‘In the Works’: Autonomous Vehicles—Are Western Australian Roads Ready?

C-MARC Research Fellow, Dr Brad Gibson, is undertaking a project on behalf of the Road Safety Commission and in partnership with Main Roads WA to investigate the technological limitations associated with road infrastructure sensing in automated and semi-automated vehicles.

Vehicle safety technologies are becoming increasingly more sophisticated. Moving beyond technologies such as Anti-lock Braking Systems (ABS) and Electronic Stability Control (ESC) systems, vehicles are now being fitted with devices that sense and respond to the surrounding environment of the vehicle. This includes systems such as Adaptive Cruise Control (ACC), Autonomous Emergency Braking (AEB), Lane Keeping Systems (LKS), and Traffic Sign Recognition (TSR), the latter of which will potentially be a fundamental technology for fully autonomous vehicles.

Technology companies and vehicle manufacturers are also beginning to trial fully automated vehicles within the fleet, with Google’s Self-driving Cars arguably the most well-known. These technologies are being developed to work effectively with existing road infrastructure, however, it is of interest to know how the existing road infrastructure can be enhanced to further the effectiveness, reliability, and safety of these technologies.

Dr Gibson’s project will identify the semi-automated and automated vehicle technologies currently available, and expected to be widely available in the marketplace within the next 5 years. The current literature relating to the performance of the identified technologies will be reviewed in order to determine technological limitations associated with road infrastructure sensing. This review will then inform the development of best-practice guidelines with regards to road infrastructure design and building that will help eliminate some of the problem areas for the sensing technology, and thus, improve the effectiveness and reliability of the identified technologies.

In addition to this, Main Roads WA will identify six sample roads of different design, marking, and pavement treatment that will be audited against the proposed best-practice guidelines. The auditing process will also include a back-to-back comparison of the performance of a Lane Departure Warning System (LDWS) at each of the study sites to determine any real-world differences with regards to the experience of the driver.

The guidelines developed in this project will be presented to Main Roads WA to assist in the formulation of future road building standards that directly relate to the accommodation of automated and semi-automated vehicle technologies in WA.
The CMARC-ARRB driving simulator was officially launched in April by the Deputy Premier and Minister for Road Safety and Police in Western Australia, The Honourable Liza Harvey MLA.

The simulator is one of the most advanced driving simulators in the Southern Hemisphere. It features a fully functioning Kia car with genuine transmission, clutch, brake, accelerator and power steering systems that is completely enclosed in a cabin with a 360 degree visual system which is mounted on a six Degrees of Freedom motion platform. The simulator is set to be used in a wide range of research projects including the testing of novel road layouts, such as the Diverging Diamond Interchange, assessing driver distraction from roadside advertising, in addition to studying at-risk groups, including young and older drivers.

The event was well attended with representatives from a wide range of organisations, including Western Australia Police, Main Roads WA, the Road Safety Commission, Monash University Accident Research Centre, ARRB Group, WALGA, Department of Health WA, Royal Perth Hospital, and the Department of Transport. The attendees varied from researchers, road safety analysts and policy makers, law enforcement officers, engineers, and ophthalmologists, which reflects the cross-disciplinary and multi-dimensional approach needed to tackle the complex issue of road safety. Already the advanced simulator has garnered interest from researchers, transport companies and road authorities from across Australia who are looking to investigate road safety issues, such as fatigue and distracted driving.

The team here at C-MARC would like to thank all who attended the launch and we look forward to collaborating with you on future road safety projects.
Safety Behaviours Among Group and Non-Group Cyclists in WA

Cyclists who are part of a cycling group or club are less likely to ride while under the influence of alcohol, more likely to feel safe riding in motor vehicle lanes and less likely to feel safe on shared paths.

A recent C-MARC PhD study compared the characteristics of Perth cyclists who were part of a cycling group or club and those who were not. While the popularity of group and bunch riding is increasing in WA, very little is known about the characteristics, safety beliefs and safety behaviours of group versus non-group riders, since this information is not recorded in crash databases.

Participants consisted of 228 cyclists recruited as potential controls for the WA component of an Australian Research Council (ARC) funded study on cyclist safety. Cyclists were recruited roadside while stopped at traffic lights at 70 locations in metropolitan Perth between March 2015 and April 2016 and completed an online survey.

This cross-sectional analysis included 124 cyclists (54%) who did not currently participate in group riding and 104 group riders (46%). Group riders were defined as those who currently rode as part of a formal or informal cycling group or club, consisting of more than 5 riders.

The majority of group (78%) and non-group riders (85%) were male and of Australian nationality (88% and 89% respectively). Most non-group riders were aged 30-50 years (50%) or 50+ years (36%), as were group riders (43% aged 30-50, 44% aged 50+ years). Over 90% of group riders also participated in cycling outside their group/club.

Overall, 33% of non-group riders and 19% of group riders reported they had possibly cycled while over the legal blood alcohol limit while undertaking any type of cycling in the previous 12 months. After controlling for potential confounding factors, group riders were over 50% less likely to report they had possibly cycled while over the legal blood alcohol limit (p=0.028). In addition, group riders (37%) were significantly more likely to report feeling safe in motor vehicle lanes than non-group riders (16%) (p<0.001) and group riders (74%) were significantly less likely to feel safe than non-group riders (86%) on shared cyclist/pedestrian paths (p=0.02).

These findings provide preliminary information about the safety behaviours of group and non-group cyclists in WA. Those who ride as part of a group or club may be at a reduced risk of undertaking risky behaviours like riding under the influence of alcohol and this could translate to all types of riding they participate in. These findings require further investigation.

C-MARC Team News

Ms Siobhan Manners—Research Associate
Siobhan graduated in 2014 from the University of Western Australia with a Bachelor of Health Science (Hons) majoring in Public Health and Anatomy and Human Biology. She has assisted as a researcher on several eye health related projects, inclusive of an investigation of sun protection usage with the Lions Eye Institute, and an investigation into Retinal Detachment incidence and trends within Western Australia. Her main areas of interest include eye health, optics and linked data applications. Siobhan joined C-MARC to gain more varied research experience and will be assisting with several current projects.

Publications


C-MARC is a West Australian based independent multi-disciplinary road safety research centre established by the West Australian State Government’s Office of Road Safety in 2009.

The Centre represents a significant partnership between the Office of Road Safety (now the Road Safety Commission), Curtin University and Monash University’s Accident Research Centre (MUARC).

C-MARC’s mission is “to be a Centre of excellence in road and other injury research and the translation of that research into policy and practice that will inform government, industry and the wider community.”

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6th International Conference on Traffic & Transport Psychology

**Date:** 2—5 August 2016  
**Location:** Brisbane, Queensland  
**Venue:** Brisbane Convention and Exhibition Centre  
**Website:** [http://icttp2016.com/](http://icttp2016.com/)

The quadrennially held international ICTTP conferences have achieved a long-standing and highly-regarded reputation as the leading international meeting in the field of traffic and transport psychology. The Sixth International Conference on Traffic & Transport Psychology (ICTTP2016) will be a global forum at which all those involved in traffic and transport psychology, human factors, cognition and behaviours, road safety research, policy, education, enforcement and injury prevention, can meet with researchers, academics, and professionals to discuss and present on the latest work being undertaken in these areas. With a theme of “Taking Traffic and Transport Psychology to the World”, the conference will provide an invaluable opportunity for a broad range of presentations, workshops, symposia and discussion, with a particular focus on geographic regions where road safety action is needed most.

ARSC2016: The Australasian Road Safety Conference

**Date:** 6—8 September 2016  
**Location:** Canberra, ACT  
**Venue:** National Convention Centre  

The Australasian Road Safety Conference is the premier road safety conference for Australia, New Zealand and the Asia Pacific region. With the theme of “Agility, Innovation, IMPACT”, ARSC2016 will showcase the regions’ outstanding researchers, practitioners, policy-makers and industry spanning the plethora of road safety issues identified in the United Nations Decade of Action for Road Safety: Road Safety Management, Infrastructure, Safe Vehicles, User Behaviour, and Post-Crash Care. ARSC2016 will bring with it a special focus on how all stakeholders can become more agile to harness the latest research, technology and policy innovations to produce the best road trauma reduction outcomes possible.

60th AAAM Scientific Conference

**Date:** 17—21 September 2016  
**Location:** Waikoloa, Hawaii, USA  
**Venue:** Hilton Waikoloa Village  
**Website:** [http://www.aaam1.org/abstracts](http://www.aaam1.org/abstracts)

The Association for the Advancement of Automotive Medicine (AAAM) is a scientific professional organization devoted entirely to traffic related injury control. Its multidisciplinary membership represents medicine, behavioural research, biomechanics, engineering, epidemiology, statistics, education, law, and public policy. The conference combines clinical, research, academic and administrative backgrounds.

27th ARRB Conference

**Date:** 16—18 November 2016  
**Location:** Melbourne, VIC  
**Venue:** Pullman Melbourne Albert Park  
**Website:** [https://www.ivvy.com/event/ARRB16/](https://www.ivvy.com/event/ARRB16/)

The ARRB Research Conference creates the opportunity for road and transport professionals to share and explore the latest ideas, knowledge and technologies in order to maximise the total economic and social benefit of road infrastructure. The 27th Conference in this series is to explore infrastructure and its associated technologies in the context of the reasons for which the roads exist and the users for whom they exist. The theme of the conference is “Linking People, Places & Opportunities”.