordingly would be extremely useful and one participant also suggested making this system dynamic so that it was capable of detecting speed zones that change at particular times of day such as around school zones. A number of participants said that all cruise control systems should now be built as Adaptive Cruise Control systems, which have a front radar built-in and adjust the vehicle's speed to suit the speed of the vehicle in front. Other suggested changes included: having the system beep whenever it exceeds the cruise speed down hills and making the system voice-activated.

> *"All the controls for the cruise should be on the steering wheel. You don't have to take your hands off the steering wheel or look down." – Wagga Wagga*

> *"Put in some sensors that tells your car that it is an 80km zone and when the speed limit changes and then automatically reduces the car's speed." – Wagga Wagga*

> *"Also make it alert the car when the speed zones change with the time of day, such as school zones." – Wagga Wagga*

> *"Make it have a beep if the car overruns the cruise speed down hills." – Sydney*

> *"Make it voice activated." – Sydney*

> *"Have a proximity detector, so it detects cars in front and adjusts the speed of the vehicle to suit." - Sydney*

4.4.1.j Summary of Main Issues

The participants, particularly the rural participants, seemed to hold very positive attitudes towards cruise control systems. While the participants stated that their main motivation for using the cruise control system is to help them avoid speeding fines, they did mention a number of safety-related reasons why they use the system, including to avoid tiredness in their legs and to maintain a safe speed around school zones. Participants stated that they mainly use the cruise control system during the day and on open-roads (e.g., highways and freeways) which are relatively flat and straight, and rarely use it on urban roads where there are many other road uses and regular traffic lights and speed zone changes.

While the participants claimed that the system is very effective in helping them maintain a particular speed, they did not feel that it is necessarily effective in helping them maintain the posted speed limit, as they tend to set the cruise speed several kilometres above the local limit. Participants stated that the system is particularly useful when driving long distances on open roads. Typically the participants find cruise control reliable, but state that it is less reliable when travelling in hilly areas, as it tends to surge up hills and overshoot when travelling downhill.

The non-users mentioned a number of reasons why they do not use the cruise control system fitted to their car, including forgetting that it is there, not feeling in control of the car when using it and finding it difficult to use while driving. Finally, the participants suggested a number of changes that could be made to current cruise control systems to make them more appealing, such as having steering wheel mounted button controls and making the system capable of detecting speed limit changes and automatically changing the cruise speed to match.

A number of general problems with cruise control were identified by participants. In particular, the participants were concerned that many cruise control systems surge up hills and then exceed the set cruise speed when travelling downhill. Another concern was that drivers are not typically shown how to use the cruise control system or told how they can expect it to change their driving experience when they first purchase a car with this system. Finally, participants were also aware of the potential dangers associated with allowing inexperienced drivers to use a cruise control system, and suggested that learner drivers should not use this system until they have mastered the driving task.

A number of differences were observed between the rural and metropolitan participants in their use and acceptability of cruise control systems. Rural participants appeared to use their cruise control system more regularly than the metropolitan participants because they tend to be out on the open roads more frequently. The rural participants also appeared on average to find the system easier to use and were more aware of the system's functionality than the metropolitan participants.

4.4.2 Manual Speed Alert

4.4.2.a Why Do Drivers Use Manual Speed Alert?

As with the cruise control system, the participants from both groups mainly use their manual speed alerting system to alert them that they are exceeding the speed limit so that they can avoid speeding fines. However, many of the participants also stated that they use the speed alerter for safety reasons, as it makes them very conscious of their speed in potentially hazardous areas, such as school zones and 50 km/h areas. One metropolitan participant also said that they use the speed alerter around town after they have been travelling for a period of time with the cruise control engaged, as they find it more difficult to judge and monitor their speed after they have been driving with their cruise control activated for any length of time.

"I use it to avoid fines." – Wagga Wagga

"I think it makes you more aware of what speed you are travelling at, not just to avoid the fines, but for actually knowing what speed you are doing." – Wagga Wagga

"It makes you very conscious of your speed, particularly around town. As soon as it beeps you take your foot off the accelerator and slow down." – Wagga Wagga

"I use it a lot during school hours, when it is 40km/h." – Sydney

"I use it to alert me that I am going over the speed limit to avoid fines and also for safety." - Sydney

Several participants from both groups also use the manual speed alerting system when teaching their children to drive, as it teaches the learner driver how to judge and maintain their speed by alerting them when their speed exceeds the preset limit. The participants also felt that having the speed alerter engaged when conducting a driving lesson allows themselves and the learner driver to focus their attention on other driving tasks and the road environment and not always on the speedometer.

"I also used it all the time when my daughter was learning to drive. I set it right on the speed limit, so she would know how to maintain the one speed." - Wagga Wagga

"I have taught my two sons how to drive and the speed alert is excellent for teaching people how to drive, so that they get the feel of different speeds in the car. You also don't have to constantly look at the speedo - you can concentrate on other things." - Sydney

Interestingly, compared to the cruise control system, far fewer of the rural participants said that they use their speed alerting system. This seemed to be because they either do not know how to use the system properly, they find it annoying, or they find it more difficult and distracting to program than cruise control. In contrast, a greater number of the metropolitan participants use the speed alerting system compared to cruise control.

4.4.2.b When Do Drivers Use Manual Speed Alert?

The metropolitan participants stated that they use their speed alerting system all of the time, but that they make particular use of it when there is a greater police presence on the roads and during school times, when the speed limit around schools reduces to 40 kilometres per hour.

"I use it all the time." – Sydney

"I set mine at 90km/h and depending on whether the police are out or not, I put it up or down. If there is a blitz on I lower it." – Sydney

"I use it a lot during school hours, when it is 40km/h." – Sydney

The rural participants tend to use their speed alerting system less regularly than the metropolitan participants, mainly using it on long weekends when there is a greater number of police around and there are double demerit points. A number of the rural participants also use the speed alerter in conjunction with their cruise control system to alert them when the cruise control overshoots its set cruise speed. In this situation, the participants typically set the speed alerter threshold one or two kilometres above the set cruise speed, so that when the speed alert issues a warning, they know that the cruise control has exceeded the set cruise speed and they can take appropriate action.

> *"I use it more on long weekends when I know that there is a greater police presence." – Wagga Wagga*

> *"I use it when I have the cruise on. When I am going down a hill, it goes over speed, so if you have your speed alert on then it warns you and pulls you up." – Wagga Wagga*

> *"If I am going to Sydney, I set the cruise on 118km/h and I set the speed alerter at 120km/h so it alerts me when the car over shoots." – Wagga Wagga*

When conducting a driving lesson is another situation where the participants from both groups use the speed alerting system. The participants feel that the system is particularly useful in this situation as it allows both the teacher and the learner driver to concentrate on the road and other aspects of driving, rather than focusing on their speed.

> *"With my daughter when she was learning. It was fantastic because I didn't have to worrying about whether she was over the limit, I could just watch the road and alert her to anything that was coming up." – Wagga Wagga*

> *"I use it when teaching a driver to drive." – Sydney*

4.4.2.c Where Do Drivers Use Manual Speed Alert?

The rural participants claimed that they mainly use their manual speed alerting system around town and use it only rarely on highways, as they typically use their cruise control on these roads. One rural participant however, stated that they tend not to use their speed alerting system around town because they find programming it in heavy traffic distracting.

> *"I only use it around town, not on the highway." – Wagga Wagga*

> *"I use it particularly around town, but if I am on a long straight road I will use my Cruise control instead." – Wagga Wagga*

In contrast, the majority of the metropolitan participants stated that they use their speed alerter both around town and out on the open road, and find it equally as useful in both situations. A number of participants also use it when travelling in lower speed zones, because they drive powerful cars that have the tendency to creep over the speed limit in the slower zones.

> *"It is useful for using in lower speed zones, particularly if you are in a powerful car." – Sydney*

"I think that you can use it in the city and on the highway – it is just as useful in both situations." – Sydney

4.4.2.d How Do Drivers Use Manual Speed Alert?

The rural and metropolitan participants stated that they learnt to use their manual speed alerting system through trial and error, practice and, in some cases when these methods failed, by reading the user manual.

All participants set their speed alerter above the speed limit so that the system does not constantly issue warnings if they sit on the speed limit. The rural participants stated that they usually set their system 5 to 10 kilometres above the posted speed limit. However, a number of the participants said that their system only increases the speed settings in 5 kilometre increments and, if their system allowed, they would prefer to set the system to only two or three kilometres above the posted limit. The metropolitan participants also typically set their speed alerting system 5 to 10 kilometres above the posted speed limit, but some stated that they set it up to 20 kilometres above the speed limit on highways. In general, the participants set the speed alerting system above the speed limit when in higher speed zones (e.g., 100 and 110 km/h zones) and at or only slightly above the limit in lower speed zones (e.g. 50 and 60 km/h zones).

"I set it 5km/h over, because you can't set it at the limit because you want to be able to do the limit without it beeping and you can't set it at 62km/h because it only goes up in 5km increments. I would prefer if it went up by 1km increments as I could set it at 62 km/h rather than 65 km/h." – Wagga Wagga

"On the freeway I have it set to 120km/h, but as soon as I come off the freeway I put it at 70 km/h." – Sydney

"I tend to set it 5 to 10 km/h over the limit. Most of the driving I do is in 60 km/h zones. On the highways I might put it at 110 km/h." - Sydney

The metropolitan and rural participants typically program their speed alerting system in much the same way. Depending of the exact configuration of the system, the participants first toggle through the menu on the trip computer until they reach the speed alert function, or press a button located on the dashboard or steering wheel to activate the speed alert system. They then press the appropriate 'up' and 'down' buttons to increase and decrease the speed at which they want the speed alert to issue warnings. Very few of the participants use the 'preset speed' function of the system, whereby drivers simply select a preset speed rather than pressing the up and down buttons a number of times to reach the desired speed. Participants did not specify why they do not use the preset function, but one reason why they may not use it is because the preset speeds typically represent common speed limits (e.g., 60, 70, 80 and 100 kilometres per hour) and the participants generally prefer to set the system a few kilometres above the speed limit. Alternatively, they may not use the preset function because they either do not know that this function exists or how to use it.

4.4.2.e Who Uses Manual Speed Alert?

As with cruise control, participants from both areas agreed that their passengers do not interact with the manual speed alerting system. Most of the participants find that their passengers comment on the system, by either saying that they find the warnings annoying or telling the driver to slow down if the system has issued several warnings. One metropolitan participant even stated that his/her passengers tend to react to the system more than they do.

> *"It annoys my passengers a lot." – Wagga Wagga*

> *"Some of my passengers always tell me to slow down when it beeps, so I don't get booked." – Sydney*

> *"They (passengers) tell you that you are going too fast. Their whingeing slows me down." - Sydney*

All of the participants were adamant that passengers should not be allowed to interact with speed alerting systems, as they believe that this could be potentially dangerous. They also felt that drivers should have full control over the vehicle and its speed at all times.

> *"They can tell you what speed you should be doing, but not be able to set the speed systems." – Wagga Wagga*

> *"Passengers should not be able to program them as that would take responsibility and control away from the driver." – Wagga Wagga*

4.4.2.f How Acceptable is Manual Speed Alert to Drivers?

Participants were asked the same set of questions regarding the acceptability of manual speed alerting systems as for the cruise control. These included: how effective they think the system is in helping them travel at the speed limit; how useful they find the system; whether they find the system easy to use; how reliable they find the system; how affordable they find the system and how much they are willing to pay for it if they were purchasing a new car.

The rural participants felt that the speed alerting system makes them more aware of the speed at which they are travelling but, as with the cruise control system, stated it is up to them whether they set the speed threshold below, at, or above the posted speed limit. Thus, the system is only effective in helping them maintain the speed limit, if they actually set the alert speed at or below the posted limit. The metropolitan participants found that the speed alerting system is generally effective in reducing their speed, but a number of the participants stated that they make a judgement regarding whether to slow down based on whether they feel that their speed is safe for the road and traffic conditions at the time. The metropolitan participants also had mixed opinions regarding whether the speed alerter or the cruise control is more effective in helping them maintain the speed limit.

> *"I think it makes you more aware at what speed you are actually travelling at." – Wagga Wagga*

“It makes you very conscious of your speed, particularly around town. So as soon as it beeps you take your foot off the accelerator and slow down.” – Wagga Wagga

“The beeping annoyed me, but ultimately I slowed down.” – Sydney

“I tend to ignore it if the speed I am doing is relatively safe.” – Sydney

“If it beeps I then make a judgement regarding whether I am going to ignore it.” – Sydney

In terms of the reliability of the speed alerting system, all participants claimed that their system is very reliable and always issues the speed warning at the correct speed.

The majority of participants from both groups said that they do not feel that they drive any differently when driving a car without a manual speed alert system. One metropolitan participant, however, said that they tend to find that they wait for the speed warning to sound before they slow down when driving another car without the system.

The metropolitan and rural participants had very different opinions regarding the usefulness of their manual speed alerting system. The majority of the rural participants stated that they do not find the system useful, as many feel that they can judge and monitor their speed and act, in a sense, as their own speed alert. They did, however, acknowledge that many drivers would find the speed alerter very useful, particularly young or inexperienced drivers who may not be able to judge and monitor their speed accurately. The metropolitan participants on the other hand, stated that they find the speed alerting system very useful, especially when there is an increased police presence. One metropolitan participant felt that the speed alert system is more useful than cruise control, but mentioned that whether this is the case for other drivers would depend on the type of driving they typically do.

“It is not particularly useful.” – Wagga Wagga

“It would be useful for learner drivers.” – Wagga Wagga

“I use it if there are speed cameras around – then I really take notice of it.” - Sydney

While some of the rural participants believe that their speed alerting system is easy to use, many feel that the system is difficult and distracting to program, particularly when driving in heavy traffic. Many participants also feel that the speed alerter is not as easy to use as the cruise control system. Indeed, many participants found that when they first drove a car equipped with a speed alerter, they either did not know that the car had a speed alert system, or they did not know what it was or how to program it, because on the majority of cars there are no labelled buttons or controls indicating the presence of the system or how to program it.

“I drove a Toyota and I didn’t know it had speed alert until it flashed at me. I had no idea how it got set at that speed or even how to turn it off. There were no buttons that I could see to control it.” – Wagga Wagga

In contrast to the rural participants, the metropolitan participants stated that they find the speed alerting system very easy to use and even easier to use than the cruise control system. In addition, these participants do not find that programming the system or changing the speed setting is distracting even when in heavy traffic.

> *"It is easy to use - much easier to use than the cruise control." – Sydney*

> *"I don't think it is distracting to change the speed settings." – Sydney*

If buying a new car, most of the participants would not be willing to pay anything to purchase a speed alerting system, as they felt that the system should come as a standard feature on cars. However, there were a couple of metropolitan participants who would be willing to pay between $100 and $500 to purchase the system aftermarket or as an optional feature.

4.4.2.g In What Situations Do Users Not Use Manual Speed Alert?

There are a number of situations in which the users of the manual speed alerter do not typically use the system. The rural participants claimed that they don't use the system when they think that using cruise control is more appropriate and they don't usually use it around town in heavy traffic as they find it distracting to program.

A number of the metropolitan participants mentioned that they do not usually use the speed alerting system on the open road, while others mentioned that they do not use it in areas of the city where there are regular speed zones changes and heavy traffic, because there is rarely the opportunity to travel over the speed limit in such areas.

4.4.2.h Why Don't Some Drivers Use Manual Speed Alert?

The non-users who participated in the focus groups mentioned a number of reasons why they do not use the speed alerting system fitted to their car. Several rural participants stated that they do not use the system because they either don't speed or because they feel that they can monitor their speed themselves and, in effect, act as their own speed alert. Another rural participant said that they do not use the system as they find it difficult to program, particularly when there are a lot of other road users around. Yet another participant stated that they do not use their speed alerter because it is packaged in the trip computer with other functions, such as fuel consumption information, which they prefer to use and have displayed when driving. This participant did mention, however, that if the speed alerter were a separate system they would consider using it. Finally, two other rural participants stated that they do not use the system as they do not know how to program it. The metropolitan participants who do not use the speed alerting system equipped to their car stated that they do not use it because they find the warnings that it issues annoying.

4.4.2.i What Changes Would Drivers Make to Current Manual Speed Alert Systems to make them More Appealing?

As part of the focus groups, participants were asked how they would design an ideal manual speed alerting system. The participants suggested several changes that they would make to current speed alerting systems to make them ideal. The most frequently mentioned change was to design the system so that it increases or decreases the speed settings in 1-kilometre intervals, rather than the 5-kilometre intervals on most current systems. Participants also mentioned that the system should be a stand-alone system, not part of the trip computer, so drivers do not have to toggle through a menu to program the system. Participants suggested that the controls should be in a more central location than their current position on the dashboard, preferably on the steering wheel. Finally, one metropolitan participant also mentioned that the auditory warnings issued by the system should be made less annoying by decreasing the volume and changing the sound.

4.4.2.j Summary of Main Issues

In general, the metropolitan participants held more positive attitudes towards the manual speed alerting system than the rural participants. Many participants stated that they use the speed alerting system to avoid speeding fines, but also mentioned a number of other safety-related reasons, including helping them to travel at safe speeds through school zones and for teaching learner drivers to judge and monitor their speed. The metropolitan participants stated that they use their speed alerting systems all of the time, but use it particularly when there is a greater police presence around. The rural participants tend to use the speed alerter less frequently and stated that they mainly use it around town and on long weekends when there are greater numbers of police present.

The participants felt that the speed alerting system is generally effective in helping them reduce their speed, but they tend to make a judgement at the time, based on the road and traffic conditions, regarding whether to ignore the warnings or slow down. The rural participants stated that they do not find the speed alerter personally useful, but acknowledged that it may be useful for learner drivers who have difficulty judging their speed. In contrast, the metropolitan participants find the speed alerter very useful, particularly when there is an increased police presence. Rural participants also find the system harder and more distracting to use than the metropolitan participants and, in particular, were concerned that on many speed alerting systems, that there is no labelling to indicate what the system is or how to use it.

The non-users of the system mentioned a number of reasons why they do not use speed alerter including: not knowing how to use it, finding it difficult or tedious to program, finding the warnings annoying or because they feel that they can monitor their own speed. A number of changes to current speed alerting systems were also recommended by participants such as having steering wheel mounted controls, designing the system as a stand-alone system and allowing drivers to increase and decrease the speed settings in 1 kilometre intervals.

A general problem with the speed alerting system identified by participants was the lack of identifying labelling of the system, making many drivers unaware that the car is even equipped with the system. Also, the participants felt that the way in which they have to program the speed alerting system is tedious (e.g., having to toggle through various menus on the trip computer to reach the system) and not user-friendly.

Several differences between the rural and metropolitan participants in their use and acceptability of the manual speed alerting system were obvious. In particular, the rural participants appear to use their speed alerting system far less than the metropolitan participants and tend to find it less useful and harder to use.

Chapter 5. GENERAL DISCUSSION

The purpose of this study was to derive an understanding about NSW drivers' interactions with manually operated speed alert and conventional cruise control devices - the extent to which they are used; how they are used; the circumstances under which they are used; any barriers to their use; their perceived usefulness; and, in particular, the perceived effectiveness of these devices in moderating speed. In this final chapter, the key findings deriving from the study are discussed.

In the first part of the chapter, issues and trends regarding the use, acceptability and perceived usefulness and effectiveness of the cruise control and manual speed alerting devices in reducing and controlling speed are discussed. Following this, differences between the metropolitan and rural participants in their use and acceptability of these devices are identified and the driver interactions between the use of cruise control and manual speed alerting systems are discussed. The major problems with current cruise control and manual speed alerting devices that are experienced by drivers are then described and some suggested changes to existing systems to overcome these problems or to make the systems more acceptable are made. Finally, recommendations are made for future action and research.

5.1 Use, Effectiveness and Acceptability of Cruise Control and Manual Speed Alerting Devices

The participants from both metropolitan and rural areas held generally positive attitudes towards the cruise control and manual speed alert systems, with participants holding slightly more positive attitudes towards the cruise control system. It is however, important to note that the participants in the current study reportedly held negative attitudes towards speeding and positive attitudes towards speeding countermeasures and this may explain their positive attitudes towards cruise control and speed alerting devices. It is possible that drivers who hold more positive attitudes towards speeding may hold negative attitudes towards cruise control and manual speed alerting devices.

In terms of usefulness, participants' main motivation for using the two systems is to help them avoid speeding fines. However, the participants interviewed did mention a number of safety-related reasons why they use the systems, including minimising tiredness in their legs (for the cruise control system) and to maintain a safe speed around school zones with reduced speed limits. Participants also mentioned that the speed alert (but not the cruise control) system is a useful support system for training learner drivers how to judge and monitor their speed and, conversely, for unburdening the trainer and learner driver of the task of monitoring speed in order to concentrate on other aspects of driving.

Participants stated that they mainly use cruise control during the day when they do the majority of their driving, on open-roads (e.g., highways and freeways) which are relatively flat and straight, and on long weekends, when there is a greater police presence around, to avoid speeding fines. The participants rarely use the systems on urban roads where there are many other road users and regular traffic lights and speed zone changes. It seems, then, that drivers self-regulate their interactions with the cruise control system; they appear to use it when it is safe to do so and, as a consequence, there appears to be little self-reported negative behavioural adaptation to the technology. The speed alerting system appears to be used more often by metropolitan than by rural drivers. Sydney drivers use it in both rural and urban areas, whereas rural drivers use it mainly around town, and even then not very often. Particular use of it is made by both groups when there is increased Police enforcement activity, and in the vicinity of schools.

In terms of effectiveness, both systems appear to be effective in helping drivers to maintain the speed *chosen* by them, although their chosen speed is almost invariably higher than the *posted* speed limit. Some rural and metropolitan participants admitted to setting cruise control speeds anywhere between 5 to 15 kilometres above the speed limit in NSW, depending on prevailing enforcement activity, road and weather conditions. Speed alert thresholds are reportedly set between 5 and 10 kilometres above the limit. Generally, speed alert and cruise thresholds are set higher than the speed limit in higher speed zones (e.g., 100 and 110 km/hr zones) and at, or only slightly above, the limit in lower speed zones. Perhaps the most important finding here is that the top speed alerting and cruise control thresholds selected by drivers appear to be directly determined by the number of kilometres above the speed limit that Police will allow a vehicle to travel before booking the driver. The implication of this is that, if the over-speed-limit tolerance allowed by NSW Police were to be reduced, speed alert and cruise control systems could be very effective in truncating speeds at the upper end of the speed distribution and in reducing mean travel speeds, at least for those who use the devices. If the Police-enforced tolerance were less than 5 km/hr above the posted speed limit, then to be effective most speed alert systems currently on the market would have to be re-designed to enable the driver to set speed alert thresholds at 1 km/hr increments above or below the speed limit. Of all the systems reviewed in this study, only the Ford system allows the driver to set speed alert thresholds at increments of less than 5 km/hr (it allows for 1 km/hr increments).

Cruise control and, in particular, manual speed alerting systems, are now standard features on many new cars and this may have implications for the use, acceptability and effectiveness of these devices, as they are no longer actually sought out and fitted only to vehicles by drivers who request them. For example, if these devices are simply fitted as a standard feature to a vehicle and are not sought after or requested, then drivers may be less inclined to use them, or may not use them properly or in the manner intended. It was noted in this regard that, when these devices are a standard feature, drivers rarely are told when they purchase their new vehicle how to use the devices properly (e.g., the most ergonomic way to program the system) or that their driving experience while using the systems is likely to differ from their normal driving experience. The majority of the focus group participants claimed, for example, that they were not made aware that the cruise control system can surge up hills and overshoot the set cruise speed when travelling down hill. Indeed, a number of participants in the current study admitted that they did take some time to adjust to the cruise control system when they first started to use it, as they felt that they had less direct control of the car and they had to become accustomed to the car surging up hills and overshooting downhill and learn to judge when they did and did not need to disengage the system around bends. One participant even mentioned that because of a bad first-time experience with their cruise control, they now no longer use this system. Other participants stated that they did not use their cruise control or manual speed alerting system because they did not know how to use it or because they were simply not aware that the system was even there. In essence, the participants claimed that they feel like drivers are given the system, but that they are then left to their own devices regarding how to operate it correctly and how to adjust their driving appropriately. For some drivers, at least, this may have led to them ceasing use of the system.

5.2 Differences Between Metropolitan and Rural Participants in the Use of Cruise Control and Manual Speed Alerting Devices

In general, the rural participants appeared to hold more positive attitudes towards the cruise control system and to use it more frequently than the metropolitan participants. This finding is not surprising given that the rural participants have a greater exposure to open roads, on which both groups of participants felt that cruise control is most useful. Indeed, a number of the metropolitan participants stated that they rarely use their cruise control system because they only use it when travelling on highways or freeways, which they seldom travel on.

In contrast, the metropolitan participants held more positive attitudes than the rural participants towards the manual speed alerting system and use it more regularly. One explanation why the metropolitan participants held more positive attitudes towards this system and used it more regularly could be because of differences in speed enforcement activity and/or speed compliance levels between metropolitan and rural areas. For example, Police speed enforcement activities may be higher in Sydney than in Wagga Wagga (although this has not been confirmed by the authors) and this may result in metropolitan drivers being more vigilant about complying with the speed limit to avoid speeding fines. Indeed, the metropolitan participants did hold more negative attitudes towards speeding than rural participants and did state that they primarily use the speed alerting system to avoid speeding fines, particularly when there is a greater police presence on the roads.

The majority of the participants appeared to be very familiar with the functionality of their cruise control and manual speed alert systems. However, a greater proportion of the rural participants appeared to use the more efficient methods of operating their cruise control systems than the metropolitan participants. In particular, the metropolitan participants had a greater tendency to increase, decrease and reset cruise speed by deactivating the cruise control system and reprogramming it from the beginning, rather than using the increase, decrease and resume functions of the system. This finding may result from the fact that the metropolitan participants use their cruise control systems less regularly than the rural participants and thus are less familiar with all of the systems functions and what methods for programming the system are most efficient. In contrast, the rural participants found the manual speed alerting system more difficult and distracting to program than the metropolitan participants. Again, this finding may be a function of rural participants using the speed alerting system less than the metropolitan participants.

5.3 Interactions Between the Use of Cruise Control and Manual Speed Alerting Devices

An interesting finding to emerge from the focus group discussions was the interactions between the use of cruise control and manual speed alerting devices. For example, as noted previously, the participants from both metropolitan and rural areas stated that they tend to use cruise control almost exclusively when travelling on the open road, not around town. The speed alerting system, on the other hand, tends to be used primarily when travelling around town or through suburbs, not out on the open road (although a number of metropolitan participants professed to using it on the open road). Another interesting finding was that several of the rural participants use their manual speed alerting system in combination with their cruise control to alert them if their cruise control overshoots down a hill. In these situations, the participants set the speed alert slightly above the set cruise speed, so that they are alerted to any variations in the vehicle's cruising speed and can react appropriately.

The participants raised an interesting issue regarding the use of these two devices by young novice drivers. A number of participants mentioned that they regularly make use of the manual speed alerting system when teaching learner drivers to drive, as it reportedly assists young drivers in learning to judge and control their speed. In contrast, the participants viewed the use of the cruise control system as dangerous, and as even a hindrance, to young drivers learning to calibrate their speed as the system maintains the speed of the vehicle and, according to them, does not give the learner driver the opportunity to learn to do this. Participants felt that novice drivers first need to learn and master the driving task before they use cruise control as they may not have the appropriate skills to control the vehicle if it surges up hills or overshoots downhill, or to judge when they need to disengage the system if approaching a bend.

5.4 The Current Findings in Context

The findings from the current study can be compared and contrasted to previous studies examining cruise control and manual speed alerting devices that were discussed in Chapter 1 of this report.

It is difficult to compare the results of the current study to the findings of Christ et al. (2000) due to the differences in methodologies (on-road trial versus focus group research) between the two studies. It is, however, interesting to note some of the similarities in findings across the two studies. Christ and colleagues found evidence of negative behavioural adaptation to cruise control. They found that drivers who were less experienced using cruise control systems tended to use the cruise control more frequently at excessive speeds on rural roads than the more experienced drivers. While the current study did not differentiate between drivers who were experienced and inexperienced with cruise control, it did find evidence that drivers typically set their cruise speed well above the posted speed limit and their tolerance for exceeding the speed limit increases in the higher speed zones.

Youngbin (1997) used a focus group methodology to examine drivers' attitudes towards cruise control systems. Some of the results of the current study are consistent with those found by Youngbin. In particular, the participants from both groups mentioned that having to constantly set and reset the cruise control system when on long drives or when they encounter traffic travelling at different speeds becomes annoying and tiresome. Many of the participants from both studies felt that adaptive cruise control would be much easier and more enjoyable to use than the conventional cruise control as it reduces the need to reset the cruise speed.

To the knowledge of the authors the current study is the first to examine the use, acceptability and effectiveness in reducing speeding of manual speed alerting systems.

5.5 Problems with Current Cruise Control and Manual Speed Alerting Systems and Recommendations for Design Improvements

The formal assessment of ergonomic and functional deficiencies in the design and operation of existing cruise control and speed alert devices was beyond the scope of this study. To yield such recommendations would have required formal usability testing of the devices (e.g., Green and Jordan, 2001), and assessment of them against relevant ergonomic guidelines and standards. The participants in the current study did highlight, however, what they perceived to be the main problems or difficulties they experience with current cruise control and manual speed alerting systems. Some of these problems have been discussed in previous sections of this chapter, but are summarised here. Table 5.1 lists these along with those changes to the systems that were suggested by the participants to resolve or improve each problem. These suggested design changes, if implemented, could be expected to significantly enhance the usability and effectiveness of cruise control and speed alerting devices.

5.6 Methodological Issues

5.6.1 Representativeness of the Participant Sample

Only drivers who currently drove Holden, Ford, Toyota or Mitsubishi vehicles were examined in the current study. Given the time involved in developing the focus group materials (e.g., the videos and the functionality checklist) for the cruise control and manual speed alerting systems fitted to each vehicle make examined, it was not possible to recruit drivers of other vehicle makes. It is possible, however, that the cruise control and manual speed alerting systems fitted to other vehicle makes are substantially different from the systems examined in the current study and hence, the drivers of other vehicle makes could differ from the current participants in their use and acceptability of these systems. Generalising the results of the current study to the general driving population is therefore difficult.

The number of participants in the current study was fairly small. While the authors aimed to recruit at least 40 participants to participate in the four focus groups, only 31 participants actually took part in the groups. While this is not expected to affect the results of the study, as the issues and themes raised were similar across groups, it is important that future research uses a larger number of participants from a range of ages and backgrounds in order to establish if the use, effectiveness and acceptability of cruise control and manual speed alerting devices differs across drivers of different ages and socio-economic backgrounds.

Table 5.1. Problems identified with cruise control and manual speed alert systems and suggested solutions.

System	Problem	Suggested Solution
Cruise Control	• System surges up hills and overshoots the set cruise speed down hill. • Drivers not shown how to use system properly or how to adjust their driving style when they purchase the system. • Programming the system using the existing controls can be difficult. • Constantly readjusting the cruise speed when moving across different speed zones can be tedious.	• Design the system so that it alerts drivers if the car overshoots the set cruise speed. • Drivers informed when purchasing the system of how to use it and how it may change their driving behaviour. • Have steering wheel mounted controls. • Design the system so that it automatically detects speed zone changes and adjusts the cruise speed accordingly.
Manual Speed Alert	• Only being able to increase/decrease the alert speed in 5 km/h increments is annoying. • Having to toggle through the trip computer menu to access the system is tedious and hides the function. • The location of the system's controls in some vehicles makes the system difficult to access. • The system has no identifying labels to indicate its presence. • The auditory warning issued by the system is annoying.	• Design all systems to increase/decrease alert speed in 1-km/h increments. • Design the system as a stand-alone system. • Place the system controls on the steering wheel or in a more accessible location on the dashboard. • Include identifying labelling on the system. • Decrease the volume or change the sound of the warning.

Finally, self-selection bias can affect the representativeness of the participant sample. The issue of self-selection bias is a problematic methodological issue in research, but can be particularly problematic with focus group research because the participants are not 'randomly' sampled. In essence, this issue relates to whether the participants who agree to participate in focus group research differ from those people who do not and, if so, how? In the current study, the sample was slightly biased towards users, rather than non-users of the devices discussed and towards females. Whether these biases affected the current findings in any systematic way is not known. The participants were also biased towards drivers who held negative attitudes towards speeding and positive attitudes towards speeding countermeasures. It is likely that these biases could lead the current sample of participants to hold more positive attitudes to cruise control and manual speed alerting systems and use them more frequently than the general driving population and this issue should be taken into consideration when interpreting the focus group results.

5.6.2 Use of Telephone Survey to Recruit Participants

The response rate for the rural telephone recruitment survey was low (3.9%) despite attempts to conduct the surveys at times when it was most likely that respondents would be at home. Also a large number of respondents who had originally agreed to participate in the focus groups pulled out when they were called back to be booked into a session, as one focus group coincided with the screening of a State of Origin football match in Wagga Wagga. Over the last few years the difficulty in recruiting research participants through the use of telephone surveys has increased (Krosnick, 1999). In addition, there is evidence that telephone surveys are biased towards respondents who have completed lower levels of education and who are in the lower income levels (Krosnick, 1999). However, as the focus group questionnaire data in Appendix G indicates, the participants in the current study were employed in a range of occupations and had achieved a range of education levels, thus there is no evidence that this bias occurred in the current study.

5.6.3 Ergonomic Assessment and Usability Testing

Ergonomic assessments or usability testing was not carried out on any of the cruise control or manual speed alerting systems discussed in the current study. Therefore, the findings from the current study and the recommendations deriving from these findings are based only on the experiences and opinions of the focus group participants. Although the information and feedback supplied by the participants provide important insights into the usability of these devices, it is also important that systematic assessments of the usability and ergonomic design of existing cruise control and manual speed alerting systems be conducted to further inform the refinement of these systems.

5.7 The Future

As the sample of drivers interviewed in this study was small, the conclusions that can be derived from it are necessarily tentative. Clearly, a more comprehensive study, involving a larger sample of drivers in each region, is needed to verify the findings deriving from this preliminary study.

The themes, however, which emerged from the two focus groups conducted in each of the rural and metropolitan locations were highly consistent. On this basis, the following, tentative, recommendations can be made.

5.7.1 Preliminary Recommendations

- The preliminary findings emerging from this study suggest that both cruise control and speed alerters might be more effective in reducing mean and peak speeds in NSW, and elsewhere, if:

    - Police-enforced over- speed-limit tolerances were reduced;
    - Police enforcement of speeding laws was increased;
    - the devices, particularly the speed alert, were better designed, ergonomically and functionally; and
    - if drivers were better educated and trained in how to use the devices.

- There is evidence that drivers are equally inclined to use cruise control for private and work purposes - provided that in both cases they are liable for any fines incurred for speeding. This knowledge could be brought to the attention of corporate car fleet owners. It may be useful for fleet owners to provide information about cruise control and its potential use in avoiding fines when they are passing on speed-related infringement notices to drivers.

- Drivers in this study do not always use the most efficient method of programming the cruise control and speed alert functions. Less efficient methods may result in greater visual and cognitive distraction whilst the vehicle is in motion and are more likely to compromise safety. On this basis:

    - the ergonomic design of the Human Machine Interface (HMI) for each system could be improved so that it is intuitively obvious to drivers how to program the systems most efficiently;
    - drivers could be told when they purchase a new vehicle how to use these devices most ergonomically; and
    - in addition, user manuals provided by suppliers and vehicle manufacturers could explicitly state the most ergonomic means by which the system should be programmed.

- The cruise control and manual speed alert systems in the different vehicles considered in this study were different in design and operation. As a result, it would not be immediately obvious to a driver how to locate and operate comparable systems when swapping between unfamiliar vehicles, for example at work. This may discourage drivers from using these functions in those vehicles. Vehicle manufacturers and suppliers should be encouraged, or mandated through changes in legislation, to standardise the design of the HMI for these systems to ensure interoperability of the systems across vehicles.

- The usage patterns of manual speed alerters by rural and metropolitan drivers appear to differ markedly in NSW. Rural drivers use it mainly around town (and even then, not that often) whereas Sydney drivers use it often around town and on the open road. The preliminary findings from this study suggest that any campaigns promoting the use of speed alerters and cruise control devices should be sensitive to the differing usage patterns of rural and metropolitan drivers.

- A number of participants commented that the manual speed alert threshold can be reduced or increased only in 5 km/hr increments, even though they would prefer that the system allow them to set the threshold only 2 or three kilometers above the posted speed limit. Manufacturers and suppliers of speed alerters could be encouraged to re-design their systems such that they are programmable in increments of 1 km/hr given the known significant decreases in road trauma associated with small reductions in mean travel speeds.

5.7.2 Research

As noted previously, this was an exploratory study and the following recommendations for further research are made:

- A survey of motorists should be conducted to establish how many vehicles are equipped with manual speed alerting and cruise control devices and to more accurately estimate the extent to which these systems are used by drivers, and driver subgroups (e.g., young drivers).
- Research is necessary to assess the actual effectiveness of cruise control and manual speed alerting devices in reducing speeding. This could involve a survey of motorists and/or an on-road evaluation study.
- A formal ergonomic assessment of existing cruise control and manual speed alerting systems should be conducted to derive information that could be used to refine the design and operation of existing devices.
- The current study only focused on 25 to 49 year old drivers. Further research is needed with drivers from a wider range of age groups to examine any differences in the use, acceptability and effectiveness in reducing speeding, of these devices in younger and older drivers. In particular, research should focus on the acceptability of these devices to NSW drivers who are likely to derive the most benefit from them (i.e., those user groups who engage most in speeding).
- The present study only focused on drivers from NSW. Further research should be conducted with drivers from other Australian states, such as Victoria, who appear to have more conservative attitudes towards speeding than NSW drivers and who are more likely to believe that speed enforcement has increased over the past two years (Mitchell-Tavener, Zipparo & Goldsworthy, 2003), in order to establish if the use and effectiveness of these devices differs across drivers from different states with varying attitudes towards speed enforcement.
- Different drivers appear to use different strategies to negotiate corners when their cruise control is engaged. Some participants use the decrease button on the steering wheel or stalk to slow down around bends (rather than disengaging the system) and the increase button to increase speed once they have cleared the bend. It is not known to what extent such control movements interfere with steering control when negotiating bends. Research is needed to determine whether such control actions interfere significantly with steering control and, if so, what technological solutions might be available to prevent drivers from using cruise control in this manner when negotiating corners.

- The findings of the current study suggest that a number of drivers make use of manual speed alerting devices when teaching learner drivers to drive. Further research on manual speed alerting and cruise control devices should be conducted to establish the benefits and disbenefits of these devices for young novice drivers and to establish if the manual speed alerter, in particular, can be used to help young drivers calibrate their choice of speed.
- There is evidence from this study that speed alerters are being used as a driver support system to warn drivers that they are exceeding the speed limit (or some other speed threshold) when they are engaged in distracting activities such as conversing with passengers. Further research is warranted to determine to what extent drivers engage in this activity and to what extent it hinders or enhances their overall level of safety.

5.8 Conclusion

The findings from this study are preliminary. However, they tentatively suggest that if Police lower the tolerable threshold above the speed limit at which they allow drivers to travel before booking them, this may encourage users of cruise control and speed alerting devices, in both rural and metropolitan areas, to correspondingly lower the speed thresholds at which they set these devices. This could result in the devices being more effective than they currently are in reducing the mean and peak travel speeds of those who use them. Better ergonomic design of these devices will make them more effective as speed moderating devices. Further research, involving a larger number of drivers, is needed to extend and verify the preliminary findings reported in this study, in particular to ascertain the extent to which these devices are routinely used by NSW drivers and the actual reductions in speed that derive from use of them.

REFERENCES

Australian Bureau of Statistics. (2000). *Estimated resident population by age and sex in statistical local areas, New South Wales 1037-6569*. Sydney, NSW: Australian Bureau of Statistics, New South Wales Office, 1998-2001.

Australian Transport Safety Bureau. (2002). *Australian road fatalities for December 2002*. www.atsb.gov.au/road/stats/pdf/mrf122002.pdf.

Brookhuis, K., & de Waard, D. (1999). Limiting speed, towards an intelligent speed adapter (ISA). *Transportation Research Part F, 16*, 1-10.

Carsten, O., & Tate, F. (2001). *Intelligent speed adaptation: The best collision avoidance system?* Institute for Transport Studies, University of Leeds, UK.

Christ, R., Smuc, M., Gatscha, M., Schmotzer, C., & Otzelberger, B. (2000). *A field study on cruise control.* On-line paper. Available: www.saf-experiments.com/eng/main/experimente.html

Green, W.S., & Jordan, P.W. (1999). *Human factors in product design. Current practice and future trends.* Philadelphia, PA: Taylor & Francis.

Greenbaum, T. L. (1988). *The practical handbook and guide to focus group research*. Lexington, Mass: Lexington Books.

Haworth, N., & Rechnitzer, G. (1993). *Description of fatal crashes involving various causal variables.* Report No. CR 119. Canberra: Federal Office of Road Safety.

Koziol, J.S., Inman, V.W., Carter, M., Robinson, M., & Barker, M. (1999). *Evaluation if intelligent cruise control system. Volume 1 – Study results* (DOT-VNTSC-NHSTA-98-3). Washington, DC: Department of Transport.

Krosnick, J. A. (1999). Survey Research. *Annual Review of Psychology, 50*, 573-567.

Lahrmann, H., Madsen, J. R., & Boroch, T. (2001). Intelligent speed adaptation – development of a GPS based ISA system and field trial of the system with 24 test drivers. *Proceedings of the 8th World Congress on Intelligent Transport Systems*, Sydney, Australia.

Mitchell-Tavener, P., Zipparo, L., & Goldsworthy, J. (2003). Survey on speeding and enforcement. Report No. CR 214a. Australian Transport and Safety Bureau, Canberra, Australia.

Patterson, A.K. (1998). *Intelligent cruise control system impact analysis.* Unpublished Masters thesis, Virginia Polytechnic Institute and State University.

Regan, M. A., Oxley, J. A., Godley, S. T., & Tingvall, C. (2001). *Intelligent transport systems: Safety and human factors issues* (Report No. 01/01). Melbourne, Australia: Royal Automobile Club of Victoria (RACV).

Regan, M.A., Young, K.L., & Haworth, N. (2003). A review of literature and trials on intelligent speed adaptation devices for light and heavy vehicles. Report No. R-237/03. Austroads, Sydney, Australia.

RTA. (2002). *Speed: Speed problem definition and countermeasure summary*. On-line paper. Available: www.rta.nsw.gov.au/safety/c1811_c.htm.

Shaout, A., & Jarrah, M.A. (1997). Cruise control technology review. *Computers and Electrical Engineering, 23*, 259-271.

Sundberg, J. (2001). Smart speed – results from the large scale field trial on intelligent speed adaptation in Umeå, Sweden. *Proceedings of the 8th World Congress on Intelligent Transport Systems*, Sydney, Australia.

Watanabe, T., Kishimoto, N., Hayafune, K., & Yamada, K. (1995). Development of an ICC system. *World Congress on ITS,* Yokohama, Japan.

Williams, A.F., Preusser, D.F., Lund, A.K., & Rasmussen, S.J. (1987). Cars owned and driven by teenagers. *Transportation Quarterly, 41 (2),* 177-188.

Van Kampen, L.T.B. (1996). *Cruise control in personenauto's: een literatuur-orientatie op verkeersveiligheidsaspecten (cruise control in passenger cars).* Report No. R-96-21. SWOV, The Netherlands.

Van Boxtel, A. (1999). Early implementation of intelligent speed adaptation (ISA) in the Netherlands. *Proceedings of the 32nd ISTA Conference*, Vienna, Austria.

VFACTS. (2002). *VFACTS National. Retail sales by segment*. Federal Chamber of Automotive Industries. Victoria, Australia.

Youngbin, Y. (1997). *A focus group study of automated highway systems and related technologies.* California PATH Working Paper, Institute of Transport Studies, Berkley, California.

Young, K.L., Regan, M.A., & Hammer, M. (2003). Driver distraction: A review of the literature. Report No. 206. Monash University Accident Research Centre, Victoria, Australia.

Young, K.L., Regan, M.A., Mitsopoulos, E., & Haworth, N. (2003). Acceptability of in-vehicle intelligent transport systems to young novice drivers in New South Wales. Report No. 199. Monash University Accident Research Centre, Victoria, Australia.

APPENDIX A. PREVALENCE OF CRUISE CONTROL AND MANUAL SPEED ALERT DEVICES IN NEW SOUTH WALES

The design and functionality of cruise control and manual speed alerting systems can vary widely across vehicle makes and models. The purpose of this appendix is to provide the reader with information regarding the different types of cruise control and manual speed alerting systems fitted to cars and how they differ across the various vehicle makes and models, discuss trends across time in terms of the fitment of these devices to vehicles (e.g., standard, optional and aftermarket fitment) and provide estimates of the proportion of vehicles sold in NSW that have either or both of these devices fitted. As there are literally thousands of different vehicle models and model variants in the Australian vehicle market, it would be an enormous task, beyond the scope of this report, to examine the cruise control and manual speed alerting systems fitted to every vehicle make and model sold in NSW. Thus, only a range of the top selling light passenger vehicle models from Toyota, Mitsubishi, Ford and Holden were examined. These four vehicle makes were chosen for examination as they are the four top selling makes in Australia (VFACTS, 2002). Information regarding the design and functionality of the cruise control and manual speed alerting systems equipped to various Toyota, Mitsubishi, Ford and Holden models and the number of vehicles equipped with either or both of these systems that were sold in NSW over the past decade was obtained from the vehicle manufacturers. In the following section, the cruise control and manual speed alerting systems fitted to these four vehicle makes are compared and contrasted. Trends in the fitment of these devices to the four vehicle makes and estimates of the proportion of these vehicles sold in NSW that have either or both of these devices fitted are then presented and discussed.

Cruise Control Systems: How Do They Differ Across Vehicles?

The cruise control systems fitted to Fords, Toyotas, Mitsubishi and Holden vehicles all have the same basic functionality. That is, they all allow the driver to turn the system on and off, set the desired cruise speed, increase and decrease the desired cruise speed, deactivate the system and resume the system to cruise at its last set cruise speed. The main difference between these systems across the vehicle makes is their physical design, such as the location and form (e.g., buttons or stalk controls) of the controls, and the specific procedure, or procedures, that are followed to execute each of the functions. In the following sections, the design and functionality of the cruise control systems fitted to each of the four vehicle makes are discussed and any major differences in the design of these system across the makes are highlighted[1].

The controls for the cruise control system fitted to current model Holdens are located on a stalk, which is situated on the right hand side of the steering wheel. To turn on the system, drivers are required to press the 'on-off/cancel' button at the end of the stalk. Drivers then set the cruise speed by accelerating to the desired cruise speed, rotating the stalk downwards once to the 'set-decel' position, and then removing their foot from the

[1] Only the systems fitted to current model vehicles will be discussed. However, any major differences between the design of the current and past model systems on a particular vehicle make will be highlighted.

accelerator. The minimum speed at which the cruise system can be set to is 40 km/h. To increase or decrease cruise speed, drivers have the option of using three different methods. First, they can rotate the stalk upwards (to increase speed) or downwards (to decrease speed) a number of times (or hold the stalk up) until the car increases or decreases to the desired speed. The car increases/decreases speed in 2 km/h increments each time the stalk is rotated. Second, they can use the more efficient method of accelerating or braking to the desired speed and then rotating the stalk upwards (to increase) or downwards (to decrease) once. Finally, drivers can use the least efficient method of disengaging the cruise control system and resetting the system from the beginning to the new speed. To disengage the cruise control system, drivers can either press the brake (or clutch), or press the 'on-off/cancel' button at then end of the stalk once. When the system is disengaged (but still on) drivers can reset the system to the last set cruise speed by rotating the stalk upwards once. Finally drivers turn the system completely off by pressing the 'on-off/cancel' button twice.

The design of the Toyota cruise control system is very similar to the Holden system. The system controls are contained on a stalk located on the right-hand side of the steering wheel and drivers follow the same procedures to turn the system on and off, set the desired cruise speed, increase and decrease cruise speed (in 1.6 km/h intervals) and resume the previous set cruise speed if the system has been disengaged. However, to cancel or disengage the Toyota cruise system, drivers are required to pull the stalk towards them once (rather than press the cancel button on the end of the stalk) or press the brake or clutch. The only other difference between the Holden and Toyota cruise control systems is a slight difference in the wording used on the control stalk (e.g. 'set/coast' on the Toyota versus 'set-decel' on the Holden).

The design and location of the cruise control system on Mitsubishi vehicles has changed significantly across models. On the earlier model Magna and Verada's (1991 models) the controls for the system were mounted on the steering wheel as buttons. On the later model Magna, Verada and Pajero's (1997 and 1999 models) the controls for the cruise control system were contained on a stalk on the right-hand side of the steering wheel. This latter design is very similar to the system fitted to Holden and Toyota vehicles. One of the main differences of the Mitsubishi system is that the on/off button is completely separate from the other controls and is located on the dashboard directly below the instrument panel. Once the system is turned on, however, the procedures followed to set the desired cruise speed, increase and decrease cruise speed (in 1.6 km/h intervals), disengage the system and resume the previous cruise speed are the same as those used on the Toyota system.

The design of the cruise control system fitted to current model Fords is quite different from that fitted to current Holden, Toyota and Mitsubishi vehicles. The controls for the system are located both on the indicator stalk and the steering wheel. To turn the cruise control system on and off, drivers are required to rotate the switch at the end of the indicator stalk up or down once, respectively. Drivers then set the desired cruise speed by operating either one of the two 'set' buttons located on the steering wheel. To increase or decrease cruise speed, drivers press (or hold down) the 'set +' or the 'set–' buttons on the steering wheel, respectively. This will increase or decrease the speed warning threshold in 2 km/h increments. Drivers can also use the more efficient method of accelerating or braking to the desired speed and then pressing the 'set +' or 'set-' buttons once. The cruise control system can be disengaged by pressing the 'Res/coast' button on the steering wheel or by pressing the brake or the clutch. Drivers can also resume the last set cruise speed by pressing the 'Res/coast' button.

Manual Speed Alerting Systems: How Do They Differ Across Vehicles?

As with the Cruise control systems, the manual speed alerting systems fitted to Toyotas, Fords, Mitsubishis and Holdens all have the same basic functionality and are usually integrated as part of the trip computer. However, they do differ slightly across the vehicles makes in terms of their design and location within the vehicle cockpit and in some of their functionality. The speed alert system in Holden vehicles is contained within the trip computer. The display window for the trip computer (where the visual warnings are displayed) is located underneath the instrument gauges and the controls are located on the dashboard to the left of the gauges. To activate the speed alert system, drivers press the 'mode' button on the dashboard several times to scroll through the trip computer menu until they reach the speed alert function. Drivers then set the alert speed by pressing, or holding down the up or down arrow buttons on the dashboard until their desired speed is shown on the display. The alert speed increases or decreases in 5 km/h intervals and can be adjusted to alert the driver at any speed between 20 and 200 km/h. Drivers can also use one of four preset speeds programmed into the system as the alert speed by pressing the 'mode' button for two seconds while the speed alert is engaged and then selecting their preferred pre-programmed speed from the four selections. This can save drivers from having to press the up and down arrows a number of times until they reach the desired alert speed. Drivers can also set the alert speed by accelerating to the speed at which they want to receive warnings and then pressing the up and down arrow buttons together. When the driver exceeds the programmed alert speed, the car issues a visual "overspeed" warning icon on the trip computer display and a brief audio chime.

The speed alert system fitted to Mitsubishi vehicles is similar to the Holden system. The system is part of the trip computer. The display window for the trip computer is located in the centre of the dashboard to the left of the driver and the controls are located on the dashboard almost behind the steering wheel. This location can make the controls difficult to reach while driving. To activate the speed alert system, drivers press the up and down arrow buttons on the dashboard and hold them down until the last set alert speed appears on the display. Drivers then set the alert speed by pressing, or holding down the up or down arrow buttons on the dashboard until their desired speed is shown on the display. The alert speed increases or decreases in 5 km/h intervals and can be adjusted to alert the driver at any speed between 20 and 195 km/h. Drivers can also set the alert speed by accelerating to the speed at which they want to receive warnings and then pressing the up and down arrow buttons together for 1 to 2 seconds. When the set speed is exceeded, the system issues a visual warning, which is displayed on the trip computer display and will beep twice. The visual warning only disappears if the vehicle reduces speed to below the alert speed.

As with the Mitsubishi and Holden speed alert systems, the speed alert system on the Toyota is included as part of the trip computer. The display window for the trip computer is located in the centre of the dashboard to the left of the driver and the controls are located on the dashboard underneath the display. To set the alert speed, drivers have to press the 'mode' button four times until the speed alert function is displayed and then press the up and down arrows a number of times until the desired speed is displayed. The alert speed increases or decreases in 5 km/h intervals and can only be adjusted to alert the driver at any speed between 40 and 200 km/h. Drivers can also use one of the three preset speeds programmed into the system as the alert speed by pressing the 'mode' button for two seconds while the speed alert is engaged and then selecting their preferred pre-programmed speed from the four selections using the up and down arrow buttons. Once the set speed is exceeded, a brief audio tone is issued and a flashing visual overspeed icon is displayed. The icon continues to flash until the vehicle's speed reduces to below the alert speed.

The Ford speed alert system is also included as part of the trip computer however, unlike the speed alerters on Holden, Toyota and Mitsubishi models, the Ford system's controls are located on the steering wheel, not on the dashboard. To activate the system, drivers have to press the 'speed alarm' or 'seek' button (depending on the model) on the steering wheel and the word 'overspeed' appears on the trip computer display. The alert speed is then set by pressing the 'Vol +' button to increase the speed or the 'Vol -' button to decrease the alert speed. The alert speed increases or decreases in 1 or 10km/h intervals, depending on how long the buttons are depressed for. The Ford system does not have any preset alert speeds. Once the driver exceeds the preset speed, the 'overspeed' icon on the display begins to flash and a brief auditory warning is issued. The visual icon continues to flash until the vehicle's speed reduces below the alert speed.

Cruise Control and Manual Speed Alert: Trends in the Fitment and Prevalence of these Systems in NSW Vehicles.

In order to determine the prevalence of cruise control and manual speed alert systems on vehicles in NSW, vehicle sales data was obtained from Holden, Ford, Toyota and Mitsubishi manufacturers for those models fitted with cruise control and/or manual speed alert devices. The four manufacturers were asked to supply details of their past and present passenger vehicle models that have cruise control and/or manual speed alert fitted and to specify whether this fitment was standard or optional. The manufacturers were also asked to supply, for each vehicle model, sales data on the number of vehicles fitted with either or both of the systems that have been sold in NSW. This data was used in combination with vehicles sales data from VFACTS to determine what percentage of the various vehicle makes and models sold in NSW each year (from 1993 to February 2003) are fitted with cruise control and/or manual speed alert devices. The standard VFACTS reports only provide Australia wide sales figures, not separately for each state, however these reports consistently show that of all the vehicles sold in Australia, approximately 35% of these are sold in NSW. Hence, this 35% figure was used to determine the approximate number of vehicles sold in NSW from the Australia wide sales data.

As the information supplied by vehicle manufacturers only contained information for a limited number of vehicle models and for a select number of years, the aim of this section of the report is to provide information on the approximate proportion of the various vehicle makes and models that are sold each year in NSW with cruise control and manual speed alert systems fitted and to discuss any trends in the data, rather than to provide an overall figure on the proportion of vehicles in NSW that are fitted with the devices[2].

[2] Due the large number and range of aftermarket cruise control and speed alert systems on the market and the limited data we received from vehicle manufacturers in terms of the range of models and years we received data for, we were unable to provide an estimate of the overall number of vehicles in NSW that are fitted with either or both of these systems. An estimate of this kind could be more accurately obtained from a survey of NSW motorists.

Furthermore, vehicle manufacturers rarely keep detailed records of how many vehicles are sold with cruise control and manual speed alert where these systems are fitted as an option. Toyota, for example, had to make an assumption that, for their models that have cruise control fitted as an option, 50 percent of the vehicles with automatic transmissions and 20 percent of vehicles with manual transmissions have these devices fitted. As the other three manufacturers also did not provide exact numbers of their vehicles that have been sold with cruise control fitted as an optional feature, the authors extended Toyota's assumption to estimate the number of Holden, Ford and Mitsubishi vehicles that have been sold with cruise control fitted as an option. The results of these analyses are presented in the following sections for each of the four vehicles makes separately.

Mitsubishi

Mitsubishi Australia provided information on the fitment of cruise control and manual speed alert devices for a number of their vehicle models: Magna, Verada, Pajero, Challenger and the Outlander. Table A.1 displays the Mitsubishi models (and model series) that have cruise control and/or manual speed alert systems fitted and specifies whether these systems were standard or optional features of the model. As illustrated, manual speed alert devices have been fitted to only a few of the later model Mitsubishi vehicles, but where it is fitted it is fitted as a standard feature. Cruise control on the other hand is more common on Mitsubishi cars, but has only been fitted as a standard feature on the more expensive model cars (e.g., Verada) and on the latest model of some of the less expensive models.

Table A.1. Cruise control and speed alert fitment to selected Mitsubishi vehicles.

Model	Cruise Control	Speed Alert
Magna		
TS	O	-
TE	O	-
TF	O	S
TH	O	S
TJ	S	S
Verada		
KS	S	-
KE	S	-
KF	S	S
KH	S	S
KJ	S	S
Pajero		
NJ	O	-
NK	S	-
NM	S	-
NP	S	-
Challenger		
PA	O	-
Outlander		
ZE	S	-

S = Standard feature, O = Optional feature, - = Not fitted

Mitsubishi Australia also provided sales figures for the number of Magnas, Veradas, Pajeros, Challengers and Outlanders fitted with cruise control and manual speed alert that have been sold in NSW each year. Sales data were provided for models fitted with cruise control for the period 1997 to the end of February 2003 and for Magna and Verada models fitted with manual speed alert systems for the period 1999 to the end of February 2003. Table A.2 displays the number and proportion of Mitsubishi vehicles fitted with cruise control that were sold in NSW each year. As cruise control is a standard feature on Veradas, Outlanders and later model Pajeros and Magnas, the proportion of these vehicles sold in NSW with this system fitted is 100 percent. For the earlier Magna series, in which cruise control was an optional feature, it was assumed that the system was fitted to 50 percent of automatic vehicles and 20 percent of manual vehicles. As displayed, cruise control was fitted to between 61 and 75 percent of Magna vehicles, with a slight upward trend in the proportion of Magna vehicles fitted with cruise control evident over the period displayed. For Challenger vehicles, it was also assumed that cruise control was fitted as an option to 50 percent of automatic vehicles and 20 percent of manual vehicles. Cruise control was fitted to approximately 42 percent of Challenger vehicles as an optional feature over the period 1998 to 2002.

Table A.2. Proportion of Mitsubishi vehicles fitted with cruise control sold in NSW.

Model		**Year**						
		1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003 (to Feb)**
Magna	Total No. sold#	11477	10362	7648	6252	8347	7872	2452
	No. sold with CC#	7122	6338	5650	4712	5745	5147	2452
	% sold with CC	**62.05**	**61.17**	**73.88**	**75.37**	**68.83**	**65.38**	**100**
Verada	Total No. sold#	1829	1192	1157	963	703	658	250
	No. sold with CC#	1829	1192	1157	963	703	658	250
	% sold with CC	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Pajero	Total No. sold#	2141	1714	2048	2614	2545	3088	993
	No. sold with CC#	2082	1685	2048	2614	2545	3088	993
	% sold with CC	**97.24**	**98.31**	**100**	**100**	**100**	**100**	**100**
Challenger	Total No. sold#	0	695	883	940	983	792	208
	No. sold with CC#	0	311	375	400	418	337	208
	% sold with CC	**0**	**44.75**	**42.47**	**42.55**	**42.52**	**42.55**	**100**
Outlander	Total No. sold#	0	0	0	0	0	0	228
	No. sold with CC#	0	0	0	0	0	0	228
	% sold with CC	**0**	**0**	**0**	**0**	**0**	**0**	**100**

* Source: VFACTS # Source: Mitsubishi Australia
CC = Cruise Control
All figures represent the number of vehicles sold in NSW only.

Manual speed alert systems have only been fitted to Magna and Verada vehicles in the Mitsubishi range. The proportion of Magnas and Veradas sold in NSW from 1999 to February 2003 that were fitted with speed alert systems is displayed in Table A.3. As illustrated, the manual speed alert system has been equipped as a standard feature to Magnas and Veradas and therefore, 100 percent of these vehicles sold in NSW during the period shown were equipped with a speed alerting system.

Table A.3. Proportion of Mitsubishi vehicles fitted with manual speed alert sold in NSW.

Model		Year				
		1999	**2000**	**2001**	**2002**	**2003 (to Feb)**
Magna	Total No. sold*	8792	8145	8347	8212	2452
	No. sold with SA*	8792	8145	8347	8212	2452
	% sold with SA	**100**	**100**	**100**	**100**	**100**
Verada	Total No. sold#	1157	963	703	658	250
	No. sold with SA#	1157	963	703	658	250
	% sold with SA	**100**	**100**	**100**	**100**	**100**

* Source: VFACTS # Source: Mitsubishi Australia
SA = Speed Alert All figures represent the number of vehicles sold in NSW only.

Toyota

Toyota Australia provided information on the fitment of cruise control and manual speed alerting devices for a range of their vehicle models: the Camry, Vienta, Avalon and the Landcruiser. Table A.4 displays the Toyota models that have cruise control and/or manual speed alert systems fitted and specifies whether these systems were standard or optional features of the model. As shown, manual speed alert devices have been fitted to Camry, Vienta and Avalon models from October 2000 onwards. Manual speed alert has not been fitted to any Landcruiser models. Speed alert is fitted to Avalon vehicles as a standard feature and has been fitted to the later model Camry and Vienta models as an optional feature. Cruise control is a more common feature on Toyota vehicles, and has been largely fitted as a standard feature, particularly on the more expensive model cars (e.g., Avalon) and on the most expensive variants of the less expensive models (e.g., Camry Sportivo).

Toyota Australia also provided sales figures for the number of Landcruisers, Camrys, Vientas and Avalons fitted with cruise control and manual speed alert that have been sold in NSW each year. Sales data were provided for models fitted with cruise control for the period 1995 to end of 2002 and for Camry/Vienta and Avalon models fitted with manual speed alert systems for the period October 2000 to the end of 2002 (Speed alert was not fitted to Toyota vehicles prior to October 2000). Table A.5 displays the number and proportion of Toyota vehicles fitted with cruise control that were sold in NSW each year between 1995 and December 2002. As cruise control is a standard feature on Avalons, the proportion of these vehicles sold in NSW with this system fitted is 100 percent. For the earlier Camry/Vienta V6 series sold in 1995 and 1996, cruise control was a standard feature, thus the proportion of these models sold in this period was 100 percent. For models where cruise control was an optional feature, such as on the Landcruisers, Camry (4 cylinders) and a number of the less expensive Camry/Vientas V6 models series, it was assumed that cruise control was fitted to 50% of automatic vehicles and 20% of manual vehicles. As displayed, cruise control has been fitted to only a small proportion of Landcruiser models (between 14% and 28%), however there is a slight upwards trend evident in the proportion of Landcruiser vehicles fitted with cruise control over the period displayed. Cruise control has been fitted to between 14% and 65% of Camry 4 cylinder models and, as with the Landcruisers, there is an upward trend in the proportion of Camrys sold with cruise control fitted over the period displayed. The proportion of Camry and Vientas (V6) fitted with cruise control is much higher than the Camry 4 cylinder or Landcruiser vehicles, with approximately 75% to 91% of these models sold in NSW fitted with the system. Unlike the other Toyota models however, the proportion of Camry and Vienta vehicles sold in NSW with cruise control fitted has decreased from 1995 to 2002.

Table A.4. Cruise control and speed alert fitment to selected Toyota vehicles.

Model	Cruise Control	Speed Alert
LandCruiser		
GXV	S	-
GXL	S	-
GXL 98	O	-
RV	S	-
VX	S	-
SAHARA	S	-
GXL TD	S	-
Camry 4cyl		
SPORTIVO SEDAN	S	O
ALTISE SEDAN	O	O
ATEVA SEDAN	S	O
CSX SEDAN	S	-
CSX WAGON	S	-
ULTIMA	S	-
CSI SEDAN	O	-
CSI WAGON	O	-
CONQUEST SEDAN	S	-
CONQUEST WAGON	S	-
Camry & Vienta V6		
CSI SEDAN	O	-
CONQUEST SEDAN	S	-
TOURING SEDAN	S	-
AZURA SEDAN	S	O
SPORTIVO SEDAN	S	O
ALTISE SEDAN	S	O
ATEVA SEDAN	S	O
CAMRY VIENTA V6 SEDAN EXE	S	-
CAMRY VIENTA V6 SEDAN ULT	S	-
CAMRY VIENTA V6 SEDAN CSI	S	-
CAMRY VIENTA V6 SEDAN T/S	S	-
GRANDE SEDAN	S	-
VXI SEDAN	S	-
CSI WAGON	O	-
CONQUEST WAGON	S	O
TOUR SERIES WGN	S	O
CAMRY VIENTA WAGNM EXE	S	-
CAMRY VIENTA V6 WAGNM CSI	S	-
VXI WAGON	S	-
WAGNM CSI	S	-
VIENTA WAGNM CSX	S	-
Avalon		
GRANDE SEDAN	S	S
VXI	S	S
GXI	S	S
CONQUEST	O	S
ADVANTAGE	S	S

S = Standard feature, O = Optional feature, - = Not fitted

Table A.5. Proportion of Toyota vehicles fitted with cruise control sold in NSW.

Model		Year							
		1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Landcruiser	Total No. sold*	6958	6453	6091	7054	6455	5927	5478	6117
	No. sold with CC#	1115	909	869	977	1179	1238	1317	1722
	% sold with CC	**16.02**	**14.09**	**14.27**	**13.85**	**18.26**	**20.89**	**24.04**	**28.15**
Camry 4 cyl	Total No. sold*	9032	7413	6689	8184	7435	6875	6389	6689
	No. sold with CC#	1824	1088	1879	4539	4892	4297	3622	3708
	% sold with CC	**20.19**	**14.68**	**28.09**	**55.46**	**65.80**	**62.50**	**56.69**	**55.43**
Camry & Vienta V6	Total No. sold#	3330	4706	5156	8049	9701	5879	3769	4389
	No. sold with CC#	3330	4706	4721	6626	8000	4595	2845	3341
	% sold with CC	**100.00**	**100.00**	**91.56**	**82.32**	**82.47**	**78.16**	**75.48**	**76.12**
Avalon	Total No. sold*	0	0	0	0	0	3065	4116	3371
	No. sold with CC#	0	0	0	0	0	3065	4116	3371
	% sold with CC	**0**	**0**	**0**	**0**	**0**	**100**	**100**	**100**

* Source: VFACTS # Source: Toyota Australia
SA = Speed Alert
All figures represent the number of vehicles sold in NSW only.

Manual speed alert systems have only been fitted to Camry/Vienta and Avalon models since October 2000. The proportion of Camrys, Vientas and Avalons sold in NSW from Oct 2000 to December 2002 that were fitted with a speed alert system is displayed in Table A.6. Manual speed alerting systems have been fitted as a standard feature on Avalon models and thus, 100% of these models sold in NSW are fitted with a manual speed alert system. Manual speed alert systems are fitted as an optional feature to Camry and Vienta models. As displayed, speed alert systems have been fitted to between 95% and 99% of Camry V6 and Vienta models and have been fitted to between 55% and 62% of Camry 4 cylinder vehicles sold in NSW from October 2000 to December 2002.

Table A.6. Proportion of Toyota vehicles fitted with Manual speed alert sold in NSW.

Model		Year		
		2000 (Oct-Dec)	**2001**	**2002**
Camry 4 cyl	Total No. sold*	1719	6389	6689
	No. sold with SA#	1074	3622	3708
	% sold with SA	**62.48**	**56.69**	**55.43**
Camry & Vienta V6	Total No. sold	1198	2964	3353
	No. sold with SA#	1149	2845	3341
	% sold with SA	**95.91**	**95.99**	**99.64**
Avalon	Total No. sold	766	4116	3371
	No. sold with SA#	766	4116	3371
	% sold with SA	**100**	**100**	**100**

* Source: VFACTS # Source: Toyota Australia.
All figures represent the total number of vehicles sold in NSW
SA = Speed Alert
Speed Alert has not been fitted to Landcruiser models.

Holden

Information on the fitment of cruise control and manual speed alerting devices on Commodore, Vectra, Astra and Barina models was provided by Holden Australia. Table A.7 displays the Holden models (and model series) that have cruise control and/or manual speed alerting systems fitted and specifies whether these systems were standard or optional features of the model. As illustrated, manual speed alerting devices have been fitted as a standard feature to the VR Calais model and all VS to VY Commodore, Berlina and Calais models and from VS to WH Statesman and Caprice models. Manual speed alert has not been fitted to any Vectra, Astra or Barina models. As with Toyota and Mitsubishi vehicles, cruise control is a more common feature on Holden vehicles than manual speed alerting devices. On the Commodore range, cruise control was fitted as an optional feature on the VR Acclaim, Calais, Berlina, Statesman and Caprice models, and as a standard feature on these models from the VS series onwards. Cruise control is fitted to Commodore Executive models as an optional feature and on the more expensive variants of the Vectra, Astra and Barina models as a standard feature.

Holden Australia also provided sales figures for the number of Commodore, Vectra, Astra and Barina models fitted with cruise control and manual speed alert that have been sold in NSW. Sales data for the Commodore range were provided according to model number, not according to year and thus, the sales data for these vehicles are presented in a separate table to the other Holden vehicles. Sales data for the Vectra, Astra and Barina models that have been fitted with cruise control was provided for the period 1997 to end of 2002. Manual speed alerting devices have not been fitted to Vectra, Astra and Barina models.

Table A.8 displays the number and proportion of Commodore models (VR to VY & WH) fitted with cruise control that were sold in NSW. As cruise control is a standard feature on Acclaim, Calais, Berlina, Statesman and caprice models, the proportion of these vehicles sold in NSW with this system fitted is 100 percent. For the Commodore Executive models, where cruise control is an optional feature, it was assumed that cruise control was fitted to 50 percent of automatic vehicles and 20 percent of manual vehicles. As displayed, based on this assumption, approximately 50 percent of VS to VY Commodore Executive models have been fitted with a cruise control system.

Table A.9 displays the number and proportion of Vectra, Astra and Barina models fitted with cruise control that have been sold in NSW between the years 1997 and the end of 2002. As cruise control is fitted as a standard feature to the more expensive model series of these vehicles, the proportion of these vehicles sold in NSW with a cruise control system fitted is 100 percent.

Table A.7. Cruise control and speed alert fitment to Holden Commodore vehicles.

Model	Cruise Control	Speed Alert
Commodore Group		
VR EXECUTIVE	-	-
VR CALAIS	O	S
VR ACCLAIM	O	-
VR BERLINA	O	-
VR STATESMAN	O	-
VR CAPRICE	O	-
VS EXECUTIVE	O	S
VS CALAIS	S	S
VS ACCLAIM	S	S
VS BERLINA	S	S
VS STATESMAN	S	S
VS CAPRICE	S	S
VT EXECUTIVE	O	S
VT ACCLAIM	S	S
VT CALAIS	S	S
VT BERLINA	S	S
VX EXECUTIVE	O	S
VX CALAIS	S	S
VX ACCLAIM	S	S
VX BERLINA	S	S
VY EXECUTIVE	O	S
VY ACCLAIM	S	S
VY CALAIS	S	S
VY BERLINA	S	S
WH STATESMAN	S	S
WH CAPRICE	S	S
Vectra		
1997-2003 CD	S	-
1997-2003 CDX	S	-
1997-2003 CDXi	S	-
Astra		
1998-2003 CD	S	-
1998/2003 CDX	S	-
1998-2003 SRi	S	-
SRi TURBO	S	-
Equipe	S	-
Barina		
2002/2003 SRi	S	-

S = Standard feature, O = Optional feature, - = Not fitted

Table A.8. Proportion of Holden Commodore vehicles fitted with cruise control sold in NSW.

Model		Year				
		VS	VT	VX	VY*	WH
Executive	Total No. sold#	40897	47136	25636	3207	0
	No. sold with CC#	19070	22364	12433	1555	0
	% sold with CC	**46.63**	**47.45**	**48.50**	**48.49**	**0**
Acclaim	Total No. sold#	12570	14276	9177	1562	0
	No. sold with CC#	12570	14276	9177	1562	0
	% sold with CC	**100**	**100**	**100**	**100**	**0**
Berlina	Total No. sold#	5217	9621	6255	1291	0
	No. sold with CC#	5217	9621	6255	1291	0
	% sold with CC	**100**	**100**	**100**	**100**	**0**
Calais	Total No. sold#	2287	4729	3120	576	0
	No. sold with CC#	2287	4729	3120	576	0
	% sold with CC	**100**	**100**	**100**	**100**	**0**
Statesman	Total No. sold#	4565	0	0	0	5452
	No. sold with CC#	4565	0	0	0	5452
	% sold with CC	**100**	**0**	**0**	**0**	**100**
Caprice	Total No. sold#	701	0	0	0	842
	No. sold with CC#	701	0	0	0	842
	% sold with CC	**100**	**0**	**0**	**0**	**100**

Source: Holden Australia (sales data was not provided for VR model Commodores)
* Number sold up to December 2002
CC = Cruise Control
All figures represent the number of vehicles sold in NSW only.

Table A.9. Proportion of other Holden vehicles fitted with cruise control sold in NSW.

Model		Year					
		1997	1998	1999	2000	2001	2002
Vectra	Total No. sold*	949	2810	3353	2911	2637	2095
	No. sold with CC	949	2810	3353	2911	2637	2095
	% sold with CC	**100**	**100**	**100**	**100**	**100**	**100**
Astra	Total No. sold*	0	557	1123	2581	4072	5821
(CD, SRi, Equipe)	No. sold with CC	0	557	1123	2581	4072	5821
	% sold with CC	**0**	**100**	**100**	**100**	**100**	**100**
Barina SRi	Total No. sold*	0	0	0	0	0	509
	No. sold with CC	0	0	0	0	0	509
	% sold with CC	**0**	**0**	**0**	**0**	**0**	**100**

*Source: Holden Australia
CC = Cruise Control
All figures represent the number of vehicles sold in NSW only.

The proportion of Executive, Acclaim, Calais, Berlina (VR to VY), Statesman and Caprice (VS to WH) models sold in NSW that were fitted with a speed alerting system is displayed in Table A.10. As shown, where manual speed alerting systems have been fitted to the Commodore range, they have been equipped as a standard feature and therefore, 100% of these vehicles sold in NSW were equipped with a speed alerting system.

Table A.10. Proportion of Holden vehicles fitted with manual speed alert sold in NSW.

Model		Year					
		VR	VS	VT	VX	VY*	WH
Executive	Total No. sold#	0	40897	47136	25636	3207	0
	No. sold with SA	0	40897	47136	25636	3207	0
	% sold with SA	**0**	**100**	**100**	**100**	**100**	**0**
Acclaim	Total No. sold	0	12570	14276	9177	1562	0
	No. sold with SA	0	12570	14276	9177	1562	0
	% sold with SA	**0**	**100**	**100**	**100**	**100**	**0**
Berlina	Total No. sold	0	5217	9621	6255	1291	0
	No. sold with SA	0	5217	9621	6255	1291	0
	% sold with SA	**0**	**100**	**100**	**100**	**100**	**0**
Calais	Total No. sold	2253	2287	4729	3120	576	0
	No. sold with SA	2253	2287	4729	3120	576	0
	% sold with SA	**100**	**100**	**100**	**100**	**100**	**0**
Statesman	Total No. sold	0	4565	0	0	0	5452
	No. sold with SA	0	4565	0	0	0	5452
	% sold with SA	**0**	**100**	**0**	**0**	**0**	**100**
Caprice	Total No. sold	0	701	0	0	0	842
	No. sold with SA	0	701	0	0	0	842
	% sold with SA	**0**	**100**	**0**	**0**	**0**	**100**

Source: Holden Australia
*Number sold up to December 2002. SA = Speed Alert
All figures represent the total number of vehicles sold in NSW

Ford

Ford Australia provided information on the fitment of cruise control and manual speed alert devices to Falcon, Fairlane, LDT, Futura, Focus, Escape, Explorer, Mondeo and Probe models. Table A.11 displays the Ford models (and model series) that have cruise control and/or manual speed alert systems fitted and specifies whether these systems were standard or optional features of the model. As illustrated, manual speed alert devices have been fitted to a range of later model Ford vehicles and, where it has been fitted, it has been fitted as a standard feature. As with Toyota, Mitsubishi and Holden vehicles discussed earlier, cruise control is a more common feature on Ford vehicles than manual speed alerting devices. Cruise control has been fitted as a standard feature to the majority of Ford vehicles. Indeed, it has only been fitted as an optional feature on the BA model Falcons and Fairmont Wagons, on the AU Forte and on a number of the XR series Falcons.

Ford Australia also provided sales figures for the number of Falcon, Fairlane, LDT, Futura, Focus, Escape, Explorer, Mondeo and Probe models fitted with cruise control and manual speed alert that have been sold in NSW. Sales data for the Falcon range were provided according to model number, not according to year and thus, the sales data for these vehicles are presented in a separate table to the other Ford vehicles. Sales data for the Focus, Fairlane, LDT, Escape, Explorer, Falcon Ute, Mondeo and Probe models that have been fitted with cruise control was provided for the period 1993 to end of 2002. Manual speed alerting devices have not been fitted to Focus, Escape, Explorer, Mondeo and Probe models.

Table A.11. Cruise control and speed alert fitment to selected Ford vehicles.

Model	Cruise Control	Speed Alert
Fairmont		
EB	-	-
EBII	S	-
ED	S	-
EF	S	-
EL	S	-
AU	S	S
BA	S	S
Gli		
EB	-	-
EBII	O	O
ED	O	O
EF	-	-
EL	O	O
AU	-	-
BA	-	-
Ghia		
EB	-	-
EBII	S	-
ED	S	-
EF	S	S
EL	S	S
AU	S	S
BA	S	S
LDT		
EB	S	-
EBII	S	-
ED	S	-
EF	S	S
EL	S	S
AU	S	S
BA	S	S
Forte		
AU	O	S
Fairlane		
EB	S	-
EBII	S	-
ED	S	-
EF	S	S
EL	S	S
AU	S	S
BA	S	S
Futura		
ED	S	-
EF	S	-
EL	S	-
AU	S	S
BA	S	S
XR's		
EB	-	-
EBII	-	-
ED	O	-
EF	S	-
EL	O	-
AU	O	S
BA	S	S
Ford Focus (Ghia only)		
LR	S	-
Ford Escape		
BA	S	-
Ford Explorer		
UN	S	-
UP	S	-
US	S	-
UT	S	-
UX	S	-
Ford Falcon Ute		
AU	S	S
AU2	S	S
AU3	S	S
BA	S	S
XH	S	S
Ford Mondeo		
HA	S	-
HB	S	-
HC	S	-
HD	S	-
HE	S	-
Ford Mondeo V6		
HE	S	-
Ford Probe		
ST	S	-
SU	S	-
SV	S	-

S = Standard feature, O = Optional feature, - = Not fitted
Information supplied from Ford Australia (Info only provided for models shown from EB series onwards)

Table A.12 displays the number and proportion of Falcon models fitted with cruise control that were sold in NSW between 1997 and the end of 2002. As displayed, cruise control was fitted as a standard feature to Fairmont, Ghia, Futura and the current XR models and thus, the proportion of these models sold in NSW during the period shown was 100 percent. For the Gli, Forte and the earlier XR models, where cruise control is an optional feature, it was assumed that cruise control was fitted to 50 percent of automatic vehicles and 20 percent of manual vehicles. As displayed, based on this assumption, approximately 47 percent of these models sold in NSW have been fitted with a cruise control system.

Table A.12. Proportion of Ford Falcon vehicles fitted with cruise control sold in NSW.

Model		**Year**					
		1997	**1998**	**1999**	**2000**	**2001**	**2002**
Fairmont	Total No. sold*	3351	2480	3128	2596	1768	1710
	No. sold with CC#	3351	2480	3128	2596	1768	1710
	% sold with CC	**100**	**100**	**100**	**100**	**100**	**100**
Ghia	Total No. sold	1041	906	989	637	562	668
	No. sold with CC	1041	906	989	637	562	668
	% sold with CC	**100**	**100**	**100**	**100**	**100**	**100**
GLI	Total No. sold	13703	9720	62	0	0	0
	No. sold with CC	6440	4568	29	0	0	0
	% sold with CC	**47.00**	**47.00**	**46.77**	**0**	**0**	**0**
Forte	Total No. sold	0	4336.15	14595	12910.45	12061	9817.15
	No. sold with CC	0	2038	6859	6067	5668	4614
	% sold with CC	**0.00**	**47.00**	**47.00**	**46.99**	**46.99**	**47.00**
Futura	Total No. sold	6148	5715	4012	3637	2861	2704
	No. sold with CC	6148	5715	4012	3637	2861	2704
	% sold with CC	**100**	**100**	**100**	**100**	**100**	**100**
XR's	Total No. sold	818	908	1239	893	1296	1656
	No. sold with CC	385	427	582	420	609	1656
	% sold with CC	**47.00**	**47.00**	**47.00**	**47.00**	**47.00**	**100**

Source: VFACTS # Source: Ford Australia
CC = Cruise Control
All figures represent the number of vehicles sold in NSW only.

The number and proportion of Focus, Fairlane, LDT, Escape, Explorer, Falcon Ute, Mondeo and Probe models that have been fitted with cruise control that were sold in NSW is displayed in Table A.13. Where cruise control is fitted to these Ford vehicles, it is fitted as a standard feature, thus the proportion of these vehicles sold in NSW with this system fitted is 100 percent.

Table A.13. Proportion of other Ford vehicles fitted with cruise control sold in NSW.

Model		**Year**									
Other Fords		**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Focus (Ghia only)	Total No. sold#	0	0	0	0	0	0	0	0	0	194
	No. sold with CC#	0	0	0	0	0	0	0	0	0	194
	% sold with CC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**100**
LDT	Total No. sold	NA	NA	285	199	146	115	112	104	52	43
	No. sold with CC	NA	NA	285	199	146	115	112	104	52	43
	% sold with CC	**NA**	**NA**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Fairlane	Total No. sold	NA	NA	1800	1450	1435	1083	1570	972	807	767
	No. sold with CC	NA	NA	1800	1450	1435	1083	1570	972	807	767
	% sold with CC	**NA**	**NA**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Escape	Total No. sold	0	0	0	0	0	0	0	0	994	1262
	No. sold with CC	0	0	0	0	0	0	0	0	994	1262
	% sold with CC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**100**	**100**
Explorer	Total No. sold	0	0	0	212	1338	1228	634	524	485	654
	No. sold with CC	0	0	0	212	1338	1228	634	524	485	654
	% sold with CC	**0**	**0**	**0**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Falcon Ute	Total No. sold	0	0	0	2833	2558	2369	3672	4794	5934	6259
	No. sold with CC	0	0	0	2833	2558	2369	3672	4794	5934	6259
	% sold with CC	**0**	**0**	**0**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mondeo	Total No. sold	0	0	998	1586	1439	930	374	416	208	8
	No. sold with CC	0	0	998	1586	1439	930	374	416	208	8
	% sold with CC	**0**	**0**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Probe	Total No. sold	0	161	273	141	111	13	0	0	0	0
	No. sold with CC	0	161	273	141	111	13	0	0	0	0
	% sold with CC	**0**	**100**	**100**	**100**	**100**	**100**	**0**	**0**	**0**	**0**

* Source: VFACTS # Source: Ford Australia
CC = Cruise Control, NA = Information not supplied by Manufacturer
All figures represent the number of vehicles sold in NSW only.

Table A.14 displays the number and proportion of Falcon models fitted with manual speed alerting devices that were sold in NSW between the years 1997 and the end of 2002. Manual speed alerting systems have been fitted as a standard feature to the Falcon range vehicles from the AU series onwards and hence, the proportion of these vehicles sold in NSW from the AU series onwards was 100 percent. Manual speed alerting systems were only equipped to the Fairmont and the Ghia models in the EF and EL series vehicles. Thus, these models were the only models in the Falcon range sold during 1997 that were fitted with this system. During 1998, only approximately 34 percent of the Falcons sold were the AU series models and the remainder were the EL models. As manual speed alerting systems were not equipped to the EL model Fortes, Futuras and XR's, it was assumed that only 34 percent of these model vehicles sold in 1998 were fitted with a manual speed alerting system (this system was a standard feature of the AU series Falcons). Falcon Gli model vehicles have not been fitted with manual speed alerting systems.

Table A.14. Proportion of Ford Falcon vehicles fitted with manual speed alert sold in NSW.

Model		**Year**					
		1997	**1998**	**1999**	**2000**	**2001**	**2002**
Fairmont	Total No. sold*	3351	2480	3128	2596	1768	1710
	No. sold with SA#	3351	2480	3128	2596	1768	1710
	% sold with SA	**100**	**100**	**100**	**100**	**100**	**100**
Ghia	Total No. sold	1041	906	989	637	562	668
	No. sold with SA	1041	906	989	637	562	668
	% sold with SA	**100**	**100**	**100**	**100**	**100**	**100**
GLI	Total No. sold	13703	9720	62	0	0	0
	No. sold with SA	0	0	0	0	0	0
	% sold with SA	**0**	**0**	**0**	**0**	**0**	**0**
Forte	Total No. sold	0	4336	14595	12910	12061	9817
	No. sold with SA	0	1474	14595	12910	12061	9817
	% sold with SA	**0**	**34**	**100**	**100**	**100**	**100**
Futura	Total No. sold	6148	5715	4012	3637	2861	2704
	No. sold with SA	0	1943	4012	3637	2861	2704
	% sold with SA	**0**	**34**	**100**	**100**	**100**	**100**
XR's	Total No. sold	818	908	1239	893	1296	1656
	No. sold with SA	0	309	1239	893	1296	1656
	% sold with SA	**0**	**34**	**100**	**100**	**100**	**100**

* Source: VFACTS # Source: Ford Australia
SA = Speed Alert
All figures represent the number of vehicles sold in NSW only.

The proportion of Ford LDT, Fairlane and Falcon Ute models sold in NSW that were fitted with a manual speed alerting system is displayed in Table A.15. As displayed, where manual speed alerting systems have been fitted to these Ford models, they have been equipped as a standard feature and therefore, 100% of these vehicles sold in NSW were equipped with a speed alerting system.

Table A.15. Proportion of other Ford vehicles fitted with manual speed alert sold in NSW.

Model		Year							
		1995	1996	1997	1998	1999	2000	2001	2002
LDT	Total No. sold*	285	199	146	115	112	104	52	43
	No. sold with SA#	285	199	146	115	112	104	52	43
	% sold with SA	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Fairlane	Total No. sold*	1800	1450	1435	1083	1570	972	807	767
	No. sold with SA#	1800	1450	1435	1083	1570	972	807	767
	% sold with SA	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Falcon Ute	Total No. sold#	0	2833	2558	2369	3672	4794	5934	6259
	No. sold with SA#	0	2833	2558	2369	3672	4794	5934	6259
	% sold with SA	**0**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* Source: VFACTS
SA = Speed Alert
All figures represent the number of vehicles sold in NSW only.

Aftermarket Fitment of Cruise Control and Manual Speed Alerting Devices

The Australian Automotive Aftermarket Association and several aftermarket automotive suppliers were contacted to obtain information on the feasibility of retrofitting cruise control and manual speed alerting devices as aftermarket products. While these suppliers and industry contacts said that these devices can be easily obtained and fitted as aftermarket products, it is very difficult to determine the number or composition of vehicles that are fitted with these devices aftermarket, as there are many variants of aftermarket cruise control and manual speed alerting systems available and these can be fitted either by a professional or purchased from an automotive retailer and fitted by the drivers themselves.

The aftermarket fitment of cruise control is popular among motorists. Indeed, one of the leading suppliers of aftermarket cruise control systems in NSW sells approximately 500 to 600 cruise control units per month in NSW. There are a number of ways in which aftermarket cruise control devices can be purchased and installed in vehicles. Aftermarket cruise control systems can be purchased from and installed by car dealers, either when the car is new, or the device can be purchased through the dealer's spare parts department. These cruise control systems are usually designed and built to the vehicle manufacturer's specifications. Many people choose to purchase a cruise control system and have it fitted aftermarket by a car dealer, as this can be less expensive than purchasing the system as an optional feature on a new vehicle from the manufacturer. Aftermarket cruise control systems can also be purchased as fully installed units that are fitted by a professional, trained installer or mechanic and are usually available in the vehicle owner's choice of control switches (e.g., stalk control or steering wheel switches). To purchase and have a cruise control system fully installed can cost anywhere between $500 and $800 depending on the type of system and vehicle it is fitted to. Finally, aftermarket cruise control can even be purchased off the shelf as D.I.Y. kits at automotive suppliers such as Autobarn or Repco and either installed by a mechanic or by the driver.

The aftermarket fitment of manual speed alerting systems is not as popular as the fitment of aftermarket cruise control systems, most likely because these systems are typically a standard feature on many new cars. Aftermarket manual speed alerting systems can be purchased from and installed by professional suppliers or they can be purchased from automotive retailers and installed by vehicle owners. To purchase and have a manual speed alerting system fully installed by a supplier or mechanic typically costs around $200 to $300 depending on the type of system purchased and vehicle it is fitted to.

Summary

Cruise control and manual speed alerting devices have been fitted to a range of vehicle models. As the proportion of vehicles fitted with cruise control and manual speed alert devices differs significantly across vehicle makes and models, it is difficult to draw conclusions as to what proportion of vehicles in NSW are fitted with cruise control and manual speed alerting systems based on the information examined. As discussed earlier, this information could be more accurately obtained through a survey of NSW motorists. Based on the data examined however, it is possible to draw conclusions regarding some of the general trends in the fitment of these devices to vehicles over the last decade. In general, cruise control systems appear to be a more common feature on vehicles (e.g., it is fitted to a wider range of models) than manual speed alerting systems. However, when speed alerting systems are fitted to vehicles, they are typically fitted as a standard feature. Cruise control, on the other hand, is often only fitted as a standard feature to the more expensive models and model variants, and is fitted as an optional feature to the less expensive models, although there is a general trend towards cruise control being equipped as a standard feature to new model cars spanning the entire price range. Moreover, the proportion of vehicles fitted with cruise control and manual speed alerting systems in NSW appears to have increased over the last 5 to 6 years. The type of fitment of these devices to vehicles may have implications for whether drivers use the devices properly or at all and on their acceptance of these systems. For example, if these devices are simply fitted as a standard feature to a vehicle and are not sought after or requested, then drivers may be less inclined to use them, or may not use them properly or in the manner intended.

The fitment of cruise control as an aftermarket product is also popular among motorists. Aftermarket cruise control systems can be purchased from and installed by car dealers, or as fully installed units that are fitted by a professional installer, or they can be purchased off the shelf as D.I.Y. kits at automotive suppliers such as Autobarn or Repco and either installed by a mechanic or by the driver. The aftermarket fitment of manual speed alerting systems is not as popular as the fitment of aftermarket cruise control systems, most likely because these systems are often a standard feature on new cars.

APPENDIX B. RECRUITMENT TELEPHONE SURVEY

MAA Cruise Control and Manual Speed Alert Telephone Recruitment Survey

Section A: Introduction | Section B: Technologies | Section C: Focus Group Recruitment | Section D: Result of Call

Section A: Introduction

Phone Number: ____

Participant Code: ____

"Hi. My name is XXXXX from the Monash University Accident Research Centre. We are doing important research that could help cut the road toll in NSW. We are looking for drivers aged 25 to 49 to take part in a short discussion group on cruise control and manual speed alert systems.

Your phone number was randomly generated from the WhitePages and I was wondering if there is a driver aged 25 to 49 in your household who may be interested in coming along to one of the groups?"

If Refusal.... "Thanks anyway, Goodbye" END OF CALL - GO TO SECTION D

If need to call back.... "What is the best contact number and time to call you back?" Best Call Back Number: ____ Best Call Back Time: ____

If Agree.... "Thanks, that's great." GO TO QUESTION A.1

A.1 "Can you please tell me your age in years?" ____

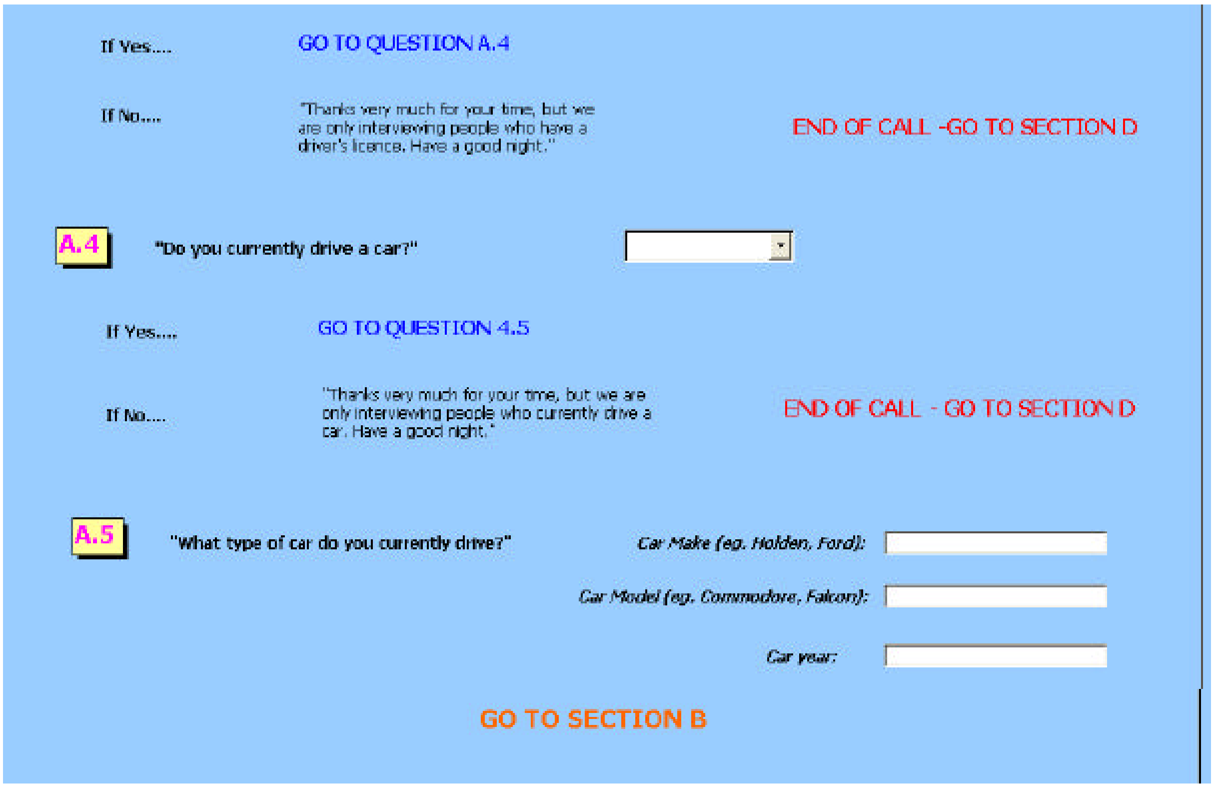
If not aged between 25 and 49.... "Thanks very much for your time, but we are only interviewing people between the ages of 25 and 49. Goodbye." END OF CALL - GO TO SECTION D

If correct age.... GO TO QUESTION A.2

A.2 Enter sex of interviewee (Should not need to ask): ____

GO TO QUESTION A.3

A.3 "Do you hold a current car driver's licence?" ____



If Yes.... GO TO QUESTION A.4

If No.... "Thanks very much for your time, but we are only interviewing people who have a driver's licence. Have a good night." END OF CALL -GO TO SECTION D

A.4 "Do you currently drive a car?"

If Yes.... GO TO QUESTION 4.5

If No.... "Thanks very much for your time, but we are only interviewing people who currently drive a car. Have a good night." END OF CALL - GO TO SECTION D

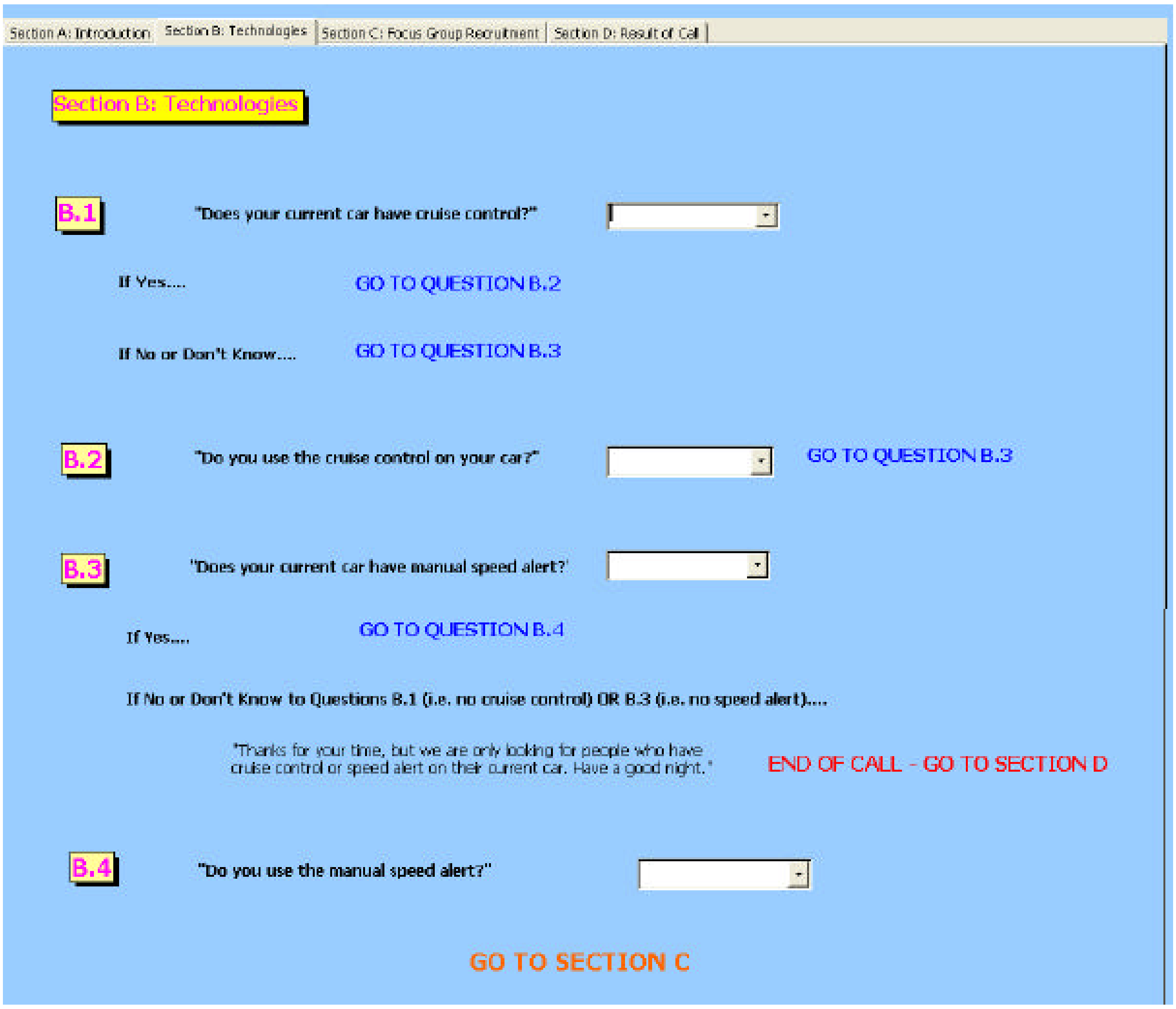
A.5 "What type of car do you currently drive?"

Car Make (eg. Holden, Ford):

Car Model (eg. Commodore, Falcon):

Car year:

GO TO SECTION B



Section A: Introduction | Section B: Technologies | Section C: Focus Group Recruitment | Section D: Result of Call

Section B: Technologies

B.1 "Does your current car have cruise control?"

If Yes.... GO TO QUESTION B.2

If No or Don't Know.... GO TO QUESTION B.3

B.2 "Do you use the cruise control on your car?" GO TO QUESTION B.3

B.3 "Does your current car have manual speed alert?"

If Yes.... GO TO QUESTION B.4

If No or Don't Know to Questions B.1 (i.e. no cruise control) OR B.3 (i.e. no speed alert)....

"Thanks for your time, but we are only looking for people who have cruise control or speed alert on their current car. Have a good night." END OF CALL - GO TO SECTION D

B.4 "Do you use the manual speed alert?"

GO TO SECTION C

Section A: Introduction | Section B: Technologies | Section C: Focus Group Recruitment | Section D: Result of Call

Section C: Focus Group Recruitment

As I mentioned at the start of the survey, we are taking this opportunity to invite people to take part in a group discussion on what people think about cruise control and manual speed alert systems and why people do or do not use them.

The discussion will be in a small group and will take around 1 1/2 to 2 hours. Those who take part will be offered $50 to compensate them for their time and travel expenses. Sessions are being conducted at the Country Comfort Hotel in Wagga Wagga sometime in late June.

So if you are interested in taking part, we are taking contact details now and in a couple of weeks, one of our staff will contact you to organise a session time. Even if you say yes now, you can still change your mind. All of your details will be kept confidential.

"So, can I add your name to our list?"

If Yes.... GO TO QUESTION C.1

If No.... END OF CALL - GO TO SURVEY CLOSE

C.1 "Can I have your name please, your first name will be fine?"

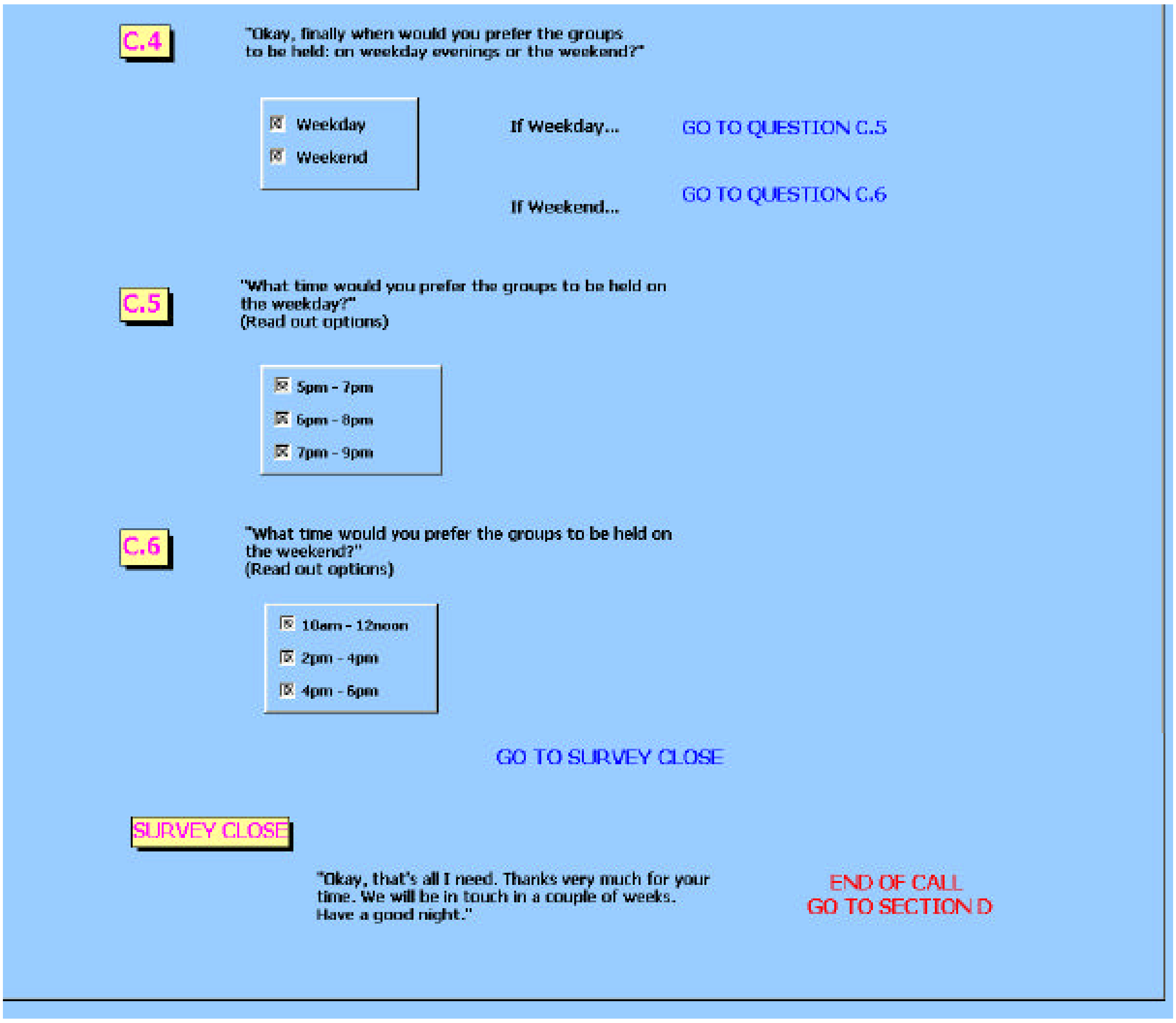
GO TO QUESTION C.2

C.2 "Can I have your contact phone number please?"

GO TO QUESTION C.3

C.3 "When is the best time to contact you on that number?"

GO TO QUESTION C.4



C.4

"Okay, finally when would you prefer the groups to be held: on weekday evenings or the weekend?"

- ☒ Weekday
- ☒ Weekend

If Weekday... GO TO QUESTION C.5

If Weekend... GO TO QUESTION C.6

C.5

"What time would you prefer the groups to be held on the weekday?"
(Read out options)

- ☒ 5pm - 7pm
- ☒ 6pm - 8pm
- ☒ 7pm - 9pm

C.6

"What time would you prefer the groups to be held on the weekend?"
(Read out options)

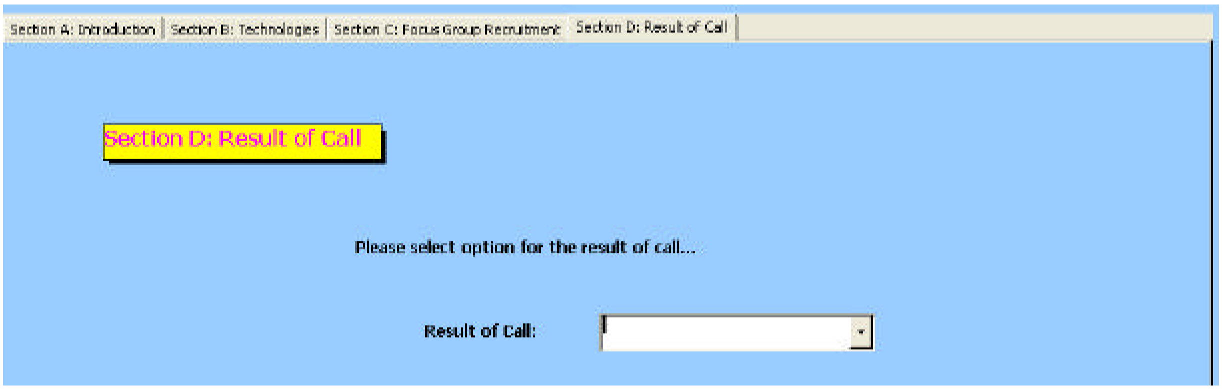
- ☒ 10am - 12noon
- ☒ 2pm - 4pm
- ☒ 4pm - 6pm

GO TO SURVEY CLOSE

SURVEY CLOSE

"Okay, that's all I need. Thanks very much for your time. We will be in touch in a couple of weeks. Have a good night."

END OF CALL
GO TO SECTION D



Section A: Introduction | Section B: Technologies | Section C: Focus Group Recruitment | Section D: Result of Call

Section D: Result of Call

Please select option for the result of call...

Result of Call:

APPENDIX C. EXPLANATORY STATEMENT AND CONSENT FORM

Explanatory Statement

Use of Manual Speed Alerting and Cruise Control Devices by NSW Drivers

Dr. Michael Regan of the Monash University Accident Research Centre in Clayton, Victoria is conducting research investigating the use of manual speed alerting and cruise control systems among NSW drivers. While these systems have the potential to reduce the incidence and severity of speed-related crashes, they are unlikely to have a positive effect on driver behaviour if they are not widely used by drivers or deemed acceptable to them. It is important, therefore, that the further design and development of these systems be accompanied by research to investigate factors that influence their use and acceptability among groups of road users.

To be eligible to participate you must be aged 17 years of age or over; hold a valid car drivers licence and drive a car equipped with a manual speed alerter and/or a cruise control system.

If you agree to take part in the project, you will be asked to participate in a small discussion group, which will be led by an experienced and trained researcher. The discussion group will begin with an explanation of the rationale behind the project, and some detail about the types of manual speed alert and cruise control devices that are equipped to cars. This will be followed by administration of a short questionnaire to gather some background information on your driving experience and experience with technologies. Some examples of the questions you will be asked in the questionnaire are: ‘How old were you when you were first licensed to drive a car?’ and “In the last 12 months have you been booked for speeding?’. This will be followed by a group discussion of views relating to the use and acceptability of these systems. The group discussion will take approximately 2 hours. You will be offered $50 to compensate you for your time and any expenses involved in travelling to the session.

As focus group participation is a public event involving several members, the confidentiality of any information provided during the actual discussion cannot be guaranteed. However, no findings that could identify any individual participant will be published. The information obtained from the questionnaire will be held confidentially. Only members of the research group will see the information you provide. To ensure the accurate recording of information, the discussion group will be video-taped, but the tapes will be erased at the end of the project. No names or identifying information will be put into any written records of the group discussion. All other data from this project will be kept at the Monash University Accident Research Centre. Only members of the research group will have access to this data, which must be stored for five years under university regulations, without any identifying information.

Participation in this research is entirely voluntary, and you are free to withdraw at any time and for any reason. If you are happy to participate could you please read the attached consent form and bring it with you to your discussion group. At the commencement of the discussion group you will be asked to sign your consent form. If you are under 18 years of age, you are also required to gain the consent of your parents/guardians to attend the focus group. Please give them the attached Parent/Guardian Explanatory Statement and Consent Form to read and sign and bring this signed consent form with you to your focus group.

If you have any queries, or would like to be informed of the aggregate research findings, please do not hesitate to contact me on telephone (03) 9905 1838 or email michael.regan@general.monash.edu.au. Alternatively, you can contact Kristie Young on telephone (03) 9905 1258 or email kristie.young@general.monash.edu.au.
You can complain about the study if you do not like something about it. To complain about the study, you need to phone (03) 9905 2052. You can then ask to speak to the secretary of the Human Ethics Committee and tell him or her that the number of the project is 2003/033**.** You could also write to the secretary. This person's address is:

The Secretary
The Standing Committee on Ethics in Research Involving Humans
Monash University
Clayton Victoria 3800
Telephone (03) 9905 2052 Fax (03) 9905 1420
Email: SCERH@adm.monash.edu.au

Thank you

Dr Michael Regan
Senior Research Fellow

Consent Form

Use of Manual Speed Alerting and Cruise Control Devices by NSW Drivers

I agree to take part in the above Monash University research project. I have had the project explained to me, and I have read the Explanatory Statement, which I keep for my records. I understand that agreeing to take part means that I am willing to:

- Take part in a discussion group concerning the acceptability of manual speed alerting and cruise control devices, and
- Allow the group discussion to be videotaped.

I understand that focus group participation is a public event and therefore the confidentiality of any information provided cannot be guaranteed. However, any information that could lead to the identification of any individual will not be disclosed in any reports on the project, or to any other party.

I also understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalised or disadvantaged in any way.

Participant's Name:………………………………………………….. (Please print)

Signature:…………………………………………………….. Date:……………

APPENDIX D. MODERATOR'S DISCUSSION GUIDE

CRUISE CONTROL/SPEED ALERT FOCUS GROUP – DISCUSSION GUIDE

1. **Why do you use the cruise control/speed alert system?**
    - Avoid speeding fines?
    - Make me/passengers safer?
    - Avoid fatigue?
    - All of the above?
    - Other?

2. **When do you use the cruise control/speed alert system?**
    - Day/night? Why?
    - No traffic around? Why?
    - Police around? Why?
    - Work/private driving? Why?
    - When driving alone/with passengers? Why?
    - Other?

3. **Where do you use the cruise control/speed alert system?**
    - Speed zones (e.g. 60 km/h)? why?
    - Road types (arterial, freeway, urban)? Why?
    - Geographic location (Vic, NSW)? Why?
    - Temporary speed changes (road works)? Why?
    - Other?

4. **How do you use the cruise control/speed alert system?**
    - **How did you learn?** (trial and error, operators manual, shown by someone else, other?)
    - **How do you program it?**
        - ***Kilometre threshold*** (set it above, at or below limit)
        - ***Operation sequence*** (what do you press, in what order, *do you know all the functionality*?)
        - ***How do you respond when system is activated?*** (CC: don't brake to deactivate system around corners; SA: slow immediately when audio alarm sounds e.g. forget to slow after hearing audio alarm)

5. **Who uses the cruise control/speed alert system?**
    - **Do your passengers interact with the system? How? When? Where?**

      What do your passengers think about the system?
        - Useful?
        - Effective?
        - Usable?
        - Annoying?

- **How do your passengers react to the system when it is activated/de-activated?**
  - Remind you if alarm sounds and you ignore it?
  - Yell at you if you go fast around corners with the CC on?
- **Do you think that the cruise control/speed alert system should be better designed so that passengers and drivers can program them?**

6. **How acceptable is the cruise control/speed alert system?**

- **How effective is the cruise control/speed alert system in helping you keep at, below or above the speed limit? When? Where? Why?**
- **When you drive a car without cruise control/speed alert, do you drive any differently?**
- **How useful is the system? Why? When? Where?**
- **Usability:**
  - Easy to learn?
  - Easy to use?
  - Errors when programming?
  - Satisfied with look, feel, and sound of system?
- **Affordability:**
  - If optional, how much would you be willing to pay for it?
- **How reliable is the system?**

7. **[USERS ONLY] Why don't you use the cruise control/speed alert system?**
   - Why not? E.g. no speed cameras
   - When not? E.g. lots of traffic
   - Where not? E.g. short trips, freeways
   - Not acceptable?
   - Other?

8. **[NON-USERS] Why don't you use the cruise control/speed alert system?**

   - All of the above (Q7)
   - Hardly ever drive
   - Spouse does driving and users system
   - System is broken
   - other

9. **If you could design the ideal cruise control/speed alert system, how would you design it?**

APPENDIX E. FOCUS GROUP QUESTIONNAIRE

Participant code: [ ]

Date: [ ]

MONASH UNIVERSITY
Accident Research Centre

Use of Manual Speed Alert and Cruise Control Devices by Drivers in NSW

Questionnaire

Thank you for coming along today. Your involvement is greatly appreciated. We would be grateful if you could take a few minutes to answer the following questions. We are interested in your honest opinion, and remember, all of the information that you provide will be kept confidential.

Part A - Personal Details

1. What is your age in years? [ ]

2. Are you male or female? [ ] Male [ ] Female

3. Are you:

- [ ] A student in secondary education
- [ ] A student in tertiary education
- [ ] In full time employment
- [ ] In part time employment
- [ ] Involved in full time home duties
- [ ] Unemployed
- [ ] Other, please specify [ ]

4. If you are in Full time or Part time employment, what type of work do you do?

[ ]

5. What is the highest level of education you have so far completed?

- ☐ Currently in Year 11 or 12
- ☐ Year 11 or less – did not complete Year 12
- ☐ Year 12 or equivalent
- ☐ Trade certificate
- ☐ Other certificate
- ☐ Associate diploma
- ☐ Bachelor's degree
- ☐ Honours year or Graduate diploma
- ☐ Masters and/or PhD
- ☐ Other, Please specify ______

6. What type of car do you currently drive?

Make: ______

Model: ______

Year: ______

7. Does your current car have cruise control?

☐ Yes ☐ No

8. If YES, do you use it?

☐ Yes ☐ No

9. Does your current car have manual speed alert?

☐ Yes ☐ No

10. If YES, do you use it?

☐ Yes ☐ No

11. If you have it, how was the cruise control fitted to your car?

Standard Feature ☐ Retrofitted by yo ☐

Optional fit by dealer ☐ Retrofitted by other person (e.g. auto mechanic) ☐

Other, Please specify ☐

12. If you have it, how was the manual speed alert fitted to your car?

Standard Feature ☐ Retrofitted by yo ☐

Optional fit by dealer ☐ Retrofitted by other person (e.g. auto mechanic) ☐

Other, Please specify ☐

Part B – Driving experience, travel patterns and driving record

1. Do you currently hold a Probationary or a Full car driver's licence?

☐ Probationary ☐ Full

2. How old were you when you were first licensed to drive a car (i.e. when you received your **probationary** licence)?

☐

3. On average, how many hours do you spend driving a car each week, including weekends, for work purposes? This includes the time that you spend driving to and from work.

☐

4. On average, how many hours do you spend driving a car each week, including weekends, for private purposes?

[ ]

5. In the last 2 years have you been caught/booked for speeding?

[ ] Yes [ ] No

If YES, on how many occasions? [ ]

6. Have you ever been involved in a crash in which speed was a contributing factor?

[ ] Yes [ ] No

Part C – Use of Technologies

1. Of the following in-vehicle technologies, which ones have you used before (you can tick more than one response)?

[ ] Route navigation [ ] Adaptive cruise control

[ ] Reverse parking aid [ ] Daytime running lights

[ ] Speed limiter

Of the technologies that you have used, which ones would you like to use again?

[ ]

2. On average, how often do you access each of the following facilities:

Email?

- ☐ Several times a day
- ☐ Once a day
- ☐ Once every two/three days
- ☐ Once a week
- ☐ Less than once a week
- ☐ Never

Internet?

- ☐ Several times a day
- ☐ Once a day
- ☐ Once every two/three days
- ☐ Once a week
- ☐ Less than once a week
- ☐ Never

Telephone banking?

- ☐ Several times a day
- ☐ Once a day
- ☐ Once every two/three days
- ☐ Once a week
- ☐ Less than once a week
- ☐ Never

Automatic teller machine?

- [ ] Several times a day
- [ ] Once a day
- [ ] Once every two/three days
- [ ] Once a week
- [ ] Less than once a week
- [ ] Never

Cable television (e.g. Foxtel)?

- [ ] Several times a day
- [ ] Once a day
- [ ] Once every two/three days
- [ ] Once a week
- [ ] Less than once a week
- [ ] Never

6. Which of the following do you own (you can tick more than one)?

[ ] Personal computer/laptop	[ ] Play station (or similar)
[ ] Mobile phone	[ ] WAP enabled mobile phone
[ ] CD writer and/or Zip drive	[ ] Digital camera
[ ] PDA (e.g. Compaq iPAQ)	[ ] DVD player

Part D - Attitudes Towards Speeding

1. To what extent do you agree or disagree with each of the following statements. (The boxes give a scale from strongly disagree on the left to strongly agree on the right)

(a) Speeding is always wrong

☐	☐	☐	☐	☐
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

(b) It makes sense to exceed speed limits to get ahead of Sunday drivers

☐	☐	☐	☐	☐
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

(c) If you are a good driver it is acceptable to drive a little faster

☐	☐	☐	☐	☐
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

(d) When road conditions are good and nobody is around driving in excess of 100 km/h in an 80 km/h zone is okay

☐	☐	☐	☐	☐
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

(e) I will ride as a passenger with someone who speeds if others are also in the car

☐	☐	☐	☐	☐
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

(f) It is okay to exceed the speed limit if you are driving safely

☐	☐	☐	☐	☐
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

(g) If you increase your driving speed by 5 km/h you are significantly more likely to be involved in a crash

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

(h) A crash at 70 km/h will be a lot more severe than a crash at 60 km/h

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

(i) It is easy to avoid being caught speeding

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

(j) It doesn't bother me if other people speed

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

(k) It is safe to speed on roads that are familiar

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

(l) Speeding enforcement is more for revenue raising than for safety

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

(m) Speed limits are too low – it is usually safe to drive faster than the speed limit

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

(n) People who exceed speed limits are a major contributor to crashes

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

Part E - Attitudes Towards ISA and other ITS

1. I would like a car:

(a) that displays to me inside the car at all times the current speed limit

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

(b) that automatically warns me if I am exceeding the speed limit

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

(c) that automatically stops me from exceeding the speed limit

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

(d) that automatically stops me from exceeding the speed limit and, in addition, slows my vehicle when driving conditions are unsafe (e.g., around curves, bad weather)

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

(e) with a cruise control system that not only lets me set the cruise speed, but also automatically slows my vehicle down and adopts a safe following distance when I approach a vehicle ahead that is travelling more slowly than my car

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

Part F - Awareness of Road Safety Issues

1. How often do you think speeding contributes to road crashes?

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Very often

2. In your opinion and regardless of what the law states, how safe or dangerous are each of these situations?

(a) Travelling at 55 km/h in a 50 km/h zone

☐ Very dangerous ☐ Dangerous ☐ Neither safe nor dangerous ☐ Safe ☐ Very safe

(b) Travelling at 65 km/h in a 60 km/h zone

☐ Very dangerous ☐ Dangerous ☐ Neither safe nor dangerous ☐ Safe ☐ Very safe

(c) Travelling at 105 km/h in a 100 km/h zone

☐ Very dangerous ☐ Dangerous ☐ Neither safe nor dangerous ☐ Safe ☐ Very safe

(d) Travelling at 60 km/h in a 50 km/h zone

☐ Very dangerous ☐ Dangerous ☐ Neither safe nor dangerous ☐ Safe ☐ Very safe

(e) Travelling at 70 km/h in a 60 km/h zone

☐ Very dangerous ☐ Dangerous ☐ Neither safe nor dangerous ☐ Safe ☐ Very safe

(f) Travelling at 110 km/h in a 100 km/h zone

☐ Very dangerous ☐ Dangerous ☐ Neither safe nor dangerous ☐ Safe ☐ Very safe

3. Regardless of what the law states, in a **50 km/h zone** how many km/h over the limit do you think you have to be before **you** consider yourself to be speeding (tick only one response)?

- ☐ Anything over 50 km/h
- ☐ 1-5 km/h over the limit
- ☐ 6-10 km/h over the limit
- ☐ 11-15 km/h over the limit
- ☐ 16-20 km/h over the limit
- ☐ 21-30 km/h over the limit
- ☐ More the 30 km/h over the limit
- ☐ Don't know

4. Regardless of what the law states, in a **60 km/h zone** how many km/h over the limit do you think you have to be before **you** consider yourself to be speeding (tick only one response)?

- ☐ Anything over 60 km/h
- ☐ 1-5 km/h over the limit
- ☐ 6-10 km/h over the limit
- ☐ 11-15 km/h over the limit
- ☐ 16-20 km/h over the limit
- ☐ 21-30 km/h over the limit
- ☐ More the 30 km/h over the limit
- ☐ Don't know

5. Regardless of what the law states, in a **100 km/h zone** how many km/h over the limit do you think you have to be before **you** consider yourself to be speeding (tick only one response)?

- ☐ Anything over 100 km/h
- ☐ 1-5 km/h over the limit
- ☐ 6-10 km/h over the limit
- ☐ 11-15 km/h over the limit
- ☐ 16-20 km/h over the limit
- ☐ 21-30 km/h over the limit
- ☐ More the 30 km/h over the limit
- ☐ Don't know

6. What are the **top three** factors influencing the speed at which you drive (tick <u>three</u> boxes only)?

- ☐ The road and weather conditions
- ☐ My chances of having a crash
- ☐ My chances of being caught
- ☐ The speed of other traffic
- ☐ The volume of traffic on the particular road
- ☐ The speed limit
- ☐ How much of a hurry I am in
- ☐ Other, Please specify ____________
- ☐ Don't Know

7. Which of the following road safety advertising campaigns are you aware of (you can tick more than one response)?

- ☐ 'Please Slow Down'/Wipe off 5
- ☐ 'Safe Speeding – There is no such Thing'
- ☐ Arrive Alive
- ☐ Speed Blitz/Speed Blitz Blues Cricket Team
- ☐ Your doing $197 – How fast are you going now?
- ☐ Road safety 2010

8. By how much can you exceed the speed limit before being booked by the police? (tick only one response)

- ☐ 1 km/h
- ☐ 3 km/h
- ☐ Don't know
- ☐ 10% of speed limit
- ☐ Other, Please specify ______

9. What is the likelihood of being caught by the police for: (The boxes give a scale from very unlikely on the left to very likely on the right.)

(a) Travelling 5 km/h over the speed limit

☐	☐	☐	☐	☐
Very unlikely	Unlikely	Neither likely nor unlikely	Likely	Very likely

(b) Travelling 10 km/h over the speed limit

☐	☐	☐	☐	☐
Very unlikely	Unlikely	Neither likely nor unlikely	Likely	Very likely

(c) Travelling 20 km/h over the speed limit

☐ Very unlikely ☐ Unlikely ☐ Neither likely nor unlikely ☐ Likely ☐ Very likely

10. The current fine for a driver who is caught exceeding the speed limit by less than 15 km/h is **$123**. Do you think that the current fine is:

☐ Far too low ☐ Too low ☐ About right ☐ Too high ☐ Far too high

Part G - Attitudes towards other countermeasures for moderating speed

1. In your opinion, how effective are each of the following measures in influencing you to keep to the speed limit? (The boxes give a scale from very ineffective on the left to very effective on the right)

(a) Penalties (e.g. fines, demerit points)

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

(b) Speed cameras

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

(c) Speed humps

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

(d) Roundabouts

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

(e) Speed signs

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

(f) Advertising

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

(g) In-car technologies that warn you if you are exceeding the speed limit

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

(h) Speed guns

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

(i) Police car presence

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

(j) Traffic islands

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

(k) In-car speed alerters that allow you to manually set the speed at which you want the system to alert you

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

(l) Cruise control systems

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

(m) In-car technologies that automatically prevent you from exceeding the speed limit

☐ Very ineffective ☐ Ineffective ☐ Neither effective nor ineffective ☐ Effective ☐ Very effective

END OF QUESTIONNAIRE

Thank you very much for your time and participation.

APPENDIX F. SAMPLE FUNCTIONALITY CHECKLIST

Functionality Checklist

Holden – Cruise Control

SET CRUISE SPEED

1. Turn cruise **on** (press ON-OFF/CANCEL button once) and **off** (press ON-OFF/CANCEL button twice)?

YES ☐ **NO** ☐

2. Set cruise speed by accelerating to desired speed and then rotating stalk downwards once?

YES ☐ **NO** ☐

INCREASE CRUISE SPEED

3. Increase cruise speed while system is on, by rotating the stalk upwards/holding it up?

YES ☐ **NO** ☐

OR

4. Increase cruise speed by turning off cruise system and resetting cruise speed from scratch?

YES ☐ **NO** ☐

DECREASE CRUISE SPEED

5. Decrease cruise speed while system is on by rotating the stalk downwards/holding it down?

YES ☐ **NO** ☐

OR

6. Decrease cruise speed by turning off cruise system and resetting cruise speed from scratch?

YES ☐ **NO** ☐

<u>DEACTIVATE CRUISE CONTROL</u>

7. Deactivate the cruise control by pressing the 'Cancel' button on the end of the stalk once?

YES ☐ **NO** ☐

<u>OR</u>

8. Deactivate the cruise control by pressing the brake (or Clutch)? **YES** ☐ **NO** ☐

<u>REACTIVATE CRUISE CONTROL</u>

9. Rotate the stalk upwards once to the RES/ACCEL position to reset the cruise system to the last set cruise speed after deactivating the system?

YES ☐ **NO** ☐

<u>OR</u>

10. Turn off cruise control system and reset cruise speed from scratch?

YES ☐ **NO** ☐

Functionality Checklist

Holden – Speed Alert

No. of focus group participants with the system: ☐

1. Set speed at which you want to be alerted by pressing the MODE button 3 times until 'overspeed' is displayed on the trip computer, then press the up or down arrow buttons to increase or decrease speed?

YES ☐ **NO** ☐

<u>OR</u>

2. Set speed at which you want to be alerted by pressing the MODE button 3 times until 'overspeed' is displayed on the trip computer and then pressing both the up and down arrow buttons together?

YES ☐ **NO** ☐

3. Set the speed at which you want to be alerted using the 'overspeed presets' (by holding the MODE button down for 2 seconds until 'overspeed preset' is displayed on the trip computer display. Then use the up and down arrows to select the desired preset speed [4 presets]).

YES ☐ **NO** ☐

APPENDIX G. FOCUS GROUP QUESTIONNAIRE RESULTS

Focus Group Questionnaire – Summary of Results

The purpose of the focus group questionnaire was to obtain information regarding the participants' demographic details, including details about their occupation and level of education, their driving experience and their experience with and use of in-vehicle ITS and other technologies (e.g., DVD's). The questionnaire also obtained information on the participants' attitudes towards speeding, speed-related ITS technologies and other speeding countermeasures and their awareness of road safety issues. In order to explore any differences between the rural and metropolitan participants, the results of the questionnaire will be reported separately for metropolitan and rural.

Occupation, Work Type and Level of Education

As part of the questionnaire, participants were asked two questions regarding their current occupation and one question about the highest level of education they have completed.

Wagga Wagga - Occupation

As illustrated in Figure F.1, 75% of the rural participants were in full time employment, while the other 25% were in part time employment. None of the participants indicated that were students, unemployed, or involved in full time home duties.

Sydney - Occupation

Figure F.2 displays the percentage of metropolitan focus group participants as a function of occupation. As illustrated, the metropolitan participants were involved in a wider range of occupations than the rural participants. A total of 10.5% of the participants were tertiary education students, 73.7% were in full time employment, 5.3% were in part time employment and 10.5% were involved in full time home duties.

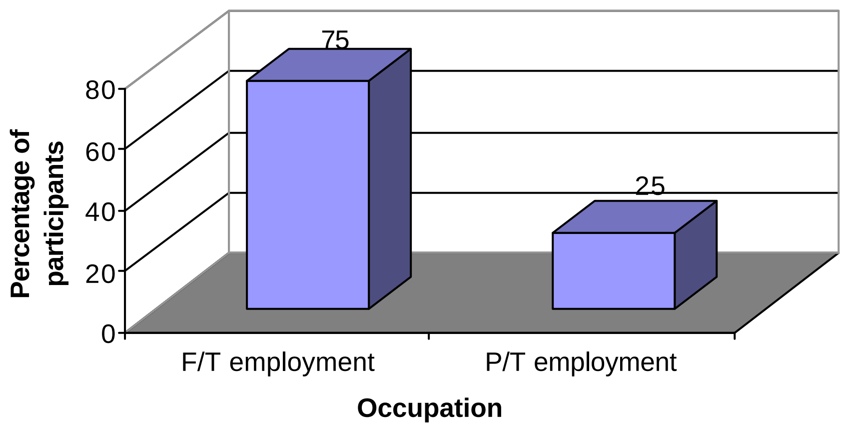


Figure F.1. Percentage of rural focus group participants as a function of occupation.

Figure F.2. Percentage of metropolitan focus group participants as a function of occupation.

Wagga Wagga – Work Type

Participants who indicated that they were in full or part time employment were asked to specify their type of work. These responses were then coded as falling into one of the following categories: Manager/Administrator, Professional, Technical/Para-professional, Trades Person, Clerk, Labourer, Sales and Personnel Service Worker, Machine Operator/Driver and Other. As displayed in Figure F.3, 33.3% of rural participants indicated that they worked in a technical or para-professional position. A total of 16.7%

participants indicated that they were a labourer, while 16.7% also said that they were in a sales position. The remainder of the participants were equally divided between professional, manager/administration, trades person or 'other' positions (8.3%).

Sydney – Work Type

Figure F.4 displays the percentage of metropolitan focus group participants as a function of work type. As shown, the metropolitan participants were involved in a slightly smaller range of work types than the rural participants. A greater proportion of the metropolitan participants (25%) indicated that they were a trades person. Thirty-seven percent of participants were in a professional position, while 31.3% indicated that they were in a technical or para-professional position. The remainder of the sample (6.2%) claimed that they were in a manager/administration position.

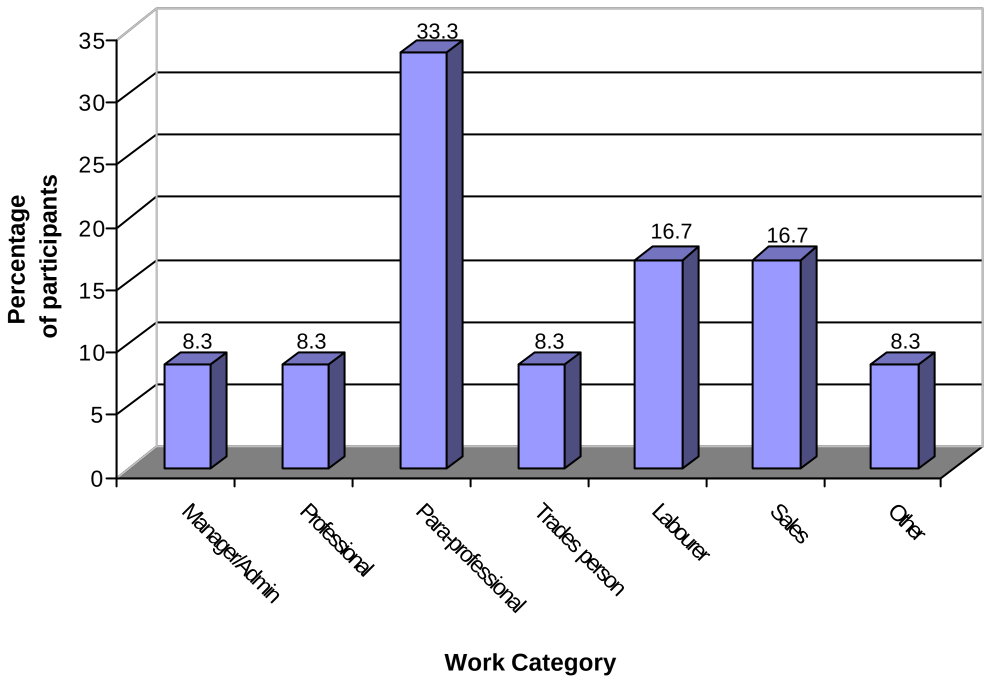


Figure 5.3. Percentage of rural participants as a function of work type.

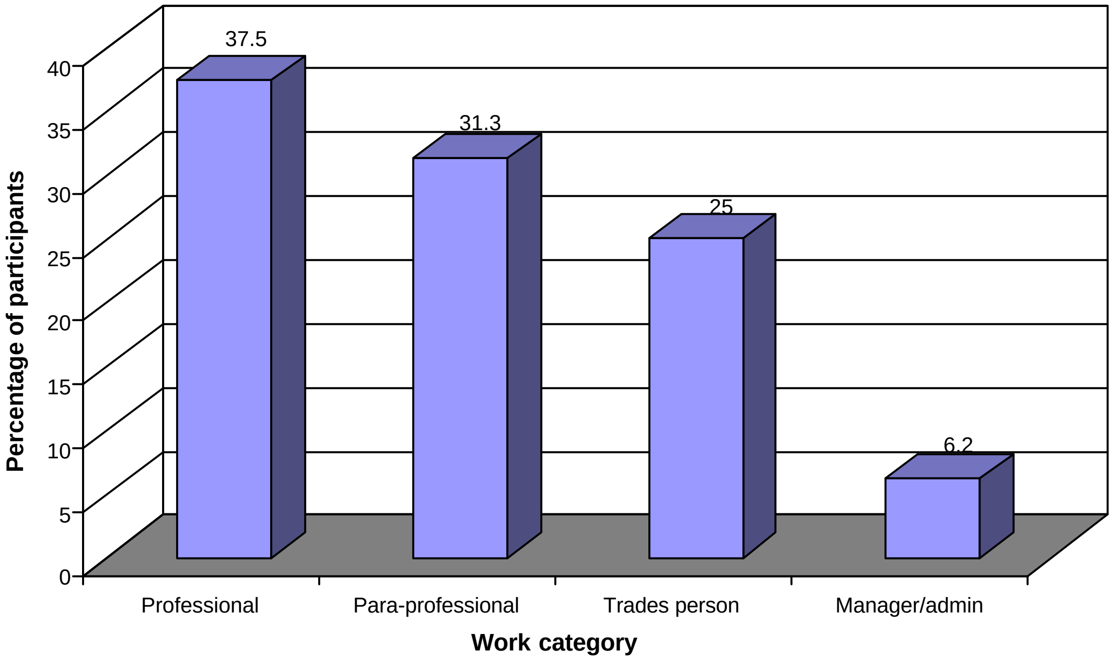


Figure 5.4. Percentage of metropolitan participants as a function of work type.

Wagga Wagga – Level of Education

The focus group participants were also asked to indicate the highest level of education they had completed at present. As shown in Figure F.5, 25% of the rural participants indicated that the highest level of education they had completed was year 11 and 25% reported that they had completed a Trade Certificate. The remaining participants were equally divided between completing year 12, a Bachelor's Degree, an Honours Degree or Graduate Diploma (16.7% in each category).

Sydney – Level of Education

The percentage of the metropolitan focus group participants as a function of education level is displayed in Figure F.6. As illustrated, 26.5% of the participants had completed year 12, 21.1% had completed a Bachelor's Degree and 15.8% had completed a trade certificate A total of 10.5% of participants had completed Honours or a Graduate Diploma and 10.5% had completed an 'other' certificate. The remaining participants were divided equally between having completed year 11 or less, an Associate Diploma or a Masters Degree.

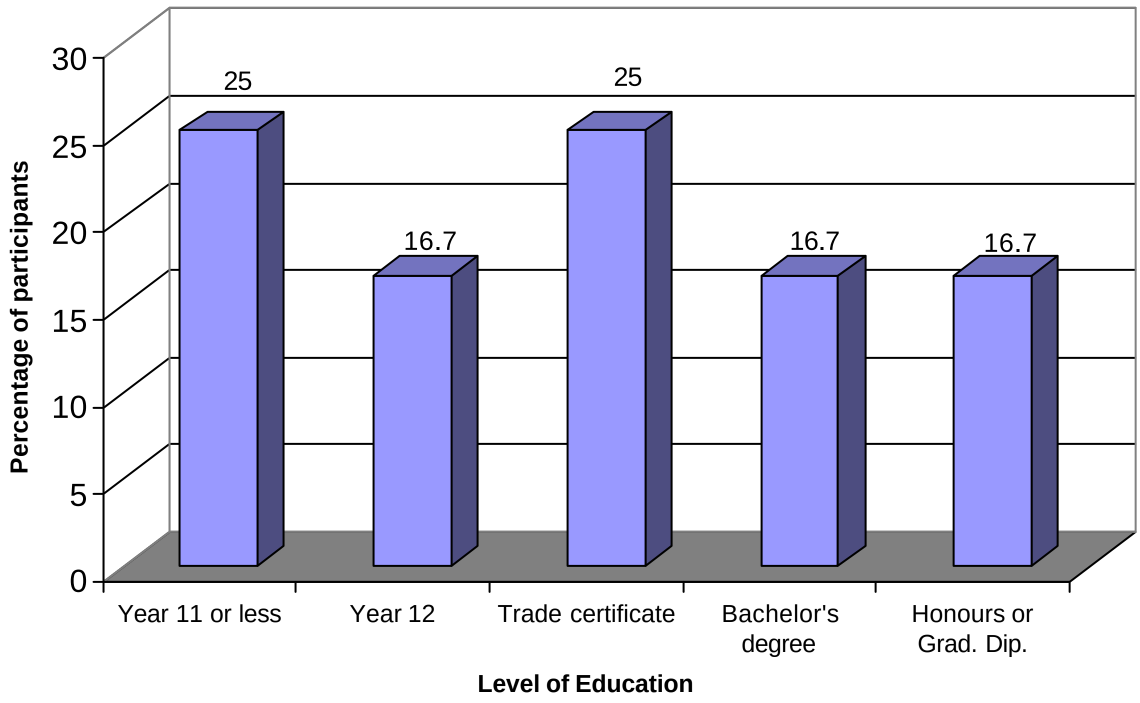


Figure F.5. Percentage of rural participants as a function of education level.

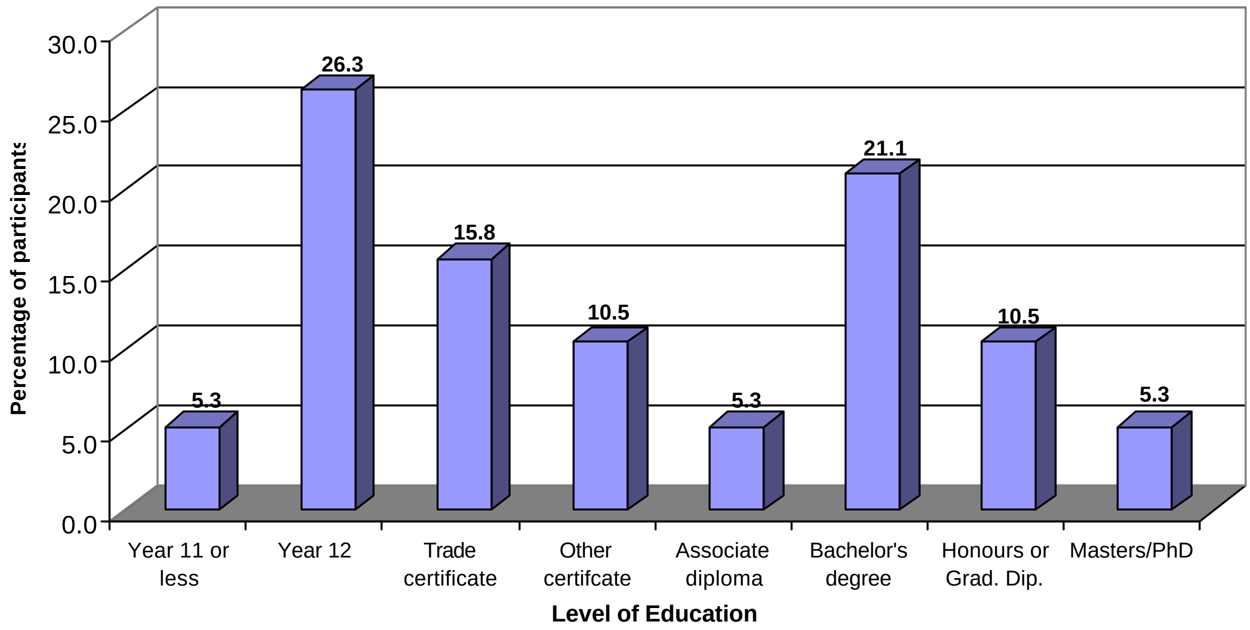


Figure F.6. Percentage of metropolitan participants as a function of education level.

Driving Experience and Driving Exposure

The next section of the questionnaire focused on participants' driving experience and driving exposure. This section asked several questions about the participants' licence type, age when they first obtained their driver's licence, how many years they have been driving, how many hours on average they spend driving for work and private purposes and history of speeding-related crashes and traffic infringements.

Wagga Wagga – Driving Experience

Table F.1 displays information on the rural participants' driving experience in terms of their licence type, age when they obtained their probationary licence and their driving experience. As illustrated, only one of the participants were still on their probationary licence. All other participants held a full driver's licence. The average age at which drivers had obtained their probationary licence was approximately at 18 years of age and was similar across the two focus groups. The number of years participants had been driving varied slightly across the two focus groups. Participants in focus group 1 had been driving for around 15 years, whereas participants in focus group 2 had been driving for approximately 23 years. This finding is not surprising given that the average age of drivers in focus group 2 (42.0 years) was higher than in focus group 1 (33.6 years).

Table F.1. Rural participants' driving experience details as a function of focus group.

	Focus Group	
Driving experience measure	**Group 1**	**Group 2**
Licence type		
Probationary	1 (12.5%)	0
Full	7 (87.5%)	4 (100%)
Age obtained licence (years)		
Mean	18	18.75
SD	2.8	1.7
Driving experience (years)		
Mean	15.6	23.25
SD	9.3	2.4

Sydney – Driving Experience

The metropolitan focus group participants' driving experience details are displayed in Table F.2. As displayed, all of the metropolitan participants held a full driver's licence. As with the rural participants, the average age at which the metropolitan participants obtained their probationary licence was 18 years of age and was similar across the two groups. The mean number of years that participants had been driving was similar across the two focus groups.

Table F.2. Metropolitan participants' driving experience details as a function of focus group.

Driving experience measure	Focus Group	
	Group 1	Group 2
Licence type		
Probationary	0	0
Full	10 (100%)	9 (100%)
Age obtained licence (years)		
Mean	18.1	18
SD	1.4	4.2
Driving experience (years)		
Mean	23.5	22.2
SD	6.9	5.7

Wagga Wagga – Driving Exposure

Participants were asked to specify the number of hours they spend driving each week for work purposes and for private purposes in order to gain information on their driving exposure. As can be seen in Table F.3, the amount of hours that the rural participants spent driving for work purposes varied across the two focus groups, with focus group 1 participants spending an average of 7.2 hours per week driving for work, while focus group 2 participants spend an average of 4.5 hours per week driving for work purposes. There was also variation across the focus groups in the number of hours participants spend driving for private purposes, although the opposite trend was found. Group 1 participants spend fewer hours each week driving for work purposes (4.5 hours) than group 2 participants, who spend 7.5 hours per week driving for private purposes.

Table F.3. Number of hours rural participants spent driving for work and private purposes.

Driving exposure	Focus Group	
	Group 1	Group 2
Work driving exposure (hours)		
Mean	7.2	4.5
Standard Deviation	6.9	4.1
Private driving exposure (hours)		
Mean	4.5	7.5
Standard Deviation	3.3	3.8

Sydney – Driving Exposure

The number of hours the metropolitan participants spend driving for work and private purposes each week is displayed in Table F.4. The metropolitan participants spent a similar number of hours driving for work purposes as the rural participants. The participants in focus group 1 spend 6 hours on average driving for work purposes each week, while Group 2 participants spend an average of 5.7 hours per week driving for work purposes. The average number of hours the metropolitan participants spend each week driving for private purposes was higher than the rural participants. The metropolitan participants spend a greater number of hours per week driving for private purposes than for work purposes, with participants in group 1 spending 8 hours per week and group 2 participants spending 9.4 hours per week driving for private purposes.

Table F.4. Number of hours metropolitan participants spent driving for work and private purposes.

Driving exposure	Focus Group	
	Group 1	Group 2
Work driving exposure (hours)		
Mean	6.05	5.7
Standard Deviation	5.2	4.4
Private driving exposure (hours)		
Mean	7.95	9.4
Standard Deviation	5.5	4.9

Wagga Wagga – Speeding Violations and Crash Record

Across the rural focus groups, two of the 12 participants (17%) indicated that they had been booked for speeding within the last 2 years. These participants were both female and aged 26 and 41 years. For both these participants, these violations occurred on only one occasion. None of the rural participants indicated that they had been involved in a crash in which speed was a contributing factor.

Sydney Participants

Across the metropolitan focus groups, a total of seven out of the 19 participants (37%) indicated that they had been booked for speeding within the last 2 years. Of these participants, four were male and three were female. Of the males, two were aged 39 years and two were 47 years of age. Of the females booked for speeding, one was 32 years of age, one was 45 years old and one was 41 years old. All seven participants indicated that they had only been booked once for speeding within the last 2 years. None of the metropolitan participants had been involved in a crash in which speed was a contributing factor.

Use of In-vehicle and Other Technologies

One section of the questionnaire focused on obtaining information about the participants' experience with various in-vehicle technologies and several commonly available technologies, such as mobile phones and DVD players. The purpose of this section was to determine if there were any differences across the focus group participants with regard to their experience with and use of technologies, as people who are more likely to purchase and use new technologies may also be more likely to use cruise control and manual speed alert devices.

Wagga Wagga – Use of In-vehicle Technologies

Participants were asked whether they had driven a car equipped with any of the following ITS technologies: Route Navigation, Adaptive Cruise Control, Reverse Parking Aid, Speed Limiter or Daytime Running Lights. As displayed in Table F.5, Daytime Running Lights was the most commonly used system, with three rural participants stating that they had driven a car fitted with this system. Two participants had driven a car equipped with Adaptive Cruise Control and a Speed Limiter, while only one of the rural participants had driven a car equipped with a Route Navigation system. None of the participants had driven a car equipped with a Reverse Parking Aid equipped.

Table F.5. Number (and percentage) of rural focus group participants as a function of ITS technology and focus group.

	Focus Group	
Technologies	**Group 1**	**Group 2**
Navigation	0	1 (25%)
ACC	1 (12.5%)	1 (25%)
Reverse parking	0	0
Speed limiter	2 (25%)	0
DRL	2 (25%)	1 (25%)

Sydney – Use of In-vehicle Technologies

The number of metropolitan participants from each focus group who had driven a car equipped with each technology is displayed in Table F.6. Unlike the rural participants, among the metropolitan participants Adaptive Cruise Control was the most commonly used system, with seven participants stating that they had driven a car fitted with this system. Six participants had driven a car equipped with a Speed Limiter, while three participants had driven a car equipped with Daytime Running Lights. Only one participant had driven a car equipped with a Reverse Parking Aid and none of the participants had driven a car equipped with a Route Navigation system.

Table F.6. Number (and percentage) of metropolitan focus group participants as a function of ITS technology and focus group.

	Focus Group	
Technologies	**Group 1**	**Group 2**
Navigation	0	0
ACC	5 (50.0%)	2 (22.2%)
Reverse parking	0	1 (11.1%)
Speed limiter	2 (20.0%)	4 (44.4%)
DRL	0	3 (33.3%)

Wagga Wagga – Facilities

Participants were asked how often they accessed the following technology-based facilities: email, internet, phone banking, ATM and Cable TV. Responses were recorded on a 6-point scale, where 1 = several times a day and 6 = never. As shown in Table F.7, the rural participants did not access any of the facilities listed more than once every two or three days. Email was the most frequently used facility by rural participants, with participants accessing it on average once every two or three days. Phone banking and cable TV were the least accessed facilities with participants accessing these facilities less than once a week on average.

Table F.7. Mean (and standard deviation) responses to each facility as a function of rural focus group, where 1 = several times a day and 6 = never.

	Focus Group	
Facilities	**Group 1**	**Group 2**
Email	2.5 (2.0)	3.5 (1.9)
Internet	3.1 (1.7)	3.8 (0.9)
Phone Bank	4.3 (1.2)	4.8 (.9)
ATM	3.5 (0.8)	4.5 (1.3)
Cable	4.8 (2.1)	6 (0)

Standard Deviation in Parentheses

Sydney – Facilities

As displayed in Table F.8, the metropolitan participants accessed the listed facilities more frequently than the rural participants. However, the least and most commonly accessed facilities were similar across these two groups. As with the rural participants, email was the facility most commonly accessed by the metropolitan participants, with participants accessing it on average more than once a day. The least commonly used facilities were phone banking and cable TV, with participants accessing these facilities once a week or less on average.

Table F.8. Mean (and standard deviation) responses to each facility as a function of metropolitan focus group, where 1 = several times a day and 6 = never.

	Focus Group	
Facilities	**Group 1**	**Group 2**
Email	1.3 (0.5)	2.0 (1.7)
Internet	1.8 (1.2)	2.1 (1.7)
Phone Bank	4.2 (1.4)	4.8 (1.2)
ATM	3.9 (0.7)	4.1 (0.8)
Cable	4.2 (1.9)	4.4 (2.4)

Wagga Wagga – Own Technologies

Finally, participants were asked to indicate whether or not they own certain technologies. These technologies and the number of rural participants who indicated that they owned them are displayed in Table F.9. As illustrated, the technologies most commonly owned by participants were mobile phones and personal computers, followed closely by DVD players. The technologies that were the least commonly owned by the participants were the PDA (hand held computer) and WAP enabled mobile phone.

Table F.9. Number (and percentage) of rural participants in each focus group who own each technology.

Technology	Focus Group	
	Group 1	Group 2
PC	6 (75.0%)	3 (75.0%)
Mobile phone	7 (87.5%)	3 (75.0%)
CD writer/Zip drive	3 (37.5%)	3 (75.0%)
PDA (e.g. Compaq)	0	0
Play Station	3 (37.5%)	3 (75.0%)
WAP enabled mobile phone	0	1 (25.0%)
Digital Camera	3 (37.5%)	3 (75.0%)
DVD player	4 (50%)	3 (75.0%)

Sydney – Own Technologies

As shown in Table F.10, the technologies most commonly owned by the metropolitan participants were mobile phones and personal computers. As with the rural participants, the technologies that were least commonly owned by the metropolitan participants were the PDA (hand held computer) and the WAP enabled mobile phone.

Table F.10. Number (and percentage) of metropolitan participants in each focus group who own each technology.

Technology	Focus Group	
	Group 1	Group 2
PC	9 (90.0%)	7 (77.7%)
Mobile phone	9 (90.0%)	7 (77.7%)
CD writer/Zip drive	3 (30.0%)	2 (22.2%)
PDA (e.g. Compaq)	1 (10.0%)	1 (11.1%)
Play Station	5 (50.0%)	5 (55.5%)
WAP enabled mobile phone	1 (10.0%)	1 (11.1%)
Digital Camera	5 (50.0%)	6 (66.6%)
DVD player	8 (80.0%)	5 (55.5%)

Use of Technologies – Users Vs. Non-users

Any differences between the users and non-users of cruise control and/or manual speed alert technologies in their use or ownership of in-vehicle and other everyday technologies were examined in order to establish if the non-users were less likely than users to interact with technology in general, or if this was just restricted to cruise control and/or manual speed alerting systems. Among the metropolitan participants, there were four non-users of cruise control and/or manual speed alert systems. None of these four non-users however, were less likely than the users to have driven a car equipped with ITS technologies. Nor did they access facilities such as email and the Internet less frequently or own fewer everyday technologies such as personal computers or mobile phones than users. Among the rural participants there were four non-users of cruise control and/or manual speed alert systems. While none of these participants were less likely than the users to have driven a car equipped with ITS technologies or own everyday technologies, the non-users did access facilities such as email and the Internet, slightly less frequently than did the users.

Attitudes Towards Speeding

As part of the questionnaire, participants were asked about their attitudes towards speeding. Responses were recorded on a 5-point scale, where 1 = strongly disagreed and 5 = strongly agree.

Wagga Wagga – Attitudes Towards Speeding

Overall, the rural participants held negative attitudes towards speeding. Participants tended to 'agree' with the statements: speeding is always wrong, if drivers increase their speed by 5 km/h they are significantly more likely to be involved in a crash and a crash at 70 km/h will be more severe than a crash at 60 km/h. Participants also 'disagreed' that it is acceptable to speed to get ahead of slow drivers, or if someone is a good driver, the road conditions are good, the road is familiar and there is little traffic around. Participants also disagreed with statements such as 'it is easy to avoid being caught speeding' and 'if the speed limits are too slow, it is safe to drive faster than the limit'.

Sydney – Attitudes Towards Speeding

The metropolitan participants appeared to hold slightly more negative attitudes towards speeding than the rural participants. Metropolitan participants tended to 'agree' to 'strongly agree' that speeding is always wrong, that if drivers increase their speed by 5 km/h they are significantly more likely to be involved in a crash and that a crash at 70 km/h will be more severe than a crash at 60 km/h. The metropolitan participants also tended to 'disagree' to 'strongly disagree' that it is acceptable to speed if you are a good driver, the road conditions are good, the road is familiar and there is little traffic around. However, many of the participants 'agreed' that it is acceptable to speed to get ahead of slow drivers. There were also mixed reactions among the participants as to whether it is acceptable to speed if the posted speed limit is too slow. Around half of the participants agreed with this statement, while the other half disagreed. One explanation as to why the metropolitan participants held slightly more negative attitudes towards speeding than the rural participants is because they may be exposed to a greater number of speeding countermeasures including greater visibility of Police and greater exposure to speed cameras. Indeed, more than double the proportion of the metropolitan participants stated that they had been fined for speeding within the last 2 years than the rural participants.

Attitudes Towards ISA and Other ITS

Participants were also asked as part of the questionnaire about their attitudes towards Intelligent Speed Adaptation (ISA) and other Intelligent Transport Systems (ITS) that are designed to limit or prevent speeding. Responses were recorded on a 5-point scale, where 1 = strongly disagreed and 5 = strongly agree.

Wagga Wagga – Attitudes Towards ISA and ITS

In general, the rural participants held very positive attitudes towards ISA systems which inform the driver of the current speed limit or alerts them that they have exceeded the posted speed limit. However the participants held negative attitudes towards more controlling ISA systems that limit the speed of the vehicle to the posted speed limit. In particular, the participants 'agreed' or 'strongly agreed' that they would like a car that: displayed the posted speed limit at all times, automatically warned them if they were exceeding the speed limit, or is equipped with a cruise control system that automatically adjusts the speed of the vehicle to match the speed of a vehicle ahead. However, the participants 'disagreed' to 'strongly disagreed' that they would like a car that automatically stopped them from exceeding the speed limit and/or that automatically reduced speed when the driving conditions were unsafe.

Sydney - Attitudes Towards ISA and ITS

As with the rural participants, the metropolitan participants held very positive attitudes towards ISA systems that informs the driver of the current speed limit or alerts them that they have exceeded the posted speed limit, but held negative attitudes towards more controlling ISA systems, which limit the speed of the vehicle to the posted speed limit. The participants 'agreed' to 'strongly agreed' that they would like a car that: displayed the posted speed limit at all times, automatically warned them if they were exceeding the speed limit, or is equipped with a cruise control system that automatically adjusts the speed of the vehicle to match the speed of a vehicle ahead. However, the participants 'disagreed' to 'strongly disagreed' that they would like a car that automatically stopped them from exceeding the speed limit. While the majority of the metropolitan participants 'disagreed' that they would like a car that, in addition to limiting them to the speed limit, also automatically reduced speed when the driving conditions were unsafe, around one quarter of the participants indicated that they would like a car equipped with this system.

Attitudes Towards Other Countermeasures for Moderating Speed

Participants were also asked as part of the questionnaire about their attitudes towards other speeding countermeasures, such as speed cameras and speeding penalties. Responses were recorded on a 5-point scale, where 1 = very ineffective and 5 = very effective.

Wagga Wagga – Attitudes Towards Speeding Countermeasures

The rural participants held positive attitudes towards the various countermeasures that exist to moderate speed. The participants felt that the following countermeasures were 'effective to 'very effective' in influencing them to stay at the posted speed limit: Penalties (e.g., fines and demerit points), speed cameras, speed humps, roundabouts, advertising, in-vehicle speed alerters or limiters, speed guns, police car presence and cruise control systems. The participants did however, indicated that they felt that speed signs and traffic islands were 'neither effective nor ineffective' in influencing them to travel at the posted speed limit.

Sydney - Attitudes Towards Speeding Countermeasures

Consistent with the rural participants, the metropolitan participants held positive attitudes towards countermeasures to prevent speeding. The participants felt that the following countermeasures were 'effective to 'very effective' in influencing them to stay at the posted speed limit: Penalties (e.g., fines and demerit points), speed cameras, speed humps, roundabouts, in-vehicle speed alerters or limiters, speed guns, police car presence and cruise control systems. As with the rural participants, the metropolitan participants indicated that they felt that speed signs and traffic islands were 'neither effective nor ineffective' in influencing them to travel at the posted speed limit. In addition, the metropolitan participants also felt that advertising was 'neither effective nor ineffective' in influencing them to stay at the posted speed limit.

Awareness of Road Safety Issues

As a final section in the questionnaire, the participants were asked questions to obtain information their awareness of road safety issues related to speeding. Participants were asked questions such as how often they think speed contributes to crashes, the factors influencing what speed they travel at and the road safety campaigns that they are aware of.

Wagga Wagga – Awareness of Road Safety Issues

In general, the rural participants were aware of many road safety issues and the dangers associated with speeding. In the first part of this section of the questionnaire, the participants were asked questions regarding how dangerous they feel that exceeding the speed limit is. When asked how often they think speeding contributes to road crashes, the rural participants indicated 'often' to 'very often'. Participants were also asked to indicate how safe or dangerous they feel it is to exceed the speed limit by 5 or 10 kilometres per hours in various speed zones. Participants indicated that exceeding the speed limit by 5 kilometres per hour in 50, 60 and 100 km/h zones is 'neither dangerous nor safe'. Participants indicated however, that exceeding the speed limit by 10 kilometres per hour in a 50 or 60 km/h zone is dangerous to very dangerous. Interestingly, the participants felt that exceeding the speed limit by 10 kilometres per hour in a 100 km/h zone was 'fairly safe', suggesting that in the higher speed zone their tolerance for exceeding the speed limit increases.

Participants were also asked to indicate for various speed zones, the number of kilometres they could exceed the speed limit by before they would consider themselves to by speeding. For 50 km/h zones, the majority of the participants indicated that they would consider themselves to be speeding at any speed between 1 to 5 km/h over the limit. For 60 km/h zones, the majority of the participants indicated that they would consider themselves to be speeding at any speed between 1 to 10 km/h over the limit, while for 100 km/h zones, the participants stated that at any speed between 11 and 15 km/h over speed limit they would consider themselves to be speeding. When asked by how much they could exceed the speed limit by before being booked by the Police, half of the participants indicated 3 km/h, which was the correct answer, a quarter indicated 1 km/h and the remainder said that they either did not know (8.3%) or 10% of the speed limit (16.7%).

Participants were asked to indicate the top three factors that influence the speed at which they travel. The three most commonly reported factors were (in order from most to least common): the road and weather conditions, the speed limit and the volume of traffic on the road. Participants were also asked to indicate which of the following road safety campaigns there were aware of: Please slow down/wipe off 5, Safe speeding – there is no such thing, Arrive Alive, Speed Blitz/ Speed Blizt Blues Cricket Team, You're doing $197 – how fast are you going and Road Safety 2010. Eighty-four percent of the participants indicated that they were aware of the 'Safe speeding – there is no such thing' and the 'You're doing $197 – how fast are you going?' campaigns. Sixty-six percent were aware of the Arrive Alive campaign, 42% were aware of the Speed Blitz Blues cricket team and 25% were aware of the Please slow down/Wipe off 5 campaign. None of the participants were aware of the Road Safety 2010 campaign.

Participants were asked to indicate the likelihood of being caught by the Police for exceeding the speed limit by various amounts. The participants indicated that as the number of kilometres drivers are exceeding the speed limit by increased so too does the likelihood of getting caught by the Police. More specifically, the participants indicated that the likelihood of getting caught by the police when exceeding the limit by 5 km/h is 'unlikely' to 'very unlikely'. At 10 km/h over the limit, the participants felt it is 'likely' to 'very likely' that drivers will get caught and at 20 km/h above the limit they indicated that the chance of getting caught by the Police is 'very likely'.

Finally, the participants were asked to indicate whether the current fine of $123 for exceeding the speed limit by less than 15 km/h is too low, too high or just right. The majority of the participants indicated that the current fine was about right.

Sydney - Awareness of Road Safety Issues

The metropolitan participants were also aware of many road safety issues and the dangers associated with speeding. When asked how often they think speeding contributes to road crashes, the metropolitan participants indicated 'often' to 'very often'. Participants were also asked to indicate how safe or dangerous they feel it is to exceed the speed limit by 5 or 10 kilometres per hours in various speed zones. Participants indicated that exceeding the speed limit by 5 kilometres per hour in 50, 60 and 100 km/h zones is 'neither dangerous nor safe'. Participants indicated however, that exceeding the speed limit by 10 kilometres per hour in a 50, 60 or a 100 km/h zone is 'dangerous' to 'very dangerous'. Interestingly, the metropolitan participants felt that exceeding the speed limit by 10 kilometres per hour in a 100 km/h zone is 'very dangerous', whereas the rural participants felt that it is 'fairly safe'.

Participants were also asked to indicate for various speed zones, the number of kilometres they could exceed the speed limit by before they would consider themselves to by speeding. For 50 km/h zones, the responses ranged from 1 to 10 km/h over the limit. For 60 km/h zones, the majority of the participants indicated that they would consider themselves to be speeding at any speed between 1 to 15 km/h over the limit, while for 100 km/h zones, the participants stated that at any speed between 11 and 15 km/h over speed limit they would consider themselves to be speeding. When asked by how much they could exceed the speed limit by before being booked by the Police, only 10% of the participants selected the correct repose of 3 km/h, one third indicated 10% and the remainder said that they either did not know (31.6%) or 1 km/h above the speed limit (15.8%).

Participants were then asked to indicate the top three factors that influence the speed at which they travel. As with the rural participants, the three most commonly reported factors were (in order from most to least common): the road and weather conditions, the speed limit and the volume of traffic on the road. When asked to indicate which of the road safety campaigns there were aware of, 74% of the participants indicated that they were aware of the 'Safe speeding – there is no such thing' campaign and 86% were aware of the 'You're doing $197 – how fast are you going?' campaign. Twenty-six percent were aware of the Arrive Alive, the Speed Blitz Blues cricket team and the Please slow down/Wipe off 5 campaigns. Only one of the participants was aware of the Road Safety 2010 campaign.

Participants were asked to indicate the likelihood of being caught by the Police for exceeding the speed limit by various amounts. Consistent with the rural participants, the metropolitan participants indicated that as the number of kilometres drivers are exceeding the speed limit by increased so too does the likelihood of getting caught by the Police. More specifically, the participants indicated that the likelihood of getting caught by the police when exceeding the limit by 5 km/h is 'unlikely' to 'very unlikely'. At 10 km/h above the limit, the participants felt it is 'likely' to 'very likely' that drivers will get caught and at 20 km/h above the limit the majority of participants indicated that the chance of getting caught by the Police is 'very likely'.

Finally, the participants were asked to indicate whether the current fine of $123 for exceeding the speed limit by less than 15 km/h is too low, too high or just right. The majority of the participants indicated that the current fine was about right.

Summary

Overall, the questionnaire results revealed that the participants from both the metropolitan and rural groups were employed in a range of occupations, however the metropolitan participants were employed in a wider range of occupations than the rural participants. In particular, a greater proportion of the metropolitan participants were employed in professional positions or as a trades person. In terms of highest education level completed, the metropolitan participants had completed a slightly higher level of education than the rural participants.

The metropolitan and rural focus group samples were similar in terms of the age at which they obtained their driver's licence, their driving experience and the number of hours spent driving for work purposes. The metropolitan participants, however, do spend a greater number of hours driving for private purposes than the rural participants. In addition, a greater proportion of metropolitan participants had been booked for speeding than the rural participants.

In regard to their use of in-vehicle technologies, several of the metropolitan and rural participants indicated that they had driven a car equipped with daytime running lights, while very few participants had used in-vehicle Route Navigation, Adaptive Cruise Control or a reverse parking aid. The most commonly used technology-based facilities were email and the Internet and this was similar across the metropolitan and rural participants. There were also no differences found between the users and non-users of cruise control and/or manual speed alert technologies in the likelihood of having driven a car equipped with ITS technologies, accessing facilities such as email and the Internet, or owning fewer everyday technologies such as personal computers or mobile phones.

Both the metropolitan and rural participants held negative attitudes towards speeding. The participants also held very positive attitudes towards ISA and other countermeasures designed to prevent speeding (e.g., speed cameras), although their attitudes towards technologies that would *limit* them to the speed limit were less positive. Finally, participants from both groups were aware of very similar issues with regard to road safety and the dangers associated with speeding. More specifically, the metropolitan and rural participants agreed that speeding often contributes to road crashes, that the likelihood of getting caught for speeding increased as the number of kilometres over the speed limit increases and that the current fines issued for speeding are about right.

APPENDIX H. FUNCTIONALITY CHECKLIST RESULTS

System Functionality Checklist – Summary of Results

During the focus groups those participants who were users of cruise control and/or manual speed alert systems completed a functionality checklist. These checklists listed all of the different functions of each system (e.g., increasing cruise speed by rotating the control stalk or resuming the previous set cruise speed after disengaging the system) and participants indicated whether or not they perform each of the various functions. The information obtained from the checklist gave information regarding those functions of the cruise control and speed alert systems that are most or least commonly used by drivers and whether they use the most efficient methods (where more than one method exists to execute a function) to operate the systems.

For the various cruise control systems the participants were asked to indicate, by ticking checkboxes, the precise procedure they use to turn on the system, set the cruise speed, increase and decrease the cruise speed, deactivate the cruise control system and reset the previously set cruise speed. For the various speed alert systems, participants were asked to indicate the precise procedure they used to program the speed alert system to the speed at which they want the system to issue speed warnings. A copy of the functionality checklist is contained in Appendix F.

Wagga Wagga

Holden

A total of 7[3] rural participants had and used a Holden cruise control system. All of these participants stated that they turn the cruise control on and off by pressing the ON-OFF button located on the end of the cruise control stalk. All of these participants also stated that they set the cruise speed by accelerating to the desired speed and then rotating the control stalk down once. To increase the cruise speed while the system is engaged, five of these participants indicated that they use the increase function of the system (i.e., rotating the control stalk downwards once), while the other two claimed that they use the less efficient method of deactivating the cruise system and then resetting it to the new cruise speed. To decrease the cruise speed while the system is engaged, four participants indicated that they use the decrease function of the system (i.e., rotate the control stalk downwards), while three claimed that they use the less efficient method of deactivating the cruise system and them resetting it to the slower cruise speed. All seven participants indicated that they deactivate the cruise control system by pressing the brake or the clutch and six of the seven participants also sometimes press the system's cancel button to deactivate the system. Finally, five participants stated that they reset the cruise control to the last set cruise speed using the 'resume' function of the system. In contrast, the other

[3] The number of rural and metropolitan participants who filled out the functionality checklists was greater than the number who indicated in the focus group questionnaire that they use cruise control and manual speed alert systems. This discrepancy may result from the fact that in the questionnaire participants were only asked to indicate whether they use the system(s) equipped to their current car. Those participants who indicated that they do not use the systems in the questionnaire may still have filled out a checklist for a previous car that they drove.

two participants stated that they use the less efficient method of deactivating the system and resetting it from the beginning to reset the previous cruise speed.

Four of the rural participants had and used a Holden manual speed alert system. All four of these participants indicated that they program their speed alert system to a particular speed setting by pressing the MODE button three times until 'overspeed' is displayed on the trip computer and then pressing the up or down arrow buttons on the dashboard to increase or decrease the alert speed. Two of the participants also stated that they use the preset speeds that are programmed into the system to set the alert speed. None of the participants said that they program the system by accelerating to the desired alert speed and then, while the speed alert system is engaged, pressing both the up and down arrow buttons together; which is actually the most efficient method of programming the Holden speed alert system.

Ford

Three rural participants had and used a Ford cruise control system. All of these participants stated that, depending on the specific system, they turn the cruise control on and off by either pressing the on/off button or rotating the cruise control stalk. All of these participants also stated that they set the cruise speed by accelerating to the desired speed and then pressing the SET button located on the steering wheel. To increase the cruise speed while the system is engaged, one participant indicated that they always only press the increase button the desired number of times. The other two participants claimed that they also use this method to increase cruise speed but, also use the more efficient method of accelerating to the desired speed and then pressing the SET button only once.

To decrease the cruise speed while the system is engaged, one participant indicated that they press the decrease button a number of times until they reach their desired speed. The other two participants claimed that they also use this method to decrease cruise speed but, also, use the more efficient method of braking until they reach the desired speed and then press the SET button only once. Two of the participants indicated that they deactivate the cruise control system either by pressing the system's Cancel button or by pressing the brake or the clutch, while the other participant claimed that that they only use the Cancel button to deactivate the cruise system. Finally, all three participants stated that they reset the cruise control to the last set cruise speed using the 'resume' function of the system. None of them stated that they use the less efficient method of deactivating the system and resetting it from the beginning to reset the previous cruise speed.

Although these three participants indicated that they had a manual speed alert system equipped to their Fords, none of the participants actually used the system.

Mitsubishi

Two rural participants had and used a Mitsubishi cruise control system. Both of these participants stated that they turn the cruise control on and off by, depending on the specific system, either pressing the on/off button on the control stalk or pressing the cruise button located on the dashboard. Both of these participants also stated that they set the cruise speed by accelerating to the desired speed and then tapping the control stalk down once. To increase the cruise speed while the system is engaged, both participants indicated that they either tap the stalk upwards a number of times until they reach their desired speed, or use the more efficient method of accelerating to the desired speed and then tapping the stalk upwards once. Neither participant claimed that they use the less efficient method of deactivating the cruise system and then resetting it from the beginning to the new cruise speed.

To decrease the cruise speed while the system is engaged, both participants indicated that they use both the decrease function of the system (i.e., tap the control stalk downwards) and the more efficient method of braking the vehicle to the desired speed and then resetting the cruise speed. Neither of the participants indicated that they use the less efficient method of deactivating the cruise system and them resetting it to the slower cruise speed. One of the participants indicated that they deactivate the cruise control system by pressing the brake or the clutch and by using the cancel function. The other participant stated that they only ever deactivate the system by pressing the brake. Finally, both participants stated that they reset the cruise control to the last set cruise speed using the 'resume' function of the system. Neither uses the less efficient method of deactivating the system and resetting it from the beginning to reset the previous cruise speed.

These two rural participants also indicated that they had and used a Mitsubishi manual speed alert system. Both of these participants indicated that they program their speed alert system to a particular speed setting by pressing the MODE button once to turn on the system and then press the up or down arrow buttons on the dashboard to increase or decrease the alert speed. The participants also indicated that they also sometimes program the system by accelerating to the speed at which they want the system to issue speed warnings and then, while the speed alert system is turned on, press the up and down arrow buttons together to set the alert speed. This latter method is the most efficient way to program the speed alert system.

Sydney

Holden

Seven of the metropolitan participants had and used a Holden cruise control system. All of these participants stated that they turn the cruise control on and off by pressing the ON-OFF button located on the end of the cruise control stalk and set the cruise speed by accelerating to the desired speed and then rotating the control stalk down once. To increase the cruise speed while the system is engaged, four of these participants indicated that they rotate the control stalk upward until they reach the desired speed. The other three claimed that they use the less efficient method of deactivating the cruise system and them resetting it to the new cruise speed. To decrease the cruise speed while the system is engaged, three participants indicated that they rotate the control stalk downwards, while four claimed that they use the less efficient method of deactivating the cruise system and them resetting it to the slower cruise speed.

All seven participants indicated that they deactivate the cruise control system by pressing the brake or the clutch and three of the seven participants also indicated that they sometimes press the system's cancel button to deactivate the system. Finally, all seven participants stated that they use the less efficient method of deactivating the cruise control system and resetting it from the beginning to reset the previous cruise speed. Surprisingly none of the participants stated that they reset the cruise control to the last set cruise speed using the 'resume' function of the system, which the more efficient method.

Ten of the Metropolitan participants had and used a Holden manual speed alert system. All ten of these participants indicated that they program their speed alert system to a particular speed setting by pressing the MODE button three times until 'overspeed' is displayed on the trip computer and then pressing the up or down arrow buttons on the dashboard to increase or decrease the alert speed. Only one of the participants also stated that they sometimes use the preset speeds that are programmed into the system to set the alert speed. None of the participants said that they program the system by accelerating to the desired alert speed and then, while the speed alert system is engaged, pressing both the up and down arrow buttons together, despite this being the most efficient method of programming the Holden speed alert system.

Ford

Four metropolitan participants had and used a Ford cruise control system. All of these participants stated that they turn the cruise control on and off by, depending on the specific system, either pressing the on/off button or rotating the cruise control stalk. All of these participants also stated that they set the cruise speed by accelerating to the desired speed and then pressing the SET button located on the steering wheel. To increase the cruise speed while the system is engaged, all four participants indicated that they press the SET increase button the desired number of times. None of them indicated that they use the more efficient method of accelerating to the desired speed and then pressing the SET button only once.

To decrease the cruise speed while the system is engaged, two participants indicated that they press the decrease button a number of times until they reach their desired speed. The other two participants claimed that they use the more efficient method of braking until they reach the desired speed and then pressing the SET button only once. The four participants indicated that they deactivate the cruise control system either by pressing the system's Cancel button or by pressing the brake or the clutch. Finally, only one participant stated that they reset the cruise control to the last set cruise speed using the 'resume' function of the system. The other three stated that they use the less efficient method of deactivating the system and resetting it from the beginning to reset the previous cruise speed.

Three metropolitan participants indicated that they had and used a Ford manual speed alert system. These participants indicated that they program their speed alert system to a particular speed setting by pressing the SEEK button located on the steering wheel for two seconds until "S" is displayed on the trip computer display and then pressing the Volume up or down arrow buttons to increase or decrease the alert speed. Only two of the participants indicated that they turn the speed alert system off using the SEEK button on the steering wheel. The third participant indicated that they never turn their speed alert system off.

Mitsubishi

Two metropolitan participants had and used a Mitsubishi cruise control system. Both of these participants stated that they turn the cruise control on and off by, depending on the specific system, either pressing the on/off button on the control stalk or pressing the cruise button located on the dashboard. Both of these participants also stated that they set the desired cruise speed by accelerating to the desired speed and then tapping the control stalk down once. To increase the cruise speed while the system is engaged, both participants indicated that they either tap the stalk upwards a number of times until they reach their desired speed. One participant also uses the more efficient method of accelerating to the desired speed and then tapping the stalk upwards once to increase cruise speed. Neither participant claimed that they use the least efficient method of deactivating the cruise system and them resetting it from the beginning to the new cruise speed.

To decrease the cruise speed while the system is engaged, both participants indicated that they use both the decrease function of the system (i.e., tap the control stalk downwards) and one also uses the more efficient method of braking the vehicle to the desired speed and then resetting the cruise speed. Neither of the participants indicated that they use the less efficient method of deactivating the cruise system and them resetting it to the slower cruise speed. Both participants indicated that they deactivate the cruise control system by pressing the brake or the clutch and one also uses the cancel function. Finally, one participant stated that they reset the cruise control to the last set cruise speed using the 'resume' function of the system. Neither uses the less efficient method of deactivating the system and resetting it from the beginning to reset the previous cruise speed. It is assumed that the second participant does not reset their previously set cruise speed or that they misinterpreted the question.

One metropolitan participant also indicated that they had and used a Mitsubishi manual speed alert system. This participant indicated that they program their speed alert system to a particular speed setting by pressing the MODE button once to turn on the system and then press the up or down arrow buttons on the dashboard to increase or decrease the alert speed. The participant indicated that they also sometimes program the system by accelerating to the speed at which they want the system to issue speed warnings and then, while the speed alert system is turned on, press the up and down arrow buttons together to set the alert speed. This latter method is the most efficient way to program the speed alert system.

Toyota

Only one metropolitan participant had and used a Toyota cruise control system. This participant stated that they turn the cruise control on and off by pressing the on/off button on the cruise control stalk and set the desired cruise speed by accelerating to the desired speed and then tapping the control stalk downwards once. To increase the cruise speed while the system is engaged, the participant indicated that they tap the stalk upwards the desired number of times. The participant stated that they never use the more efficient method of accelerating to the desired speed and then tapping the stalk up only once to increase cruise speed.

To decrease the cruise speed while the system is engaged, the participant indicated that they tap the stalk downwards a number of times until they reach their desired speed. They indicated that they do not use the more efficient method of braking until they reach the desired speed and then tap the stalk downwards only once. The participant indicated that they deactivate the cruise control system by pressing the brake or the clutch, rather than by pressing the system's Cancel button. Finally, the participant stated that they reset the cruise control to the last set cruise speed by deactivating the system and then resetting it from the beginning, which the least efficient method of reactivating the system. The more efficient method is to press the system's Resume button.

None of the metropolitan participants drove a Toyota equipped with a manual speed alert system.

Summary

Overall, the majority of the participants appeared to be very familiar with the functionality of their cruise control and manual speed alert systems. A greater proportion of the rural participants, however, appeared to use the more efficient methods of operating their cruise control and speed alert systems compared to the metropolitan participants. In particular, the metropolitan participants had a greater tendency to increase, decrease and reset cruise speed by deactivating the cruise control system and reprogramming it from the beginning, rather than using the increase, decrease and resume functions of the system.