

# 2008 Annual Report

## Centre for Automotive Safety Research





### Contents

Director's report	1
CASR overview	3
CASR projects	8
Looking forward to 2009	11
Staff profiles	12
Publications	15

The Centre for Automotive Safety Research is a research unit of the University of Adelaide and is supported by sustaining funds from the State Government Department for Transport, Energy and Infrastructure and the Motor Accident Commission. We carry out high quality road safety research aimed at reducing the human and economic costs of road trauma.



Government of South Australia

Department for Transport, Energy and Infrastructure



MOTOR ACCIDENT COMMISSION

Centre for Automotive Safety Research



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# Director's report



We at CASR are proud to present our Annual Report for 2008.

This was a year of change for CASR with the retirement of our previous Director, Professor Jack McLean, after over 35 years as head of CASR (and its predecessor RARU). In March 2008 I was privileged to take up the role of Director and certainly had some big shoes to fill. My first year has coincided with interesting and exciting times at CASR and we are confident these will continue into the future.

We have had a long-term aim to better understand the causes of crashes and injury and this interest was reflected in our research in 2008. This included our

program of at scene crash investigation and our work with mass crash data. We are also using hospital, vehicle and licence databases to better understand the people and vehicles involved in crashes.

In addition to our work in South Australia we used our in depth crash investigations to identify infrastructure issues for Austroads and our knowledge of speed management to design a speed survey program for Queensland Transport. We also helped Tasmania review their road safety strategy and continued work for the Federal Government on pedestrian protection.



We have been pleased to continue our relationship with the Australasian New Car Assessment Program, carrying out pedestrian sub system testing for seven new vehicles in 2008. We continued to research ways to improve these tests by working with ANCAP and vehicle manufacturers and sponsoring postgraduate research to better understand and interpret pedestrian testing.

In August we held a workshop to identify road safety research needs and help us develop our forward research program. The workshop included stakeholders from government, industry and motoring organisations. The opening speaker was Dr Soames Job, the General Manager for Road Safety with the New South Wales Road Traffic Authority. His insightful and thought provoking opening speech set the scene for a successful and informative afternoon.

In November the annual Australian Road Safety Research, Policing and Education Conference was held in Adelaide. CASR staff members were closely involved with management of the conference as part of the steering committee and leading the

development of the technical program. Eleven CASR papers were presented at the conference including 'Self-regulation of driving behaviour among older drivers: findings from a five year follow-up' by Matthew Baldock, J Thompson and J Mathias, which was the winner of the Peter Vulcan Best Paper award.

We continued our international collaboration in 2008. Jack McLean and Robert Anderson travelled to China to take part in a collaborative activity based at Hunan University, Changsha, teaching topics in crash investigation and we continued our collaboration with the French research organisation INRETS to assess the validity of pedestrian injury models. We also hosted a number of international visitors who were in Adelaide for the Road Safety Research, Policing and Education Conference. These included Prof Dr Ahmad Farhan Mohd Sadullah the new Director of MIROS (the Malaysian Road Safety Research Institute) and Ms Jeanne Breen, a world renowned expert in road safety management.

In 2008 we have been proud to continue to support road safety activities in South

Australia including membership of the Road Safety Advisory Council and its Task Forces, presentations to community and interest groups and providing input and research advice on the development of road safety countermeasures.

During 2008 CASR has again been assisted and guided by the work of our Reference Board and this has been particularly important to me in my first year as Director. The end of the year also brought changes to the Board with the retirement of our Chairman, Mr Mike Quinn. All of us at CASR would like to extend our thanks to Mike for his help and support during the last seven years.

In conclusion I wish to acknowledge with gratitude the support of our sponsors, the Department for Transport, Energy and Infrastructure and the Motor Accident Commission. These sponsors have directly commissioned important road safety research and also, through their sustaining funding, allowed us to develop new road safety researchers and contribute our expertise to improving road safety in South Australia.



# CASR overview

CASR conducts multidisciplinary research in road safety and injury control. The Centre is involved with teaching and the community, runs an in-depth crash investigation program and conducts a wide variety of research projects.

## Teaching and training

### Undergraduate study

The Automotive Safety Engineering course, part of the Mechanical Engineering degree, 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. The course involved guest lectures from Ford Australia, Autoliv Australia and Bosch Australia. Advea Engineering also sponsored the course by way of providing the software tool MADYMO for student use.

In 2009 CASR will also be co-ordinating and teaching the Traffic Engineering and Design course for the Civil Engineering undergraduate degree.

### Postgraduate study

CASR supports three PhD students who are currently working on various engineering research projects. Jeffrey Dutschke is modelling the biomechanics of intracranial trauma. Jamie Mackenzie 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.

French Master of Engineering student François Coulongeat spent several months at CASR as part of an ongoing collaboration between CASR and the Université de la Méditerranée, Laboratoire de Biomécanique Appliquée of INRETS (Institut National de Recherche sur les Transports et leur Sécurité). François was particularly interested in studying



the sensitivity of pedestrian crash reconstruction, and also the multi-body modelling of impacts with windscreen panels on vehicles. He spent time in the CASR laboratory and developed MADYMO models for our collaborative pedestrian modelling activity.

Komal Hiranandani undertook a six month placement with CASR as part of the Masters of Organisational Psychology and Human Factors program run by the School of Psychology at the University of Adelaide. While with CASR, Komal participated in in-depth at-scene crash investigation, undertook a review of policies related to roadside drug testing of drivers, and contributed sections to the report "Annual Performance Indicators of Enforced Driver Behaviours in South Australia, 2007".

### In-depth crash investigation training

Beginning in November 2007, and continuing throughout January 2008, CASR provided a course in crash investigation to two engineers from MIROS (Malaysian Institute of Road Safety Research). The training included office-based tutorial sessions with CASR staff, covering all aspects of road safety, and also practical training. The practical training included attendance of road crashes at-scene, and follow-up analysis of the information collected. Professor Dr Ahmad Farhan Mohd Sadullah, the new Director of MIROS, visited CASR on November 13 and met with our crash investigation team to discuss methods and outcomes of in-depth crash investigation. Our work with MIROS follows the course given to a group of engineers from Thailand in 2006, establishing CASR as a leader in the area of in-depth crash investigation throughout South East Asia.

## Community

### Road Safety Advisory Council

CASR is proud to be associated with the South Australian Road Safety Advisory Council. Our involvement includes staff serving on various committees. Mary Lydon is a member of the Council as well as the chair of the Road Safety Issues Sub-committee. Robert Anderson is a member of the Vehicle Restraint Use Taskforce. Craig Kloeden and Jeremy Woolley are both members of the Speed Management Taskforce and Jeremy is also a representative on the Heavy Vehicle Taskforce.

### Dukes Highway Road Safety Summit

The Coorong District Council called a road safety summit to discuss the fatal and serious road crashes occurring on the Dukes Highway.

The summit was held at the Tintinara War Memorial Hall on 19 November 2008 and was well attended by local councillors, politicians, the police, emergency services personnel and members of the community.

A CASR presentation on the characteristics of road crashes occurring on the Dukes Highway and possible countermeasures was given by Craig Kloeden along with a number of DTEI presentations.

There was a robust discussion of a number of issues and a real desire in the community to improve the road safety situation on the Dukes Highway.

## Analysis of mass data

There are a number of mass data sets that we routinely use in our research. The most important being the road crash database. Mortality and hospital inpatient databases, alcohol and drug testing databases, and licensing and registration databases are also used in various research projects. CASR is supervising the collection of regular speed survey data and maintains a database of the survey data for the tracking of vehicles speeds over time in South Australia.

CASR continues to develop a web-based interface to the road crash database. The interface, known as WebTARS (Web interface to the Traffic Accident Reporting System) allows basic queries to be made about crashes and includes a mapping facility for crash locations. This provides a powerful and easy to use tool for studying and exploring the nature of crashes in South Australia.

For more information please contact  
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## Library

CASR holds the largest and most comprehensive collection of road accident material in Australia. The library provides CASR staff with:

- the latest research reports, conference proceedings, books and journals
- literature reviews
- current awareness services
- inter-library loans

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



## Computer modelling & reconstruction of pedestrian crashes

CASR continues to devise simulation tools to study how pedestrians are injured in collisions with vehicles. The simulation represents the pedestrian as a 'multi-body' model of segments connected by kinematic joints. The properties of the model are based on the properties of the human body as measured in human volunteer tests, and validated against published data from tests on human cadavers.

The modelling provides information on head impact speeds typically encountered in pedestrian crashes. This in turn is used to develop test methods to assess the pedestrian safety of vehicles. Our current interest extends to developing methods of modelling crashes that account for any uncertainties in the reconstruction of the crash.

In 2008 we continued to collaborate with the French Institut National de Recherche sur les Transports et leur Sécurité (INRETS) on the reconstruction and simulation of pedestrian collisions. This work is focused on validating our methods through the use of physical experimentation. The results of this ongoing collaboration were presented at the International Crashworthiness Conference in Kyoto, Japan during 2008 and a paper on contact modelling has been accepted in the Journal of Nonlinear Dynamics.

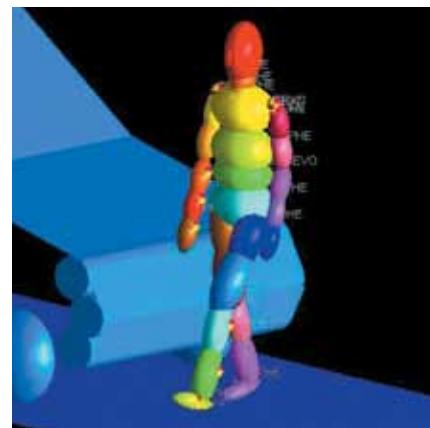
## Impact laboratory testing

CASR studies the influence of vehicle design on pedestrian injury in a collision. The Streeter Impact Laboratory is a central component of our pedestrian safety research, which considers both accident prevention and injury mitigation through vehicle design.

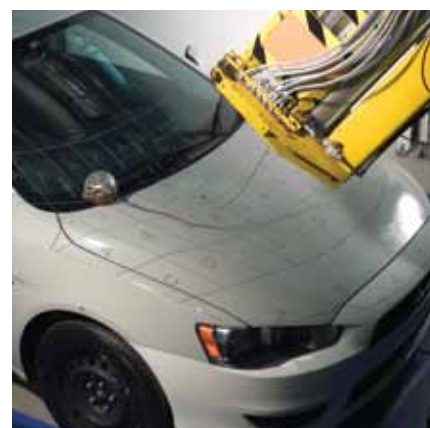
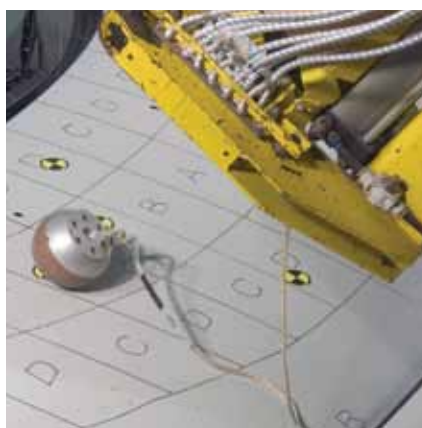
It is the only laboratory in Australia able to conduct pedestrian "sub-system" impact tests on vehicles. It is equipped to assess the danger posed by the front of a vehicle to a pedestrian. Our study does not use crash test dummies, as is

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's main client is the Australasian New Car Assessment Program, who regularly publishes the results of the pedestrian sub-system tests (see "Pedestrian testing for the Australasian New Car Assessment Program").

The laboratory remains essential to the development of methods to reconstruct pedestrian crashes. We continue to



develop methods that use testing and simulation to faithfully estimate the forces present in impacts between a pedestrian and a vehicle in a collision. This in turn suggests acceptable limits for impact forces and characteristics of safer vehicle designs. In 2008, as noted previously, we continued our collaboration with INRETS, France, which included a test program centered on the analysis of impact data to characterise vehicles for simulation purposes.



## Pedestrian testing for the Australasian New Car Assessment Program

One of our most significant clients is 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 pedestrian tests, and since 2000 we 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 a 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 can nominate extra tests and different locations to modify the test score. 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 and 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, and it measures the risk of ligament damage to the knee and the risk of fracturing the tibia and fibula. Knee injury is assessed by examining the kinematics of the 'knee joint' in the legform and tibia/fibula fracture risk by the impact deceleration of that part of the legform.

Individual test scores are summarised by 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 generally lie in the range of one to three stars.

In 2008 we tested the Mazda BT-50, Mahindra Pik-Up, Subaru Forester, Mitsubishi Lancer, Ford Falcon, Nissan Navara and the Honda Jazz.

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





## In-depth crash investigation

In 2008, CASR was active in its program of in-depth investigation of South Australian road crashes. The activity was focused on completion of a major end of project report for the Metropolitan In-Depth Crash Investigation Study, and on continued case collection for the Rural In-Depth Crash Investigation Study.

A key and unexpected finding with regard to human factors was the substantial contribution to crash involvement made by medical conditions. The types of medical conditions most often implicated in crashes differed according to crash type. Conditions leading to the loss of consciousness were more common in single vehicle crashes, mental health problems were more common in pedestrian crashes, and intersection crashes were often associated with conditions causing cognitive impairment.

Infrastructure issues were also important. Driver difficulties with filter right turns at signalised intersections, the lack of dedicated right turn lanes, parked vehicles encroaching upon or blocking the kerbside lane, and pedestrians walking through stationary traffic rather than using a nearby pedestrian crossing all played a role in either a crash happening or the resultant severity of injury. Some of these issues are considered to be the results of road user behaviour but the best remedy is often an infrastructure treatment, such as the installation of fences near crossings or controlled right turns.

The Rural In-Depth Crash Study continued in 2008 and by year's end, a total of 128 crashes had been investigated. All crashes investigated in the study occurred beyond the metropolitan area but within 100 km of Adelaide. The crashes occurred on roads with speed limits of 80 km/h or more and involved transportation to hospital of at least one crash participant.

In 2009 we will be alternating between metropolitan and rural crash investigations.



This will allow CASR to provide timely advice on key issues affecting these two very different groups of crashes.

CASR presents a regular series of seminars to key road safety personnel regarding lessons learned from in-depth crash investigation, particularly with regard to road

infrastructure. A seminar was presented late in 2008 on the topic of crashes associated with shared kerbside lanes. Additionally, we will be organising seminars in which we analyse all of the factors contributing to individual crashes, with discussion invited from relevant stakeholders regarding potential countermeasures.

Some of these issues are considered to be the results of road user behaviour but the best remedy is often an infrastructure treatment.

# CASR projects

## The crash and offence experience of newly licensed young drivers

In 2007, CASR conducted a study that tracked the crash and offence experience of nearly 50,000 newly licensed young drivers during their first few years of driving.

A rapid increase in driving competency was found particularly in the first year of driving on a provisional licence leading to large reductions in crash rates, predominantly for crashes involving drivers leaving the roadway or making right filter turns across traffic. While moving violations showed a similar evolution to crashes: speed, seat belt and alcohol offences all showed increasing rates over time from when drivers obtained their provisional licence.

The project was funded by Austroads and was published as an Austroads Report in 2008 and can be found at: <http://www.onlinepublications.austroads.com.au/script/FreeDownload.asp?DocN=AUSTROADS41446>

For more information please contact  
Craig Kloeden  
[craig@casr.adelaide.edu.au](mailto:craig@casr.adelaide.edu.au)

## Medical conditions as a contributor in crash causation

The extent to which medical conditions contribute to crash causation is not well understood. However, there are indications that they may play a significant role.

In 2008 CASR commenced a project to examine the extent to which medical conditions contributed to crash causation in a representative sample. The primary aim of this study is to determine the proportion of casualty crashes resulting in treatment or admission to hospital that can be associated with the effects of a medical condition or an acute medical event. The study involves examination of the medical records for all drivers, riders, pedestrians

and cyclists involved in motor vehicle collisions on public roads in South Australia who present to the Royal Adelaide Hospital (RAH) over a three year period, between January 2008 and December 2010.



The medical records are matched with a number of other data sources including Vehicle Collision Records (VCR's) generated by the South Australian Police, Traffic Accident Reporting System (TARS), licensing records from the SA Department of Motor Registration and drug and alcohol screening records generated by the Forensic Science Centre of South Australia. This detailed examination of the circumstances surrounding each person's involvement in a crash enables identification of those crashes that are

directly related to medical conditions, as opposed to those for which a crash participant's pre-existing medical conditions are unrelated.

For more information please contact  
Tori Lindsay  
[tori@casr.adelaide.edu.au](mailto:tori@casr.adelaide.edu.au)

### Performance indicators of enforced driver behaviours

CASR is commissioned by the Department for Transport, Energy and Infrastructure (SA) to produce an annual report quantifying performance indicators for selected enforced behaviours (drink driving, drug driving, speeding and restraint use) in South Australia. These annual reports are used to inform policy and develop strategies. The drink driving section includes data concerning the number of random breath tests conducted, the percentage of licensed drivers tested, the number of drink drivers detected, the number of drink drivers detected using random breath testing, blood alcohol levels of seriously and fatally injured drivers and riders, roadside drink driving surveys, and expenditure on anti-drink driving publicity.

The most recent report has a section on drug driving that includes data on the number of random drug tests, number of positive drug detections, number of fatally injured drivers positive for drugs and expenditure on anti-drug driving publicity. The speeding section provides data concerning the number of hours of speed detection, the number of drivers detected speeding, speeding detection rates, the extent of excessive speed as the apparent error in serious and fatal crashes, on-road speed surveys, and expenditure on anti-speeding publicity. The restraint use section provides data concerning levels of restraint use enforcement, restraint non-use offences, restraint use by vehicle occupants in serious and fatal crashes, on-road observational restraint use surveys, and expenditure on restraint use publicity.

For some categories of information, comparisons are made with interstate jurisdictions.

**For more information please contact**  
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### Accidents to intoxicated pedestrians in South Australia

This project reviewed the literature on alcohol-intoxicated pedestrian casualties, concentrating on possible countermeasures. It also presents data on the blood alcohol concentrations (BAC) of pedestrian accident victims in South Australia, though all the datasets used have limitations (BAC is unknown in many cases). In South Australia and elsewhere, the alcohol levels of many pedestrians killed and injured are very high indeed. A number of measures are available for preventing intoxicated pedestrian accidents, but it is unlikely that any would have a large effect on the total number of pedestrian casualties. In most respects, improved safety of drunk pedestrians will come about by making the environment safer for all pedestrians, drunk or sober. The measure that would be expected to be most effective is a reduction of speed limits.

**For more information please contact**  
**Paul Hutchinson**  
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### Queensland Transport: Provision of a speed survey methodology

In 2008, CASR was commissioned by Queensland Transport to develop a speed survey methodology for the ongoing monitoring of vehicle speeds in Queensland.

Based on the lessons learned in setting up South Australian speed surveys, CASR was able to provide a detailed methodology specifying how many sites, the types of sites, the length of the surveys and the data to be collected at each site that would yield a cost effective but still meaningful collection of data for monitoring the speeds of vehicles in Queensland. Queensland Transport is currently in the process of starting data collection based on the CASR supplied methodology.

**For more information please contact**  
**Craig Kloeden**  
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### Benefits of the introduction of an Australian Design Rule on pedestrian protection

Improvements to frontal vehicle design can improve a pedestrian's chance of survival and reduce the risk of serious injury in a collision. Europe and Japan have introduced vehicle design regulations to improve the safety of pedestrians who are unfortunate enough to be struck by a passenger vehicle, but there are no design rules pertaining to pedestrian protection in Australia.

CASR has completed a study that estimated the likely benefits for Australia of an Australian Design Rule for Motor Vehicle Safety (ADR) on pedestrian protection. Using results for individual makes and models tested by EuroNCAP and ANCAP, CASR was able to quantify the gap in pedestrian protection currently offered by the Australian new-car fleet, and the level that would be offered by a compliant new car-fleet. When combined with cost-benefit data from Europe, the analysis estimated the reductions in fatal and serious injuries that would be likely if the ADR was introduced. The study showed that an appropriate Australian Design Rule would reduce, in Australia, fatalities by approximately 28, serious injuries by 1000, and slight injuries by 1250 each year, with associated savings in crash costs of \$385 million per year.

For more information please contact  
**Robert Anderson**  
robert@casr.adelaide.edu.au

### Identifying and improving exposure measures

Exposure information, accompanied by comparable crash data, allows the identification of specific high crash risk groups and road environments that can be targeted by appropriate road safety measures. This project was designed to identify current sources of exposure data available in South Australia and to make recommendations about the most useful measures of exposure for road safety and how they might best be obtained. The objectives of this study were addressed through a review of the international literature, examination of relevant databases and discussions with organisations that collect exposure data. A list of sources of exposure data was compiled and any limitations associated with the data were acknowledged. A discussion of the importance of exposure measures in road safety concluded with comments on four possible strategies for collecting better exposure data in the future: data collection by conventional means, the use of new technology for data collection, better theoretical understanding of induced exposure methods and the collection of compatible exposure data for road crash research. This report provides a useful reference for road safety researchers interested in understanding and obtaining travel exposure measures.

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

### Vehicle improvements to reduce the number and severity of rear end crashes

This report resulted from a contract with the Heads of Compulsory Third Party Insurance in Australia and New Zealand to review vehicle technology developed to reduce the incidence of rear end crashes and the whiplash injuries that may result.

Chapters cover: crash avoidance measures; passive safety measures built into improved seat and head restraint designs; assessment procedures that have been developed to assess the efficacy of various seat and head restraint designs in rear impacts; testing and assessment programs that are used to inform consumers of the relative performance of the seats in different models of vehicle, and includes up-to-date information on the recently released EuroNCAP proposal to assess whiplash protection measures; the uptake of both seat-based whiplash countermeasures and also brake assistive technologies in Australia; and research on the costs and benefits of vehicle based measures to reduce rear end crashes and whiplash injury.

Commentary is given on the opportunities for increasing the awareness of consumers in relation to vehicle based rear-end crash and whiplash countermeasures.

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

# Looking forward to 2009

This is the first year of our three-year research program developed after our research needs workshop. We will be carrying out important research in the areas of speed management, motorcycle safety and vehicle and driver countermeasures. We are also planning to work on linking a variety of databases providing crash, vehicle and driver information to better understand crash and injury patterns and mechanisms.

An important part of the research program will be to work with our sponsors on the development of the next Road Safety Strategy for South Australia. This research will start in 2009 and continue for the next two years.

The research program will continue to evolve and be better targeted. During the year we will work with our sponsors, researchers and other stakeholders to identify new priority areas to incorporate into our future research program.

Everyone at CASR is looking forward to 2009 and we are sure we will continue to develop and to make a significant contribution to road safety.

In 2009 we intend improving the dissemination of our research. We will be holding a seminar series addressing major road safety research issues and will be holding targeted presentations for particular customer or interest groups. We will also be developing new ways for users to access road safety information through our excellent library services.

We will be increasing our numbers of postgraduate students in 2009 and we are proud that the RAA has chosen to provide to CASR a scholarship for postgraduate research on the safety and mobility of

older drivers. We are also excited to be taking on the challenge of teaching Traffic Engineering to fourth year Civil and Environmental Engineering students and hope to introduce them to the importance of traffic engineering to a safe and efficient road system.

Finally, research collaboration is a vital part of advancing road safety and in 2009 we hope to work even more closely with other Australian and International road safety research units.





# 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 2008. 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 (particularly brain injury), computer simulation, and impact testing. He also conducts evaluations of road and vehicle safety effectiveness including modelling effects at the fleet level.

His current research interests include 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.

Robert is a member of Engineers Australia Injury Biomechanics Panel and the SA Road Safety Advisory Council Vehicle Restraint Use Task Force. He is also a Committee member on the Standards Australia Committee for Child Restraint Use in Motor Vehicles.



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

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

His current projects include a review of penalties in South Australia for road traffic offences, a review of drug driving legislation and law enforcement in Western Australia, examination of issues related to drivers with dementia in Victoria, 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 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).



## 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 hazards and protection scenarios, the crashworthiness of the South Australian fleet and a review of road safety penalties in South Australia.



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

Jeff is currently undertaking a PhD, modelling the biomechanics of intracranial trauma.

Jeff's research will take the injury data from previous experiments where anaesthetised sheep were struck in the head and compare this data against a finite element model of the same sheep experiment. The comparison will be made with criteria that exist in the literature with the aim to elucidate the potential of these criteria for a predictive capability in finite element models.



## 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.

His current projects include pedestrian and cyclist crashes in Adelaide in recent years, comparison of crash numbers before and after speed limit reductions, and reviews of the intoxicated pedestrian problem and of 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 IT**

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.

In a recently completed Austroads project, Craig tracked the crash and offence experience of 50,000 newly licensed drivers over a number of years. 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 and the International Council for Alcohol, Drugs and Traffic Safety (ICADTS).



#### **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.

The aim of Jamie's 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, Professorial Research Fellow**

Jack specialises in crash injury biomechanics, 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, he has recently been appointed a Director of the Australian Institute for Motor Sport Safety.

In 2008 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 investigation and is currently working on pedestrian sub-system testing and pedestrian crash safety including conducting testing for the ANCAP program.

In 2002 Giulio was a co-author of the Best Scientific Paper (The Peter Vulcan Award) at the Australasian Road Safety Research Policing and Education Conference.

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.

The head component of pedestrian testing is conducted by firing a dummy headform into specific locations on the front of the vehicle. The level of protection is estimated by calculating the Head Injury Criterion, or HIC, a value derived from the level of deceleration experienced by the headform. Daniel's project seeks to develop relationships between HIC and the characteristics of the impact - including the headform mass, firing speed and dynamic deformation.



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

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

Andrew is responsible for managing and developing the impact laboratory.

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



#### **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 the State and Local Government road authorities about road safety issues. Jeremy has also spent a considerable part of his career researching speeding and the benefits of speed limit changes and has conducted many road safety evaluations to inform policy makers.

His current activities include providing advice to road agencies on findings from CASR in-depth crash investigations, policies for roadside hazard treatments and the adoption of centreline safety barriers. He has produced evaluations for the Tasmanian Road Safety Task Force and the National Transport Commission on Heavy Vehicle Speeding. He has also been involved with projects on regular speed data collection and analysis in two states and delivered lectures on road safety in various training courses.

In 2008, Jeremy finished his term as the President of the SA branch of the Australian Institute of Traffic Planning and Management (AITPM), a position he has held for the last three years. He is also a committee member of the Australasian College of Road Safety (SA Branch).



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

Lisa specialises in young driver research, driver attitudes and behaviour, evaluation of road safety programs and in-depth crash investigation.

She is currently working on projects that consider the personality characteristics and attitudes of young drivers, in-depth investigation of rural crashes, a review of road safety penalties in SA, performance indicators of enforced driver behaviours (drink driving, drug driving, speeding and restraint use), identifying and improving exposure measures and a review of coffee stops as a safety measure.

In 2008 Lisa travelled to Europe as part of the second Austroads road safety professionals study tour.

#### **Administrative Staff**



**Leonie Witter**  
Business Manager



**Jaime Royals, BA**  
Information Manager



**Marleen Sommeriva, BSc (Tech Phys)**  
Research Officer



**Jen Herman**  
Administration Assistant

Our dedicated administration team is vital to the success of CASR.



# Publications



## Book chapters

Wundersitz LN, Burns N (2008) 'Personality and attitudinal predictors of traffic offences among young drivers - a prospective analysis' in Driver behaviour and training: volume III, Dorn L (ed). Ashgate Publishing, Aldershot.

## Conference papers

Anderson RWG, Ponte G, Searson DJ (2008) Potential benefit of an Australian design rule on pedestrian protection. Presented at the Australasian Road Safety Research, Policing and Education Conference, Adelaide, Australia, 9-12 November.

Baldock M, Thompson JP, Mathias JL (2008) Self-regulation of driving behaviour among older drivers: findings from a 5 year follow up. Presented at the Australasian Road Safety Research, Policing and Education Conference, Adelaide, Australia, 9-12 November.

Doecke S, Anderson RWG, Ponte G (2008) Bull bar prevalence among types of vehicles in Metropolitan Adelaide. Presented at Australasian Road Safety Research, Policing and Education Conference, Adelaide, Australia, 9-12 November.

Hutchinson TP (2008) How might young driver behaviour be improved? By therapy for all 17 year olds? Presented at the 31st National Conference of the Australian Association for Cognitive and Behavioural Therapy, Adelaide, 17-21 September.

Hutchinson TP (2008) Patterns of can and cannot: condensing data on success versus failure of several patients at several tasks, and attempting to infer medical structure. Presented at the Better Choices Better Health Conference, Adelaide, Australia, 24-26 November.

Hutchinson TP, Kloeden CN, Long AD (2008) Bicycle crashes in South Australia. Presented at the Australasian Road Safety Research, Policing and Education Conference, Adelaide, Australia, 9-12 November.

Kloeden CN (2008) The crash experience of newly licensed young drivers in South Australia. Presented at the Australasian Road Safety Research, Policing and Education Conference, Adelaide, Australia, 9-12 November.

Lindsay T, Baldock MRJ (2008) Medical conditions as a contributing factor in crash casuatio. Presented at the Australasian Road Safety Research, Policing and Education Conference, Adelaide, Australia, 9-12 November.

Long AD, Hutchinson TP (2008) Evaluation of the Adelaide Hills speed limit change from 110km/h to 80km/h. Presented at the Australasian Road Safety Research, Policing and Education Conference, Adelaide, Australia, 9-12 November.

Mackenzie JRR (2008) Characteristics of high severity crashes on 80-110 km/h rural roads in South Australia. Presented at the Australasian Road Safety Research, Policing and Education Conference, Adelaide, Australia, 9-12 November.

McLean AJ, Anderson RWG (2008) Metrification of the urban speed limit and pedestrian fatalities. Presented at the Australasian Road Safety Research, Policing and Education Conference, Adelaide, Australia, 9-12 November.

Searson DJ, Anderson RWG (2008) Pedestrian impact testing: modelling the effect of head-form mass and speed. Presented at the Australasian Road Safety Research, Policing and Education Conference, Adelaide, Australia, 9-12 November.

Wundersitz LN (2008) Can personality characteristics predict the crash involvement of young drivers? Presented at the Australasian Road Safety Research, Policing and Education Conference, Adelaide, Australia, 9-12 November.

Wundersitz LN, Burns N (2008) Can personality characteristics and attitudes predict risky driving behaviour among young drivers? in Proceedings of the High Risk Road Users Conference, Brisbane, Australia, 18-19 September 2008.



## Research reports

- Anderson RWG, Baldock MRJ (2008) Vehicle improvements to reduce the number and severity of rear end crashes (CASR052). Adelaide: Centre for Automotive Safety Research.
- Anderson RWG (2008) Pedestrian collisions in South Australia (CASR039). Adelaide: Centre for Automotive Safety Research.
- Anderson RWG, Ponte G, Doecke S (2008) A survey of bullbar prevalence at pedestrian crash sites in Adelaide, South Australia (CASR040). Adelaide: Centre for Automotive Safety Research.
- Anderson RWG, Ponte G, Searson D (2008) Benefits for Australia of the introduction of an ADR on pedestrian protection (CASR048). Adelaide: Centre for Automotive Safety Research.
- Baldock M, Kloeden CN, McLean AJ (2008) In-depth research into rural road crashes (CASR057). Adelaide: Centre for Automotive Safety Research.
- Baldock M (2008) Best practice criteria in practical driving tests of medically referred drivers (CASR013). Adelaide: Centre for Automotive Safety Research.
- Hutchinson TP (2008) Tailgating (CASR046). Adelaide: Centre for Automotive Safety Research.
- Hutchinson TP (2008) Road courtesy and road safety (CASR044). Adelaide: Centre for Automotive Safety Research.
- Hutchinson TP, Woolley JE (2008) Should U-turns be permitted at signalised intersections? (CASR017). Adelaide: Centre for Automotive Safety Research.
- Wundersitz LN, Hutchinson TP (2008) Identifying and improving exposure measures (CASR053). Adelaide: Centre for Automotive Safety Research.
- Wundersitz LN, Baldock MRJ (2008) Annual performance indicators of enforced driver behaviours in South Australia, 2006 (CASR043). Adelaide: Centre for Automotive Safety Research.
- Wundersitz LN, Baldock MRJ (2008) Annual performance indicators of enforced driver behaviours in South Australia, 2005 (CASR035). Adelaide: Centre for Automotive Safety Research.
- Wundersitz LN, Baldock MRJ (2008) Review of the literature on coffee stops as a road safety measure (CASR041). Adelaide: Centre for Automotive Safety Research.
- Wundersitz LN, Woolley JE (2008) Best practice review of drink driving enforcement in South Australia (CASR036). Adelaide: Centre for Automotive Safety Research.

## Journal articles

- Anderson RWG, Hutchinson TP (2008) Optimising product advice based on age when design criteria are based on weight: child restraints in vehicles. *Ergonomics*; iFirst [available online only].
- Anderson RWG, van den Berg AL, Ponte G, Streeter L, McLean, AJ (2008) Testing the pedestrian safety of bull bars: methods and results. *Journal of the Australasian College of Road Safety*; 19(1): 35-43.
- Baldock M, Berndt A, Mathias JL (2008) The functional correlates of older drivers' on-road driving test errors. *Topics in Geriatric Rehabilitation*; 24(3): 204-223.
- Baldock M (2008) Cannabis and the risk of crash involvement. *Flinders Journal of Law Reform*; 10(3): 795-814.
- Hutchinson, TP 2008. Inconsistent effects of a feature on home prices: Lang's two-market explanation. *Housing Policy Debate*; 19: 573-582.
- Hutchinson TP (2008) Promoting child booster seat use: has no-one ever done high-quality research? *American Journal of Preventive Medicine*; 34: 267-268.
- Hutchinson TP (2008) Discussion of "Importance of tail dependence in bivariate frequency analysis" by A. Poulin, D. Huard, A.-C. Favre, and S. Pugin. *Journal of Hydrologic Engineering (American Society of Civil Engineers)*; 13: 1202.
- Hutchinson TP (2008) Linkage of police and hospital data on road crashes. *Australian and New Zealand Journal of Public Health*; 32(3): 292.
- Hutchinson TP (2008) On ratings of comfort and exertion by visual display unit users and ratings of workplace layout and working posture by expert ergonomists. *Applied Ergonomics*; 39: 131-132.
- Hutchinson TP, Kloeden CN, Long AD (2008) Overview of pedal cyclist traffic casualties in South Australia. *Ergonomics Australia*; 22(1): 6-15.
- Kloeden CN, Anderson RWG, Hutchinson TP (2008) Differences between groups of drivers: offences contrasted with crashes. *Flinders Journal of Law Reform*; 10(3): 815-830.



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