Lessons from in-depth study – parked vehicles

Have you ever cursed receiving a parking ticket for leaving your car on a main road during clearway times? What are clearways and why do authorities police them?

Clearways were introduced in the 1970s, preventing kerbside parking on major traffic routes during peak periods. This was primarily to ensure efficient traffic flow but also reduced the number of side swipe collisions with parked vehicles.

Several crashes that have been investigated by the in-depth team from CASR have involved parked vehicles on main roads. In some instances, parked vehicles are not struck directly but cause a collision between passing overtaking cars. Drivers entering and exiting their parked vehicles are also at risk while waiting for passing traffic, especially when the passing vehicles are trucks or have wide fittings or trailers. Parked vehicles on main roads also pose a significant hazard for cyclists. The act of looking over the shoulder for traffic when overtaking parked cars has been a major factor in several collisions between parked cars and cyclists.

Recently, Jeremy Woolley spoke to Department for Transport, Energy and Infrastructure staff about clearways and their role in reducing crashes involving parked vehicles. “One issue that needs further consideration is the designated clearway times,”Jeremy says. “Often, these times do not cover the times of day when the most accidents with parked cars occur. It is suggested that a detailed review of clearway operating times be conducted.”

For more information please contact
Jeremy Woolley
jeremy@casr.adelaide.edu.au

Upcoming CASR seminars

The CASR seminar series addresses major topics in the fight to reduce road trauma and highlight the latest research in the area.

24 July, **Managing traffic safety**, Dr Jeremy Woolley

4 September, **Young drivers**, Craig Kloeden

16 October, **Medical conditions in crash causation**, Tori Lindsay

27 November, **Pedestrian impact testing**, Andrew van den Berg & Giulio Ponte

The seminars are held in The Art Gallery Auditorium from 4.00 - 5.30pm.

To confirm your attendance please contact, Leonie Witter on (08) 8303 4114 or email leonie@casr.adelaide.edu.au

New publications

Pedestrian and cyclist crashes in the Adelaide Metropolitan Area (CASR055)

Annual performance indicators of enforced driver behaviours in South Australia, 2007 (CASR058)

Review of Western Australian drug driving laws (CASR064)

The full report series can be accessed at
http://casr.adelaide.edu.au/publications/researchreports/

If you would like to subscribe to the electronic mailing list for this newsletter (free), or you would like to be removed from the mailing list altogether, please email library@casr.adelaide.edu.au

Government of South Australia
Department for Transport, Energy and Infrastructure

MOTOR ACCIDENT COMMISSION

Centre for Automotive Safety Research
University of Adelaide,
Adelaide SA 5005

Ph +61 08 8303 5997
Fax +61 08 8232 4995
Email casr@adelaide.edu.au
Web http://casr.adelaide.edu.au

THE UNIVERSITY OF ADELAIDE AUSTRALIA

At the scene

Newsletter of the Centre for Automotive Safety Research

Issue 2, July 2009

In May, Jeremy Woolley and Matthew Baldock evaluated the new Western Australian drug driving laws and enforcement programs.

Review of WA drug driving laws

The amended laws include provisions for roadside drug testing of drivers and the establishment of two offences: driving with the presence of a prescribed drug in oral fluid or blood, and driving while impaired by a drug. The evaluation involved extensive data analysis and interviews with all parties involved in the enforcement and prosecution of drug drivers.

Jeremy and Matthew concluded that the initial period of the drug driving legislation in WA had been a success overall but a number of recommendations were made to improve the new program of enforcement.

Data for just over 12 months of roadside drug testing comprised 10,000 drug tests performed in 1,000 hours of enforcement, 30% of which took place in rural areas. The drugs tested for were methamphetamine, MDMA or ecstasy, and cannabis, using a three-tiered testing process. The most common confirmed drug cases involved methamphetamine alone (40% of positive cases) and methamphetamine combined with cannabis (23%).

Matthew said, “One of the most significant findings of the study was that the second screening test failed to detect the presence of drugs in 20% of samples later confirmed to be drug positive in laboratory analyses. The second screening test was particularly ineffective for detection of cannabis. However, the Chemistry Centre of WA has been in contact with the test manufacturers and new testing kits are now being used. It is expected that this will resolve the problem but ongoing monitoring is needed to confirm this.”

Matthew added, “The authorities in WA are to be commended for analysing samples at the laboratory that were negative on the second screening test, despite this not being required by the legislation. This enabled the identification of the problem. The Chemistry Centre’s proactive response is also commendable.”

The conclusions of the process evaluation were generally positive but the report recommended against a general rollout of driver drug testing across the WA Police. Jeremy said this was because “there are legitimate concerns about the transportation and storage of evidentiary samples, especially given the range of environmental and climatic conditions throughout WA. With a general rollout, there could be an increase in the likelihood of operator error and inaccurate test results.”

One area that did require improvement was the enforcement of drug impaired driving laws. A charge of drug impaired driving requires demonstration of driver impairment, rather than merely a drug positive fluid sample. Very few drug impaired driving charges were made during the first 12 months of the legislation. The authors argued that this component of the enforcement needed to be promoted more in the WA Police force. As Jeremy says, “random oral fluid testing should not be the only means available for discouraging drug driving”.

Other recommendations made by the authors included: a review of the penalties for all impaired driving offences, regular educational briefings to Magistrates and Prosecutors, regular communication with other jurisdictions, and a future crash-based evaluation to assess the road safety impact of driver drug testing.

This report was commissioned by the Department of Premier and Cabinet (WA). To access the report go to: http://casr.adelaide.edu.au/publications/researchreports/CASR064.pdf

For more information please contact, **Jeremy Woolley,** jeremy@casr.adelaide.edu.au

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Message from CASR

Hello and welcome to the new financial year. At CASR we believe it is vital to build the next generation of road safety experts, and so in this edition of our newsletter we have decided to profile our PhD students. It is exciting to see these new researchers developing new ideas and finding new ways to reduce road trauma as you can see from the work being done on Electronic Stability Control. Please enjoy the newsletter and we are always pleased to receive your comments and ideas.

Mary Lydon, Director, mary@casr.adelaide.edu.au

Laser Speed Measurement Device goes global

The Centre for Automotive Safety Research and Cellbond of the UK have entered into an agreement to provide speed measurement technology to crash test laboratories around the world. The Laser Speed Measuring Device (LSMD) was developed at the Centre's impact test laboratory and licensed to Cellbond. Cellbond had been requested by several of their customers to offer a highly accurate device for measuring the speed of projectiles, such as pedestrian sub-system impactors, and approached CASR to manufacture and supply the Laser Speed Measuring Device (LSMD). As a result, Cellbond is the exclusive manufacturer and distributor of this system worldwide.

Cellbond launched the production version of the LSMD at the Enhanced Safety of Vehicles (ESV) Conference in Stuttgart, Germany in June 2009. Carmen Roesch and Petros Goutas from Cellbond attended the Conference and manned a stand at the exhibition area where Cellbond's new products were presented. The LSMD attracted a lot of interest from the conference participants that visited the Cellbond stand and the feedback has been very positive.

Petros Goutas, Cellbond's Product Development Manager said, "The LSMD measures the velocity of passing objects with high accuracy. This feature, in combination with its ease of use makes it a market-leading product. CASR have been operating their own pedestrian impact test lab for 10 years, conducting research on pedestrian safety and providing testing services for government, Australian NCAP and industry. This experience is built into the design of this LSMD".

Cellbond's LSMD is specifically designed to satisfy the requirements of pedestrian sub-system impact testing. It is also suitable for any application requiring highly accurate speed measurement such as full-scale crash tests or component sled tests. An accuracy of 0.1% is easily achievable. In addition, the LSMD has been benchmarked against a number of systems at renowned European test labs.

About Cellbond: Cellbond is situated in Huntingdon, Cambridgeshire, England and specialises in design, development and manufacture of technology based composite structures for impact absorption, and solutions for pedestrian impact testing. Cellbond provides solutions throughout a wide range of industries including Automotive, Rail and Marine.

For more information on the LSMD, contact:
Robert Anderson, CASR,
robert@casr.adelaide.edu.au,
+61 08 8303 5997

Petros Goutas, Cellbond
petros.goutas@cellbond.com
+34 91 4451374
+44 1480 435302

Current projects

Effect of speed limits on travel times in rural South Australia

Clear zones and barriers

Crashworthiness of the South Australian vehicle fleet

Medical conditions as a factor in crash causation

Speed characteristics of vehicles in South Australia

Collaboration yielding results

CASR has entered into a long-term collaboration with INRETS (Institut National de Recherche sur les Transports et leur Sécurité) in France. Researchers from the INRETS Laboratoire de Biomécanique Appliquée based at the Université de la Méditerranée in Marseilles, are working with CASR on pedestrian collision research. Brought together by a common interest in crash investigation and crash simulation, Dr Thierry Serre and Dr Robert Anderson have been working on a research program that they hope will benefit both organisations. "The objective of this collaboration is to share our experiences in the field of pedestrian safety," Dr Serre said. "Combining INRETS' knowledge of human biomechanical behaviour with CASR's expertise in vehicle characteristics allows us to improve pedestrian collision simulations."

"The crash testing methods that have been developed to protect pedestrians in collisions are based on computer simulations of typical crashes," said Dr Anderson, "but aspects of those models are sorely in need of improvement. With Dr Serre, we've been working on ways of making those simulations more accurate over a greater range of conditions."

The collaborators are particularly interested in the ways that pedestrian simulation can be harnessed as part of the reconstruction of real pedestrian injury, to provide some idea of the forces experienced by the pedestrian in the crash. "That would help to confirm the validity and usefulness of the crash test procedures," said Dr Anderson.

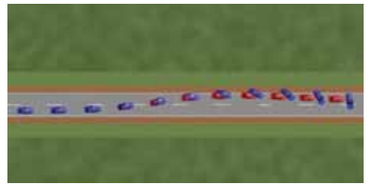
Dr Serre is visiting CASR in early July to plan activities for the coming year.

Jamie MacKenzie

Daniel Searson

Jeff Dutschke

Benefits of Electronic Stability Control (ESC)



Postgraduate student Jamie MacKenzie is currently studying the effects of Electronic Stability Control on crashes on rural roads.

"This research attempts to understand how ESC systems interact with the environment, vehicle and driver to prevent crashes from occurring," Jamie says. "By understanding how ESC works, it will be possible to take better advantage of the benefits it offers."

About 60% of all fatal 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 constant. Electronic Stability Control (ESC) is an active safety system which has shown potential in preventing crashes on high speed rural roads. Studies have shown that the crash rate for vehicles equipped with ESC is around 30% lower than the crash rate for vehicles not equipped with ESC. For the specific case of single vehicle crashes on high speed rural roads the reduction in crash rate for vehicles equipped with ESC was shown to be even higher. ESC is therefore an important new technology that will help to reduce the number of deaths on Australian rural roads.

As part of Jamie's research, twenty crash scenarios were developed based on real crashes which occurred on South Australian rural roads. The scenarios were reconstructed and simulated using state of the art software. With the assistance of Robert Bosch (Australia) Pty. Ltd., each scenario was then simulated again, but this time equipping the vehicle with ESC. "The scenarios gave an indication of how a vehicle equipped with ESC would have responded to a situation which resulted in a collision for a vehicle not equipped with ESC," explains Jamie.

Twelve of the simulations produced a conclusive result. In ten cases, a vehicle equipped with ESC would have avoided a collision altogether. In two cases, a vehicle equipped with ESC would have reduced the severity of the collision.

The results from the simulations show how an ESC system brakes individual wheels in response to various critical situations, the actions of the driver and how the ESC system responds to these, and finally the trajectory of the vehicle as the ESC system attempts to prevent it from skidding.

The results show that ESC systems are able to significantly benefit vehicle dynamics in real-world crash scenarios. ESC systems aid drivers in avoiding a loss of control during an emergency manoeuvre. An increase in the number of vehicles in Australia equipped with ESC would be expected to reduce the number of high speed, loss of control crashes. The effectiveness of the system can be maximised by continuing to seal roadside shoulders, maintain and upgrade road surfaces, increase the width of clear zones, install roadside and median crash barriers, set appropriate speed limits and educate drivers about the dangers of driving recklessly, at high speeds, while fatigued or while under the influence of alcohol/drugs.

In June the Federal Government announced that ESC will be mandatory in all new-model passenger vehicles from 2011.

Research sponsored by the Department of Infrastructure, Transport, Regional Development and Local Government.

For more information please contact,
Jamie MacKenzie
jamie@casr.adelaide.edu.au

Postgraduates in the spotlight

Jamie MacKenzie
Jamie is undertaking a PhD, studying the potential effects of Electronic Stability Control (ESC) on crashes on Australian rural roads. His research aims to predict the effect that ESC will have on Australian rural crashes.

Jamie hopes his research will contribute to a reduction in the number of fatal and serious injury crashes on rural roads. One of the key issues in road safety, Jamie believes "is the conbination of excessive speeds and poor infrastructure on rural roads. As well as the fact that some new vehicles still do not include ESC and other safety systems as a standard feature."

And on studying at CASR "what is great about studying at CASR is that it is a research faculty and not a teaching faculty. I'm surrounded by other people who are conducting research."

Daniel Searson
Daniel is currently studying the characteristics of pedestrian headform impacts. His research aims to quantify how different factors influence the results of pedestrian headform impact tests. For example, the speed and mass of the headform and the stiffness of the bonnet.

Daniel hopes his research will assist in introducing appropriate regulatory testing for pedestrian protection, and will help understand ways in which vehicles can be designed to be safer for pedestrians in the event of a collision.

Daniel enjoys studying in the multi disciplinary environment CASR provides. "It gives me a broader understanding of road safety issues, instead of just what I am working on."

"I believe a major issue in road safety is protection for vulnerable road users. A lot of emphasis is given to designing vehicles to keep their occupants safe, because that is what sells. However, around 20% of the Australian road toll is pedestrians, so it makes sense to design vehicles with their safety in mind as well."

Jeff Dutschke
Jeff is currently completing a PhD on biomechanics of intracranial trauma. Jeff hopes his research will contribute to a better understanding of how injury occurs during an impact to the head.

"What is most rewarding about studying at CASR is that I am working in an area that is beneficial to society and working with people that have diverse backgrounds and qualifications," Jeff says.

"I believe a major issue in road safety is speeding and reducing speed limits for all traffic. Another important countermeasure is integrating intelligent vehicle systems into the future car fleet."