

2009 Annual Report

Centre for Automotive Safety Research





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Government
of South Australia
Department for Transport,
Energy and Infrastructure



Centre for
Automotive Safety Research

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Message from the Director



We are pleased to present our annual report for 2009. As you will see from this publication we had a rewarding and interesting year undertaking a range of research projects which we believe will contribute to reducing road trauma in Australia.

Our important program of at scene, in-depth crash investigations continued in 2009. We consider this work vital in increasing our understanding of how crashes happen and why people are injured and we will strengthen our team in 2010 with additional crash investigators. In 2010 we also intend to use our unique dataset to better understand the changing properties of fatal crashes and the factors contributing to crashes involving younger drivers.

In 2009 we continued our important association with the Australasian New Car Assessment Program (ANCAP) aimed at encouraging vehicle design that minimises pedestrian injuries. We are keen to continue to be involved in raising awareness of pedestrian testing and informing vehicle purchasers of the implications for pedestrians of their choice of vehicles.

We were also pleased to work with the wider community to promote road safety. This occurs through our support to the Road Safety Advisory Council (RSAC) through its committees and task forces and also through providing information and seminars to many community and educational groups.

In 2010 we are looking forward to being closely involved in the development of the new South Australian Road Safety Strategy. We will be providing research support and will also be working with RSAC and a range of community groups to develop and promote the strategy.

At CASR we see the development of new road safety researchers as a vital part of our role so we were very pleased in 2009 to welcome two new PhD students: James Thompson is the first recipient of

the RAA scholarship and will be working in the area of mobility for elderly drivers and Blair Turner from ARRB will be undertaking research on speed and rural crashes. In 2010 we expect to welcome another student to take up a postgraduate scholarship provided by Motorcycling Australia.

The valuable work done by CASR is only possible because of the support of the South Australian Department for Transport, Energy and Infrastructure (DTEI) and the Motor Accident Commission (MAC). This support allows us to carry out an ongoing research program relevant to the needs of South Australia, to develop high-level road safety research expertise available to South Australia. It also enables us to undertake work for a variety of national and international clients.



CASR overview



Grants awarded

In 2009, Robert Anderson was awarded two highly competitive grants.

A pathogenetic and pharmacotherapeutic study of non-accidental head injury in children (the shaken baby syndrome) using an ovine model

Funded by the National Health and Medical Research Council

Non-accidental head injury (often termed the “shaken baby syndrome” or SBS) is a major cause of death and neurological disturbance in human infants. However, the mechanism of brain injury is poorly understood, particularly whether shaking alone is sufficient to cause brain damage or if an additional head impact is required. Moreover, there is currently no effective treatment for this neurological disorder.

This project aims to investigate these issues and evaluate a novel drug therapy for SBS, which aims to reduce cerebral oedema and the resultant rise in intra-cranial pressure, a substantial elevation of the latter being largely responsible for the clinical outcome in such cases.

Robert Anderson is a Chief investigator on the project as part of a collaboration with the School of Medical Sciences, the Discipline of Pathology and the Institute of Medical and Veterinary Science. In 2010, Baptiste Sandoz, a postdoctoral fellow from the French National Transport Safety Institute, will join the Centre and will be principally responsible for measuring the biomechanics of the model which will be used to explore the mechanisms of injury. The project is funded for a three year period.

Quantifying the link between tissue strain and brain dysfunction in a sheep model of neurotrauma

Funded by the Brain Foundation

This project studies how the brain of anaesthetised sheep responds mechanically and physiologically to dynamic indentation. The experimental procedure complies fully with all animal ethics requirements. The results will provide information on the tolerance of the brain to mechanical loads, and this can be applied to numerical models of human head impact, leading to improved injury tolerance criteria for head protection. The study is being conducted in collaboration with a long-time collaborator with CASR, Tetsuya Nishimoto of Nihon University, Japan.

Robert Anderson (Chief investigator) and Prof. Bob Vink (Co-investigator; Head of the School of Medical Science) were jointly awarded the Brain Foundation Grant. The Grant is highly competitive and prestigious, with an estimated success rate of less than 10%.

Teaching and training

Undergraduate study

In 2009 CASR presented the Traffic Engineering and Design course for the Civil Engineering undergraduate degree. Mary Lydon, Jeremy Woolley and Paul Hutchinson all presented lectures in the areas of traffic management, modelling and impact assessment.

The Centre also delivered the Automotive Safety Engineering course for the Mechanical Engineering degree. The course taught students about the principles of active and passive safety in automobile design and the role of safe vehicles within a broader context of road safety.



Library

CASR holds the largest and most comprehensive collection of road accident material in Australia, including many resources not available at any other library. The highly specialised library provides support to staff at the Centre by way of literature reviews, current awareness services.

The library holds a comprehensive collection of primary and secondary materials including the latest research reports, conference proceedings, journals and books from both Australia and overseas.

In 2009 the library developed a Publications database containing over 700 publications authored by CASR staff. The database contains bibliographic detail about all publications as well as full text documents where possible. The database is available to the community on the CASR website.

For more information go to <http://www.casr.adelaide.edu.au/library>

Postgraduate study

CASR supports five PhD students who are currently working on various engineering and behavioural research projects.

James Thompson commenced his PhD in 2009 after receiving a Road Safety Research Scholarship generously provided by the Royal Automobile Association of South Australia. James will be studying the crash risk of older drivers in urban and rural areas.

Blair Turner also commenced his PhD in 2009 on the topic of reducing road casualties on rural roads through reduced speeds.

Jeff Dutschke is investigating the effect of particular criterion for head injury on vehicle design. Jamie McKenzie is studying the potential effects of Electronic Stability Control (ESC) on crashes on Australian rural roads. Daniel Searson is studying the characteristics of pedestrian headform impacts as used in the Australasian New Car Assessment Program.





At scene in-depth crash investigation

CASR continued to be active in the field of at-scene in-depth crash investigation in 2009. Having focused exclusively on rural crashes in recent years, we decided to expand our case collection to include metropolitan area crashes as well. On-call times were divided so that in every three week period, two weeks were dedicated to rural crash investigation and one to metropolitan crashes. At year's end, 188 crashes had been investigated as part of the study. Of these, 158 occurred in rural areas and 30 in Metropolitan Adelaide.

Data from in-depth crash investigation continues to be used in various CASR projects. In 2009 the data has been used in the "Lessons from In-Depth Crash Investigation" reports for Austroads and in a study comparing the effectiveness of clear zones and safety barriers. In 2010 the data will be used in an analysis of younger driver crashes and as a means of auditing the Traffic Accident Reporting System database.

CASR presented seminars referring to our in-depth work in 2009. These included an overview by Director Mary Lydon, a presentation by Jamie Mackenzie about Electronic Stability Control and a presentation by Jeremy Woolley on crashes involving visual obstructions caused by other vehicles. Dr Jeremy Woolley and Matthew Baldock also presented an Australian College of Road Safety Lunchtime Dialogue concerned with roadside hazards, which made extensive use of in-depth crash investigation findings.

In October, the Centre for Automotive Safety Research, in conjunction with the Department for Transport, Energy and Infrastructure (DTEI), convened the inaugural CASR Case Study Workshop. The workshop used information collected by CASR through its at scene, in-depth crash investigation to examine the key issues contributing to a sample of crashes occurring

at one particular high risk intersection. A group of road safety stakeholders discussed these issues, identified potential countermeasures and assigned follow-up actions to key personnel present at the workshop. The road safety stakeholders who attended the Workshop included various representatives of the Department for Transport Energy and Infrastructure, SA Police Major Crash Investigation, Barossa Council and the Country Fire Service.

The idea for the workshop came from the system of crash review used by the Swedish Road Administration, known as OLA. In Swedish, OLA stands for "objective facts", "solutions" and "intentions".

Additional workshops of this sort are being planned for 2010. The particular types of crashes to be discussed remain to be decided. It is hoped that we can expand the range of stakeholders attending the workshop.

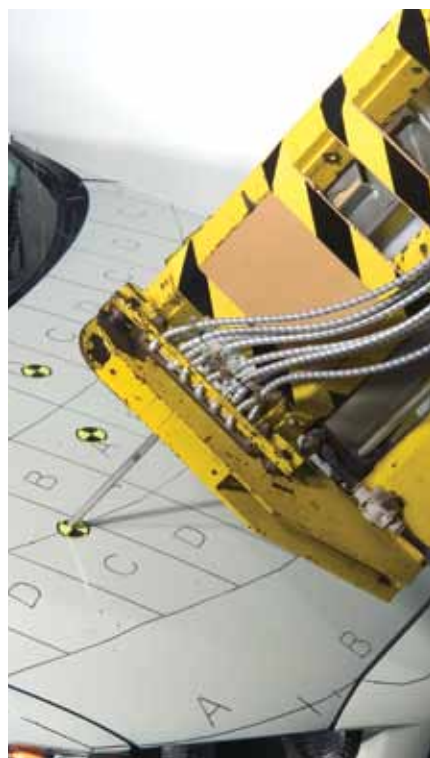
Impact Laboratory testing

The CASR Impact Laboratory is a purpose built facility designed for conducting pedestrian sub-system testing. The Impact Laboratory is a central component of our pedestrian safety research, which considers both accident prevention and injury mitigation through vehicle design.

The lab is equipped to assess the danger posed by the front of a vehicle to a pedestrian. Our tests do not use crash test dummies, as is done with studies on occupant protection, but “sub-systems” that represent, separately, the head, upper leg, and lower leg of a pedestrian. These sub-system impactors are launched at the stationary vehicle.

The laboratory is the official testing facility for the pedestrian component of the Australasian New Car Assessment Program (ANCAP). ANCAP is a consortium of Australian and New Zealand motoring clubs, State government departments, and motor injury insurance authorities. It provides vehicle buyers with information on the crash performance of vehicles, including side impact tests, offset-frontal tests and pedestrian tests. Since 1999 we have been contracted to perform the subsystem tests and to date have tested around 70 vehicles for the program.

The tests are designed to measure the risk of injury to pedestrians in a collision with the front of the vehicle. Many kinds of crash test use instrumented dummies to measure injury risk, but for pedestrian safety tests ‘sub-system’ impactors representing different regions of the body are used. The different impactors represent the head of an adult pedestrian, the head of child pedestrian, the upper leg of an adult pedestrian and the knee/lower leg of the pedestrian.



The headform tests are conducted on the bonnet and at the base of the windscreen at a speed of 40 km/h (the windscreen itself is considered to be ‘safe’ and unlikely to cause serious injury on its own). Twelve different locations are tested, and manufacturers have the opportunity to nominate extra tests and different locations. The results of the headform tests contribute most strongly to the overall assessment of the vehicle. The headform measures impact deceleration, and this is used to rate the severity of the impact.

The upper legform tests are conducted along the leading edge of the vehicle, around the forward-most area of a passenger vehicle’s bonnet. The impactor measures the severity of the impact in terms of the risk of fracture to an adult pedestrian’s femur and pelvis.

The full legform tests are conducted along the front bumper of the vehicle. They measure the risk of ligament damage to the knee and the risk of fracturing the tibia and fibula.

Individual test scores are summarised for a vehicle using a star rating between 0 and 4. Generally, the testing has shown a range of results, with some vehicles clearly designed to ensure some level of protection for pedestrians, while other vehicles have performed poorly. The test scores are generally in the range of one to three stars.

In 2009 we tested the Suzuki APV, Kia Sorato, Hyundai iLoad, Subaru Liberty, Subaru Outback, Proton Jumbuck, Great Wall SA220, Great Wall V240, Honda City, Hyundai SantaFe and Subaru Exiga.

For more information on the full ANCAP program, please visit <http://www.ancap.com.au>

Project summaries

On-road observational survey of adult and child restraint use in South Australia

On-road observational surveys of seat belt and child restraint use provide valuable information on the levels of restraint use in the community and on the characteristics of vehicle occupants who are not using restraints. Very few observational restraint use surveys have been conducted in Australian jurisdictions in recent years and the last observational survey undertaken in South Australia was in 2002.

This project involved conducting a new on-road observational survey to monitor the levels of restraint use by occupants of passenger vehicles in areas previously surveyed in South Australia: metropolitan Adelaide and five rural regions. Trained field observers recorded the vehicle type, plates displayed on the vehicle, and the seating position, gender and restraint use of vehicle occupants including the uses and types of any child restraints. For the first time in this series of surveys, restraint use was observed on weekends in addition to weekdays.

The study found that restraint use for all vehicle occupants in passenger vehicles was 98.4% in the Adelaide metropolitan area and ranged from 96.8% to 98.2% in the rural regions. The levels of restraint use observed in the current survey were the highest since surveys began in 1998. Rear seat passengers and adult males had the lowest levels of restraint use. Child restraint use was relatively high but varied by region. Findings from this survey might assist in the development of restraint use publicity campaigns and the monitoring of their effectiveness.

For more information please contact

Lisa Wundersitz,

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Effectiveness of Electronic Stability Control

About 60% of all fatal road crashes in Australia occur on rural roads. While advances have been made in reducing the number of fatal crashes on metropolitan roads, the number of fatal crashes on rural roads remains relatively steady. Electronic Stability Control (ESC) is an active safety system, which has shown potential in preventing crashes on high-speed rural roads. The ESC system can detect when a vehicle is about to skid and apply braking interventions to individual wheels to prevent the skid from occurring. Previous studies have shown that vehicles equipped with ESC have a significantly reduced crash rate compared with vehicles not equipped with ESC. The way that the ESC system intervenes to prevent or lower the severity of crashes on rural roads has not yet been studied. Twenty crash scenarios were developed based on actual rural road crashes obtained from the CASR in-depth crash database. With the assistance of Robert Bosch (Australia) Pty. Ltd., twelve of the scenarios were simulated using a vehicle model with and without ESC fitted. The simulations produced detailed plots that displayed the timing and magnitude of the ESC system's interventions. In two of the scenarios, no simulation was necessary as the driver made no attempt to avoid a collision. In six scenarios, the attempt at simulation was unsuccessful. For the twelve successful simulations, ESC was found to prevent a collision in ten cases and reduce the severity of the collision in the remaining two.

For more information please contact

Jamie Mackenzie,

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Headform impact test performance of vehicles under the GTR on pedestrian safety

A new Global Technical Regulation (GTR) on pedestrian safety may be adopted in Australia in the near future. This regulation would require most new passenger vehicle designs to pass a series of pedestrian safety tests in order to be approved for sale.

The primary goal of this project was to determine how many vehicles previously tested under the Australasian New Car Assessment Program (ANCAP) might be expected to pass the headform component of the GTR in Australia. The project was conducted in two parts. In the first part, three popular new vehicles were tested under the GTR child headform testing protocol. One of these vehicles passed the requirements of the GTR, and the remaining two failed the requirements, but could probably be made to pass with little modification. In the second part of the project, a theoretical method was developed for predicting the outcome of GTR tests, based on previous ANCAP results. This method was used to predict best-case and worst-case estimates of performance for 60 vehicles previously tested by ANCAP, 33 of which were current vehicle models as of November 2009.

The results indicated that about half of the current vehicle models considered would pass the GTR with little or no modification. The remainder would probably require more significant design changes in order to comply with the requirements. The current vehicles performed better, on average, than older vehicle models.

For more information please contact Daniel Searson,
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Review of Western Australian Drug Driving Laws

The Department of the Premier and Cabinet in Western Australia commissioned CASR to evaluate the first 12 months of the implementation of WA's new drug driving legislation. The new legislation made provision for two new offences: driving with the presence of a prescribed illicit drug in oral fluid or blood, and driving while impaired by a drug. The review of the amended legislation and associated drug driving law enforcement included three components: a process evaluation of the roadside oral fluid testing and drug impaired driving enforcement programs; an analysis of testing, offence detection and legal penalty data pertaining to the first year of operation of the new drug enforcement measures, and a report on consultations with various stakeholders.

One issue identified in the review was a high false negative rate associated with one of the devices used to conduct the roadside driver drug testing. New test kits were ordered and it was recommended that the laboratory testing of negative roadside samples continue in order to monitor whether the new kits were producing more accurate results. It was also found that there was very little enforcement of the drug impaired driving legislation. It was recommended that drug impaired driving legislation be more adequately promoted and resourced within the agency and that confusion between random oral fluid testing and drug impaired driving be addressed throughout the WA Police.

Other recommendations in the report included a review of penalties applied to all impaired driving offences, regular educational briefings for Magistrates and Prosecutors, the addition of certain variables to the drug testing database, that a general rollout of drug testing across the Agency not proceed, that more regular communication with other jurisdictions be formalised, and that a future crash based evaluation be conducted.

For more information please contact Matthew Baldock, matthew@casr.adelaide.edu.au



Pedestrian and cyclist crashes in metropolitan Adelaide

In-depth at-scene investigations of motor vehicle road crashes in the Adelaide Metropolitan Area were conducted in the period April 2002 to October 2005. The database from that study is used to throw light upon pedestrian and pedal cyclist crashes. The database of routinely reported crashes is also utilised in respect of pedestrian and cyclist fatalities.

As pedestrian casualties are more numerous than cyclist casualties, the majority of results concern the former. In the 81 cases in the in-depth series, many different types of pedestrian accident can be identified. Of the 40 pedestrian fatalities in 2003-2006, 29 fell into at least one of the following three categories: at night, pedestrian was drunk, or pedestrian was elderly. Two points to note about this contrast between the two series are that (1) the in-depth study concentrated on crashes in normal working hours, and thus nighttime crashes are underrepresented, and consequently so is drunkenness, and (2) it is an open question whether there really are only three types of central story that cover the majority of pedestrian fatalities, or whether this finding is a consequence of the lack of detail in routine police data.

Taking the several series of crashes together, seven issues are prominent, and were considered from the point of view of possible countermeasures: nighttime; drunkenness of pedestrians; visual obstruction by traffic; visual obstruction by roadside objects; possible improvements to other details of the road; trucks (visibility from the cab, and side protection) and speed. There is also consideration of the competing needs for space of environmentally-friendly modes and motorised modes of transport: perhaps users of power-assisted cycles (slow motorcycles) are a potential natural ally of pedestrians and pedal cyclists in the demand for urban space.

For more information please contact Paul Hutchinson, paul@casr.adelaide.edu.au

Speed Surveys

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.

Based on the lessons learned in setting up the South Australian speed surveys, CASR developed a methodology for conducting a similar survey in Queensland. Two such surveys were conducted during 2009 and CASR is analysing and reporting on the results.

For more information please contact
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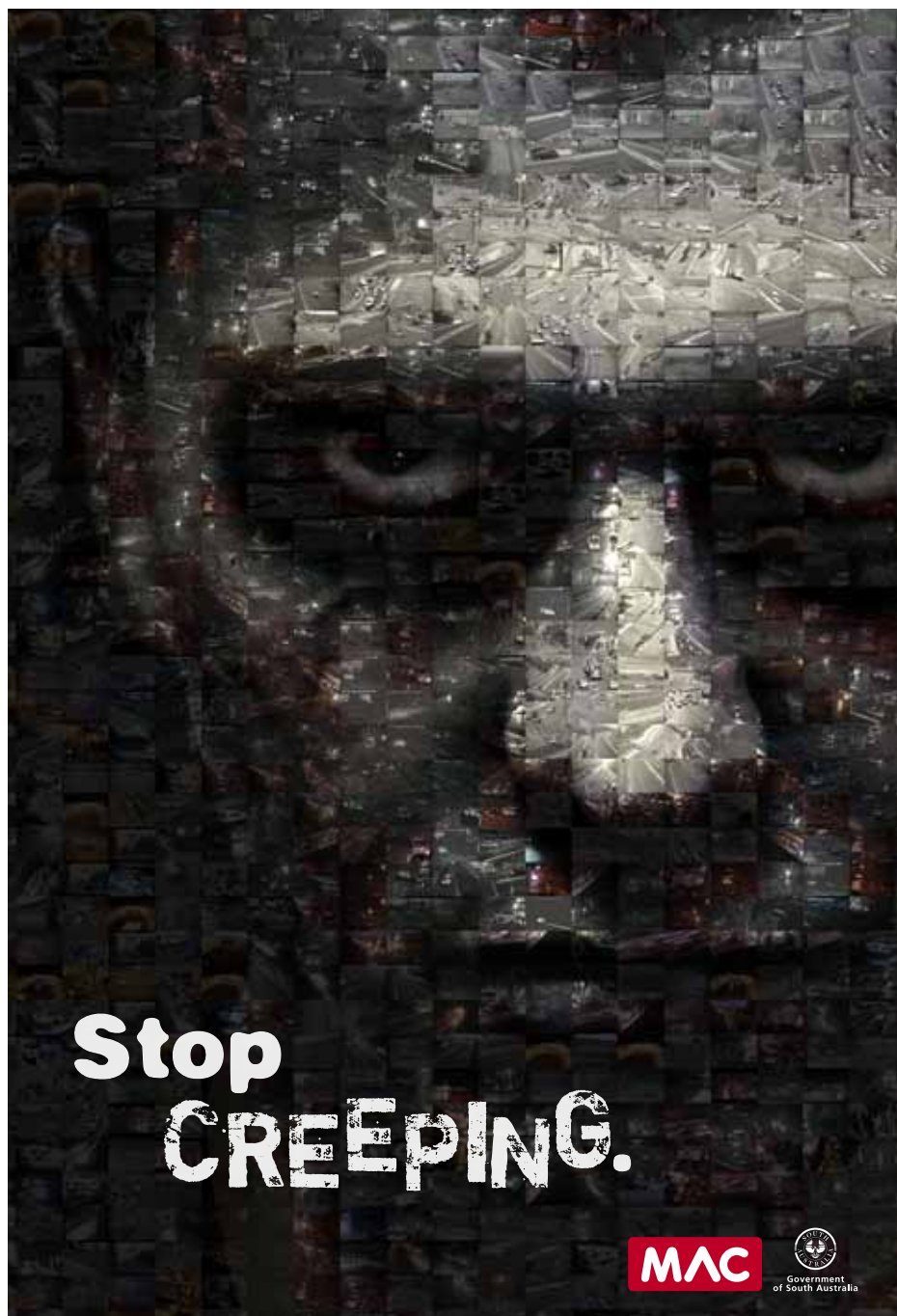


Best practice in road safety mass media campaigns: A literature review

Mass media campaigns are used extensively as a means of promoting road safety issues. It is important to understand what elements make a road safety mass media campaign effective and how we might enhance future campaigns. This project was designed to provide a timely update of what is currently known about road safety advertising design and evaluation. Australian and international advertising literature published from 2001 to 2009 was reviewed to determine best practice for road safety mass media campaigns. Instead of examining whether road safety advertising is effective or not, this review focused on what aspects of road safety advertising are more effective and for whom.

Design factors that can improve campaign effectiveness can include integrating advertising with other activities (e.g. enforcement), tailoring message content and means of communication to the characteristics of the target audience, using psychological theories of behaviour change, and using new technology and multiple forms of media to reach the target audience. The usefulness of different types of appeals (e.g. emotional, rational, threat) was also reviewed with new evidence suggesting that gender may influence the effectiveness of different emotional appeals.

The review also highlighted the difficulties in establishing the effectiveness of a mass media campaign, considered different evaluation methods and discussed the value of different campaign evaluation measures. The ideal campaign evaluation methodology is not always feasible or practical but where possible, evaluations should be based on before and after comparisons of behaviours that can be objectively observed and are closely linked to safety such as on-road speed or seat belt surveys.



For more information please contact Lisa Wundersitz, lisa@casr.adelaide.edu.au

Management of the licensing of drivers affected by cognitive impairment, including dementia

Vicroads commissioned CASR to report on the issues of licensing cognitively impaired drivers. The report focussed on the issues of identification and referral of drivers with dementia for assessment of fitness to drive, the appropriate time intervals between periodic reviews of drivers with dementia, and how to increase the likelihood that those with dementia adhere to the decision to cancel their driver's licence.

For more information please contact Matthew Baldock, matthew@casr.adelaide.edu.au



Evaluation of the effectiveness of the Community Policing and Education Project

VicRoads has commissioned CASR to evaluate the effectiveness of the Community Policing and Education Project, which uses education and enforcement by Victoria Police to improve motorcycle safety. The two year Project, which was launched in January 2009, aims to reduce the incidence of risk-taking behaviours by riders and drivers of other vehicles that put motorcyclists at risk of a crash or injury in the event of a crash.

CASR's evaluation of the Project includes a process evaluation, an analysis of crash and offence data, a series of on-road speed surveys, roadside observations of Victorian road users, and an online survey of Victorian motorcyclists. The evaluation is scheduled for completion in 2011.

For more information please contact Matthew Baldock, matthew@casr.adelaide.edu.au





Crashworthiness of the vehicle fleet

Cars in South Australia are older, on average, than those of most other Australian States. The mean age of passenger vehicles registered in South Australia is around 11.2 years compared with 9.9 years for the entire Australian registered passenger vehicle fleet and 9.3 years for registered passenger vehicles of New South Wales. This phenomenon may mean that, kilometre for kilometre, South Australians are driving vehicles that are older and therefore less crashworthy than much of the rest of the Country. This project estimated the magnitude of any increased risk implied by the older vehicle fleet.

Based on the mean age of vehicles, tow-away crashes in South Australia have a 3% over-representation of seriously injured or killed drivers compared with the national average. Young drivers appear to be doubly disadvantaged in that they have a higher rate of serious and fatal crashes for a given vehicle age, and they tend to crash vehicles that are much older than the vehicles crashed by other drivers. Despite this, the benefits of fleet renewal on average age-related crashworthiness are relatively modest and it may be more fruitful to encourage the safest new car fleet now so that road safety benefits can be realised in 10-15 years time. In the meantime, removal of impediments to younger drivers who would otherwise drive newer and safer cars could be beneficial.

This project examined the simulation testing of accidents between pedestrians and SUVs and high ground clearance work utilities from several perspectives. First, pedestrian safety assessments made by the European New Car Assessment Program (EuroNCAP) and the Australasian New Car Assessment Program (ANCAP) were analysed. SUVs performed slightly worse than sedans on a vehicle-to-vehicle basis, while work utilities performed very poorly. Individual vehicle results were weighted by Australian sales volumes. When weighted, there was little overall difference in the performance of SUVs and sedans. However, bull bar fitment has the potential to severely degrade the level of pedestrian protection. Given the high rate of fitment, and the possibility of buying dealer fitted bull bars, organisations such as ANCAP might

consider the safety implications of bull bars in the assessment of SUVs and work utilities.

In the second part of this project, simulations of pedestrian/vehicle collisions were performed using a variety of vehicles, bull bar types, pedestrian orientations, speeds and braking levels. Results showed that, generally, impact loads were higher in SUV and work utility simulations than sedan simulations. Head injury potential was also higher, but this observation was complicated by the fact that the reason for this was loading via neck tension rather than impact severity. Indeed, the head impact severity was often less in SUV and work utility simulations because of lower head impact speeds. These results may have implications for the interpretation of subsystem test results of the kind used by ANCAP and EuroNCAP.

For more information please contact
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Staff profiles



Professor Mary Lydon, PhD, MEngSci, BSc (Hons), Director

Mary Lydon joined the University of Adelaide as Director of the Centre for Automotive Safety Research in March 2009. Mary has over 30 years experience in roads and road safety including senior positions in both research and operations.

She has qualifications in civil engineering, operations research and transport and is a Fellow of the Institution of Engineers. She is a member of the South Australian Road Safety Advisory Council and the Standards Australia Committee on Road Safety Management.

Mary's research interests include rural road safety, road design, traffic management and road safety management.



Dr Robert Anderson, PhD, BE (Hons), Deputy Director

Robert specialises in the biomechanics of crash injury, computer simulation, and impact testing. He also conducts evaluations of road and vehicle safety effectiveness including modelling effects of vehicle safety attributes at the fleet level.

His current research interests include the tolerance of the brain to physical insults, the modelling of rate dependent contact behaviour in impact testing, the relative efficacy of head impact test criteria, modelling pedestrian impacts, the effectiveness of electronic stability control and investigating the deployment of safety features in the registered vehicle fleet.

Robert won the Elizabeth Penfold Simpson Prize in 2003 for neurotrauma research and the Peter Vulcan Award for Best Scientific Paper at the Australasian Road Safety Research, Policing and Education Conference in 2002 and again in 2009. Last year he was also awarded the neurotrauma grant award by the Brain Foundation.

Robert is a member of the Engineers Australia Injury Biomechanics Panel and chairs the SA Road Safety Advisory Council Emerging Vehicle Technology Task Force. He is also a member of the Standards Australia Committee for Child Restraint Use in Motor Vehicles. He teaches automotive safety and restraint design to final-year mechanical engineering students.



Dr Matthew Baldock, PhD, BA (Hons), Research Fellow

Matthew specialises in research involving older drivers, motorcyclists, drugs and alcohol, and in-depth crash investigation.

His current projects include an evaluation for VicRoads of the effectiveness of a Community Policing and Education project aimed at motorcycle safety in Victoria, an in-depth review of recent fatal crashes in South Australia, analyses of research needs in motorcycle safety and sleepiness and driving, in-depth investigation of South Australian road crashes, and annual performance indicators of enforced driver behaviours.

In 2008 Matthew won the Peter Vulcan Award for the best research paper presented at the 2008 Australasian Road Safety Research, Policing and Education Conference.

The project, conducted with James Thompson, also won the 2008 Elsie Harwood Award, which is a national award for empirical research in the field of ageing conducted as part of a fourth year or Masters program in psychology.

Matthew is a member of the International Council on Alcohol, Drugs and Traffic Safety (ICADTS) and Chair of the Road Safety Advisory Council Motorcycle Safety Task Force. He is also affiliated with the University of Adelaide School of Psychology.



Sam Doecke, BE (Hons), Research Officer

Sam specialises in computer aided crash reconstruction and simulation, in-depth crash investigation and automotive engineering.

Sam works as part of the in-depth crash investigation team and his current projects include evaluating roadside protection scenarios, simulating pedestrian impacts with 4WDs and an analysis of performance indicators of enforced driver behaviour.



Jeff Dutschke, BE (Hons), BSc, Postgraduate student

Jeff is currently undertaking a PhD, investigating how crashworthiness is affected by the use of one of the many criteria that are available to evaluate potential head injury.

Jeffrey worked with the CASR crash investigation team during 2009, investigating accidents at scene.

At the 2009 Road Safety Research Policing and Education Conference Jeffrey was awarded the John Kirby Memorial Road Safety Award for best paper by a new researcher for his work investigating the effect of lower speed limits.



Dr Paul Hutchinson, PhD, MA, Senior Research Fellow

Paul specialises in trying to understand data across quite a wide range of fields, both starting from the data and openmindedly perceiving the significant features, and starting from theoretical ideas and actively looking for confirmation or disconfirmation. Data sources that he has experience with include accident records, behavioural observations, and engineering experiments. Some of his work has implications outside of road safety, for mainstream statistics, psychology, engineering, or transport.

Recent projects have included comparison of the injury severities of the drivers of the older car and the newer car in the same crash, analysis of pedestrian and cyclist accidents in Adelaide, comparing crash numbers before and after speed limit reductions, and reviews of the blackspot treatment process, media campaign evaluations, the intoxicated pedestrian problem, and obtaining appropriate measures of travel activity.

Paul is a member of the Chartered Institute of Transport and Logistics, the Institution of Highways and Transportation, the British Psychological Society, the Safety and Reliability Society and the Royal Statistical Society.



Craig Kloeden, BA, Research Fellow

Craig's main area of specialisation is the analysis of large data sets particularly in relation to the crash experience of drivers and the speeding behaviour of motorists.

Craig has a thorough understanding of the South Australian crash database consisting of nearly 1 million crashes and is continuing to develop web based interfaces for exploring this data.

Craig also analyses annual speed data collected each year from 132 sites around South Australia in order to track the changing speed behaviour of motorists over time.

Craig is a member of the SA Road Safety Advisory Council Speed Task Force and ICADTS (The International Council for Alcohol, Drugs and Traffic Safety).



Tori Lindsay, RN RM, Dip App Sc, BN Ed, Research Officer

Tori specialises in in-depth crash investigation, the relationship between medical health status and crash involvement and health outcomes as a result of crash involvement, including Abbreviated Injury Scoring.

Her current projects include a study related to medical conditions as a contributing factor to crash causation. This comprehensive project involves examination and analysis of information from multiple sources related to collisions occurring on public roads in South Australia. The study is to be conducted over a three year period and it is expected that approximately 1,500 collisions will be investigated during the course of the project.

Tori is a member of the International Traffic Medicine Association.



Jamie Mackenzie, BE (Hons), Postgraduate student

Jamie is currently undertaking a PhD, studying the potential benefits of electronic stability control (ESC) on crashes on Australian rural roads.

Many European, American and some Australian papers have shown that Electronic Stability Control (ESC) provides a large reduction in crash rate. Most papers point out that the greatest reduction is for crashes where a driver loses control of their vehicle. In Australia, this type of loss of control crash occurs mostly in rural areas comprising higher speed limits and unsealed roadside shoulders.

Australian roads differ from European and American roads in many ways. Long stretches of rural highway with unsealed shoulders are not encountered in most European countries. The materials used on road surfaces will also differ from other countries. In addition, the Australian climate is unique in that there is little rainfall and virtually zero snow or ice compared with America and Europe. The results of overseas studies, while being a useful indication, cannot be simply applied to Australian roads and conditions.

The aim of this research is to predict the effect that ESC will have on Australian rural crashes. Working closely with Bosch Australia, a set of simulations will highlight how ESC prevents crashes. Data from a South Australian crash database will also be used to determine the incidence of loss of control type crashes on rural roads.



Professor Jack McLean, PhD, MSc, ME, BE, FTSE, Professorial Research Fellow

Jack's research areas include crash injury biomechanics with a particular interest in head injury, human factors in crash causation and vehicle, road and traffic factors in crash and injury causation.

A Fellow of the Australian Academy of Technological Sciences and Engineering.

Jack was awarded the 2008 International Distinguished Career Award from the American Public Health Association (Injury Control and Emergency Health Services Section) "For leadership in injury control with contributions that have a significant and long term impact on the problem of injury."

He has also received numerous other awards including the Centenary Medal, Commonwealth of Australia in 2003 and an Award for Engineering Excellence from the United States National Highway Traffic Safety Administration in 2007.



Giulio Ponte, BE, Research Engineer

Giulio specialises in pedestrian crash safety, and in-depth crash research.

He is currently working on pedestrian sub-system testing and pedestrian crash safety including completing testing for the ANCAP program.

He has extensive experience in at-scene investigation of vehicle crashes.

Giulio is presently enrolled in a Masters of Traffic Engineering.



Daniel Searson, BE (Hons), Postgraduate student

Daniel is currently undertaking a PhD studying the characteristics of pedestrian headform impacts.

Pedestrian impact testing is used to assess the level of protection provided by a vehicle to a pedestrian in the event of a collision. Testing is conducted as part of EuroNCAP and ANCAP. It is also conducted for compliance with regulations in Europe and Japan, and as part of the upcoming Global Technical Regulation on pedestrian safety.

This project seeks to examine how choices of headform mass and test speed influence the results of such testing, both in the laboratory and in a real-world context. This will be achieved using a theoretical model, validated with data from testing conducted at CASR. Results from this project have been included as part of a recent CASR report, as well as at the 2008 and 2009 Road Safety Research, Policing and Education conferences.



James Thompson, BA, BHSc(Hons), Postgraduate Student

James is currently undertaking a PhD in ageing and mobility after receiving the Road Safety Research Scholarship from the Royal Automobile Association of South Australia.

Research indicates that older drivers have an elevated crash risk on a per-kilometre driven basis and an increased risk of fatality and serious injury from crashes. However, it is important that they continue driving for as long as it remains reasonable and safe to do so. This is because there is often a marked impact of driving cessation on an individual's health and mobility, especially if the ex-driver has no other mobility options.

The situation may be worse for rural older drivers. Living rurally results in a greater dependence on driving and may create a reluctance to stop driving. Consequently, they may have an increased crash risk. Motor vehicle crash fatality rates are higher in rural areas than urban areas. However, research has not compared the crash, serious injury, and fatality rates of rural and urban older drivers. James intends for his research to do this and explore ways of minimising any such increased crash risk.



Andrew van den Berg, BE (Hons), Impact Laboratory Manager

Andrew specialises in pedestrian crash safety, instrumentation and signal processing.

He is currently conducting pedestrian sub-system tests for the Australasian New Car Assessment Program and for the car industry.



Dr Jeremy Woolley, PhD, BE (Hons), Senior Research Fellow

Jeremy specialises in road infrastructure design and management and is an accredited road safety auditor. He plays a key role in reviewing CASR in-depth crash investigations and is in constant liaison with National State and Local Government road authorities regarding road safety issues. Dr Woolley has also spent a considerable amount of his career researching the benefits of speed limit changes and has conducted many road safety evaluations to inform policy makers. He has extensive experience in working with national road safety stakeholders including transport and enforcement agencies.

His current activities include providing advice to road agencies on findings from CASR in-depth crash investigations and research into the implications of adopting safe system principles for Australian roads.

Jeremy delivers lectures on road safety in various training courses and is the supervisor of postgraduate research students. At the 2009 Road Safety Research Policing and Education Conference he co-authored a paper that was awarded the John Kirby Memorial Road Safety Award for best paper by a new researcher. Jeremy is currently South Australian Branch President of the Australasian College of Road Safety and immediate past president of the Australian Institute of Traffic Planning and Management. In 2009 Jeremy served on the Speed Management, Heavy Vehicle and Infrastructure task forces of the Road Safety Advisory Council.



Dr Lisa Wundersitz, PhD, BA (Hons), Research Fellow

Lisa specialises in research involving younger drivers, road user attitudes and behaviour, evaluation of road safety programs and in-depth crash investigation.

Her current projects include a review of best practice for road safety mass media campaigns, an on-road observational survey of adult and child restraint use, a review of penalties for road traffic offences in South Australia, and performance indicators of enforced driver behaviours (drink driving, drug driving, speeding and restraint use). She is also a member of the in-depth crash investigation team, attending crashes at-scene and conducting follow up interviews with crash participants.

Administrative Staff



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Publications



Reports

- Anderson RWG, Doecke S, Searson DJ (2009) Vehicle age-related crashworthiness of the South Australian passenger fleet (CASR062), Centre for Automotive Safety Research, Adelaide.
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