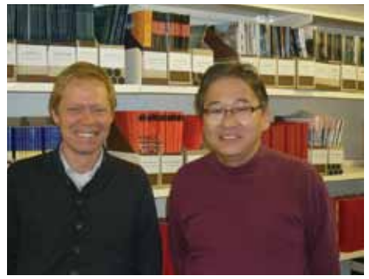
Visiting researcher from Nihon University



Professor Tetsuya Nishimoto from Nihon University, Japan, is currently undertaking a sabbatical at CASR. During his time with the Centre, Professor Nishimoto will be collaborating with Robert Anderson on brain injury research and other vehicle safety related research. Specifically, he will be conducting numerical modelling of the experiments Robert has been running at the Hanson Institute to assess the response of the sheep brain to direct deformation. Professor Nishimoto will be at CASR until October.

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In the spotlight – Jennifer Grigo

Jennifer studied psychology and psychophysiology as an undergraduate at Swinburne University of Technology before completing her honours in psychology at Flinders University in 2009.

Since joining CASR Jennifer has been involved in a number of projects. Within the human factors field, Jennifer has reviewed the role of sleepiness and fatigue in road safety, including specific challenges within the heavy vehicle industry. Jennifer has also investigated the influence of alcohol, cannabis, opiates, amphetamines, and cocaine on human performance and crash risk, and has studied the relative risks associated with different types of mobile phone use while driving, as well as the prevalence and reasons for this use.

Jennifer has conducted observational surveys of motorcyclist protective clothing in both Victoria and South Australia and produced a review of motorcyclist injuries, post-impact movements, and crash configurations in order to determine the potential benefits of abrasion resistant clothing for both commuters and recreational riders. Jennifer is also a part of CASR's in-depth crash investigation team. Within this team, Jennifer regularly attends crashes and conducts interviews with crash involved drivers in order to gather detailed information on the vehicle, site, and human factors involved in road crashes.

Jennifer is currently working with her colleagues on an annual report looking into the enforcement and publicity associated with speeding, restraint use, drink driving, and drug driving both within South Australia and in comparison to other Australian states/territories. She is also involved in a review of the suitability of Western Australian penalties for road safety offences, a traffic infrastructure-related driving simulation project, and an analysis of the effect of various countermeasures on compulsory third party insurance costs and road casualties.

'I am interested in human factors relevant to road safety' Jen says. 'Particularly studies of human performance and changes in driving conduct due to factors such as sleepiness, substance use, and mental health. I am also interested in the cognitive-emotional reasons for different driver behaviours'.

From 2002 to 2010, 56% of motorcycle crashes studied through CASR's metropolitan and rural in-depth crash investigation involved a motorcyclist sliding or tumbling along the road.

New publications

Doecke SD, Anderson RWG, Woolley JE (2011) **Advisory Intelligent Speed Adaptation for government fleets** (CASR099)

Grigo JAL, Baldock MRJ (2011) **Sleepiness and road crashes: Challenges of definition and measurement** (CASR082)

Lindsay VL, Ryan GA (2011) **Medical Conditions as a Contributing Factor in Crash Causation** (AP-R389-11), Austroads, Sydney.

Raftery SJ, Grigo JAL, Woolley JE (2011) **Heavy vehicle road safety: Research scan** (CASR100)

Wundersitz LN, Baldock MRJ (2011) **The relative contribution of system failures and extreme behaviour in South Australian crashes** (CASR092)

Wundersitz LN (2011) **Best practice in OHSW mass media campaigns** (CASR091)

At the scene

Newsletter of the Centre for Automotive Safety Research

Issue 10, September 2011

Road crashes: Extreme behaviours or simple mistakes?

There is a common belief that road crashes, particularly fatal crashes, are mostly the result of deliberate risk taking or extreme behaviour as these crashes usually receive much media attention.

New research by CASR has found that the majority of crashes do not involve extreme behaviour but involve people making minor mistakes or simple errors.

A key part of the Safe System approach in road safety is designing a road transport system that forgives mistakes and protects road users when something goes wrong. Therefore, crashes due to simple road user errors are essentially the result of a system failure. Crashes resulting from system failures can be addressed through improvements to road system design more readily than crashes resulting from extreme behaviours. 'The classification of crash causation in terms of system failures or extreme behaviour is important for determining the extent to which a Safe System approach is capable of reducing the number of crashes,' principal researcher Lisa Wundersitz explains.

In order to examine the relative contribution of system failures and extreme behaviour in South Australian crashes, two datasets were examined in the study: Coroner's investigation files and databases of in-depth crash investigations conducted by CASR. Experienced researchers carefully examined the causal factors in each crash in the datasets and classified them according to a specific definition.

The results indicated that very few non-fatal crashes (3% metropolitan, 9% rural) involved extreme behaviour by road users and, even in fatal crashes, the majority (57%) were the result of system failures. 'These findings suggest that improvements to the road transport system including roads, roadsides, vehicles and enforcement can be expected to be much more effective in reducing crashes than concentrating on preventing extreme behaviour,' says Lisa. 'Such a strategy could reduce the incidence and severity of a large proportion of crashes in South Australia'.

For more information please contact
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Together we can save millions of lives.
DECADE OF ACTION FOR ROAD SAFETY 2011-2020
www.decadeofaction.org

CASR supports the Decade of Action for Road Safety 2011-2020

From left to right (all from CASR): Andrew van den Berg, Impact Laboratory Manager, Mary Lydon, Director, Robert Anderson, Deputy Director

Message from CASR

Our laboratory in Kent Town has now been in operation for six months and, as we hoped, it is has become a focus for promoting ANCAP and the importance of pedestrian protection in vehicle design. Whilst the protection modern vehicles provide to vehicle occupants has improved dramatically in recent years, the improvement in pedestrian protection has been much more limited. We want to play a major role in educating the community on the opportunities for reducing pedestrian injuries through vehicle design and vehicle purchasing decisions.

In the short time since we opened the laboratory it has been the subject of a number of media stories, we have hosted meetings of the MAC, ANCAP and CASR boards and will soon provide the location for an event promoting 'stars on cars'.

On 7th September the Friends and Benefactors of the University of Adelaide visited the laboratory and were given presentations on the work of the laboratory and the wider research undertaken by CASR.

Visiting representatives of vehicle manufacturers have also been pleasantly surprised by the comfortable workspace provided for them and are all still impressed by the quality and accuracy of the vehicle testing undertaken by CASR.

Getting our research to those practitioners and policy makers who can use it and make a real difference to road trauma is very important to us. A major initiative has been our Knowledge Transfer Program in which we are intending to cover the major topics of road safety over a two-year period. So far this year we have held four successful and well-attended sessions covering an introduction to road safety, issue on urban roads, speed and speed management and high-risk road users. The final event this year will be held on 18th November and will address safety issues for rural roads.

To arrange a tour of the laboratory or find out more about our Knowledge Transfer program contact Leonie Witter at leonie@casr.adelaide.edu.au.

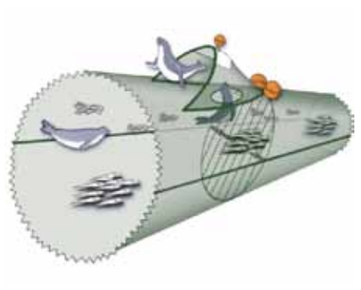
Impact Testing of the New Zealand Sea Lion Exclusion Device

Sea lion exclusion devices (SLEDs) are used to prevent accidental drowning of New Zealand sea lions in NZ squid fisheries.

The SLED consists of a stainless steel grid and an escape hatch placed inside the squid net. The intention is that, during a trawl, fish or squid pass through the grid undamaged into the cod end of the trawler nets, while the grid diverts sea lions toward the escape hatch.

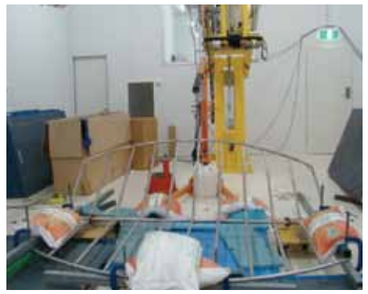
Following the introduction of SLEDs, there was some concern that the sea lions were at risk of head injury following heavy impacts with the grid.

CASR was contracted by the New Zealand Ministry of Fisheries to conduct a series of headform impact tests on a SLED grid, and to estimate the risk posed to sea lions by the grid during trawl operations. The results will be incorporated into a population risk model that is central to the management of the fishery and the setting of seasonal trawl limits.



A photograph of a SLED (courtesy Dr Wendi Roe), and a diagram of the SLED, demonstrating the intended method of sea lion diversion (Tilzey and Wise, 2005)

For more information please contact Giulio Ponte, giulio@casr.adelaide.edu.au



Various set-ups for the SLED Grid Testing

Sleepiness identification in crashes

Until recently, the relationship between sleepiness and crashes has been largely underestimated in the scientific literature.

This is partially because the involvement of sleepiness in crashes is not easily confirmed without a subjective report from the driver. This continues to be an issue because unlike other factors, sleepiness does not leave objective confirmatory evidence at a crash scene.

After a crash has occurred, a crash scene contains a wealth of evidence that can be used to explain how and why the crash happened. Details can be collected from the site, the road, vehicles involved, crash participants, witnesses and so on. For example, site information such as tyre marks or skid marks left on a road can be used to estimate the involvement of excessive speed in a crash. These marks can also be combined with evidence of vehicle damage and final positions to determine crash configurations. The crash configurations can provide evidence for failures to give way or traffic violations. The layout and state of roads, weather conditions, and knowledge of traffic signal sequences can aid in verifying this evidence.

In terms of vehicle information, other than damage, the vehicles themselves can be tested post-crash for mechanical defects that may have lead to the crash itself or the injuries sustained, while seatbelts can be examined for evidence of compliance to restraint use laws. When it comes to human factors, witnesses may provide accounts of dangerous driving or mobile phone use, and police can check phone records if required. Also, drug and alcohol use can be readily tested for by police using breath and or blood analysis.

Unlike these other potential factors that can lead to crashes, without the acknowledgement of the driver often the only evidence for the involvement of sleepiness is an absence of other evidence. For example, a late night run off road crash may be suggestive of sleepiness, especially if there is no evidence of emergency braking or avoidance manoeuvres, but many crashes may have these characteristics and not be sleepiness related. Therefore until other factors such as excessive speed, alcohol or drug use are ruled out, there is little evidence that sleepiness was involved. This means that often a scarcity of evidence for other factors needs to be confirmed before sleepiness is closely considered. This is a serious problem because there is always the true possibility that a sleepy driver may be speeding, intoxicated, distracted and so on. This leads to under-reporting of sleepiness in crashes, even for crashes with characteristics that are suggestive of sleepiness.

The situation is worse for crashes that are less suggestive of sleepiness. Consider a common metropolitan rear-end crash during daylight hours, here it is highly likely that sleepiness will be overlooked unless it is reported by the driver. Sleepiness does not necessarily occur only at night or in the mid afternoon, many factors can influence individuals' current level of sleepiness, and impairments can occur well before a driver falls asleep. In this crash situation, without a subjective report from the driver it is extremely difficult to identify sleepiness as a contributing factor, and hence it is likely to remain undetected.

Due to the difficulties in objectively identifying sleepiness post-crash, the true role of sleepiness in road safety is likely to continue to be underestimated. Sleepiness is a serious issue in road safety as it has the ability to reduce the efficiency of crash avoidance manoeuvres leading to crashes of greater severity. Currently, technological solutions are being developed to accurately identify sleepiness in drivers and recent advances in this area show promise. These technologies could be of great benefit to road safety by warning drivers of sleepiness, helping fleet managers identify drivers who are at risk, and aiding in sleepiness detection post-crash. At present, this area of research still has some way to go before the potential benefits can be realised.

For more information please contact Jennifer Grigo jennifer@casr.adelaide.edu.au

In the spotlight

Simon Raftery

Simon's educational background is in psychology. Simon has an honour degree in psychology from the University of South Australia and in 2006 started a PhD examining the relationship between the function of a person's substance use and offending behaviour. Simon's thesis is now in the finishing stages and will be submitted by the end of the year.

In his time at CASR Simon has been involved in a number of projects, including a review of road safety education for school students, roadside observations of motorcycle safety gear, a research scan of heavy vehicle road safety, and an investigation of restraint use in fatal crashes. Simon's current projects include an examination of the characteristics of old-car crashes, a review of road traffic penalties in WA, and a study of bicycling exposure and crashes. Simon is also a part of the in-depth crash investigation team and is responsible for the on-site investigation of crashes and also conducts interviews with involved drivers and witnesses.

'Research in road safety encompasses a variety of different areas and research disciplines. It allows me to indulge my interest in all aspects of psychology, including, cognitive, social, neuropsychology, forensic psychology, and developmental psychology' says Simon. 'Working as part of a multidisciplinary team also means I get to explore problems from other perspectives and share my knowledge with others to produce high quality, meaningful research. Road safety is also one of those rare fields where your research can have a direct, positive benefit on the community. It gives you the chance to influence the world and make it a better, safer place for everyone. Our work here at CASR saves lives, not every researcher can say that'.