Annual Report to Road Safety Council

2013-14

C-MARC

CURTIN-MONASH ACCIDENT RESEARCH CENTRE
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August 2014
Abstract
This report describes the fifth annual report to the Road Safety Council of the Curtin - Monash Accident Research Centre (C-MARC) for the 12 month period up to July 2014. The report covers the research and management activities of the Centre, and outcomes.

Disclaimer
This report is disseminated in the interest of information exchange. The views expressed here are those of the authors and not necessarily those of Curtin University or Monash University.
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ATTACHMENT: Road Safety Council Finance Statement............................................... Error! Bookmark not defined.
FOREWORD

As Chair of the Curtin - Monash Accident Research Centre Advisory Board I am pleased to provide the foreword to the Centre’s fifth Annual Report to the Road Safety Council of Western Australia.

The Centre is now in its sixth year of operation and, as an independent research centre, fulfils an important role in road safety research and research translation and advocates strongly for accident prevention in government, industry and the wider community.

The Centre works closely with the Office of Road Safety (on behalf of the Road Safety Council) and has reached agreement, in principle, for a further five year contract to build on the important research the Centre has undertaken in the past five years.

C-MARC promotes its research findings through research reports and publications, active engagement with the media and relevant professional groups, and the development of an informative website.

The Centre’s relationships with the Road Safety Council of Western Australia and Monash University remain critically important to its success as a centre of excellence in accident research and research translation, especially in relation to road safety.

I would like to congratulate and thank all members of C-MARC for their untiring efforts to build the Centre and contributing to its research outcomes and reputation.

Emeritus Professor Patrick Garnett
Chair
Curtin - Monash Accident Research Centre Advisory Board
1. INTRODUCTION

In December 2008, Curtin University, Monash University and the Office of Road Safety signed agreements to form the Curtin-Monash Accident Research Centre to assist in meeting the research needs of the WA Road Safety Council (RSC).

This report is the fifth annual report of the Centre to the RSC, covering the 12 months to July 2014. As such, this report recognises activities which may be of interest to the RSC, but does not include all activities in detail, particularly if the RSC does not have a direct interest, such as externally funded projects.
2. C-MARC MANAGEMENT

2.1 C-MARC's Foundation

C-MARC is a joint arrangement between Curtin University and Monash University Accident Research Centre (MUARC). Importantly, the Faculty of Health Sciences in Curtin University hosts C-MARC, while MUARC provides valuable skills, knowledge and capacity for safety research and the business of research generally. As a result, C-MARC's activities are based on:

- The needs, policies and practices of Curtin University and Monash University;
- The Collaboration Agreement for the Establishment and Operation of the Curtin-Monash Accident Research Centre; and
- The Funding Deed, Deed of Agreement.

C-MARC's research activities are based on the requirements of:

- The Road Safety Council;
- Other funders of research; and
- The University’s research program, including students.

2.2 Governance

C-MARC is generally externally funded and commenced with a foundation contract with the WA Government through the Office of Road Safety, on behalf of the Road Safety Council, which resulted in a formal Funding Deed. The agreement between Curtin and MUARC is formally described in a Collaboration Agreement for Establishment and Operation. These two documents include prescriptive requirements, which C-MARC will meet. C-MARC will also meet other Curtin University objectives as well as policy and procedural requirements.

C-MARC operates under the oversight of the C-MARC Board, which provides direction and active participation in achieving the Centre's objectives. The Board met on four occasions in the 12 months to July 2014. C-MARC is managed in collaboration with the Office of Road Safety, through the Funding Agreement Facilitation Committee (FAFC), which met four times in the 12 months to July 2014.

The vision for C-MARC, endorsed by the Board, is:
To be a Centre of excellence in accident research and research translation that reduces accidents and injuries (especially in relation to road safety), and advocates for accident prevention in government, industry and the wider community.

C-MARC aims to:

- Contribute information to reduce road and other accident and injury trauma;
- Be recognised as a research Centre of excellence in improving safety;
- Meet the requirements of the Road Safety Council, Office of Road Safety and further clients and stakeholders; and
- Provide a valuable contribution to Monash and Curtin Universities.

The Board recognises the two major challenges for the Centre are:

- The delivery of research which is valued by stakeholders; and
- The Centre's sustainability.

C-MARC operates in a University environment, on a business model, where the business is research. C-MARC's research is valuable to government, industry and the public in WA and to the academic community.

Due to the diversity of perspectives and skills required for safety research, C-MARC collaborates with others in the Faculty of Health Sciences, other faculties and other individuals and organisations.

C-MARC actively promotes its research outcomes for practical application in government, industry and the general community. C-MARC is a proactive public voice in promoting safety and reducing the consequences of accidents. This exposure contributes to the purpose of improving road safety and results in a recognisable brand representing value and legitimacy.

C-MARC is funded through commercial research (fee for service) and academic research (research and other grants). C-MARC's client base commenced with the Office of Road Safety and government transport agencies and is intended to extend to other government agencies and the private sector, including mining and general industry.
The Funding Deed specifies various specific requirements of C-MARC to the RSC. The Funding Agreement Facilitation Committee (FAFC) provides the primary contract liaison between C-MARC and the Office of Road Safety on behalf of the Road Safety Council.

2.3 Centre Staff
At the current time C-MARC staff is comprised of:

- Professor Lynn Meuleners, Director, full time;
- Dr Jennifer Oxley (MUARC), Deputy Director;
- Mr. Peter Palamara, Research Fellow, full time;
- Dr Min Zhang, Main Roads Research Fellow, full time;
- Mr. Matthew Govorko, Research Associate, casual;
- Ms. Michelle Fraser, Research Associate, casual;
- Ms. Patricia Barrett, Research Associate, casual; and
- Ms. Seraina Agramunt, Research Associate, casual.

The full range of MUARC staff are available to C-MARC and several have worked on, or are presently working on C-MARC projects. They include:

- Professor Mark Stevenson
- Professor Max Cameron
- Professor Michael Lenne
- Associate Professor Stuart Newstead
- Associate Professor Judith Charlton
- Dr Michael Fitzharris
- Dr David Logan
- Ms Nimmi Candappa
- Ms Belinda Clark

C-MARC now has access to many other researchers who are interested in collaborating, or have collaborated on safety research projects. These include:

- Delia Hendrie, Senior Research Fellow, School of Public Health and Centre for Population Health, Curtin University;
- Dr Paul Roberts, ARRB;
• Professor Sharon Biermann, Director of PATREC, University of Western Australia;
• Professor Mark Young, Senior Research Fellow, Brunel University, London, England;
• Dr Jonathon Ng, Ophthalmologist, Royal Perth Hospital, Western Australia;
• Associate Professor Nigel Morlet, Ophthalmologist, Royal Perth Hospital, Western Australia;
• Professor Bill Morgan, Head of Ophthalmology, Royal Perth Hospital, Western Australia;
• Professor David Hillman, Western Australian Sleep Disorders Research Institute;
• Professor Max Bulsara, Chair of Biostatistics, Notre Dame University;
• Professor Rebecca Ivers, Director of the Injury Division, The George Institute for Global Health, The University of Sydney, New South Wales;
• Professor Tanya Chikritzhs, National Drug Research Institute, Curtin University;
• Professor Xiangyu Wang, Acting Woodside Chair Professor in LNG Construction & Co-Director, Australasian Joint Research Centre for Building Information Modelling (BIM), School of Built Environment, Curtin University.
• Associate Professor Robert Anderson, Centre for Automobile Safety Research, The University of Adelaide.
• Dr Janiz Janz, Senior Lecturer, Health, Safety and Environment, School of Public Health, Curtin University

Staff are also available to collaborate in other schools and Centres including:
• the Faculty of Health Sciences;
• the Curtin School of Business;
• the National Drug Research Institute;
• the Centre for International Health;
• the Centre for Population Health Research;
• the Department of Spatial Sciences; and
• the School of Urban and Regional Planning.
3. **2013/14 IN SUMMARY**

C-MARC's development in 2013-14 continued with:

- The 2013/14 RSC research program;
- Projects for other stakeholders;
- Developing local capacity;
- Building profile; and
- Advocating road safety to stakeholders, government generally, business and beyond.

The following baseline research projects were completed during the previous 12 months:

- 09-009RSC – Modelling the improvements in vehicle safety
- 10-014RSC – An investigation of urban area run-off road crashes in Western Australia, 2005-2009
- 11-020RSC – Safe roads and roadsides – Improved curve delineation
- 11-021RSC – Designing safer roads to counter driver errors – rural crashes
- 12-024RSC – Serious injury pedestrian crashes at intersections
- 11-018RSC – Population prevalence of blood alcohol content in drivers: Measuring the current extent of drink driving through roadside surveys
- 11-022RSC - Road safety advocacy (ongoing)

The C-MARC Board is confident that the Centre is progressing in the right direction. There are still challenges ahead to achieve the Centre's vision. To achieve it will require strong performance by the Centre itself, support from its institutional partners and further contributions from all RSC agencies.

C-MARC continues to deliver a strong academic portfolio which includes attracting higher degree by research students, success in securing competitive research grants and publishing of peer reviewed papers in high impact journals.
C-MARC continues to improve the visibility of road safety as a community issue, assist in improving road safety policy and practice, and build C-MARC's significance. In this regard, C-MARC has successfully engaged with governments to change policy, which results in improvements to road safety.

C-MARC looks forward to a continuing, expanding and increasingly productive and valuable relationship with the Road Safety Council.
4. CENTRE RESEARCH ACTIVITIES

4.1 2009/10 Road Safety Council Baseline Projects

The following table summarises the progress of research projects for the 2009/10 Road Safety Council Research Program.

<table>
<thead>
<tr>
<th>09-009RSC - Modelling the road trauma effects of potential vehicle safety improvements in the Western Australian light passenger vehicle fleet</th>
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<tbody>
<tr>
<td><strong>Status:</strong> Completed</td>
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<tr>
<td><strong>Outcomes:</strong> The project profiled 2006-2009 crash data and 2006-2012 registrations for West Australian passenger vehicles by fleet type: metropolitan corporate, rural corporate, government and private. It also projects crashes and occupant injuries by road user, for the 2012 registered new vehicles over 22 years as a baseline for evaluating different fleet purchasing scenarios. The WA corporate and government fleet was found to have an over representation of aggressive vehicle market groups and to be growing in proportion of all registrations. The safety implications for both for the fleet drivers and the general public on transfer to private ownership were addressed by evaluating alternative vehicle purchasing scenarios. The best outcome in terms of reductions in the societal cost of crashes and occupant injuries was found with the scenario which mandated 100% fitment of forward collision and autonomous emergency braking systems operating at all speeds to fleet vehicles. This scenario produced societal savings of $117 million and prevented serious and fatal injuries to over 200 road users. The best outcomes that came within fleet buyer break-even costs were vehicle substitution scenarios. Purchasing of large vehicles instead of medium and large SUVs in metropolitan areas and medium SUVs instead of large SUVs in rural areas, not only was estimated to save society $17 million in crash related costs but also was estimated to be purchased for less than corporate and government fleets under current purchasing practices.</td>
</tr>
<tr>
<td><strong>Research and Policy Implications:</strong> The results of this project help establish priorities for selecting crash avoidance technologies such as forward collision warning and autonomous braking. They also underscore the need to reduce the aggressivity of the urban commercial fleet. The project also demonstrates the potential benefit of the wider promotion and use of ANCAP and Used Car Safety Rating information.</td>
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</table>

4.2 2010/11 Road Safety Council Baseline Projects

The following table summarises the progress of research projects for the Road Safety Research Program for 2010/11.

<table>
<thead>
<tr>
<th>10-012RSC - Economic factors and road safety</th>
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<tr>
<td><strong>Statement of Problem:</strong> The association between movements in the economy and road crashes is well established. This project investigates this association in a Western Australian context.</td>
</tr>
<tr>
<td><strong>Purpose:</strong> To quantify and explain the association between the Western Australian economy (individual economic factors) and serious casualty crash levels.</td>
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</tbody>
</table>
Progress: A draft final report on the Stage 1 analysis was circulated to PAG members in June, 2013. Feedback from the PAG members was obtained and integrated into the report. Results of the study were presented to the Road Safety Council at its October 2013 meeting. The RSC were happy with the study and endorsed the report recommendations. One additional analysis was requested by the Executive Director of the Office of Road Safety to include in the report, being an analysis of the effect of the economy on road trauma in metropolitan Perth and the rest of WA separately. The results have being integrated into the final report which was submitted to the ORS and Project Advisory Group for review September 2014.

10-014RSC - An investigation of urban area run-off road crashes in Western Australia, 2005-2009

Status: Completed

Outcomes: Part One of the study failed to identify new, innovative barrier technologies that were specifically suited to the built urban environment. Part Two, which involved the analysis of n=12,843 run off road crashes in metropolitan Perth 2005-2009, showed there was a need for a broader application of barriers in the built environment. Around 95% of crashes involved the collision with a roadside object with only 5% impacting a roadside barrier. A number of recommendations based on the Safe System were provided, including the need to identify and monitor blackspots in urban areas for run off road crashes, and the most appropriate engineering and road countermeasures to reduce the likelihood of vehicles leaving the road environment, rolling over, and/or colliding with non-frangible objects that increase the risk of injury. The final report was submitted to the WA Office of Road 23rd December 2013 and tabled with the Road Safety Council in the first quarter of 2014.

Research and Policy Implications: Future research using GIS technologies should ‘map’ urban area hot-spots for run off road crashes to inform local government and other agencies of locations in need of treatment using best-practice and location appropriate measures. This reporting could be conducted on an annual basis. Research should also keep a watching brief for the development of roadside barriers best suited to the built urban area environment. Further to this, the location of and type of barriers across the urban road network should be subject to an ongoing assessment against current standards, best practice, and environmental suitability.

4.3 2011/12 Road Safety Council Baseline Projects

The following table summarises the progress of research projects for the Road Safety Research Program for 2011/12.

11-018RSC - Population prevalence of blood alcohol content in drivers: Measuring the current extent of drink driving through roadside surveys

Status: Completed

Outcomes: Over a six-week period in April-May 2012, C-MARC survey teams attended 36 WA Police Random Breath Testing bus sites on Thursday, Friday and Saturday nights to replicate the BAC surveys conducted back in 1999 (Ryan, 2000) and 2000 (Kirov, 2001). A...
A total of 8,435 drivers and riders were tested over the six week survey period. The findings showed a reduction in the proportion of drivers/riders detected with both positive (but legal) as well as illegal BAC levels (≥0.05 g/100ml or 0.02g/100ml for learner, provision drivers), compared with drivers/riders in the 1999 and 2000 surveys. Around 1.4% returned an illegal BAC level, which was significantly lower than that reported in 2000 (1.9%) and 1999 (1.9%). The ‘back calculation’ procedure used by WA Police resulted in 26 drivers not receiving a drink driving charge and a further 65 drivers receiving a reduced charge ranging from one to four BAC charge levels lower. It was recommended that regular RBT enforcement schedules should be extended into the early hours of the morning to reflect the evolving changes in socialising and alcohol consumption patterns and that the back calculation policy be reviewed. The final report was submitted to the WA Office of Road Safety in February 2014 and tabled with the Road Safety Council in the second quarter of 2014.

Research and Policy Implications: The survey should be repeated every three years to monitor late night driver/riders BAC levels. Western Australia should discontinue the practice of back calculation to be consistent with other Australian jurisdictions and to strengthen police enforcement of drink-driving.

11-019RSC - Estimating road safety outcomes based on economic factors

Status: Project was withdrawn. Please see comments regarding Report 10-012RSC.

11-020RSC - Safe roads and roadsides: Improved curve delineation

Status: Completed

Outcomes: The study reviewed a range of curve delineation treatments, including low cost effective basic treatments such as pavement markings, post-mounted delineators and Chevron Alignment Markers. Other more advanced treatments, which are higher in cost, were also reviewed. The review noted that the effect of delineation treatments on the reduction in crashes on curves can be as high as 47% for a combination of basic and enhanced delineation treatments. The analysis of crashes on midblock curves in Western Australia 2007-2011 highlighted the involvement of higher speed zones, alcohol and younger, less experienced drivers. The investigation concluded with the development of a proposed trial of an enhanced Chevron Alignment Marker known as Chevroflex. It was recommended that this treatment be trialled at a number of Main Roads WA identified high frequency, horizontal midblock curve crash sites in the South West and Wheatbelt North areas. The final report was submitted to the WA Office of Road Safety in March 2014 and tabled with the Road Safety Council in the second quarter of 2014.

Research and Policy Implications: Future research using GIS techniques should be used to investigate and ‘map’ the latest crash data for run off road crashes on curves to identify ‘hot spots’. This work should be undertaken as an alliance between MRWA and local government. The identified sites should be audited to determine the appropriateness and standards of existing delineation measures and where enhancement is required. The recommended trial of Chevroflex is being considered by MRWA.

11-021RSC - Designing safer roads to counter driver errors - rural crashes

Status: Completed
Outcomes: The incidence of serious casualty run-off-road crashes in rural Western Australia is significant. Driver behaviour including inadvertent error and deliberate unsafe behaviour compound this issue. Many countermeasures were identified in the literature to address driver error in WA along remote and regional areas. These ranged from perceptual countermeasures such as transverse lines and wide centreline marking to physical measures such as rumble strips and increased lighting. A taxonomy was developed to link the areas of concern with respect to road design and driver error, with available countermeasures.

Research and Policy Implications: The means of utilising the taxonomy is documented in the report. Essentially, once the area of concern is identified (speed, impairment etc), the driver error can be selected, leading to the identification of the road design inadequacy. This then leads to several countermeasures that can be implemented or trialled. The taxonomy provides a systematic approach to the consideration of a particular road safety problem and solution.

4.4 2012/13 Road Safety Council Baseline Projects

The following table summarises the progress of research projects for the Road Safety Research Program for 2012/13.

12-023RSC – An investigation of illicit drug related fatal crashes, traffic offences and drivers in Western Australia

Statement of problem: Nearly one in five Australians who use illicit drugs report having driven in the previous 12 months whilst drug affected. This represents an important road safety issue as the use of illicit drugs such as marijuana and amphetamines whilst driving is known to be associated with an increased risk of crashing, particularly fatal crashes. In Western Australia however, there is minimal contemporary information on the prevalence and characteristics of illicit drug related crashes and traffic offences and involved drivers to inform drug-driving countermeasures.

Purpose: The purpose of this project is to provide relevant stakeholders with an understanding of the prevalence and characteristics of illicit drug related fatal crashes and traffic offences and drug-drivers to support the development of educational, licensing and enforcement countermeasures to better manage illicit drug related driving.

Outcomes: The first draft report was submitted on the 2nd July 2014 to the ORS and Project Advisory Group for review. A meeting was held 3rd September with ORS and Project Advisory Group to discuss recommendations and finalize the report. The finding of the report relate to two areas of illicit drug related driving: drivers and motorcycle riders fatally injured during the period 2000-2012, and, drivers and motorcycle riders committing a Section 64AC offence (illicit drugs in oral fluids) during the period 2008-2012. For fatally injured drivers, 22.7% of fatally injured drivers tested positive to one or more illicit substances, predominantly THC and methylamphetamine. The illicit drug fatality rate (per 100,000 licensed drivers/riders) was found not to have significantly declined over the period. Significantly higher adjusted odds of testing positive for an illicit drug was noted for males, those aged under 40 years of age, drivers with a BAC in the range of 0.05gm%–0.149gm% and those testing positive for Benzodiazepines and Benzodiazepines in conjunction with Opioid substances. In relation to Section 64AC offences, around six in ten offences related to the detection of methylamphetamine alone and two in ten for the detection of methylamphetamine combined with THC. Males, younger age drivers/riders, and year of
offence were found to be significantly related to the increased odds of testing positive to multiple substances. The majority of Section 64AC offenders were noted to be male, younger in age, and detected in the South-East Metropolitan Perth area. These findings have not been adjusted for the amount of drug testing undertaken during the study period. Final report to be submitted week beginning September 22, 2014.

**Research and Policy Implications:** Research and policy implications were finalized at the Project Advisory Group meeting. The areas for consideration include: the linkage of driver licensing and crash data to improve the profiling of fatally injured illicit drug affected drivers/riders; data sharing to facilitate better surveillance and reporting; roadside testing policies and practices to monitor the relationship between illicit drugs and alcohol.

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**12-024RSC – Serious injury pedestrian crashes at intersections**

**Status:** Completed.

**Outcomes:** Two percent (n=88) of the n=4,326 crashes occurring at traffic intersections in the Perth Central Business District 2008-2012 involved 93 pedestrians. Around 85% occurred at signalised intersections. The vast majority of the intersections were equipped with *Walk-Don’t Walk* signals; six in ten were equipped with a ‘head start’ phasing, while around half were Exclusive walk intersections. Pedestrians were equally as likely to be struck at Exclusive walk and Parallel walk intersections. Across both intersection signal types, pedestrians were most commonly struck to the near and far side by vehicles that were proceeding straight ahead through the intersection and not turning across the path of the pedestrian. There is reason to believe that pedestrians, more so than drivers, were in breach of their controlling signals. A number of recommendations were provided, including that MRWA undertake an observational study of pedestrian crossing behaviour and consider a trial of countdown timers which display the time left to cross. The final report was submitted to the WA Office of Road Safety in December 2013 and the report tabled with the Road Safety Council in the first quarter of 2014.

**Research and Policy Implications:** Signalised intersections that have been converted from Exclusive to Parallel walk should continue to be monitored to determine the on-going impact of this change on the risk of pedestrian crashes. Future research should also survey pedestrian crossing behaviour to determine the type and frequency of behaviours that increase their risk of being struck by vehicles. The proposed trial of countdown timers to facilitate safe crossing behaviour has been approved by MRWA.

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**12-025RSC – Speed camera program evaluation**

**Purpose:** The project aims to develop and apply a comprehensive evaluation framework for the WA speed enforcement strategy. The framework will consist of both process and outcome evaluation components in order to assess the effectiveness in implementing the strategy according to the best practice guidelines as well as quantify what the program has contributed to reducing road trauma in Western Australia.

The project will be undertaken in 3 stages. **Stage 1** will develop a speed enforcement evaluation framework for WA, covering both process and outcome evaluation considering both automated and non-automated enforcement modes.
**Stage 2** will apply the framework to those elements of the speed enforcement strategy that have been implemented to the end of 2012.

**Stage 3** will apply the framework to those elements of the speed enforcement strategy that were not able to be considered in Stage 2.

**Status:** Work on Stage 1 of this project is continuing. Previous activity has reviewed the strategy elements to determining the data requirements to support the evaluation framework. A PAG meeting for the project was held on November 1st. The PAG strongly supported the objectives and scope of the project. Data requirements from the key agencies required to facilitate the project were reviewed at the PAG meeting. A suitable analyst to extract the required data from Police was identified and engaged and work was conducted over March to May to extract data on locations and operation dates for all types of traffic cameras used in W.A. Work is now underway enhancing the detail of this data including populating some missing location co-ordinate data via the use of location descriptions provided. A strategy for mapping this data and having it spatially linked to the crash data for analysis is being investigated using either Curtin resources or co-operation from Main Roads W.A.

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**12-026RSC – Road safety advocacy**

**Purpose:** The purpose of this activity is to promote accurate road safety knowledge and safe practices to the public and to decision makers through a range of media and other avenues, including conference attendances. Advocacy activity continues to raise road safety as community and government issues, transfers knowledge to road safety partners, and increases C-MARC's profile and credibility.

**Status:** C-MARC staff continue to be asked for media comment and offer information, which has recently included electronic, print and internet outlets. Several discussions with newspaper journalists have not resulted in stories.

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**4.5 2013/14 Road Safety Council Baseline Projects**

The following table summarises the progress of research projects for the Road Safety Research Program for 2013/14.

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**13-027 RSC – Evaluation of the West Australian Graduated Driver Training and Licensing program**

**Statement of problem:** There is good evidence internationally and elsewhere in Australia to show that GDTL programs in their various forms can effectively counter crashes and injury among novices. Western Australia’s version of GDTL has been progressively introduced over the last 10 years, with the most major reforms occurring in 2002. During this time there has been a limited evaluation of the implementation of the earliest version of the program and but no research addressing the important outcomes of crash involvement and injury.

**Purpose:** The primary aim of the proposed research is to systematically investigate the effect of the GDTL program 2002 onward in its various permutations on the incidence of
crashes and injuries among novice drivers. The evaluation will be undertaken over the 2013/2014 and 2014/2015 annual programs of research. Planning and design for the project is currently underway. The WA Department of Transport (Licensing Services), WA Police, Main Roads Western Australia, and the WA Health Department have been identified as key agencies for the supply of data for this project. The project will draw on the experiences and learnings of MUARC’s recent evaluation of the Queensland graduated licensing program. Ethics approval has been granted by Curtin University and data requests lodged with Department of Transport (Licensing).

**Status:** Difficulties with MRWA crash data in relation to the identification of drivers for linkage purposes were identified. The Data Linkage Branch is liaising with the Insurance Commission of WA (who provides primary crash data to MRWA) to update post-2010 crash data with identifying driver information. It is expected that this will be finalised by the end of August 2014. In the meantime a submission for linked data has been drafted and lodged with the Data Linkage Branch. Comments have been received and re-drafting is in progress and will be finalised once the Department of Transport (Licensing) provides final assurances regarding the type and quality of data required for the evaluation. It is unlikely that linked Licensing, Crash and Health data will be provided prior to December 2014.

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**13-028RSC - An in-depth analysis of motor vehicle driver traffic offense and demerit loss data**

This project has been put on hold till the appropriate data becomes available.
4.6 Injury Prevention Research

The following table summarises other injury prevention projects being undertaken by Professor Lynn Meuleners.

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Understanding the impact of cataract vision impairment on risk of falls

CIs: Dr Lisa Keay, Professor Lynn Meuleners, Dr Jonathon Ng, Dr Nigel Morlet, Professor Peter McCluskey

_Funded by an NHMRC grant for three years - $780,000_

**Aim:** A prospective, 24-month cohort study is planned involving over 700 patients aged 70 years or older with bilateral cataract presenting for surgery at public hospital eye clinics in Sydney, Melbourne, Perth and Adelaide.

**Status:** Data recruitment has commenced. WA has recruited 45 participants to date. There has been on-going discussion with Royal Perth Hospital re recruiting. An ophthalmology resident is recruiting RPH patients with cataract.

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Dementia and hospitalisations due to an injury: A population based study

CI: Professor Lynn Meuleners

_Funded by Alzheimer’s Australia for one year - $20,000_

**Aim:** A retrospective, population-based cohort study will be undertaken using data from the Hospital Morbidity Data System (HMDS), the Trauma Registry and the Western Australian Mortality Database from 2001 to 2011. The WADLS will be used to compare injury related outcomes as well as crash risk for people with and without a diagnosis of dementia, aged 65+.

**Status:** Data received from the WA data Linkage Unit. Data analysis has started.

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Neurocognitive predictors of risky driving in young people

CIs: Professor Julie Stout, Professor Mark Stevenson, Professor Lynn Meuleners

_Funded by the Neurotrauma Research Fund for two years- $196,000_

**Aim:** This study will be the first examination of developmentally-relevant measures of cognition in conjunction with both self-reported and naturalistic driving behaviour in young novice drivers. Identification of cognitive characteristics in young drivers that predict driving risk behaviour will contribute essential evidence to inform prevention strategies to improve road safety in young people at highest crash risk.

**Status:** A total of 290 young drivers have completed Phase One of the study (online survey). High and low risk drivers have been identified from this sample and recruited for Phase Two of the study (in-vehicle monitoring and travel diary). Fifteen low risk drivers and 15 high risk drivers have now completed Phase 2.
Data analysis is close to completion. The final report will be submitted to Neurotrauma Research Program by November 2014.

Motor control and driving ability – quantifying the utility of motor control screening protocols for older drivers

CIs: Professor Garry Allison, Professor Lynn Meuleners, Ms Delia Hendrie

*Funded by the Neurotrauma Research Fund for one year - $50,000*

**Aim:** The main objective of this project is to document if lower limb motor control and mobility function impact on driving performance in an older population with varying levels of mobility. This is a collaborative project with Curtin’s School of Physiotherapy. A qualified driving assessor will be performing the on-road assessments.

**Status:** Data recruitment has been completed and data analysis has started.

Safer cycling and the urban road environment

CIs: Professor Mark Stevenson, Dr Marilyn Johnson, Dr Jennie Oxley, Professor Lynn Meuleners, A/Prof Belinda Gabbe, Prof Geoffrey Rose, Prof Jennifer Dill, Dr Roderick Katz, Mr David Moyses, Mrs Juliet Bartels, Mr Michael Nieuwesteeg, Mr Peter Bourke

*Funded by an ARC Linkage grant over three year - $1,200,000*

**Aim:** The aim of the project is to improve the safety of cyclists through identifying enhanced urban road design and evaluating new designs in Australia’s first cycling simulator.

**Status:** The project commenced July 2013. Ethics approval has been granted by Curtin University and Royal Perth Hospital. Applications for site approvals have been submitted to Sir Charles Gairdner and Fremantle Hospitals. A nurse from RPH commenced case recruitment in July 2014. A PhD student has also been identified.

Driving performance and self-regulation among older drivers with bilateral cataract: a prospective cohort study

CIs: Professor Lynn Meuleners, Dr Lisa Keay, Dr Mark Young, Dr Jonathon Ng, Dr Nigel Morlet, Professor Peter McCluskey

*Funded by an ARC Discovery grant over three years - $376,000*

**Aim:** This prospective study will use naturalistic in-vehicle driver monitoring devices and a state-of-the-art driving simulator to examine the association between clinical measures of vision, refractive management, driving patterns, self-regulation and driver performance for bilateral cataract patients before first eye surgery, between surgeries and after second eye surgery.
**Status:** Ethics approval to conduct the study has been received from Curtin University and Royal Perth Hospital. Applications for site approvals have been submitted to Sir Charles Gairdner and Fremantle Hospitals. Simulator programming is now complete and in-vehicle monitoring devices have been ordered. A PhD student has started on the project.
4.7 Main Roads WA Research Fellowship Program

The following projects are part of the Main Roads research fellowship. The new Fellow commenced January 20, 2014.

The effectiveness and cost-effectiveness of the Black Spot Program in Western Australia, 2007/08, 2009/10, 2010/11

Purpose: To evaluate the effectiveness of projects treated under the State Black Spot Program in terms of the net reduction in crash frequency and crash costs at treated sites in WA. The evaluation also examined the effectiveness of the program by treatment category at both broad and specific levels of categorisation.

Methods: A quasi-experimental “before” and “after” comparison will be adopted in casualty crash and all reported crash frequencies (include fatalities, hospitalisation and PDO crashes) at sites treated under the State Black Spot Program. The analysis also included the estimation of the net economic worth of the Program.

Status: Ongoing. The draft reports of the 2007-2008 and 2009-2010 evaluations have been completed and are waiting for the economic evaluations. Required data of Black Spot Projects completed in 2010-2011 have been requested from Main Roads. A four year approval of the Black Spot Program evaluation has been obtained from Curtin University Human Research Ethics Committee.

The epidemiology of heavy vehicle crashes in Western Australia: 2001-2013

Purpose: To describe the magnitude of the problem; identify trends; characteristics of the population at risk, as well as vehicular type, temporal, and environmental factors related to an articulated heavy vehicle crash.

Methods: A retrospective study design will be undertaken using crash records from 2001 to 2013. The analysis will be stratified by metropolitan, rural and remote areas of Western Australia as well as by truck type.

Status: Ongoing. GIS and crash datasets of the project have been requested from Main Roads. GIS training and regular meetings are ongoing.
4.8 Grant Submissions for Funding in 2013/14

ARC Discovery Grant, Driving performance and self-regulation among older drivers with bilateral cataract: A prospective cohort study – Successful
Funding requested $376,000 over three years
CIs: Professor Lynn Meuleners, Dr Lisa Keay, Dr Mark Young, Dr Jonathon Ng, Dr Nigel Morlet, Professor Peter McCluskey

ARC Linkage Grant, Safer cycling and the urban road environment – Successful
Funding requested $1,200,000 over three years
CIs: Professor Mark Stevenson, Dr Marilyn Johnson, Dr Jennie Oxley, Professor Lynn Meuleners, A/Prof Belinda Gabbe, Prof Geoffrey Rose, Prof Jennifer Dill, Dr Roderick Katz, Mr David Moyses, Mrs Juliet Bartels, Mr Michael Nieuwesteeg, Mr Michael Nieuwesteeg

Department of Health Tender, Falls prevention in older adults with vision impairment – Unsuccessful
Funding requested $528,000 over three years
CIs: Professor Lynn Meuleners, Dr Jonathon Ng, Dr Nigel Morlet, Ms. Delia Hendrie

NHMRC partnership grant, Land use, transport and population health: integrated modelling to inform strategic health policy – awaiting decision
Funding requested $1,800,000 over three years
CIs: Professor Mark Stevenson, Professor Majid Sarvi, Professor Rodney McClure, Professor Peter Newman, Professor Lynn Meuleners, Associate Professor Stuart Newstead, Professor Mark Wallace, Associate Professor Michael Fitzharris

Austroads Proposal SS1957: Distraction and Attitudes towards Safe Pedestrian Behaviour - Unsuccessful
Funding requested $100,000
CIs: Dr Jennie Oxley, Professor Mike Lenne, Dr Kirstie Young, Professor Lynn Meuleners, Associate Professor Nicola Starkey, Associate Professor Samuel Charlton

Canadian Institute of Health Research, The Crash Causation and Outcome Study; A multicentre study of risk factors for and consequences of minor road traffic crashes. - Unsuccessful
Funding requested: $1,200,000 over five years
CIs: Dr Jeff Brubacher, Dr Brasher, Dr Brussoni, Dr Chan, Dr Desapriya, Dr Lund, Professor Meuleners
5. **FINANCIAL REPORT**

The Statement of Income and Expenditure for the year ended 30 June 2014 is attached. This period covers the operation of the road safety activities of the Centre from July 2013 to June 2014 inclusive.

The Statement covers the RSC base contract funding costs within the Centre:

- Balance Carried Forward: XXXX
- Total Revenue: XXXX
- Total Expenditure: XXXX
- Net Operating Result: XXXX
- Balance of Funds: XXXX

As per the Funding Deed, the annual audited financial report has been completed based on the part of the centre's finances, which apply to the Road Safety Council funding and research activity.
6. OTHER CENTRE ACTIVITIES

Consistent with research, C-MARC is involved in many complementary activities to build the sustainability of the Centre.

6.1 C-MARC Profile, Media and Advocacy

Considerable effort has been spent on increasing the awareness of C-MARC through dialogue with more than 200 key stakeholders, clients, potential associates and interested professionals.

C-MARC has been active in a variety of activities to increase its profile to the road safety community including:

- Meeting with MUARC staff to develop possible research projects;
- Meeting with representatives of agencies involved in the Road Safety Council;
- Three C-MARC sponsored seminars from local and international road safety researchers, with numerous participants mostly road safety practitioners;
- Participation in other professional and public events;
- Production of three C-MARC newsletters; and
- Contributions to Curtin and other newsletters.

C-MARC has been actively engaging with the media, both proactively and reactively. This engagement provides research information and influences policy to the public, the road safety industry, policy makers and elected representatives. Media activity advocating road safety topics, responses to public issues and safety improvements have included:

- Nine radio interviews on road safety issues;
- Approximately 27 public print and on-line news articles; and
- Numerous reports in national professional journals, publication of peer–reviewed journals, Curtin newsletters and other publications.

The C-MARC website has been continually updated throughout the year and contains a variety of current information for the public, researchers and practitioners.
6.2 Research Students

The following research is being undertaken by students under C-MARC supervision.

Miss Michelle Hobday. **The effect of alcohol outlets and sales on alcohol related injuries presenting at emergency departments in Perth, Australia from 2004 to 2009**
PhD (commenced 2011) Curtin University  
**Supervised by:** Professor Lynn Meuleners, Associate Professor Tanya Chikritzhs and Dr Wenbin Liang.  
**Status:** Final thesis submitted April 2014.

Mr Kien To. **Impact of bilateral cataract surgery on quality of life, depression, falls and other injury: A prospective study in Vietnam**
PhD (commenced 2011) Curtin University  
**Supervised by:** Professor Lynn Meuleners, Professor Andy Lee, Dr Dat van Duong  
**Status:** Final thesis submitted July 2014.

Ms Michelle Fraser. **Safer cycling and the urban road environment**  
PhD (commencing 2014) Curtin University  
**Supervised by:** Professor Lynn Meuleners, Professor Mark Stevenson, Dr Kyle Chow  
**Status:** Application accepted, soon to enrol.

Ms Seraina Agramunt. **Driving performance and self-regulation among older drivers with bilateral cataract: a prospective cohort study**  
PhD (commenced 2014) Curtin University  
**Supervised by:** Professor Lynn Meuleners, Dr Kyle Chow, Dr Jonathon Ng  
**Status:** In progress

Dr Rogers Nditanchou. **Population based estimation of traffic injuries in Yaounde, Cameroon using the capture-recapture method**  
Master of Public Health (commenced second semester 2014) Curtin University  
**Supervised by:** Dr Janis Janz; Mr Peter Palamara  
**Status:** In progress
6.3 Publications

The following papers were published in scholarly-refereed journals 2013/14.


To KG, Meuleners L, Fraser M, Do DV, Duong DV, Huynh V, To QG, Phi TD, Tran HH, Nguyen ND. The Impact of Cataract Surgery on Vision-Related Quality of Life for Bilateral Cataract Patients in Ho Chi Minh City, Vietnam: A Prospective Study. *Health and Quality of Life Outcomes* 2014, 12(1): 16.


To KG, Meuleners L, Fraser M, Duong DV, Do DV, Huynh V, Phi TD, Tran HH, Nguyen ND. The Impact of Cataract Surgery on Depressive Symptoms for


Submitted and under review


6.4 Presentations

Meuleners L. **Validating driving behaviours using a driving simulator.** 4th International Conference of Road Safety and Simulation, Rome, October 2013 – Presented an oral paper

Palamara P., Chen HY, Meuleners L. **Preliminary findings of removing filter movements from signalised intersections in WA.** Road Safety Research, Policing and Education Conference, Brisbane, August 2013 – Presented an oral paper

Palamara P. **Predictors of alcohol impairment among crash involved drivers and motorcycle riders in Western Australia.** Paper accepted for presentation to the International Council on Alcohol, Drugs and Traffic Safety Conference, Brisbane, August 2013 – Presented an oral paper

Meuleners L. Ng J, Morlet N, Fraser M. **The impact of first and second eye cataract surgery on injurious falls that require hospitalisation: a whole population study.** International Health Data Linkage Conference in Vancouver, Canada April 28, 29, 30 – Accepted as a rapid fire oral presentation.

Meuleners L, To K, Fraser M. **A longitudinal study of the impact of first and second eye cataract surgery on falls in Vietnam.** The Association for Research in Vision and Ophthalmology (AVRO) Conference, Orlando Florida, May 4, 5, 6 - Accepted as an oral paper.

Palamara, P. **An investigation of car versus pedestrian crashes at signalized intersections in the Perth Central Business District: Who’s running the gauntlet?** 2014 Road Safety Research, Policing and Education Conference, November 12th-14th, Melbourne. Accepted as oral presentation


Palamara, P. Clark, B. **Prevalence and characteristics of late night drink-driving in Perth, Western Australia.** Submitted to the 7th Australasian Drug and Alcohol Strategy Conference, Brisbane, March 2015.
6.5 Staff Development

Staff attended the following conferences, in most cases either presenting papers or chairing sessions, with hundreds of participants:

- Data Linkage Conference, St. Andrew’s, Scotland
- Road Safety Conference, Queensland, Australia
- International Council on Alcohol, Drugs and Traffic Safety Conference, Brisbane, Queensland, Australia
- International Health Data Linkage Conference, Vancouver, Canada
- The Association for Research in Vision and Ophthalmology (AVRO) Conference, Orlando, Florida, United States

6.6 Professional Participation

Staff at C-MARC are members of various professional organisations including the Australasian College of Road Safety (ACRS) and the Australian Injury Prevention Network. Professor Lynn Meuleners and Mr Peter Palamara are members of the executive of the WA chapter of the Australasian College of Road Safety.

Professor Lynn Meuleners has been attending meetings of the Heavy Vehicle Working Group which is headed by Pascal Felix, the Director of Heavy Vehicle Operations, Main Roads WA.

Professor Lynn Meuleners and Mr Peter Palamara were asked by ARRB to be part of the group tendering for the Main Roads service contract which was successful.

Professor Lynn Meuleners and Dr Paul Roberts from ARRB have been asked by Professor Laurence Hartley from Murdoch University to co-ordinate and organise the highly prestigious Fatigue Conference which will be held in Fremantle, March 2015 as Professor Hartley is retiring.

C-MARC staff involvement increases awareness of the Centre, fosters collaboration and enhances knowledge of C-MARC staff and other professionals. Such dialogue also informs staff about safety issues and facilitates the translation of research into practice.