Researcher wins prestigious Brain Foundation Grant

Robert Anderson (Chief investigator) and Prof. Bob Vink (Co-investigator; Head of the School of Medical Science) have been awarded a Brain Foundation Grant entitled “Quantifying the link between tissue strain and brain dysfunction in a sheep model of neurotrauma” ($40,000). Their proposal is to study how the brain of the sheep responds mechanically and physiologically to dynamic indentation. 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.

In late September, Robert received the award at a ceremony in Sydney attended by the Governor of New South Wales and other distinguished guests.

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

Upcoming CASR seminars

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

November 27
Medical Conditions as a factor in crash causation
Tori Lindsay

The extent to which medical conditions contribute to crash causation is not well understood. However the are indications they may play a significant role. In recent In-Depth Crash Investigation of Metropolitan crashes it was identified that over 13% of active participants were involved in the crash as a direct result of a medical condition or acute medical event.

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

Vehicle age-related crashworthiness of the South Australian car fleet (CASR062)

On-road observational surveys of restraint use and child restraint use, 2009 (CASR065)

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

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At the scene

Newsletter of the Centre for Automotive Safety Research

Issue 3, October 2009

Do older vehicles offer less protection in a crash?

CASR recently released a new report on the crashworthiness of passenger vehicles in South Australia.

The objective of the study was to examine to what extent the age of vehicles in South Australia is affecting the crashworthiness of the vehicle fleet.

Previous work has already shown that newer vehicles offer more protection than older vehicles in a crash. Work at the Monash University Accident Research Centre suggested that the rate of serious crashes increases with the age of the vehicle. This change is not related to the age of the vehicle per se, but to aspects of the design of the vehicle important to safety.

The median age of passenger vehicles in South Australia is 8.9 years which is older than the national average. The study estimated the consequences on the rate of serious injury crashes of the age profile of vehicles in the State.

The study approached this question from a few different angles, but the consistent result was that the State probably has about 3% more serious crashes than it would if the vehicle age profile were similar to that of the Australian average.

To effect a 10% decline in serious crashes through fleet renewal would require a radical change to the age distribution including a reduction in the mean age to 7.5 years.

Some consideration was given to younger drivers who 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 on average than the vehicles crashed by other drivers.

Principal researcher, Dr Robert Anderson said, “it should be borne in mind that the influence of new-car safety on the fleet’s average safety is not immediate. Of course, if all vehicles were replaced instantaneously with new vehicles, there would be a significant benefit, but the reality is that this benefit takes many years to realise, and new vehicle safety will mainly benefit future drivers that are presently young children. In the shorter term, there may well be merit in understanding the impediments to young drivers driving newer (and safer) vehicles; for example, there may be conditions on vehicle insurance which may inhibit the use of newer cars to members of households that are young drivers.”

“It may be fruitful to focus on trends in vehicle safety technology and other safety related characteristics of the fleet, particularly with vehicles entering the registered fleet for the first time (either as new cars or as imported second-hand cars). It is probable that positively influencing the level of safety in vehicles entering the registered fleet will have road safety benefits many years into the future.”

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

Contents

Message from CASR

Welcome to our third newsletter and thank you for all your comments and positive feedback. Recently I was asked to give the keynote address for the AITPM annual conference in Adelaide. I was greatly encouraged by the interest in safety shown by the many transport planners and managers and their willingness to embrace new safety ideas. CASR is fortunate to be guided and assisted by an Advisory Board which includes representatives from our major supporters and the three Adelaide universities. Our long term independent Chairman, Mike Quinn, retired at the end of 2008 and we are delighted that Mr Tom Phillips has agreed to take up the role. Tom has extensive experience in many areas of business and public service. He is a former CEO of Mitsubishi Motors and was named South Australian Businessman of the year in 2002. He has held Board positions with many organisations and is currently Chair of the Safe Work Australia Council and a member of Flinders University Council. We are looking forward to benefiting from Tom's advice and experience as we continue to develop CASR into a leading contributor to road safety research.

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

Community engagement activities

National conference on injury prevention and safety promotion: information booth

CASR was well-represented at the recent 9th National Conference on Injury Prevention and Safety Promotion held in Melbourne from July 26 to July 28.

Three CASR staff members, Matthew Baldock, Tori Lindsay and Andrew van den Berg, attended the conference and presented papers. Matthew presented a talk on "The crashes of older drivers - evidence from at-scene in-depth crash investigation", Tori updated conference attendees on her current work with a talk called "Medical conditions as a contributing factor in crash causation", while Andrew van den Berg summarised some of our work stemming from the Impact Laboratory in a talk called "Assessing pedestrian vehicle safety in Australia".

In addition to presenting talks, CASR hosted a booth at the conference. Matthew, Tori and Andrew displayed some of the technology we use in the Impact Laboratory and promoted our reports and other activities.

Current projects

- Speed characteristics of vehicles in South Australia
- Evaluation of safety cameras in South Australia
- Evaluation of Black Spot Program
- Reviewing motorcycle issues
- Media issues
- Pedestrians and 4WDs test methods

Maths and science in road safety research

Daniel Searson, a PhD student at CASR, spoke to Year 10 students recently about the ways in which mathematics and science are used in road safety research.

The students will be using road safety as a context for learning about Newton's laws of motion, and other related topics.

Daniel showed how statistics can be used to identify important road safety issues, and how basic physics can be used to explain the risks associated with travelling speed. The presentation also included an overview of how crash testing is used to measure the safety of a vehicle design.

The talk was held at Gleeson College and was also attended by students from Golden Grove High School and Pedare College.

In the spotlight – Craig Kloeden

Craig has worked at CASR for 22 years. His educational background is in computer science and psychology with a touch of engineering.

Major research projects that he has worked on include: in-depth at-scene investigation of road crashes; a closed course study on alcohol use in a realistic night driving situation; running roadside breath alcohol surveys of Adelaide drivers; determining the relationship between travel speed and injury crash involvement in both urban and rural areas; the role of roadside hazards in crashes; and evaluation of the introduction of a default 50 km/h speed limit in South Australia.

In 2008, Craig completed a large study looking at the crash and offence experience of 50,000 newly licensed young South Australian drivers.

Craig's current research is focussed on tracking and understanding vehicle speeds. Since 2007, Craig has been tracking vehicle speeds at 130 sites around South Australia. In 2008, he also developed a methodology for a similar system in Queensland and analysed the results for the first year of data collection in 2009. He is also a member of the South Australian Speed Management Task Force.

Over the past five years, Craig has developed a web based interface to the South Australian crash data that can quickly produce basic crash statistics and allows crashes to be plotted on interactive maps.

'What is great about working at CASR is being surrounded by smart people from many disciplines who interact to produce high quality research. The environment at CASR also allows long term difficult projects to be undertaken to produce results not possible anywhere else in the world.'

Lessons from In-depth

Collisions with trees on rural roads

The number of people being killed on rural roads as a result of collisions with trees has received much media attention of late.

Unsurprisingly, when vehicles leave the road out of control it is more likely that a tree is hit than any other type of hazard. Perhaps what is less well appreciated is that the ability for vehicles to protect its occupants depends on the orientation of the vehicle when it collides with the tree. The protection offered by a sedan type vehicle in a frontal collision is much greater than that of a side collision. In a frontal collision, there is effectively the entire length of the bonnet to deform and decelerate the vehicle during the collision. With a side impact, there is much less vehicle structure to protect the occupants and large deformations can occur resulting in severe injuries to occupants. Although subject to many qualifications, it would be desirable that side impacts of vehicles with trees or poles not exceed 40km/h. Consider then, the types of speed limits that are permitted on rural roads at present and the prevalence of trees along these roads.

There are various ways in which loss of control type crashes can be avoided. Electronic Stability Control is finding its way into modern vehicles and will likely have an effect in reducing loss of control type crashes. Audio-tactile edge linemarking (lines that cause vibration when run over) and sealed road shoulders should also be adopted as much as possible.

One of the key safety design principles on our rural roads is to maintain what is termed a "clearzone" on either side of the road. Ideally the width of this zone should be 9 metres and be free of trees or other objects that would cause injury or death when struck by a vehicle. The philosophy behind the clearzone is that when a vehicle leaves the road there is room for the driver to manoeuvre back onto the road or brake heavily. Should a consequent collision with a hazard occur, some speed may have been lost prior to impact thus reducing the severity of the collision. In practice, not all hazards can be removed or relocated and another option is to install crash barriers protecting errant vehicles from the hazards.

Many crashes investigated by CASR have shown that vehicle occupants are still receiving fatal or serious injuries beyond the traditional 9m clearzone. Using current indepth crash cases, CASR has been researching run off road crashes and the trajectory of vehicles when they begin to lose control. The orientation of vehicles during collisions with hazards is being scrutinised along with resulting impact speeds. The work will raise interesting road design questions in relation to the balance between maintaining a clearzone free of hazards or the provision of crash barriers. It will also provide valuable information on how innovative treatments such as barriers down the centre of rural roads may contribute to reduced road trauma.

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