From the Director

When collating research outputs over the past few months in order to highlight a few studies for this issue of Big Impact, I was astounded not only that there were 14 peer-review papers to consider as well as two MUARC reports, but also a wealth of seminars and keynote addresses.

The range in our research output covered aspects on Intelligent Transport Systems, the use of naturalistic driving methods through to a study providing evidence for the need to regulate electronic stability control in light commercial vehicles. In relation to the latter, this issue highlights the considerable benefits that can be achieved in relation to reduced fatalities, serious injuries and concomitant cost savings from the opportunities to regulate the introduction of such technology. This interesting research clearly highlights MUARC’s ongoing commitment to translating key research findings in to policy and practice.

As we begin to implement MUARC’s five-year strategic research plan, we have chosen to strengthen our expertise in In-depth Crash Investigation and the opportunities this data affords in relation to our understanding of vehicle crashworthiness, the efficacy of various safety devices, to name a few examples. Consequently, I have recently appointed Dr Michael Fitzharris as Associate Director of Regulation and In-depth Crash Investigation; Michael will lead a dynamic group of staff including scientists, engineers and nurses and create an expanded research program in this exciting field.

Finally, I welcome any feedback on our research newsletter so that we can continue to improve the interface between the researchers and the policymakers.

Please don’t hesitate to contact either myself or the researchers if you wish to follow-up on our research.

Professor Mark Stevenson
Director, MUARC

Recent publications

MUARC has produced 14 journal papers over this period. A selection of these papers are below:

In addition MUARC has released two reports which are available for download from the MUARC website:
MUARC research supports the case for mandatory fitment of ESC in light commercial vehicles

MUARC’s long history of examining the crash reduction benefits of ESC continues with an investigation of the likely benefits of mandatory ESC fitment in light commercial vehicles.

Electronic stability control (ESC) was first introduced in passenger cars in 1995. ESC systems continuously monitor vehicle direction and steering behaviour and responds to re-establish vehicle stability when a loss of control is imminent. Early research performed overseas indicated significant crash reductions associated with ESC. In the first Australian study of ESC using population level crash data, Jim Scully and Dr Stuart Newstead from MUARC reported that the benefits of ESC in Australia and New Zealand were comparable to overseas reports. For passenger cars, ESC was associated with a 32% reduction in the risk of single vehicle crashes and a 68% reduction in crash risk for 4WD vehicles. These findings were confirmed in a follow-up study in 2010 by Scully and Newstead who also found that ESC fitment led to an 82% reduction in 4WD rollover crashes.

This research reinforced the need for the mandatory fitment of ESC in passenger cars. Both the Victorian and Australian government responded by adopting regulations in 2009 to ensure the fitment of ESC in all passenger cars and sports utility vehicles (SUVs).

As light commercial vehicles form a significant part of the Australian vehicle fleet, the question of whether there would be benefit to extending the mandate to include all light commercial vehicles was asked by the Commonwealth Department of Infrastructure and Transport. This question was addressed by Dr Michael Fitzharris, Mr James Scully and Dr Stuart Newstead. In their report, mandatory fitment in 2013 would speed up the introduction of ESC into all light commercial vehicles by seven years, and by 2034, all vehicles in the fleet would have ESC. Using standard cost-effectiveness and regulatory assessment guidelines, the benefits of the mandate were found to be significant, over and above the voluntary fitment rate.

Over the 30 year assessment period, the researchers estimated there would be 700 fatalities saved and 6934 fewer drivers seriously injured in crashes involving light commercial vehicles. In financial terms, the benefit to the community would be in the order of $AUD 3.1 billion for a cost of $AUD 1.3 billion, thus being highly cost-effective. Accelerated fitment of ESC demanded by the mandate would result in 24 additional lives saved and around $AUD 253 million saved in injury costs.

This research clearly supports the mandatory fitment of ESC into all light commercial (Class NA) vehicles in Australia. It is anticipated that moves will be made to amend current Australian Design Rules to include provision for ESC to be fitted as standard equipment at some time in the future.

Further information about MUARC’s research on ESC is available on the website and by the report authors (http://www.monash.edu/miri/muarc).
Alcohol whilst riding – Is any positive blood alcohol level safe?

In most jurisdictions, legal blood alcohol concentration (BAC) limits are the same for motorcycle riders as they are for motorists. To date, there has been limited research investigating the effect that low-dose alcohol consumption has on riding.

This MUARC study is the first study to use an advanced simulator to investigate rider performance under two simulated road conditions (rural and urban). The simulator also allows researchers to record how riders respond to hazards without putting riders’ or other road user’s safety at risk.

Using MUARC’s motorcycle simulator, researchers compared the performance of novice and experienced riders by examining weaving within the lane and speed as well their ability to respond a peripheral detection task (using the indicator to respond to icons appearing at random intervals). During the urban scenario, the participants had to respond to a hazard situation of an unexpected pedestrian walking onto the road.

For the purpose of this study, novices had less than two years of riding experience, whereas experienced riders had to have spent at least five years and 5000km on the road. Participants were asked to ride both the rural and urban scenarios with a BAC at 0% (sober), 0.02% and 0.05%. These BAC levels correspond to the legal BAC limit for L and P-plate riders (0% and 0.02%) and experienced riders (0.05%).

Experience does not counteract the effect of alcohol

Alcohol clearly affected riding performance for novice and experienced riders. In the urban scenario, speed control and weaving were affected by alcohol consumption especially for the novice riders. In the rural scenario, both groups of riders demonstrated slowed response times to the peripheral detection task, taking significantly longer to use the indicator after seeing the icons.

One of the most interesting findings we can draw from this research is that experience does not counteract the effect of alcohol. The odds of colliding with unexpected hazards such as pedestrians crossing the road were increased, particularly with the group of novice riders. The research supports the approach of the graduated licence system in many jurisdictions which requires a zero BAC for novice (L and P plate) riders. There is also some evidence that the legal limit of 0.05% BAC may be too high. Both novice and experienced riders demonstrated impaired riding performance and reduced reaction times at this low dose of alcohol.

Further research is required to investigate low dose BAC in both motorcycle riders and car drivers in order to assess the appropriateness of current worldwide BAC limits.

Dr Fitzharris to lead the Regulation and In-depth Crash Investigations team

The Regulation and In-depth Crash Investigations team, led by Dr Michael Fitzharris, has been established within MUARC in recognition of the central role that regulation plays in road safety and vehicle safety in particular. This includes traditional forms of regulation such as laws, regulations and design rules, but also ‘soft’ regulations including the role of NCAP and industry codes of practice in promoting safety.

The research conducted by the team aims to support regulatory reform and decision-making at the state, national and global level by examining the benefits of current and future vehicle safety systems and aspects of road user behaviour.

Underpinning our research is the use of cost-effectiveness methods using in-depth crash data and other enhanced datasets including claims data held by compensation agencies. This type of analysis permits effective, evidence-based decisions to be made with a view to identifying key road safety problems and arriving at ways to reduce the overall cost of injury to the community.

Current research projects include the Australian National Crash In-depth Study (ANCIS) - which has nearly 1000 crashes fully investigated, an examination of the likely benefits of a new side impact protection standard, the economic cost of distraction crashes, and the effects of ESC and side impact airbags in Victoria. Past projects have examined the influence of Intelligent Speed Adaptation (ISA) in heavy vehicles and the benefits of ESC in light commercial vehicles. The research team has capacity to perform crash reconstruction simulations and occupant injury modelling.

The research group has a strong collaborative links with a number of research groups in Australia, as well as in the US and a number of countries in Africa.
Leading transport safety research

www.monash.edu/imir/muarc