From the Director

WELCOME to the first edition of Big Impact for 2014. In this issue, we highlight findings from the largest study of heavy vehicle crashes in Australia and also discuss a new research facility that is being established with the support of the Department of Defence. The new research facility will enable MUARC to continue and extend its research in the area of heavy vehicle transport safety.

Our recently published paper on heavy vehicle safety, is a culmination of 4 years of research involving a collaboration of academics, government and industry partners. The research focused on the role of driver payment, driver schedules, truck configuration and the role of sleepiness and sleep disorders on the risk of heavy vehicle crashes. Key findings from the study point to necessary changes in scheduling of trips along with increased frequency of breaks to reduce the challenges associated with the monotonous task of driving. We encourage you to review the findings highlighted in this issue and subsequent papers published from this large study (see publication listing in this issue).

Our annual MUARC lecture will be held next week. Prof Stanton’s lecture on autonomous vehicles is particularly pertinent given the speed at which this technology is developing; and for which the opportunities for road safety are important.

We look forward to the opportunities this year will bring; particularly collaborations with you all.

Professor Mark Stevenson
Director, MUARC

Heavy vehicle publications.


Australian study analyses the causes of truck accidents

Approximately one in five deaths on Australian roads involves a heavy vehicle.

A STUDY led by Prof Mark Stevenson studied the causes of truck accidents between 2008 and 2011 in New South Wales and Western Australia: looking at issues ranging from sleepiness; driving experience; payment of rates; use of stimulants to stay awake; health of driver and truck characteristics such as provision of cruise control, antilock braking etc.

The study shines a spotlight onto the trucking industry and how and why its accident rate is so high.

The study – published in the American Journal of Epidemiology – looked at 530 heavy vehicle drivers who had recently crashed and 517 heavy vehicle drivers who had not. Drivers’ crash histories, truck details, driving schedules, payment rates, sleep patterns and measure of health were collected. Subjects were also required to wear a nasal flow monitor to measure sleep apnoea over one night to measure sleepiness.

The study found that long-distance truckers are almost three times more likely to get in an accident when they drive during midnight-to-dawn hours with few breaks. Driving for more than three hours a night can contribute to performance errors equivalent to driving with a blood alcohol concentration of 0.08.

Safety devices on the trucks were also linked to crash rates. For instance, the researchers found not having anti-lock braking systems on a truck was tied to a 50 percent higher risk of crashing. Lack of cruise control was tied to a 64 percent higher risk. Also travelling with an empty load in an articulated truck was associated with an almost two fold increase in having a crash. According to Professor Stevenson this may be attributed to factors such as speed associated with time restrictions imposed to pick up a new load and/or finish a shift.

The truckers were recruited at rest stops along heavily travelled truck routes in New South Wales and Western Australia. Drivers in both groups answered questions related to sleep, driving and lifestyle habits during a 40-minute interview. They also wore a sleep monitor for one night. Participants were in their mid-40s, on average.

Truckers who had been driving for less than eight hours had about half the odds of crashing as those further into their trip.

The study found that:

- to have used caffeinated drinks to stay awake in the previous month (69% versus 44% in controls)
- have less than ten years driving experience (41% vs 20%)
- only 59% had more than ten years driving experience compared to 80% of those who had not had accidents

The study was a collaboration between The George Institute (Sydney), Curtin University (CMARC) (WA), The University of NSW, Queensland University of Technology (CarrsQ) and the Woolcock Medical Research Institute (Sydney)
The human factors and simulation laboratory at the Monash University Accident Research Centre (MUARC) has recently expanded, thanks to our on-going partnership with the Defence Science and Technology Organisation (DSTO).

The laboratory simulates a class of defence land vehicle that is being provided through Project LAND 121, which will deliver a networked and integrated capability and will see the delivery of vehicles with a generational advancement on current fleet technology. The project will deliver around 7,500 protected and unprotected vehicles across the range of lightweight, light, medium and heavy fleet segments.

The simulated vehicle features two motion-based chairs that move in sync and that can simulate a range of motion provided by military vehicles in sealed and unsealed roads. The right hand seat is the driver while the left hand seat is typically for a commander who can interact with a touch screen battle management system (BMS).

The new lab also uses software that is designed to simulate military environments (VBS-2). “This laboratory is a great addition to our existing simulation suite that includes both portable and mid-range driving simulators,” said Professor Mike Lenné, Associate Director – MUARC’s Human Factors.

As part of our new multi-year agreement, the team at MUARC will be working with DSTO to conduct research in three primary areas. Firstly, exploring workload, performance and fatigue in crews and the impact on both individual and crew performance in driving and related military tasks. Secondly, to explore the role of training technologies in affording and constraining the acquisition of the required knowledge, skills and abilities required to effectively operate vehicles and associated sub-systems. Thirdly, to examine the role of training and related interventions designed to enhance the safe and economical employment of vehicle platforms. MUARC has two PhD students working on the program already and are looking to build a strong program in the short term.
Designer of adaptive cruise control for Jaguar to speak in Melbourne

PROFESSOR Neville Stanton, the Chair of Human Factors Engineering at the University of Southampton in the UK, will give the MUARC Annual Lecture on Tuesday March 4 at 10 am.

Professor Stanton is currently funded by Jaguar and the European Union to conduct research into highly automated vehicles and was instrumental in designing new human interfaces such as Adaptive Cruise Control for Jaguar.

The MUARC lecture will be at the Monash University Law Chambers in the city.

Contact 03 9905 4021 to RSVP.

Below is a sample of other recent MUARC publications

Trotter, M., Salmon, P.M., Lenne, M.G., 2013, Impromaps: applying Rasmussen’s Risk Management Framework to improvisation incidents, Safety Science [P], vol 64, Elsevier BV, Netherlands, pp. 60 70.


Young, K.L., Salmon, P.M., Cornelissen, M., 2013, Distraction induced driving error: an on road examination of the errors made by distracted and undistracted drivers, Accident Analysis and Prevention [P], vol 58, Elsevier Ltd, United Kingdom, pp. 218 225.

Young, K.L., Salmon, P.M., Cornelissen, M., 2013, Missing links? The effects of distraction on driver situation awareness, Safety Science [P], vol 56, Elsevier BV, Netherlands, pp. 36 43.