Annual Report to Road Safety Council

2012-13

C-MARC

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Title
C-MARC Annual Report 2012/13

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Abstract
This report describes the fourth annual report to the Road Safety Council of the Curtin - Monash Accident Research Centre (C-MARC) for the 12 month period up to July 2013. The report covers the research and management activities of the Centre, and outcomes.

Keywords
Road safety; Research

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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FOREWORD

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

The Centre is now in its fifth 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 continues to work closely with the Office of Road Safety (on behalf of the Road Safety Council) in establishing its annual research agenda and has reached agreement on a fifth tranche of projects for 2013-14. 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 it works towards achieving long-term financial and staffing sustainability 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 fourth annual report of the Centre to the RSC, covering the 12 months to July 2013. 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 School of Public Health 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 2013. 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 2013.

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 School of Public Health, 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:

- Associate Professor Lynn Meuleners, Director, full time;
- Dr Jennifer Oxley (MUARC), Deputy Director;
- Peter Palamara, Research Fellow, full time;
- Catarina Antao, Research Associate, casual;
- Michelle Fraser, Research Associate, casual; and
- Michelle Broughton, 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
- Associate Professor Michael Lenne
- Associate Professor Stuart Newstead
- Associate Professor Bruce Corben
- Associate Professor Judith Charlton
- Dr Michael Fitzharris
- Dr David Logan
- 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 Dean Bertolatti, Associate Professor Occupational Health & Safety Environmental Health, Curtin University;
- Dr Janis Jansz, Senior Lecturer Occupational Health & Safety Environmental 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;
- Dr Lisa Keay, Senior Research Fellow, The George Institute for Global Health, The University of Sydney, New South Wales;
- 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, Deputy Director, Centre for Automobile Safety Research, The University of Adelaide.
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. **2012/13 IN SUMMARY**

C-MARC’s development in 2012-13 continued with:
- The 2012/13 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:
- 09-005RSC - Sociocultural understanding of young people
- 10-010RSC - Understanding and documenting the long-term consequences of road trauma
- 10-013RSC - Understanding the high occurrence of serious casualty crashes in Western Australia, by location
- 11-022RSC - Road safety advocacy (ongoing)
- 11-004-MRF - The validity of a driving simulator: Assessment of driving performance among Western Australian drivers
- 11-005-MRF - Factors associated with motorcycle crashes at intersections in Western Australia

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 first Road Safety Council Research Program for 2009/10.

<table>
<thead>
<tr>
<th>Project Code</th>
<th>Research Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>09-005RSC</td>
<td>Sociocultural understanding of young people</td>
</tr>
<tr>
<td>Status:</td>
<td>Completed</td>
</tr>
<tr>
<td>Outcomes:</td>
<td>This research project identified varying levels of evidence of a relationship between risk taking on the road by young people and risk taking in other health related areas. Factors that contribute to these behaviours and programs to minimise them were also identified and reviewed for their potential application.</td>
</tr>
<tr>
<td>Research and Policy Implications:</td>
<td>Recommendations were made for further research using linked data to develop contemporary Western Australian evidence of the relationship between risk taking on and off the road among young road users. The key features of successful countermeasures to reduce general risk taking behaviours were discussed in relation to graduated driver licensing policies and other initiatives to reduce risk taking on the road.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project Code</th>
<th>Research Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>09-009RSC</td>
<td>Modelling the improvements in vehicle safety through uptake of safety features in new cars and strategies to increase penetration throughout the fleet</td>
</tr>
<tr>
<td>Statement of Problem:</td>
<td>The annual cost of road trauma in Australia was recently estimated at approximately $17.3 billion. Road crashes are also the most common cause of work-related fatalities, accounting for around 30% of these deaths in Australia. Given the contribution of safer vehicles to reducing the road toll, substantial road safety advances can be made by directing the purchasing practices of owners of commercial and government fleets towards safer vehicles.</td>
</tr>
<tr>
<td>Purpose:</td>
<td>To measure the benefits of different fleet purchasing strategies based on vehicle safety features, in terms of road trauma savings.</td>
</tr>
<tr>
<td>Progress:</td>
<td>The project full technical report and summary report were completed in June 2013 and presented to a meeting of the PAG. The PAG gave feedback on the project reports which has been incorporated meaning the project is now complete. Overall the PAG were very happy with the project outcomes and fully endorsed the results and reports. Final results from the project were to have been presented to the Road Safety Council at its July meeting but project leader Stuart Newstead was unable to attend the meeting. Final results will be presented to the RSC at the October 2013 meeting.</td>
</tr>
</tbody>
</table>

4.2 2010/11 Road Safety Council Baseline Projects

The following table summarises the RSC Research Program for 2010/11.

<table>
<thead>
<tr>
<th>Project Code</th>
<th>Research Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-010RSC</td>
<td>Understanding and documenting the long-term consequences of road trauma</td>
</tr>
<tr>
<td>Status:</td>
<td>Completed</td>
</tr>
</tbody>
</table>
**Outcomes:** Based on a review of the relevant literature, interviews with stakeholders, and documentation of available sources of data, the research identified and discussed the following as critical to understanding and documenting the long term consequences of road trauma: the different perspectives for costing the long term consequences of road trauma; the most appropriate costing unit(s); the level of injury severity to be considered; the cost components; issues in the measurement in the quality of life; how to ‘value’ fatal injuries, and gaps in information in measuring the long term consequences of injury.

**Research and Policy Implications:** It was recommended that future research should initially focus on the cost components relevant to longer term injury outcomes given the information gap in this area. It was also recommended that further research address more detailed severity levels of the cost and consequences of road injury and the use of qualitative methods to examine the experiences of injured persons and their families. When costing long term consequences of road trauma, it was recommended that both the injured person and the crash should compromise the costing units and that quality of life measures should be converted to monetary values using ‘willingness to pay’.

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**10-012RSC - Economic factors and road safety**

**Statement of Problem:** The association between movements in the economy and road crashes is well established. This project investigates this association in a Western Australian context.

**Purpose:** To quantify and explain the association between the Western Australian economy (individual economic factors) and serious casualty crash levels.

**Progress:** Stage 1 analysis was completed in June 2013 and a draft report prepared. The draft report was reviewed by the PAG and comments received incorporated into the report. There were some queries about the scope of the project which will need to be addressed before Stage 2 work commences in the near future. It is planned to have a further meeting of the PAG to discuss project scope in Stage 2. There are limited project funds left for the Stage 2 analysis meaning project funding will also have to be reviewed at the PAG. Final results from Stage 1 of the project were to have been presented to the Road Safety Council at its July meeting but project leader Stuart Newstead was unable to attend the meeting. Final results will be presented to the RSC in October 2013.

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**10-013RSC - Understanding the high occurrence of serious casualty crashes in Western Australia, by location**

**Status:** Completed

**Outcomes:** Safe Systems factors contributing to the comparatively higher rate of death and serious injury crashes in the regional and remote areas of Western Australia were identified. These included road and road side factors, the involvement of higher speeds, and unsafe road user behaviours such as higher level of alcohol impairment and failure to use seat belts.

**Research and Policy implications:** Further research is required to elucidate the factors that undermine safe road user behaviour. The findings also highlight the importance of the continuation of programs to improve roads and roadsides (e.g., through barriers and curve delineation) in non-urban areas and the consideration of reduced speed limits on roads that lack appropriate infrastructure to limit crashes and injury.

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**10-014RSC - Develop new barriers for urban areas**

**Statement of Problem:** While run-off-road crashes in rural areas have received considerable research and engineering treatment, equivalent crashes in urban areas receive relatively little attention.
Purpose: To assess the frequency and severity of run-off-road crashes in urban areas and to identify possible engineering and other countermeasures.

Status: The report has been submitted (November 2012) to the Office of Road Safety and is awaiting PAG sign off.

### 4.3 2011/12 Road Safety Council Baseline Projects

The following table summarises the RSC 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

**Purpose:** The overall aim of this project is to monitor changes in driver BAC levels over time. This will be undertaken through the replication of two previous roadside surveys conducted by Ryan (2000) during 1999 and later by Kirov (2001) during 2000. The survey data will be collected at Police booze bus RBT sites and where feasible, based on replicating the locations used in these two previous surveys. The ability to collect the corresponding BAC data from satellite vehicles associated with the survey sites will also be explored. Survey data will be analysed to identify changes in driver BAC levels since 1999 and to estimate the prevalence of BAC among drivers in the Perth metropolitan area.

**Status:** The final draft report has been submitted to the PAG (May 2013) and is awaiting PAG sign off.

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

**Statement of Problem:** The effect of changes to macroeconomic factors, such as GDP and employment has been investigated, but has not been applied to forecasting or estimating future changes. Such factors can affect the transport system by changing travel demand or travel patterns and modes, which either may positively or negatively affect travel and therefore road safety.

**Purpose:** This project will build on the 2010/11 project to investigate the relationship between economic factors and road safety to provide estimates of future road safety outcomes based on scenario examples of changes to macroeconomic factors related to road safety. Initial background work on this project has commenced, but further work is awaiting completion of the previous project (10-012RSC).

**Status:** Due to staff changes, this project was renegotiated with the ORS to agree on suitable requirements and completion. It has been agreed Stuart Newstead is taking over project leadership and the project scope was revised and approved by the ORS. Project tasks and timing will be submitted to the PAG for approval on completion of the related preceding project 10-012 RSC detailed earlier. It is envisaged that the budget allocated to this project will cover both its completion as well as fixing the issues identified with project 10-012 RSC. Work on this project will commence in June after the Stage 1 report (project 10-012 RSC) is completed (see the project update for project 10-012 for further details).

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

**Statement of Problem:** Main Roads requires recommendations for decisions for specific countermeasures based on experience elsewhere and investigation of the outcomes in WA. This work will investigate one of these potential countermeasures; improved curve delineation.
**Purpose:** This research addresses several questions including the WA situation for the relevant crash types, the WA context and WA practice, differences from other locations jurisdictions, best practice, likely outcomes from introducing the countermeasure and possible alternatives. This project has commenced and Gary Manning (MRWA) contacted to discuss project scope. Meeting held with MRWA on the 27th March (with Albert Symcox and Abu Shamleh Bassam) to clarify the aims, objectives and activities of the project. Work is progressing: the retrieval of literature on best practice for curve delineation and information on products to improve curve delineation.

**Status:** The report was submitted to the ORS February 26, 2013. Report has been discussed with MRWA and feedback has been received. Second draft report submitted to the ORS 2nd July 2013.

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

**Statement of problem:** While the Safe System approach to road safety aims to produce alert and compliant drivers, at least some road users will remain less than alert and compliant thereby threatening other road users, and even the most skilled and compliant road users may make errors when driving. A main challenge to the Safe System approach is to minimise either the occurrence of driver errors or the impact of these errors - be the errors inadvertent or arising from deliberately unsafe behaviours. Behaviour change programs have been successful in the past but their effects are slowing and it is timely to seek new ways of designing and operating roads to accommodate the inevitable human errors.

**Purpose:** This research will assess the respective roles of inadvertent errors and unsafe driver behaviour and specifically, speed and speeding in rural road crashes to identify road design features, which aim to minimise the occurrence of inappropriate speeds and other errors, and their consequences.

**Status:** Further liaison ensued re taxonomy layouts and modifications were sought by Main Roads on the drafts presented. Due to conflicting project commitments, staff availability and additional graphics software being required, the stakeholder workshop was delayed until the layouts were finalised. A workshop was held August 20, 2013 with relevant stakeholders and report completion thereafter.
### 2012/13 Road Safety Council Baseline Projects

The following table summarises the RSC 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, traffic offences and drug-drivers to support the development of educational, licensing and enforcement countermeasures to better manage illicit drug related driving.

**Status:** A Project Advisory Group has been convened with membership from the ORS, Main Roads WA, Department of Transport - Licensing Services; the ChemCentre, WA Police, RAC WA, and the WA Coroner’s Office. The first meeting of the group was held on the 27th September to verify the scope of the project, the project methods, and assistance required to retrieve relevant data. It is hoped that we will obtain ethics approval and all relevant data by mid-December 2012 – late-January 2013. In the meantime a relevant literature search and review continues. Curtin University Ethics has been obtained (December 2012) and WA Police data request still under review. The scope of the project has been reduced to Part 1 only (in-depth literature review) until WAPOL can provide data. A draft report of Task One of the project (in-depth literature review) was provided to the ORS 2nd July 2013.

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

**Statement of problem:** In 2010, pedestrians accounted for 21% of road users killed and 23% of road users seriously injured on WA roads. While the majority of passenger crashes are noted to occur mid-block rather than at intersections, the recent microanalysis of serious injury crashes at n=20 metropolitan Perth intersections highlighted the potential injury risk for pedestrians at intersections. The microanalysis was limited to a small number of intersections and as such provides an incomplete understanding of the epidemiology of pedestrian crashes at intersections, the risk factors for injury and opportunities for intervention.

**Purpose:** The purpose of this project is to provide Main Roads WA with a detailed account of the epidemiology of pedestrian crashes at West Australian intersections, the risk factors for their occurrence, and recommendations for intervention, particularly in relation to best practice for pedestrian signalisation.

**Status:** Required data has been received (April) from MRWA and analysis is currently underway. Some difficulties have been encountered in determining accurate dates and information for signalised intersection modifications. Final report expected to be submitted September, 2013.

**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 determine the data requirements to support the evaluation framework. Data requirements have now been determined and meetings between MUARC and C-MARC staff are planned to plan and progress the data collection activities to support the project. Whilst data collection is being undertaken, work on structuring the evaluation framework will take place concurrently.

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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.

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**4.5 Injury Prevention Research**

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

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**The impact of first and second eye cataract surgery on falls and utilisation of mental health services among older Australians**

*Funded by an ARC Project grant*

Project is complete.

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*Funded by Main Roads WA*

**Aim:** The aim of this study is to evaluate the effectiveness and cost-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.

**Status:** Currently writing the report.

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**Proximity to alcohol outlets and risk of road crash: A population-based study**
Understanding the impact of cataract vision impairment on risk of falls

*Funded by an NHMRC grant*

**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:** Submitted ethics approval to RPH and Curtin University. Ethics approval granted for Sydney for overall study. Expected date of data recruitment is September/October 2013. We are still looking for a PhD student to undertake the study.

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

*Funded by Alzheimer’s Australia*

**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:** Application for data has been made. Crash data has also been requested. Literature review is complete.

Neurocognitive predictors of risky driving in young people

*Funded by the Neurotrauma Research Fund*

**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:** Problems were identified with the online survey, which have been rectified. We will now be using driving license number which will be verified by licensing before a person can receive their gift voucher. Previous data collected will be used as a pilot study. Recruitment has been started again and is progressing smoothly.
Motor control and driving ability – quantifying the utility of motor control screening protocols for older drivers

Funded by the Neurotrauma Research Fund

**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:** Ten participants have been recruited into the study. Aiming for 30 participants.

Assessing the validity of the UC-win driving simulator

Project is complete.

### 4.6 Main Roads WA Research Fellowship Program

The following projects are part of the Main Roads research fellowship.

#### The effectiveness and cost-effectiveness of the Safer Roads Program

**Purpose:** To evaluate the effectiveness of the Safer Roads Program that was implemented in WA between 2005-2009 in terms of net reductions in crash frequency and crash costs.

**Methods:** De-identified crash data from 2000-2011 will be extracted from the Integrated Road Information System (IRIS), which is maintained by Main Roads WA. A non-experimental retrospective before-after study will be used in this study. The GEE weighted Poisson model will be used to analyse crash data to determine the net reductions in crash frequency. The crash-severity method will be used to estimate the net reductions in crash costs. The Road Safety Risk Manager program will be used to estimate the risk reduction and risk cost ratio of the Safer Roads Program.

**Status:** A preliminary report is being written.

#### The effectiveness and cost-effectiveness of signalised intersections in Perth

**Purpose:** To evaluate the effectiveness of various traffic control signals at intersections in WA in terms of net reductions in crash frequency and crash costs. To examine risk factors that are associated with crashes at signalised intersections by types of crash (e.g. rear-end crash) as well as types of vehicle (e.g. motorcycle).

**Methods:** De-identified crash data from 1995-2011 will be extracted from the Integrated Road Information System (IRIS), which is maintained by Main Roads WA. A non-experimental retrospective before-after study will be used in this study. The GEE weighted Poisson model will be used to analyse crash data to determine the net reductions in crash frequency. The crash-severity method will be used to estimate the net reductions in crash costs. The distribution of factors that are of interest, such as types of traffic control signal, road types, or the number of lanes, by types of crash and types of vehicle will be examined by chi-square test.

**Status:** Ethics approval received at 17/08/2011; crash analyses undertaken, organising access to intersection information.
The effectiveness and cost-effectiveness of red light speed cameras in Perth
Project is complete.

Factors associated with motorcycle crashes at intersections in Western Australia
Project is complete.

4.7 Grant Submissions for Funding in 2012/13

ARC Linkage Grant, Cycling safety and urban design - Successful
CIs: Professor Mark Stevenson, Dr Marilyn Johnson, Dr Jennifer Oxley, Associate Professor Lynn Meuleners, Associate Professor Belinda Gabbe, Professor Geoffrey Rose, Professor Jennifer Dill, Dr Roderick Katz, Mr David Moyses, Mrs Julie Bartels, Mr Michael Niewesteeg, Mr Peter Bourke

NHMRC, Understanding the impact of cataract vision impairment on risk of falls - Successful
CIs: Dr Lisa Keay, Associate Professor Lynn Meuleners, Professor Peter McCluskey, Dr Jonathon Ng, Dr Nigel Morlet

Australian-China Council 2012-2013 Grant, Australia and Taiwan Road Safety Workshop - Successful
CIs: Dr Tom, Chen, Associate Professor Lynn Meuleners, Ms Delia Hendrie

Dementia Research Grant, Dementia and hospitalisations due to an injury: A population study - Successful
CIs: Dr Tom, Chen and Associate Professor Lynn Meuleners

Australian Rechabite Foundation, Proximity to alcohol outlets and risk of road crash: A population-based study – Successful
CIs Professor Rebecca Ivers, Associate Professor Lynn Meuleners, Professor Tanya Chikritzhs, Dr Soufiane Boufous

Neurotrauma Research Program, Neurocognitive predictors of risky driving in young people - Successful
CIs: Professor Julie Stout, Professor Mark Stevenson, Associate Professor Lynn Meuleners

Neurotrauma Research Program, Motor control and driving ability - quantifying the utility of motor control screening protocols for older drivers - Successful
CIs: Professor Garry Allison, Associate Professor Lynn Meuleners, Ms Delia Hendrie, Dr. Tiffany Grisbrook

Defence Health Foundation Grants for Medical Research, Population-based health outcomes after burn injury hospitalisation in Western Australia – unsuccessful
CIs: Professor Fiona Wood, Dr Janine Duke, Associate Professor Lynn Meuleners, Professor Suzanne Rea

Healthway, The application of in-vehicle real-time data collection technology to reduce the incidence of speeding among young novice drivers in Western Australia - Unsuccessful
CIs: Mr Peter Palamara, Dr Tom Chen, Ms Michelle Fraser, Professor Max Bulsara
5. **FINANCIAL REPORT**

The Statement of Income and Expenditure for the year ended 30 June 2013 is attached. This period covers the operation of the road safety activities of the Centre from July 2012 to June 2013 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;
- Two C-MARC sponsored seminars from local and international road safety researchers, with more than 30 participants mostly road safety practitioners;
- Participation in other professional and public events;
- Production of two C-MARC newsletters;
- Production of an annual report sent to all stakeholders; 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:

- Regular radio and television interviews on road safety issues;
- Forty-five public print and on-line news articles; and
- At least thirteen 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:** Associate Professor Lynn Meuleners, Associate Professor Tanya Chikritzhs and Dr Wenbin Liang.

**Status:** Progressing well. Thesis to be completed by December 2013.

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:** Associate Professor Lynn Meuleners, Professor Andy Lee, Dr Dat van Duong

**Status:** Progressing well. Thesis to be completed by March 2014.

Miss Alison Blane. **Characterisation of driving performance and self-regulation among older drivers with glaucoma**

PhD (commenced 2013) Curtin University

**Supervised by:** Associate Professor Lynn Meuleners, Professor Max Bulsara, Dr Paul Roberts, Dr Jonathon Ng, Dr Nigel Morlet

**Status:** Progressing well. Candidacy to be completed by September 2013.

6.3 Publications

The following papers were published in scholarly-refereed journals.


**Submitted and under review**

Fraser ML, Meuleners LB, Ng J, Morlet N. **Driver self-regulation and depressive symptoms in cataract patients awaiting surgery.** Submitted to *BMC Ophthalmology.*

To KG, Meuleners L, Chen HY, Lee A, Phi TD, Nguyen ND. **Assessing the psychometric properties of the National Eye Institute 25-Item Visual Function Questionnaire among bilateral cataract patients for a Vietnamese population.** Submitted to the *Australasian Journal of Ageing.*

To KG, Meuleners L, Fraser M, Do DV, Duong DV, Huynh V, To QG, Phi TD, Tran HH, Nguyen ND. **Prevalence and visual risk factors for a fall in bilateral...**
cataract patients in Ho Chi Minh City, Vietnam. Submitted to *Ophthalmic Epidemiology*.

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 visual function and vision-related quality of life for bilateral cataract patients in Ho Chi Minh City, Vietnam*. Submitted to *Quality of Life Research*.

Meuleners LB, Chen HY, Fraser M, Chambers F. *A validation study of driving errors using a driving simulator*. Submitted to the *Journal of Transportation Studies*.

Meuleners LB, Fraser M. *Gender differences in recurrent mental health contacts after hospitalisation due to interpersonal violence: Western Australia 1997 to 2009*. Submitted to *Journal of Interpersonal Violence*.

### 6.4 Presentations

Meuleners L. *European Society of Cataract and Refractive Surgeons*, Milan, Italy, 8-12th September 2012.


Palamara P. Non-use of seat belts and associated risk taking behaviours among drivers involved in a motor vehicle crash in metropolitan, regional and remote Western Australia. *Australasian Road Safety Research, Policing and Education Conference*, Wellington, New Zealand, 4-6th October 2012.

6.5 Staff Development

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

- European Society of Cataract and Refractive Surgeons, Milan, Italy;
- Australasian Road Safety Research, Policing and Education Conference, Wellington, New Zealand; and
- Safety World Conference, Wellington, New Zealand.

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. Lynn Meuleners is the treasurer of the AIPN and an executive member on the committee. Michelle Fraser is the student representative on the AIPN. Lynn Meuleners and Peter Palamara are members of the executive of the WA chapter of the Australasian College of Road Safety.

Lynn Meuleners was asked to be on the Heavy Vehicle Working Group which will be headed by Pascal Felix, the Director of Heavy Vehicle Operations, Main Roads WA.

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

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.