



THE UNIVERSITY  
of ADELAIDE

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# At the Scene

Newsletter of the Centre for Automotive Safety Research

## Feature



In March this year, the Centre's founder Professor Jack McLean retired after 40 years of service to road safety research.

Jack has since accepted the prestigious position of Emeritus Professor with the University of Adelaide.

During Jack's distinguished career he has contributed significantly to the scientific evidence and rigorous research that has brought about numerous road safety countermeasures including mandatory seat belts, alcohol legislation and speed management. Jack instigated the first Australian in-depth at scene study of road accidents in the 1960s.

To read more about Jack's time at the Centre visit the CASR website. Here you can also read some of Jack's reflections on the changes in road safety since he started in the profession.

## Special Issue: Research Highlights 2012

During 2012 CASR was involved in a wide variety of road safety research projects covering all aspects of the Safe System. This newsletter summarises a selection of the projects from the research program.

### Safer People

#### Characteristics of motorcycle riders involved in crashes

The aim of this ongoing project is to provide an analysis of a large dataset pertaining to South Australian motorcycle crashes. The dataset includes 377 motorcycle crashes resulting in a hospital admission or fatality for at least one crash participant. The linked data includes medical data, police-reported crash data, drug and alcohol testing data, and licensing data. The injuries sustained by the motorcyclists will be coded according to the Abbreviated Injury Scale (AIS). Other variables will then be examined for their relationship with injury severity. This will enable identification of the risk factors for motorcycle crashes causing serious injuries.

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#### The relative contribution of system failures and extreme behaviour in crashes

This study examined the relative contribution of system failures and extreme behaviour in South Australian crashes as identified from information in Coroner's investigation files and in-depth crash investigations conducted by CASR. The analysis of 83 fatal crashes, 272 non-fatal metropolitan injury

# Message from the Director

Welcome to this issue of **At the Scene**. I am pleased to be able to report that 2012 was another successful year for the Centre. The breadth and depth of the studies we have been fortunate enough to be involved in reinforces that there are still great opportunities to continue to reduce risks faced by drivers, passengers, riders, pedestrians and cyclists.

It's important to us that our research stays relevant to the safety issues facing road users and the needs of road safety policy and the field in general. I was particularly pleased that CASR has been developing expertise in new methods to examine the benefits and requirements of new vehicle technologies such as Autonomous Emergency Braking.

A feature of our approach to this kind of work, and indeed all our work, is that it is grounded in a deep appreciation of the nature of crashes. The utility of the data we collect in our in-depth crash investigation program continues to reinforce the value of this activity, as it continues to provide a rich source of information for many of our studies.

On behalf of the Centre, I would like to take the opportunity to acknowledge and thank all of our clients, supporters and partners. We thank the Motor Accident Commission and the South Australian Department of Planning, Transport and Infrastructure both of which continue to collaboratively support the work of the Centre. We also acknowledge the collaborative relationship we have with the Australasian New Car Assessment Program who we are proud to support with testing services and other advice.

We wish all readers a safe and productive 2013 and look forward to working with you to continue to reduce the social and economic costs of road trauma.

crashes and 181 non-fatal rural crashes indicated that very few non-fatal crashes (3% metropolitan, 9% rural) involved extreme behaviour by road users and, even in fatal crashes, the majority (57%) were the result of system failures. These findings suggest that improvements to the road transport system can be expected to be much more effective in reducing crashes than concentrating on preventing extreme behaviours.

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## **Developing measures to reduce the incidence of unlicensed driving**

Austrorads commissioned a report into the best candidate countermeasures for unlicensed driving. The report is based on a review of international literature and on discussions with key stakeholders. A path to implementation was developed for countermeasures identified as being those most likely to be effective and feasible in Australia for reducing unlicensed driving. These countermeasures fell into the broad categories of improved detection, more effective sanctions, encouraging licensing, and making unlicensed driving more difficult.

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## **Update of the Strategic Guide for Expenditure of the Motorcycle Safety Levy Funding**

The aim of this project was to update the *Strategic Guide for Expenditure of the Motorcycle Safety Levy Funding*, first published in Victoria in 2004. Victorian motorcycle crash, registration and licensing data were analysed; an audit of expenditure of the first decade of the Motorcycle Safety Levy was undertaken; and workshops were held with stakeholders to discuss funding priorities for improving the safety of motorcycling in Victoria. On the basis of this work, priorities were recommended for roads and roadsides, motorcyclists and other road users, motorcycles and equipment, maximising the benefits of Levy expenditure, and monitoring and reporting of activities related to the Levy.

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## **Conspicuity of South Australian cyclists: implications for safety**

CASR conducted an observational study of the conspicuity of cyclists commuting to and from the Adelaide CBD. A total of 715 cyclists were observed across four different locations. The general level of front and rear conspicuity among observed cyclists was concerning with high frontal conspicuity observed for 38% and high rear conspicuity observed for 18%. The use of backpacks was observed to reduce the rear conspicuity of 57% of cyclists. Statistical analysis suggested that conspicuity may be associated with the individual characteristics of cyclists and the characteristics of different cyclist groups, although research is necessary to investigate this hypothesis further.

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## Analysis of infringement data from fixed red light and speed cameras at signalised intersections in South Australia

Infringement data from safety cameras at 21 metropolitan Adelaide signalised intersections was obtained. From this data, the change in the number of recorded disobey red light and speeding infringements for each safety camera during the first year of operation was investigated. It was found that both speeding and red light running decreased over time after the installation of a safety camera. Red light running decreased slowly over time, while speeding decreased more rapidly. For the serious levels of speeding, there was a more rapid fall in the number of infringements during the first few weeks and a slower decline thereafter. Based on this, safety cameras appear to generate a worthwhile improvement in driver behaviour.

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## Safer driving technologies and insurance premiums: young drivers

This project examines the motivation of young drivers to select the vehicles they do. CASR staff spoke to young people and their parents to determine what factors influence their vehicle choice. A major theme explored with them was whether the costs of comprehensive vehicle insurance was a factor in preventing younger drivers from using newer vehicles. New vehicles are more likely to have the kinds of technology that assist young and novice drivers in avoiding crashes. However, for many reasons, mainly economic, young drivers tend to drive, and crash, older vehicles. The project also

involved speaking with the insurance industry about how risks are priced with respect to young drivers and new technology.

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## An evaluation of speed education resources

The aim of this project was to identify public education materials that might best be used to increase community acceptance for lower speed limits. A total of 64 educational resources from around Australia were reviewed, the majority of which tended to focus on the safety aspects of speed. The better resources addressed a wider range of evidence and often included information regarding the environmental impacts of speed, fuel economy, or travel time and were also considered to be more accessible to the public. It is suggested that speed education resources could be strengthened with the addition of evidence addressing the reasons why people speed.

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## In-depth crash analysis of cyclists involved in casualty crashes

This study explored the circumstances surrounding crash involvement for a group of 61 bicycle riders who were admitted to hospital following a crash with a motorised vehicle. These cyclists were generally experienced road users who undertook road cycling on a regular basis. On average, the cyclists self-reported their cycling exposure at close to 10,000 km/annum. Male cyclists aged between 36 and 55 years were the group most frequently involved in these crashes. Drivers undertaking a turning



## Safer Speeds

### Vehicle speeds in SA 2009, 2010

The management and control of vehicle speeds is an important road safety measure. In order to evaluate the effects of the general speed reduction program, CASR has been monitoring the speeds of vehicles at approximately 130 sites around South Australia each year since 2007 and will continue to do so into the future. The consistency of the surveys allows changes in vehicle speeds on different road types to be tracked over time.

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manoeuvre, particularly a right turn, posed the biggest threat to cyclists who were generally travelling straight on a carriageway. Cyclists who struck the side of a vehicle were generally found to sustain more serious injuries when compared to other crash types.

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## Safer Roads



### Post impact trajectory of vehicles at metropolitan intersections

The aim of this project was to provide guidance on roadside design at intersections to avoid or mitigate secondary impacts. Information from in-depth investigation of 78 intersection crashes was analysed. Of these, thirty two vehicles were found to have had a secondary collision, with nine being more severe than the initial vehicle-to-vehicle collision. Following the initial collision more than a quarter travelled 15 metres or further and around 10% travelled further than 27 metres. It was also found that 40% of vehicles at signalised intersection departed the intersections and therefore crossed the part of the roadway designated as pedestrian crossings.

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### Segregation of road user types: bicycles

There are clear safety benefits from segregating bicycle traffic from motorised traffic on roads. A challenge facing road authorities is knowing how much segregation to provide and where to provide it. This project involved a literature review of international best practice, after which cycling infrastructure scenarios were tested on a local government area in inner Adelaide. Aggregate crash data from the Traffic Accident Reporting System (TARS), hospital records and in-depth crash investigations was used as input to the study along with site inspections of the study area. The crash information is currently being compared to the standard infrastructure treatments to determine to what extent cyclist crashes would have been avoided.

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Kloeden, C. N., & Woolley, J. E. (2012). **Vehicle speeds in South Australia 2010** (CASR097).

Lindsay, V. L. (2012). **Characteristics of alcohol impaired road users involved in casualty crashes** (CASR105).

## CASR Reports 2012

### Safer Vehicles

#### Measuring the effects of safe vehicle purchasing by Fleet SA

Three methods of identifying work-related crashes were utilised to estimate the burden of work-related road crashes in South Australia. The characteristics of the vehicles and drivers involved, as well as the circumstances in which work-related crashes occurred were also investigated. The crash and injury experience of a large fleet was also explored. An audit of the uptake of various vehicle technologies was conducted which enabled the analysis of what effect these had upon crash rate and severity. Uptake of technology in the fleet was found to be strong and a reduction in crash risk was found for vehicles equipped with ESC.

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#### Measuring underbonnet clearances in order to evaluate pedestrian safety performance of vehicles at various impact speeds

In this project the underbonnet clearance of five ANCAP tested vehicles was measured and used to estimate the overall risk posed to a pedestrian. At speeds greater than the ANCAP 40 km/h test speed there is a risk that the bonnet will deform sufficiently that it 'bottoms out' on something much harder underneath, unless sufficient clearance is afforded. The risk posed to some individual test locations was higher when bottoming out was taken into account, however generally the clearance available was found to be sufficient.

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#### Heavy vehicle performance indicators

In 2012 CASR was commissioned by Austroroads to undertake a project to develop national (including Australia and New Zealand) safety performance indicators to monitor, identify, and address heavy vehicle safety issues. This work identified and recommended the minimum data required to effectively monitor heavy vehicle safety performance in the key areas of crash, vehicle, infrastructure, speed, and people. As part of the project CASR also developed an accident-reporting template for use in recording the necessary data when attending a crash involving a heavy vehicle.

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#### Potential benefits of forward collision avoidance technology

This project considered the potential benefits of forward collision avoidance technology, otherwise known as Autonomous Emergency Braking. Simulation was used to identify the potential effects of the technology in over 100 crashes investigated at the scene.



If a technology has reliability in a broad range of conditions, it is expected to provide a 20 to 35% reduction in fatal and injury crash risks.

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#### The safety attributes of registered passenger vehicles and vehicles involved in serious crashes in South Australia

This study was a preliminary analysis of the composition of the general registered fleet in South Australia and also of vehicles that were involved in serious crashes in the recent past. Vehicles were matched with specification data supplied by RL Polk Australia Ltd. This matching allowed us to examine the rate of uptake of various safety technologies and standards in the two fleets, and to examine the prevalence of technologies overall. For example, at a time when electronic stability control was in 50% of all new vehicles, it was in only 13% of registered vehicles and in 6% of vehicles that crashed.

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