Preventing injuries, Saving lives, Building futures
The new Monash Injury Research Institute is one of the world’s most comprehensive injury prevention research centres.

Underpinned by scientific and academic excellence, MIRI incorporates the highly respected Monash University Accident Research Centre (MUARC) and other key Monash researchers and groups.

While MUARC continues to lead research in transport safety, this expertise is now enhanced by our collaboration with researchers from across Monash University.

MIRI identifies emerging injury problems, monitors progress, determines and evaluates solutions and advises on safety strategies.

MIRI’s structure allows our experts to actively collaborate in solving pressing, practical problems. This collaboration also allows us to offer our external partners access to expertise across their field of interest.

Our main research focus covers
• transport safety
• home, sport and leisure safety
• workplace safety
• patient safety
• violence and suicide prevention
• acute care
• injury outcomes
• disaster resilience

These research areas are uniquely designed to meet the range of challenges that comprise injury prevention and treatment.

We address the causes of both intentional injury (violence and suicide prevention research unit) and unintentional injury (transport safety, home, sport and leisure safety, workplace safety and transport safety).

We address both the prevention of injury as well as the treatment and recovery from injury (injury outcomes, acute care).

And, we address issues of scale (disaster resilience).

Our model is one of the world’s most effective demonstrations of the public health approach to a major health priority.

Our future is exciting, as we continue to build on the substantial research and leadership achievements of our first 24 years.

www.monash.edu/mini
Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair’s Foreword</td>
<td>5</td>
</tr>
<tr>
<td>Directorate and MIRI structure</td>
<td>6</td>
</tr>
<tr>
<td>Australian Centre for Research into Injury in Sport and its Prevention</td>
<td>10</td>
</tr>
<tr>
<td>Child Abuse Prevention Research Australia</td>
<td>14</td>
</tr>
<tr>
<td>Injury Outcomes Research Unit</td>
<td>16</td>
</tr>
<tr>
<td>Falls Prevention Research Unit</td>
<td>19</td>
</tr>
<tr>
<td>Victorian Injury Surveillance Unit</td>
<td>21</td>
</tr>
<tr>
<td>MUARC Director’s Report</td>
<td>25</td>
</tr>
<tr>
<td>MUARC Behavioural Safety Science</td>
<td>26</td>
</tr>
<tr>
<td>Monash University Accident Research Foundation</td>
<td>33</td>
</tr>
<tr>
<td>MUARC Human Factors</td>
<td>34</td>
</tr>
<tr>
<td>MUARC Injury Analysis and Data</td>
<td>40</td>
</tr>
<tr>
<td>MUARC Safe System Strategies and Infrastructure</td>
<td>46</td>
</tr>
<tr>
<td>MUARC Europe</td>
<td>50</td>
</tr>
<tr>
<td>MUARC Malaysia</td>
<td>52</td>
</tr>
<tr>
<td>MUARC South Africa</td>
<td>56</td>
</tr>
<tr>
<td>Statement of income and expenditure</td>
<td>57</td>
</tr>
<tr>
<td>External project committee members</td>
<td>58</td>
</tr>
<tr>
<td>Research training</td>
<td>60</td>
</tr>
<tr>
<td>Publications</td>
<td>72</td>
</tr>
</tbody>
</table>
I am very pleased to present this first MIRI report.

In January 2011 Monash established the Injury Research Institute as a whole-of-university, interdisciplinary collective focused on the primary, secondary and tertiary prevention of injury in all settings.

The Institute will

• integrate existing Monash research centres with new research units to establish a cross-university engagement of interdisciplinary strength that includes expertise from the social and behavioural sciences, health and medical sciences, business and economics, engineering, law, arts, and design, in a strategic integration of Monash campuses on four continents

• develop the capacity of this enhanced, integrated Monash activity by supporting new researchers with specialist education, training activities and collaborative opportunities provided by international leading experts in the field

• initiate University, national and international programs in all-cause injury research, in cooperation with state, national and international partners across industry, community and government, particularly focused on advancing the evidence base to inform public and private resource allocation, policy development, and population injury prevention and resilience programs

• establish the environment, capacity and mechanisms for translating all-cause injury research into sustained prevention practice and demonstrate the effectiveness of multi-disciplinary population-level prevention programs addressing: violence and suicide prevention, transport safety, workplace safety, home, sport and leisure safety, health care/patient safety, acute care, rehabilitation and injury outcomes, and disaster prevention, resilience and community safety.

Reducing the burden of injury and improving community safety requires an integrated, solution-based collaboration between high-achieving researchers and end users of the new knowledge.

Monash will build on its substantial track record and capacity and take the leadership role in what is only now becoming internationally recognised as one of the grand public health challenges of the century. MIRI aims to pursue excellence in collaborative research that focuses on achieving measurable improvements in all-cause injury-related health.

We look forward to performance outlined in this 2011 report being just the start of substantial escalation in injury research capacity at Monash that will be further demonstrated in the reports to follow in future years.
Reducing the global burden of injuries is one of the main challenges for public health in the 21st century. Every day, almost 16,000 people die from injuries. Injury accounts for nine per cent of the world’s deaths and 12 per cent of the world’s burden of diseases (Disability Adjusted Life Years lost). Injuries are a threat to health of people of all ages and socioeconomic strata and from every country in the world. The consequences of injury have been extensively documented across the personal and societal measures of wellbeing. Road traffic injuries, burns, drowning, falls and violence (intentional self-harm and assaults) are the most common cause of injury.

Almost 7.4 per cent of all deaths in Australia are from injury. Of the 10,000 injury deaths each year, an average of 275 are children and 1000 are young adults. Injury is the leading cause of death in Australia for individuals aged one to 44 years. More than two in every three funerals for young adults are the result of death by injury. Injury accounts for more than one in 20 hospitalisations in Australia, with almost 426,000 injury hospitalisations per year. Evidence suggests that there are $1.3 trillion of potential health gains to be made from reducing injuries. In July 2005, the Australian Health Ministers approved release of the National Injury Prevention and Safety Promotion Plan 2004–2014.
However, without genuine cross-sectoral involvement in an adequately resourced whole of government evidence-based commitment to implementation, the plan has had little impact on population level indicators of injury in Australia. 

Existing structures, current reliance on self-directed homogenous processes and the isolated delivery of fragmented interventions are not working. Current interventions throughout the world are developed in relative isolation by a variety of issue-specific centres and are limited in application and transferability. The gap in the national and international arenas of informed advocacy, multi-disciplinary action, and effective deployment of finite resources all contribute to the growing human and financial costs resulting from preventable injuries in all settings.

We need to harness existing knowledge and expertise to build and deliver a more focused, better coordinated and broadly articulated approach to preventing injuries, saving lives and building environments and communities in which future opportunities can be maximised.

The 60 per cent reduction in the road toll achieved in Victoria in the past 30 years shows that focused, coordinated investment across multiple domains can pay dividends. Throughout the 1980s, the Australian road toll averaged around 3000 deaths per year. The Australian road toll is now around 1500 deaths per year. The Monash University Accident Research Centre (MUARC) has played an important role in this achievement and has continued to demonstrate the strategic thinking and decisive leadership needed to grow the science supporting positive injury prevention and safety outcomes.

Rising to this challenge of the growing global burden of injury, Monash University established in 2011 the Injury Research Institute (MIRI). By transferring the approaches pioneered in the area of road safety to applications across the full spectrum of the causes of injury, the new Institute will facilitate the breakthroughs required to reduce all-cause injury death and disability in Australia. The Institute will build on the solid platform within MUARC to provide the leadership, environment and structure needed to deliver measurable outcomes by the affiliated centres and units.
This past year has, for MIRI, been a wonderfully exciting year of growth and opportunity. As always, our achievements have been driven by staff excellence and dedication.

In 2011 we relaunched our website with its comprehensive information regarding the full nature and extent of MIRI endeavours. I invite you to keep in touch with this dynamic website to monitor our ongoing development. In the meanwhile, look through this report for a sense of what we all at MIRI have been doing this year. I thank both the staff and partners for such wonderful commitment to our goals and I look forward to growing our efforts in 2012.

Peer reviewed journal articles by year of publication

Number of current NHMRC/ARC grants by year
Abbreviations

VSPRU: Violence and Suicide Prevention Research Unit
CAPRA: Child Abuse Prevention Research Australia
MUARC: Monash University Accident Research Centre
VISU: Victorian Injury Surveillance Unit
ACRISP: Australian Centre for Research into Injury in Sport and its Prevention
FPRU: Falls Prevention Research Unit
WIPRU: Workplace Injury Prevention Research Unit
PaSaRU: Patient Safety Research Unit
IORU: Injury Outcomes Research Unit
MDRI: Disaster Resilience Initiative

Christine Chesterman
(transfered to another part of Monash University in February)
Finance Administration Officer

Kitie Douanghoutha
Computer support

Brenda Gibson
(until August)
Senior HR Advisor
The term ‘sports injury’ covers the full spectrum of injury that occurs to people during sport, physical activity and active recreation, whether they are elite athletes, community sport participants or people enjoying active leisure or play. This major research program is concerned with the distribution and determinants of sports injury, evaluation of intervention strategies to prevent these injuries and the translation of this knowledge to real-world safety behaviours.

Australian Centre for Research into Injury in Sport and its Prevention

Team Leader
Professor Caroline Finch
ASTAT, PhD, MSc, BSc(Hons).
NHMRC Principal Research Fellow

Dr Alex Donaldson
DHSc, MSc, BEd, DipT
Research Fellow

Dr Peta White
PhD, BA(Hons), BEd, DipTeach
Research Fellow

Kathy Diamantopoulou
MSc, BSc(Hons) Research Fellow/
Senior Research Statistician
Expertise

The multi-disciplinary research team has qualifications and specialist training in areas including biostatistics, behavioural psychology, health promotion and physiotherapy.

Adjunct appointments within ACRISP are

- Dr Paul McCrory, an expert on the management and assessment of concussion in sport.
- Dr Andrew McIntosh, an impact injury biomechanist who is expert on helmet design for sport, bicycling and motorcycling.
- Dr Hugh Seward, a sports physician with particular expertise in Australian Football League (AFL Medical Officers Association) injury prevention, treatment and management.
- Associate Professor Evert Verhagen, a sports injury prevention/physical activity promotion epidemiologist from the Netherlands.

Resources

National and international competitive research funding funds ACRISP in-house and collaborative research. The team receives infrastructure support from the International Olympic Committee (IOC). A National Health and Medical Research Council (NHMRC) Principal Research Fellowship supports Professor Finch and the NHMRC funds a number of projects. Projects are also funded through competitive grants from the Australian Sports Commission and the Australian Football League (AFL) Research Board. Additional sector and industry relevant funding has been obtained from the Victorian Health Promotion Foundation, Department of Planning and Community Development - Sport and Recreation Victoria Division, Sports Medicine Australia, the NSW Sporting Injuries Committee and JLT Sport.

Highlights and Outcomes

- Development of evidence-based and expert-consensus informed exercise training program (FootyFirst) for preventing lower limb injuries in community Australian Football as part of an NHMRC Partnerships Grant – Towards a national sports safety strategy – addressing facilitators and barriers towards safety guideline uptake (The NoGAPS Project).
- Evaluation of a theory-informed dissemination and implementation plan for sports safety policy in community rugby union through funding received from the NSW Sporting Injuries Committee.
- Professor Finch was a keynote speaker at the 3rd World Conference on Sports Injury Prevention held in Monaco in April.
- Jenny Jacobssen, a PhD student from Linkoping University in Sweden, spent five weeks within ACRISP for research collaborations.
- Professor Finch was appointed as the Inaugural Senior Associate Editor for Implementation and Dissemination for the British Journal of Sports Medicine.
- Professor Finch assisted in planning and delivering a major talk, ‘Research partnerships for prevention’ at a Monash Breakfast Seminar, ‘Engaging Communities and Industry Through Sport’.
- Professor Finch commenced a new cross-fertilisation editorial blog role to link the journals Injury Prevention and British Journal of Sports Medicine.
- The ACRISP team entered a formal MOU with Department of Public and Occupational Health and the EMGO Institute for Health and Care Research of the Vrije University Medical Center in Amsterdam for research collaborations between two research groups.
- First-year School of Physiotherapy student Ben Tilley worked as a vacation student on the NoGAPS project.

IOC Centre for Research into the Prevention of Injury and Protection of Athlete Health (funded by the International Olympic Committee)

Following an international review, the ACRISP team was supported as one of only four international IOC Centres for Research into the Prevention of Injury and Protection of Athlete Health. The other centres are in Norway, Canada and South Africa. The team is led by Professor Finch and includes Professor Jill Cook (Monash School of Physiotherapy) and Dr Paul McCrory and Dr Andrew McIntosh.

The National Guidance for Australian Football Partnerships and Safety (NoGAPS) project (funded by the NHMRC, AFL Research Board, VicHealth, Department of Planning and Community Development - Sport and Recreation Victoria Division, Sports Medicine Australia, the NSW Sporting Injuries Committee, JLT Sport)

The project aims to identify factors that influence the translation of evidence-based injury prevention interventions into practice in community sport, and to provide specific evidence for the effectiveness of an evidence-based exercise-training program for lower limb injury prevention in community Australian Football.

Training loads and injury risk in elite athletes (funded by the Australian Institute of Sport)

This project was in collaboration with the Department of Physical Therapies and Applied Research at the Australian Institute

Christina Ekegren
Msc, PG Cert (Teaching), BPhysio(Hons) PhD student

Peter Richardson
BAppSc, Dip Acu,BApScI(Hons) PhD student

Samantha Bailey
Administrative Assistant

Adjunct Appointments

Dr Andrew McIntosh
Dr Hugh Seward
Dr Paul McCrory
Associate Professor Evert Verhagen
of Sport in Canberra. It involved data linkage, and exploratory analysis, of several databases of injury events, their treatment and other outcomes which were matched to both baseline profiles of the musculoskeletal, psychological and training profiles of elite athletes.

The Preventing Australian Football Injuries through exercise (PAFIX) study (funded by the NHMRC)

This is a randomised controlled evaluation of the effectiveness of an exercise training intervention for the prevention of lower limb injuries in community Australian football players. This year, significant database management work was undertaken and several papers submitted for publication.

Making a difference in sports safety: a pilot study in applying theory informed approach to the diffusion of safety initiatives in community level sport (funded by the NSW Sporting Injuries Committee)

Conducted with the University of NSW and Australian Rugby Union (ARU), this research explored ways of improving the adoption and implementation of safety policies and practices in community sport. It developed, implemented and evaluated the impact on community rugby union coaches of a theory-informed dissemination plan for the Mayday Safety Procedure – an ARU neck and spinal injury prevention intervention. A survey of knowledge and practice of coaches of senior community rugby teams in five zones/associations in NSW took place at the end of the 2010 season. The project team has developed a Mayday Safety Procedure dissemination plan informed by the Diffusion of Innovations theory, which the ARU development officers implemented in one association during the 2011 season.

Presentations

- Finch C. (Invited Speaker), NHMRC partnership grants. Deakin University Early Career Researchers Workshop, September.
- Finch C. (Keynote Address) Challenges

- Finch C. (Poster) NoGAPS: The design and evaluation plan of a large-scale implementation study. Global Implementation Conference, Washington DC, USA, August.

National and international collaborations
- Australian Football League (AFL)
- Australian Institute of Sport
- Australian Rugby Union (ARU)
- Australian Sports Medicine Federation
- Bond University, Faculty of Law
- Brunel University, London, UK
- Department of Planning and Community Development – Sport and Recreation Division
- EMGO, Vrije University, Netherlands
- International Olympic Committee (IOC) Medical Commission
- Jardine Lloyd Thompson Pty Ltd
- NSW Sporting Injuries Committee
- Sport Injury Prevention Centre, The University of Calgary
- Sports Medicine Australia (Victorian Branch and National Office)
- University of Ballarat, School of Health Sciences
- University of British Columbia, Vancouver, Canada
- University of New South Wales
- Victorian Health Promotion Foundation

Staff membership of boards and committees
- Dance UK Physiotherapy Advisory Group (C Ekegren)
- Sports Medicine Australia - Victoria Branch Board (P White)
- British Journal of Sports Medicine. Senior Associate Editor for Implementation and Dissemination. 2011–present (C Finch)
- Editorial Board Member. International Journal of Injury Control and Safety Promotion (C Finch)
- Editorial Board Member. Injury Prevention. 2008–present (C Finch)
- Editorial Board Member. British Journal of Sports Medicine (C Finch)
- Editorial Board Member. Journal of Science and Medicine in Sport (C Finch)
- Ministerial nominated appointment to Victorian State Government, Sports Injury Prevention Taskforce (C Finch)
- International Scientific Committee Member. Eleventh World Conference on Injury Prevention and Safety Promotion. To be held in New Zealand in October 2012. (C Finch)

Delegates at the 3rd International Conference on Sports Injury Prevention, Monaco.

Left: The NoGAPS project aims to identify the translation of evidence-based injury prevention into practice.
Child Abuse Prevention Research Australia (CAPRA) is a strategic collaboration between the Australian Childhood Foundation and Monash University. The purpose of the research is to improve child protection and to dramatically reduce the rate of child abuse, neglect and murder. We achieve this through

- providing evidence-based advice to government and child health organisations
- guiding the development of policies and practice, and
- promoting the rights and voices of children through child-centred research.
Expertise

CAPRA staff have a strong practice background in child protection, health and education settings. Our research has contributed to major law reform in child sexual abuse, child murder and mandatory reporting. Most of our research is published in books and journals nationally and internationally. We have a strong tradition of contributing to public debate through opinion pieces in major newspapers.

Highlights and Outcomes

CAPRA joined MIRI in mid-2011 from Faculty of Medicine, Nursing and Health Sciences. Research undertaken by CAPRA has made significant contributions locally, nationally and internationally to the issue of child abuse. This includes two books which promote children's voices: Physical punishment in childhood: The rights of the child by Bernadette Saunders and Chris Goddard and The truth is no longer a lie: Children’s experiences of abuse and professional interventions by Neerosh Mudaly and Chris Goddard. The latter was the first book to give children’s views on child abuse.

Janet Stanley’s and Chris Goddard's book on research on the high levels of violence against professionals who respond to child abuse was published by Wiley in the UK and USA. In the Firing Line: Violence and power in child protection work made a significant contribution to the international literature on child protection. Recommendations from this research have been adopted internationally.

In November 2008 CAPRA with Access Economics and the Australian Childhood Foundation published a major report on the cost of child abuse to the Australian community.

Current projects include child exploitation on the internet, the murder of children, therapeutic responses to traumatised children, and gaps in social welfare provision. Highlights in 2011 included:

• The Honorable Philip Cummins in March launched the report ‘It takes me a little longer to get angry now’, a preliminary evaluation report of animal assisted education and therapy for children experiencing family violence and homelessness.
• Professor Goddard and Dr Frederick met with the Victorian Minister of Community Services in August regarding CAPRA’s Gaps in Social Welfare provision study.
• Professor Goddard and Dr Newton appeared before the Senate Committee in March regarding the CAPRA submission to the Senate Legal and Constitutional Affairs Legislation Committee: Inquiry into the Commonwealth Commissioner for Children and Young People Bill 2010.
• Submission to the Protecting Victoria’s Vulnerable Children Inquiry in April.
• Professor Goddard was invited to and served on the Reference Committee of the Protecting Victoria’s Vulnerable Children Inquiry. The Committee met four times between April and October.
• CAPRA hosted ‘Best Practice Issues in Child Death Reviews’ by Dr John Devaney, School of Sociology, Social Policy & Social Work, Queen’s University, Belfast, Northern Ireland in July.
• Dr Frederick and Professor Goddard presented to the ISPCAN regional conference in Finland in September on ‘The need for multi-professional cooperation between government authorities and experts in Non Government Organisations to effectively meet social needs’.
• Dr Mudaly presented to the Asia-Pacific Conference on Child Abuse & Neglect in New Delhi, India, in October on ‘Protecting children in the dissemination of research: ethical obligations’.
• Professor Goddard presented in London in June on ‘The Complexities of Caring for Child Protection Workers’.
• Professor Goddard presented the public address on ‘The silencing of children’ at the Department of Health and Human Services seminar at the University of Tasmania in December.
Injury imposes a major burden both to the injured person and society. Not all patients respond to treatment in the same way, and not all treatments are equal. There is a wide variation in the speed and extent to which people recover. Injury Outcomes Research Unit (IORU) researchers explore the reasons for variation in the way people injured in workplace and road crash incidents respond to rehabilitation and treatment and recover. This group’s research means we are gaining new insights into how best to care for patients in the Australian healthcare system. Our researchers are working to understand the nature of the problem and establish trials to support evidence-based improvements in care.
Expertise

Expertise in this group covers the disciplines of medicine, epidemiology, statistics, psychology, health promotion and population health. Collectively these researchers represent one of the largest population health injury outcomes research groups in Australia.

Resources

This unit has access to state, national and international databases on injury outcome including Compensation Research Database, Australian National Crash In-depth Study database and Australian Fatal Road Crash Database. IORU researchers have longstanding collaborative networks with similar groups throughout the world.

Highlights and Outcomes

Evaluation of the TAC 2015 Strategy
Chief Investigators: Associate Professor Alex Collie (ISCRR), Dr Michael Fitzharris (MIRI), Associate Professor Belinda Gabbe (DEPM, Faculty of Medicine)

Project team: Dr Carlyn Muir (MIRI), Dr Swati Shourie (MIRI), Miss Emily Kerr (MIRI)

In 2010, the Victorian Transport Accident Commission (TAC) embarked on a significant and comprehensively revised claims management model known as TAC 2015. In doing so, the TAC has for the first time explicitly specified improved client outcomes as a key goal, along with improved client satisfaction and scheme viability.

In collaboration with the Institute for Safety, Compensation and Recovery Research (ISCRR), the IORU is evaluating the TAC 2015 strategy. The key objective is to determine whether the TAC 2015 strategy has been implemented as intended, and whether the strategy has had a measurable impact on the three key goals of the TAC.

In addition to the overall evaluation, action projects are informing the transition process. The team has conducted staff surveys in the claims teams to track staff attitudes and impacts of the previous claims model and the new claims model. Other projects include the early identification of clients at risk of differential pain, return-to-work and psychological health difficulties post-crash, a review of case and claims management best practice, and an examination of outcomes measures used to track client health.

The findings and recommendations of the action projects, and of the staff survey of the transition to TAC 2015, will provide an in-depth understanding of the implementation of the strategy, which in turn will permit a greater understanding of the process, impacts and outcomes of the TAC 2015 strategy in the long run.

A vocational rehabilitation intervention of chronic compensated musculoskeletal disorders
Chief Investigators: Professor Niki Ellis (ISCRR), Professor Gwen Jull (UQ), Dr Venerina Johnston (UQ), Professor Jenny Strong (UQ), Dr Sue Gargett (ISCRR), Professor Malcolm Battersby (Flinders University)

Project team: Dr Dianne Sheppard (MIRI)

Musculoskeletal disorders are common, costly and a national health research priority. The intervention adds self-management training to usual care/vocational rehabilitation for workers with chronic injuries. Self-management training has been effective in improving health and quality of life in chronic diseases but has not yet been examined in work disability prevention. Self-management provides the worker with opportunities to manage the impact of pain. Findings intend to show the acceptability, effectiveness (job readiness, health efficacy and pain) and cost-effectiveness of the intervention and will model a client-centred, prevention-focused health service.

ARC-Linkage: Determining the individual, community, workplace and societal impacts of compensable injury in Australia
Chief investigators: Dr Alex Collie (ISCRR), Dr Adam Vogel (University of Melbourne), Professor Helen Keleher (Monash), Professor Rod McClure (MIRI), Professor Alan Petersen (Monash), Professor Nike Ellis (ISCRR)

Project team: Dr Sharon Newman (MIRI)

This three-year project, which commenced in 2011, aims to develop a standardised assessment of the individual, community, workplace and societal impacts of compensable injury and incorporate this into the existing performance monitoring.
practices of partner organisations TAC, Comcare (the worker’s compensation insurer for the Australian Government) and WorkSafe Victoria.

We have completed a meta-review of the published literature in the area of injury outcome in order to describe the nature of reported injury outcomes at the level of individuals, the community, society and workplace. This is the first stage in developing a conceptual framework and instrument for assessing the broader impacts of compensable injury, including health outcomes. WorkSafe, the TAC and Comcare and the Australian Research Council fund the project.

The findings from the project will (1) expand our knowledge of the impact of compensable injury beyond the individual level impacts to community, societal and employer impacts, (2) inform client and injured worker outcome surveys of WorkSafe, the TAC and Comcare and (3) develop and validate survey instruments that WorkSafe, the TAC and Comcare may use in future outcome surveys.

Outcomes of Compensated Injury in Victoria: A Longitudinal Approach
Chief investigators: Dr Janneke Berecki-Gisolf (MIRI), Alex Collie (ISCRR), Professor Rod McClure (MIRI)

The purpose of this study is to explore how pre-existing health conditions impact work- and transport injury rates and outcomes. This will be done by collecting WorkSafe Victoria and TAC claims data linked to Medicare and Pharmaceutical Benefits Scheme records, to provide a knowledge base for research on injury prevention and injury outcomes.

Return to work after work-related injury or illness
Chief investigators: Dr Janneke Berecki-Gisolf (MIRI), Alex Collie (ISCRR), Professor Rod McClure (MIRI)

Retrospective analysis of WorkSafe Victoria claims and payments data from the Compensation Research Database has led to two major findings. First, the incidence of work-disability due to work-related injury or illness increases with age, as does the duration of time off work. Because the ageing of the workforce is ongoing, we can expect the lost-time claim burden to increase, if policy and practice remains otherwise unchanged. Second, work disability recurrences are common and have considerable impact on sustained return to work outcomes. A policy focus on education about secondary prevention may help to improve long-term return to work outcomes, particularly for workers with musculoskeletal disorder. Additional analysis of TAC early interview and payments data has led to a model for the early identification of clients at risk for delayed return to work.

Health service use after work-related injury or illness
Chief investigators: Dr Janneke Berecki-Gisolf (MIRI), Alex Collie (ISCRR), Professor Rod McClure (MIRI)

Anderson and Newman’s model of health service use determinants was adapted for a compensated population. This framework provides a conceptual basis for analysis of determinants of service use after compensable injury.

Presentations
• Ellis, N. Futures in WHS: Implications for physics in work-related practice. Australian Physiotherapy Association conference (Brisbane). October.
• Fitzharris, M. Making our vehicles safer - how do we get there quickly? (Workshop) Australian College of Road Safety, Melbourne Convention and Exhibition Centre, Victoria. September.
• Fitzharris, M. Prioritising vehicle safety injury prevention countermeasures: the need for robust SCI incidence data. 50th Annual Scientific Meeting 2011: USA (combined meeting with ASIA; The 2011 International Conference on Spinal Cord Medicine and Rehabilitation), Washington, DC. June.
• Berecki-Gisolf J. 1st Australasian Compensation Health Research Forum in Melbourne (2011). Poster presentation titled ‘The Impact of Ageing on Work Disability and Return to Work’ which won the poster award for research ‘most likely to make a difference’
Falls remain a significant threat to the safety, health and independence of our older citizens. It is estimated that every year around one in three people aged over 65 and living in their own home will have a fall, and this rate increases with age. Preventing falls is an important part of promoting healthy and independent ageing, and reducing medical and support service costs. The Falls Prevention Research Unit (FPRU) assesses the effectiveness of falls interventions for older people, examines the population-level impact of proven interventions and works to maximise the translation of research to policy and practice.
Expertise

The FPRU team has training in public health, epidemiology, psychology, applied statistics, and nursing, and expertise in undertaking randomised controlled trials, program evaluation, survey research and modelling population level effects. The team has a long history of providing policy and strategy advice to government on falls prevention programs.

Resources

FPRU research is supported by a strong track record of obtaining nationally competitive research funding, in addition to health sector government contracts. As a MIRI unit, FPRU has access to the state injury surveillance health sector databases through the Victorian Injury Surveillance Unit.

Highlights and Outcomes

Reducing falls among older people in Victoria: better evidence, better targeting, better outcomes

The aim of this project is to enable a more effective policy response to the falls prevention challenge in Victoria. It is designed to underpin a re-orientation of the Department of Health falls prevention program and evaluate its delivery. Despite the robust evidence base on effective falls interventions for community dwelling older people, translation into falls reductions has not yet been fully realised. The challenge is to deliver the most effective interventions efficiently at a population level, and for these interventions to be taken up by older people. Project highlights include:

- identification of characteristics of older fallers most frequently admitted to hospital and factors associated with increased length of stay
- identification of factors influencing the uptake of four proven falls interventions by older people
- research results informed and shaped the 2010/11 Department of Health falls prevention program submission guidelines
- provision of a summary of these characteristics and factors to agencies funded to deliver falls prevention programs by the Department of Health
- development of a survey for the Hospital Admission Risk Program to identify barriers and facilitators for incorporation of falls interventions into this program
- testing and finalisation of sustainability guidelines for community falls prevention programs, which were made available to agencies funded to deliver falls prevention programs
- development of a plan for the evaluation of falls prevention interventions being delivered by six consortia of agencies in metropolitan Melbourne.

The project is funded by the NHMRC and Victorian Department of Health, and includes collaborators at the National Ageing Research Institute, La Trobe University, Southern Health, University of Sydney, and the Victorian Department of Health.

Presentations

- “Good for others but not for me”: why older adults who see the value of group exercise to prevent falls choose not to participate. Terry Haines, Lesley Day, Caroline Finch, Keith Hill, Lindy Clemson, Margaret Thomas, Catherine Thompson. Oral presentation: Physiotherapy Conference 2011, Brisbane, October.
The Victorian Injury Surveillance Unit (VISU) is funded by the Victorian Department of Health and other agencies to perform five core functions related to injury surveillance data analysis and information dissemination.

Emily Kerr
BHSc
Research Assistant

Erin Cassell
MPH, BA
Senior Research Fellow

Angela Clapperton
MCounselling, GradDip Ed Psych, BSC(Behav) Research Fellow

Karen Ashby
MPH, GradDip Health Science, BA Research Fellow

Victorian Injury Surveillance Unit
The functions of the Victorian Injury Surveillance Unit (VISU) are to

- provide a mostly free-of-charge data and information service to government departments and bodies, community health and safety organisations, business, the media, education institutions, researchers and the community
- produce VISU publications *Hazard*, which focuses on serious and emerging injury issues and *E-Bulletin*, which provides the latest available data and information on the frequency, rates, causes and patterns of injury in Victoria
- maintain and develop the VISU web page (www.monash.edu.au/miri/visu) containing injury reports, fact sheets, *Hazard* and *E-Bulletins*
- provide special data reports to underpin government injury prevention policies and programs, safety regulations and laws, and government and community injury prevention project planning and evaluation
- provide data to stimulate and support injury prevention research and evaluation projects.

**Expertise**

The team’s major strengths are our knowledge, skills and expertise in maintaining and manipulating three very large injury surveillance datasets containing millions of cases as well as our ability to interpret, report and disseminate these data for prevention and research purposes. The team’s work includes

- epidemiological research, mainly descriptive studies, related to the analysis and interpretation of injury surveillance data
- call-back studies (case or case control studies) involving injury patients recruited through a selection of the 38 hospitals contributing injury data to the Victorian Emergency Minimum Dataset (VEMD)
- evaluation studies utilising injury surveillance and other quantitative and qualitative data.

**Resources**

**Databases**

*Injury Deaths Dataset: (Source: Australian Bureau of Statistics Death Unit Record File - ABS-DURF)*

De-identified Victorian injury death records are supplied to VISU by the ABS annually from their mortality unit record data collection and loaded onto the VISU-held ABS-DURF (Injury Deaths) dataset. The ABS sources their deaths data from deaths registrations administered by the various state and territory Registrars of Births, Deaths and Marriages. VISU holds unit record data on injury deaths (deaths due to external causes) for 1970, 1975, 1980, 1985, 1990-2006. There has been a delay in the supply of Victorian death data for 2007-2009 but these years should be available in 2012. The VISU ABS-DURF dataset contains 166,000 cases.

*Hospital admissions (Source: Victorian Admitted Episodes Dataset-VAED)*

The VAED records admissions (hospitalisations) to all Victorian public and private hospitals. Hospital admissions for injury and poisoning that contain

---

The VISU team provided injury data to a NSW inquiry into the safety of trampolines. The inquiry led to the NSW government calling for mandatory Australian safety standards for trampolines.
an external cause of injury code are extracted from the VAED by the Victorian Department of Health and supplied in de-identified unit record format to VISU every six months. The file is cleaned, checked and loaded onto the VISU-held VAED dataset. This dataset holds injury hospitalisations from 1985 and currently contains 3.7 million cases recorded from 1 July, 1987 to 30 June, 2011 (24 years).

Emergency Department (ED) presentations (Source: Victorian Emergency Minimum Dataset (VEMD))

The VEMD records Emergency Department (ED) presentations to all 38 Victorian hospitals that provide 24-hour ED services. Injury and poisoning cases are extracted from the VEMD by the Victorian Department of Health and supplied six-monthly in de-identified unit record format to VISU (prior to 2004 VISU collected injury surveillance data directly from hospital EDs). The VISU-held VEMD injury surveillance dataset holds some data from 1989 and currently contains 4 million cases recorded from 1 January, 1996 to 30 June, 2011 (15.5 years).

Highlights and Outcomes

Injury surveillance research reports

Through our Data and Information Service, VISU staff produced and disseminated 236 short injury research reports on: (1) injuries in specific health regions e.g. Injury in Hume Region; Indigenous injury by health regions and local government areas e.g., Bicycling injury in Geelong and Surf Coast residents; (2) specific causes of injury e.g. falls, transport such as bicycling, dog bite, child driveway runovers, quad bike injury, juvenile fire play-related injury, assaults, self-harm, child abuse and neglect, (3) injury in specific settings e.g. home, school, workplace; (4) injury during specific activities for example, work, sports; and (5) injury in specific groups e.g. older people, children and Indigenous Victorians).

A major component of VISU’s work is providing research reports on specific consumer product-related injuries to the Australian Competition and Consumer Commission (ACCC), state consumer departments and government and parliamentary committees to support the development and monitoring of consumer regulations and standards and to identify hazardous products. In 2011, VISU provided detailed reports to these bodies on a range of topics including injury relating to trampolines, TV and other furniture tipovers, jolly jumpers, prams and strollers, hydraulic trolley jacks and ingestion of magnets.

VISU clients included federal and state government departments and agencies (including health, education, transport and consumer affairs), local councils, parliamentary committees, state coroners, non-government bodies including safety organisations, industry, graduate students, researchers, the media and community organisations. Data reports were used for injury prevention and research purposes, evaluations and for population health monitoring.

Hazard and E-Bulletin

VISU published one issue of Hazard and two E-Bulletins in 2011. In Hazard 73 data on deaths and hospital-treated injury due to assaults on young people aged 15-34 years in public places were analysed and evidence-based recommendations on the prevention of these assaults were made. In the first of the VISU E-Bulletins, the latest available year of hospital-treated unintentional injury data (2009) was extracted from the VISU-held hospital injury surveillance datasets and analysed by age group to identify priority issues for prevention.

More than 1500 hard copies of each issue of Hazard are distributed through our general and special mailing lists and current and past issues of Hazard and the E-Bulletin are available for download from the VISU web page: www.monash.edu/miri/visu. At least 178,000 copies of Hazard were downloaded from the VISU webpage in 2010-2011 and the E-Bulletins were accessed 10,000 times over the same period.

Contributions to government policy and safety regulations

In July 2010, the Victorian Department of Health advised injury prevention organisations that approval had been gained to develop a new Victorian Injury Prevention Plan (VIPP). This commitment was confirmed in the Victorian Public Health and Wellbeing Plan 2011-2015, released in 2011. In the second half of 2011, VISU provided two in-depth injury surveillance reports to the department — Injury causes, trends and burden, Victoria 2009 (published on VISU webpage, see below) and Injury in Victoria by setting: home, sports, road, work etc. — to support the development of the VIPP, particularly in relation to deciding the priorities and directions for prevention. In November 2011 the Director of VISU gave the keynote address to the Victorian Safe Community Network (VSCN) forum: Informing future directions for
injury prevention, which was attended by approximately 40 stakeholders from government and non-government agencies to discuss future directions for injury prevention. All agencies in attendance, including VISU, were keen to be engaged in the development of the VIPP and to work in partnership on its development and implementation in 2012.

In November, the Victorian Minister for Sport and Recreation announced a new taskforce to investigate the issue of sports injury prevention. The Victorian Sports Injury Prevention Taskforce (SIPT) is supported by leading organisations, including Sports Medicine Australia, VicHealth and VicSport, and prominent academics in the sports injury field including MIRI’s Professor Caroline Finch. The taskforce will deliver a report in 2013 to support sporting bodies, sports management authorities and local government with risk management strategies and sports injury prevention plans. To underpin the taskforce’s initial work, in December 2011 VISU provided a baseline report on sports injuries in Victoria — Hospital-treated sports injury among Victorians by Local Government Area (LGA) of residence, 2009/10 — and will continue to support the SIPT with sports injury data reports through 2012.

In March, the ACCC released the report ‘Targeted study of injury data involving motorised mobility scooters’ completed by the Monash University Department of Forensic Medicine and Monash University Accident Research Centre (Victorian Injury Surveillance Unit). Our research indicated that there were 442 motorised mobility scooter fall injury hospitalisations in Australia between July 2006 and June 2008. However, the total number of hospitalisations was likely to be greater than 700 if other accidents, such as road crashes, were included. The ACCC has started working with stakeholders to develop and implement strategies for a united approach to minimise deaths and injuries related to mobility scooters. These stakeholders include representatives from the mobility scooter industry, health, injury prevention and aged care organisations, and other government agencies.

VISU provided Victorian trampoline injury data to the NSW Product Safety Committee inquiry into the safety of trampolines. As a result of this inquiry, the NSW government called for a review of existing Australian safety standards for trampolines, after the committee found unacceptable hazards and dangers associated with some products in the domestic market. As a result of the NSW referral, the Product Safety Branch of the ACCC has taken action to develop a draft Regulation Impact Statement (RIS) for domestic trampolines, featuring VISU data, to be released for public comment in early 2012. Standards Australia concurrently announced a revision of the voluntary trampoline standard as a precursor to making the standard mandatory, which will allow the development of further safety regulations. The Director of VISU has been invited onto the Trampoline Standards Committee.

Presentations


• Ashby K. Call back study investigating child dog bite injury that occurs in the domestic setting. Oral presentation to the 10th National Conference on Injury Prevention and Safety Promotion, held at Brisbane Convention & Exhibition Centre, November.


• Clapperton A. Rock fishing deaths and injury in Australia. Poster presentation to the 10th National Conference on Injury Prevention and Safety Promotion, held at Brisbane Convention & Exhibition Centre, November.

Staff Membership on Committees

• Victorian Safe Communities Network (VSCN), Executive (E. Cassell)
• Kidsafe Victoria, Board (E. Cassell)
• Victorian Child and Adolescent Monitoring System (VCAMS) Data Management Committee convened by the Department of Education and Early Childhood Development (DEECD) (E. Cassell)
Over the past 12 months MUARC has become an entirely transport safety focused research centre. It is the largest research grouping within the newly established Monash Injury Research Institute.

This change has given MUARC an opportunity to reflect on its past and to position itself for the future to ensure we can deliver innovative transport safety solutions. Given the entirely transport safety focus, it was an opportune time to establish an ambitious research strategy for the next five years.

Over the first two quarters of 2011 the senior staff worked on developing a comprehensive forward-looking five-year strategy. The development of this strategy culminated in our hosting of a stakeholder day in which transport and road safety stakeholders from across Australasia were invited to an interactive session in which we presented our research agenda for the future. It also gave us the opportunity to hear from the various agencies and to calibrate our research strategy to ensure we will be well placed to provide the innovative transport solutions into the future.

This year was also a successful year for MUARC on a number of counts. We continued to increase our portfolio of nationally competitive grants, obtaining two new grants totalling more than $800,000; I congratulate the teams headed by Dr Jude Charlton and Dr Paul Salmon. We also continued to secure competitive contract research with our funding increasing by 35 per cent from the previous year. These are just a few indicators of the ongoing success of the MUARC staff. As well, our doctoral program continues to mature with three students graduating with Doctor of Philosophy degrees having undertaken their dissertations in transport safety.

We commenced this year a large population-based study investigating motorcycle injury, funded through an ARC Linkage Grant. This research will establish the evidence on rider risk factors relevant to the contemporary rider population as well as explore the role of road infrastructure and travel speed in serious motorcycle crashes. The project staff are drawn from across MUARC research teams to harness the broad multidisciplinary skill base required for such an ambitious project.

My first year as the Director of MUARC has been challenging but very fulfilling. I am fortunate to have talented and dedicated staff who have contributed much this year and I would like to thank all of them for their ongoing commitment to our (recently established) Mission namely,“through excellence in research we will inform policy and practice to eliminate serious injury in the transport sector and we will focus our efforts nationally and internationally where we will

- understand and deliver innovative transport safety solutions
- contribute scientific evidence to public discussion on transport safety
- translate the scientific evidence into policy and practice and
- build research training programs.”
The research activity of the Behavioural Safety Science team focuses on understanding and managing human behaviour to meet the challenge of preventing injury and improving safety, primarily in the transportation context. Under the leadership of Associate Director Dr Jude Charlton, the team’s research priorities centre on the vulnerable road user groups, drivers and vehicle occupants, pedestrians and cyclists, older road users, youth and children. Reducing road users’ risk of death and serious injury as a result of exposure to excessive crash forces, is a key platform of the Safe System approach. The team’s overriding objective across all projects is to research and recommend strategies either to prevent crash involvement in the first instance, or to ensure better road user protection when crashes do occur. A significant feature of the team’s activity is the safe transportation and mobility of the ageing population and those with impairments that impact on their safety as road users. A variety of research methods and technologies are used including driving simulation, instrumented vehicles and real-world observation, survey and interview techniques and mass data analysis.

Associate Director – MUARC
Dr Judith Charlton
PhD, MSc, BEd, MAPS
Senior Research Fellow

Dr Sjaan Koppel
PhD, BAppSc(Hons), BA
ARC Post Doctoral Fellow

Dr Jennie Oxley
PhD, BSc(Hons)
Senior Research Fellow

Jim Langford
MEDSt, BA(Hons)
Senior Research Fellow

Dr Marilyn Johnson
PhD, MAppSocRes, BA(Hons)
Expertise

The team’s disciplinary expertise includes psychology, applied health sciences, epidemiology, education and social sciences. Their research also relies on strong links with engineering, neuroscience and gerontology researchers and students within MIRI as well as in other faculties and institutions. The researchers engage with government, industry and professional groups locally, nationally and globally through the projects described below.

Resources

Simulation Research

The team employs the MUARC advanced driving simulator and portable simulator laboratories in much of its research. A range of driving environments have been generated for both experimental and training purposes, including intersection gap selection tasks and hazard avoidance for a range of road types, traffic and signage, and light and weather conditions. The portable simulator offers a unique capacity for off-campus research and is easily transported to community and clinical settings. The simulator offers a safe and efficient method of collecting information on how drivers behave in challenging traffic situations and provides collision and near-collision data that cannot easily be observed in the real world. Using evidence from crash data, experimental traffic scenarios are skilfully designed to simulate real world driving situations which pose a significant challenge for seniors or other groups of interest such as drivers with early dementia, Parkinson’s disease and vision impairments.

Simulator validation: A critical question in simulation research is the extent to which the simulator elicits the same driving behaviours that occur when driving in the real world – called behavioural validity. This research compares performance of drivers in simulators with their performance in instrumented vehicles under similar traffic/road conditions. This is important for simulator acceptance and credibility, and is vital when simulator performance influences real world outcomes, such as designing roads and road signs and making decisions about fitness to drive. MUARC’s reputation in simulator validation work is highly regarded and the team has contributed an invited chapter on this topic in a significant driving simulation book, Handbook of Driving Simulation for Engineering, Medicine and Psychology (edited by Fisher et al., published in 2011).

Pedestrian simulation: The team has extensive experience in applying simulation techniques in other road user settings including evaluation of pedestrian

Michelle Scully
BBSc(Hons), BMus
Research Associate

Louise Beasley
BEdSt, Cert Res Aged Services Mgmt
Research Associate, Ozcandrive Project

Elizabeth Jacobs
DipAppSci (Nursing Mngt), BNursing, GradCert (DiabEd & Hlth Care) Research Associate, Ozcandrive Project

Lorraine Atkinson
Administrative Manager, Ozcandrive Project

Elizabeth Varvaris
Administrative Assistant
behaviour. Recent work also includes the development of a successful training package to teach children to select safe gaps in traffic when crossing roads.

Instrumented cars, naturalistic driving and road user observation methods

For many research questions, it is important to make real-world observations of drivers, cyclists and pedestrians. These studies use covert monitoring of behaviour with various technologies including

- sophisticated instrumented vehicles equipped with cameras, eye-tracking equipment and data
- acquisition units which monitor speed, braking and steering
- in-vehicle camera systems to study child passenger out-of-position
- status and driver distraction
- fixed cameras to study cyclist and driver behaviour at intersections
- bicycle helmet-mounted cameras to study cyclist-driver behaviour on designated cycling routes.

Using these techniques, the team has gathered a rich data bank of behavioural and vehicle-based information. The team has rapidly expanding capabilities in this area and has completed world-leading research using naturalistic driving methods to evaluate seniors’ intersection driving, cyclists’ red-light running and involvement in near-crash and crash events, and children’s out-of-position status in child restraints.

Highlights and Outcomes

2011 was a productive year for the Behavioural Safety Science team. Significant funding was attracted through the Australian Research Council Linkage Grant scheme to expand our work in an international collaboration on safety of children in cars (led by Jude Charlton, Sjaan Koppel and Missy Rudin-Brown). Grants were also awarded to the team through the NRMA ACT Road Safety Trust to expand our research on a training resource for older drivers (led by Jennie Oxley) and in the area of cycling safety (led by Marilyn Johnson).

The team also secured a prestigious grant as part of a collaboration with European colleagues through the EU Erasmus Lifelong Learning Programme Grant Scheme for a project entitled DEVICE: DEsign for Vulnerable generations: Children and Elderly. The aim of the project is to identify and develop opportunities to enhance educational programs with ergonomics, usability concepts and user experience approaches to better address the needs of vulnerable generations, with a specific focus on children and older adults.

Ongoing projects included the Ozcadrive cohort study of older drivers; Return to driving following Traumatic Brain Injury; cycling safety; and, jointly with the Injury Analysis and Data Team, a survey of consumer choices of vehicles for MUARC Baseline sponsors.

Dr Charlton also contributed to the NHMRC ‘National Best Practice Guidelines on the safe restraint of children travelling in cars’ as an expert advisor on the Steering Committee. In November, with Jim Langford, Jude hosted a Round Table on Restricted Licenses in Perth, WA, attended by key road safety jurisdiction managers of older driver licensing, resulting in the development of a proposal for a national evaluation of the effectiveness of licensing restrictions for managing the safety of older (and impaired) drivers. In addition to her role of managing the Behavioural Safety Science Team’s research activities, Jude contributed to MIRI’s education and training as Coordinator of the Graduate Studies Program and supervised six PhD students.

Jim Langford continues to contribute to research in the older driver area: In addition to his participation in the Ozcadrive older driver cohort study, he was a senior investigator on several research projects for Austroads, VicRoads and the New Zealand Transport Agency. Jim contributed as expert advisor to a review of licensing and medical review practices with the Missouri Department of Transportation. Jim is currently completing PhD studies as a Monash staff candidate.

Dr Jennie Oxley contributes to research activities as a significant member of the team, through her supervision of postgraduate students, Marilyn Johnson, Roszalina Raml, Sarawathy Venkataraman and Kelly Bryden. Jennie also continues to play a leading role internationally in older driver research through her activities as co-chair of the United States Transportation Research Board (TRB) Sub-committee on Enhancing Older Women’s Safe Mobility. At the same time, Jennie maintains her primary role in advancing injury prevention research activities in Malaysia and throughout the region, as Associate Director, Regional Engagement.

The team’s achievements included the completion of a major report on medical conditions and driving (MUARC Report 300), commissioned by VicRoads. This research has informed the recent revisions of the Austroads Fitness to Drive guidelines and resulted in an invited presentation by Jude Charlton at the 5th International Fit to Drive, Traffic Expert Congress in The Hague in 2011. The team also contributed to major projects in the young driver area for Queensland Transport and VicRoads.

An important feature of the team’s work is knowledge translation, achieved through scientific publications. In 2011, team members co-authored eight peer reviewed publications in journal papers, conference proceedings and edited book chapters. Team researchers also communicated their scientific findings through seminars and workshops to the motor vehicle industry and health practitioners, presentations to teachers and parents, and regular communication with relevant State and Federal government departments. The media regularly asked team members to comment or write on older drivers, children, novice drivers and cyclists.

PhD students supervised by Dr Jude Charlton, Dr Jennie Oxley and Dr Sjaan Koppel also contributed to the team’s research activities in vulnerable road user behaviour: Hafez Alavi (pedestrian safety), Lisa Molnar (older driver self regulation), Marilyn Johnson (cycling safety), Carlyn Muir (vision impairment and driving), Rachel Mence (managing older driver safety); and PhD (Psychology) and DPsych candidates: Kelly Bryden (older drivers and wayfinding strategies), Karen Scally (Parkinson’s disease and driving); David Ralph (psychiatric illness and driving), James Gooden and Pam Ross (Traumatic Brain Injury and return to driving).
Research Highlights

Older drivers
With the baby boomer cohort about to enter old age, there is an urgent need to understand more about the next wave of older road users and how to effectively manage their safe mobility. The team’s research is centred around three broad research questions:

• How do we identify at-risk older drivers?
• What are the most effective solutions for managing at-risk older drivers?
• What is the full societal impact of reducing/stopping driving on the mobility, health and economic wellbeing of older drivers?

The following highlights a significant program of work addressing older driver safety:

ARC Linkage Grant: Ozcandrive

The broad aims of the project are to reduce vehicle-related injuries and deaths and improve the quality of life of older Australian drivers by extending their safe mobility. The project builds on the knowledge generated by two decades of older driver research at MUARC and a key outcome will be the development of evidence-based screening for safe driving.

The project is a collaboration between MUARC, Monash University Department of Medicine, La Trobe University, the University of Ottawa in Canada, VicRoads, the Victorian Department of Justice, the Victorian Transport Accident Commission, the New Zealand Road Safety Trust and the Victorian Transport Accident Commission, the New Zealand Road Safety Trust.

The following highlights a significant program of work addressing older driver safety:

ARC Linkage Grant: Ozcandrive

The broad aims of the project are to reduce vehicle-related injuries and deaths and improve the quality of life of older Australian drivers by extending their safe mobility. The project builds on the knowledge generated by two decades of older driver research at MUARC and a key outcome will be the development of evidence-based screening for safe driving.

The project is a collaboration between MUARC, Monash University Department of Medicine, La Trobe University, the University of Ottawa in Canada, VicRoads, the Victorian Department of Justice, the Victorian Transport Accident Commission, the New Zealand Road Safety Trust and Eastern Health.

Using a longitudinal study design, the project will track a cohort of 300 drivers aged 75+ in Australia and NZ and 1000 drivers aged 70+ at seven research centres throughout Canada, assessing changes in functional abilities, driving patterns and driving performance over five years.

Together, the two projects will involve about 1300 drivers and will study their health and driving patterns over five years. A novel component of the project is the use of in-vehicle data recording devices to assist in documenting the natural driving patterns of seniors.

Investigators are Drs Jude Charlton, Jim Langford, Sjaan Koppel, Morris Odell and Petris Darzins from Monash University, Drs Marilyn DiStefano and Wendy Macdonald from La Trobe University and Dr Shawn Marshall from Ottawa Hospital Research Institute.

The project team made significant achievements this year.

• By mid-2011 the team had achieved the target number of 250 drivers at the Melbourne site and in June, commenced Year 2 assessments.

• In addition to the Melbourne project site, Ozcandrive hosts a site in Wellington, New Zealand, coordinated by Opus International. Bill Frith and Jared Thomas lead the Wellington team with researchers Kate Mora, Abi Harding, Bob Stevenson and Grace Rive conducting participant assessments and installing vehicle GPS units. The NZ Team reached their full complement of 45 participants in mid-March.

• Dr Jude Charlton and Jim Langford travelled to Ottawa, Canada to attend the annual Candrive/Ozcandrive project meeting with international collaborators.

• Biannual Project Meetings of Partners and Investigators were held at MUARC in April and November.

• Undergraduate students Emma Owen (Monash Psych Hons), Amy Allen ACU Psych Hons), Duncan Joiner and Jason Manakis (Monash Aerospace Engineering students) joined MUARC on Vacation Research Scholarships and Fourth Year Engineering placements over the 2010-2011 summer. Monash undergraduate students Cara Dawson (Psychology), Kevin Mascarenhas and Johan Davydov (Engineering) also commenced as vacation research scholars in the summer of 2011-2012. The students have made an invaluable contribution on tasks including data quality control, GPS unit installations in participants’ vehicles and development of an electronic checklist for Driving Observation Schedule - the DOS App. Several of the students continue to work as valued members of the Ozcandrive team.

• The team hosted Candrive team visitors including Professor Michelle Porter and Glynys Smith from University of Winnipeg.

Postdoctoral Fellowship to study safe mobility of seniors
Dr Sjaan Koppel holds an Australian Research Council Australian Postdoctoral Fellowship – Industry. The fellowship is linked to the five-year older driver cohort study. The broad aim of Ozcandrive is to reduce vehicle related injuries and deaths and improve the quality of life of older Australian drivers by extending their safe mobility. However it is also important to note that growing evidence has identified a range of negative psychosocial and health consequences following driving cessation for older adults, including increased health problems and a higher likelihood of depression. As part of her fellowship, Sjaan will develop a parallel research program to improve the quality of life of older Australians following driving cessation. Sjaan will identify the key factors associated with psychological wellbeing following driving cessation to develop evidence-based guidelines to inform licensing authorities and healthcare professionals so they are able to assist older adults and their families in preventing or alleviating negative consequences following driving cessation, while assisting in a healthier transition from older driver to non-driver.

Australian Postgraduate Award – Industry Scholarship to study safe mobility of seniors
Rachel Mence commenced PhD candidature at MIRI in March 2011, taking up the Australian Postgraduate Award- Industry scholarship with the Ozcandrive project. Rachel’s project will focus on on-road driving performance, measured by the Driving Observation Schedule (DOS).

The task is designed to reflect a naturalistic driving experience, incorporating a 30-minute drive over familiar routes in the driver’s own vehicle. Rachel will refine the methods for recording and quantifying on-road driving behaviours, providing a snapshot of participants’ everyday driving. This will allow investigators to examine how driving behaviours change over time.

Children in cars: What children are really doing in the rear seat of cars and are they a source of distraction in the vehicle
Child restraints systems (CRS) for vehicles are designed to provide specialised protection for child occupants in the event of a crash. However, children do not sit perfectly still and upright while travelling in vehicles, potentially leading to inappropriate seating positions throughout their journey. This behaviour may compromise the safety benefits associated
with CRS and may distract the driver from the driving task and therefore affect driving performance.

In a world-first study, this project trialed a naturalistic, observational approach to examine how children are restrained and seated in their CRS while travelling in their car. The study was funded through the AutoCRC in partnership with GM Holden. Families with children aged between one and eight years old drove an instrumented ‘study vehicle’ on their regular trips for three weeks. All children used their regular CRS. A discrete video recording system in the vehicle provided images of the driver and front seat passenger, the rear seat child passengers and the traffic ahead.

The recordings inside and outside the vehicle were analysed to examine the children's behavior in their CRS and identify potential distracting activities, where ‘distraction’ was broadly defined as any activity that distracted the driver or competed for their attention while driving. Analyses revealed that children were out-of-position, and hence likely to be sub-optimally restrained, for around 60 per cent of the time during trip and 12 per cent of all distracting activities were child-occupant related (such as turning to look at children in the back seat, checking in the rear vision mirror, or passing items to their children). The findings highlight the need to raise awareness amongst parents that sub-optimal restraint use has serious implications for their child’s CRS effectiveness in the event of a crash. Parents need to be educated about the potential crash and injury risks associated with both child occupant-related and non-child occupant-related activities while driving their children. The preliminary research resulted in two publications.

In 2011 Dr Jude Chariton, Dr Sjaan Koppel and Dr Missy Rudin-Brown (Human Factors Team) assembled an international team of researchers to expand the child safety research program. Significant funding was secured through the ARC linkage scheme and the project was expected to commence in early 2012. The collaboration brings together researchers from MUARC, the Children’s Hospital of Philadelphia Research Institute, University of Michigan Transportation Research Institute and Chalmers University of Technology and industry partners Britax ChildCare, Autoliv, VicRoads, Transport Accident Commission, RACV, Proquip and General Motors Holden. The project will build on the findings of the pilot study using innovative naturalistic driving methods to observe and quantify the positions of child occupants in cars, identify the injury effects of out-of-position status and evaluate the impact of child passengers on driver distraction. Outcomes will be used to optimise vehicle and CRS design and develop targeted safety education strategies to mitigate injury to children in car crashes.

Medical conditions and driving
Following the successful first edition MUARC Report 213, a second edition of ‘The Influence of chronic illness on crash involvement of motor vehicle drivers ’ (MUARC Report 300), was commissioned by VicRoads. The report provides a comprehensive review of the literature pertaining to the influence of chronic illness and impairments on crash involvement. A risk rating system was applied to all medical conditions of interest. This provided a means of identifying those conditions that presented the greatest risk. Based on both new evidence and evidence cited in the 2004 first edition, MUARC Report 213, eight conditions were found to have at least a moderately elevated risk of crash involvement (relative risk greater than 2.0) compared with the irrelevant control group: alcohol abuse and dependence, dementia, epilepsy, multiple sclerosis, psychiatric disorders (considered as a group), schizophrenia, sleep apnoea and cataracts. Guidelines regarding fitness to drive from selected jurisdictions were also considered in the light of evidence for crash risk. These comparisons revealed a number of differences across the jurisdictions and highlighted some inconsistencies with the available evidence for crash risk. A number of recommendations were made for managing the risk of injury crashes associated with medical conditions. The findings of this review also highlighted the need for a cooperative international
approach to future research using population-based, prospective studies to advance scientific knowledge linking impairment from medical conditions and crash risk.

The report, released in late 2010, led to invited consultations for the revision to the Austroads, Assessing Fitness to Drive Guidelines and an invited paper presented at the Fit to Drive, 5th International Traffic Expert Congress, The Hague, April 2011.

Return to driving following Traumatic Brain Injury

More than two-thirds of persons with a traumatic brain injury (TBI) return to driving. Despite this, limited research investigating driving performance following TBI has been conducted. Dr Jude Charlton and colleagues from Monash School of Psychology, the Epworth Hospital, Lakehead University and the University of Ottawa formed a collaboration to examine the nature and causes of driving difficulties following TBI as a basis for developing more reliable and valid assessment procedures for readiness to return to driving. Funded through the joint Transport Accident Commission - Ontario Neurotrauma Foundation funding scheme, the project, ‘Safer roads to recovery: Assessing readiness for driving after traumatic brain injury’, will study driving performance of young drivers with brain injury’ in simulated, on-road and naturalistic driving conditions. Findings from this study will contribute to evidence for rehabilitation clinicians assessing driver readiness. This research will guide the development of more sensitive driving evaluation procedures and driver retraining programs, thereby contributing to improved safety and mobility for those with TBI who return to driving.

DEVICE: DEsign for Vulnerable generations: Children and Elderly

The overall aim of the DEVICE project is to bridge traditional industrial design programs with ergonomics, usability concepts and user experience approaches with a specific focus on vulnerable generations. The MUARC team will contribute to the project by reviewing innovative practices, defining gaps and identifying educational priorities in design for vulnerable generations in education, training and industry in the Australian context. The team will also explore opportunities for translation of best practice educational models in design for vulnerable groups to other geographic contexts. The project is funded under the EU Erasmus Lifelong Learning Programme Grant Scheme. Partners include U Bologna, U Modena et Reggio Emilia, Politecnico di Milano and Politecnico di Torino (COOR Consortium) and Loughborough, ReLab, Chalmers, Innovate 4 Future, Reggio Children, and Monash University.

Presentations

Dr Charlton presented on child safety and older driver issues at the several international conferences and symposia including

- Charlton, JL, Catchlove, M, Scully, M, Koppel, S (2011). Older Driver distraction: A naturalistic study of behavior at intersections. The Eye and the Auto, 12-14 September, Detroit, USA
- Charlton, JL. Odell, M, Mui, C, Devlin, A (2011) Visual field loss and intersection gap selection, The Eye and the Auto, 12-14 September, Detroit, USA
- Investigators’ and Partners’ Meeting for the ARC Linkage Ozcandrive Older Driver Cohort Study, 22 November, 2011, Monash University Accident Research Centre.
- Charlton, JL. (Forum leader) Cross-Cutting Research, MUARC Seminar, Older and Impaired Road Users. Monash University Accident Research Centre. 21 November.
- Charlton, JL and Langford, J. Restricted Licenses Round table for jurisdictional managers, licensing, 10 November, Perth Convention Centre, Perth, WA.
- Charlton, JL. Ozcandrive Project Update. Presentation to Candrive Investigators meeting. 24-25 October, Ottawa Hospital, Ottawa, Canada.
- Charlton, JL. Presentation on MUARC Behavioural Safety Science Research. University of California, Berkeley. PATH: Human Factors Research and Development, 14 October. Richmond, CA, USA
- Charlton, JL (2011). Children in Cars: A Naturalistic Observation Study. Presentation to GM North America 12 September, 2011 at The GM Renaissance Learning Centre, Detroit, MI, USA
- Charlton, JL. Keeping children safe in cars. Presentations to ReLab and University Modena e Reggio Emilia and Reggio Emilia School, Pedagogist Group, 11-12 April, Reggio Emilia, Italy.
- Charlton, JL. Older Driver research at MUARC. Research meeting and presentation to SWOV Researchers. 6 April, SWOV, Duiodoom, The Hague, The Netherlands.
• National Convention on Forensic Medicine and Science: Road Safety, National Institute of Forensic Medicine, 21-22 November, Kuala Lumpur.

Invited presentations

• ‘Injury prevention programs: The Australian experience and lessons we can share’ (Oxley)
• ‘Fitness to drive and mobility’ (Oxley)
• ‘Effect of alcohol and drugs on road safety’ (Oxley)
• Jamaludin & Oxley Injury Symposium (Institute of Health Management, Ministry of Health). Invited Presentation: ‘Reducing injuries: The role of research in developing and evaluating evidence-based solutions, November, Kuala Lumpur (Jamaludin & Oxley)
• Ramli AEA-PHAA post-graduate student conference, ‘Effectiveness of motorcycle helmets for preventing head and facial injuries, December WINNER: Best presentation for policy and practice (Ramli)

Staff membership of Boards and Committees

• Amy Gillett Foundation, Road Safety Advisory Committee (M. Johnson)
• Association for the Advancement of Automotive Medicine, Chicago, Illinois, Scientific Program Committee, Member (S. Koppel, J. Oxley)
• Australasian College of Road Safety (Victorian Chapter) Committee (J. Charlton, J. Oxley)
• BrainLink, Board of Directors (J. Charlton)
• Monash University Clayton Bicycle Strategy Steering Group (M. Johnson)
• Monash University Human Research Ethics Committee (MUHREC), Management Committee (M. Johnson)
• Technical Working Group and Steering Committee, NHMRC ‘National Best Practice Guidelines on the safe restraint of children travelling in cars’ (J. Charlton)
• US Transportation Research Board (TRB) Sub-committee Enhancing Older Women’s Safe Mobility (Co-chair: J. Oxley)
• International Advisory Panel, Institute for Mobility, Activity, and Participation (I-MAP) College of Public Health and Health Professions, University of Florida, USA (J. Charlton)
• Scientific Committee, International Conference (Elsevier) on Aging, Mobility and Quality of Life (AMQoL) (J. Charlton)

Top: Liz Jacobs and Louise Beasley, Ozcandrive Research Associates, changing the data cards in the in-car recording device in participants’ car.
Above: Dr Sjaan Koppel and Ozcandrive participant undertaking annual assessment for Ozcandrive project at the Eastern Health Peter James Centre.
Monash University Accident Research Foundation

The Monash University Council established the Accident Research Foundation on 16 December 1996.

As stated in the Regulations, the objects of the Foundation “shall be to support, encourage and promote the work of the Accident Research Centre generally, and to provide funds for research by the Centre aimed at preventing accidents and reducing injuries on the road, in the home, in sport and recreation, at work and in other places or activities ...”

The Monash University Accident Research Foundation has made scholarships available for students at MUARC for study in any of the principal research areas.

The Foundation supported two MUARC scholars during 2011.

John Lane Memorial Scholarship

Dr John Lane, recognised as the father of aviation safety in Australia, and a leader in road safety, died in January 1999. In recognition of Dr Lane’s contribution in the field of injury prevention, and as a personal tribute, the Trustees of the Foundation established the John Lane Memorial Scholarship. Robin Hutchinson held this scholarship in 2011 (see page 62).

Peter Vulcan Scholarship

Professor Peter Vulcan retired in 1998, bringing to an end 11 years of outstanding service as the champion and Founding Director of the Accident Research Centre. This award recognises his unique and distinguished contribution both to injury prevention and the Centre. No scholarship was awarded in 2011.

Safe Family Research Scholarship

The Amy Gillett Foundation was established in recognition of the champion Australian cyclist who died while training in Germany in 2005. Amy’s parents, Mary and Denis Safe, recognise that a growing number of cyclists are killed and injured on Australian roads each year. The Amy Gillett Foundation offers, in conjunction with the Monash University Accident Research Foundation, this scholarship to encourage research in this field. Marilyn Johnson held this scholarship in 2011 (see page 63).

C-MARC Curtin Monash Accident Research Centre

CMARC was established in late 2008-early 2009 as a partnership between Curtin University of Technology (Western Australia) and Monash University supported by the State of Western Australia. The Centre’s activities include:

• investigation of, and research into, the causes of road crashes and resulting injuries in Western Australia
• identification and evaluation of existing and potential measures in Australia and worldwide to prevent road crashes and resulting injury
• development of data and research findings on road crashes and their causes
• development of road safety strategies
• making recommendations to the State and its agencies in connection to road safety
• making public its findings and recommendations
• ensuring that all possible means of, and methods for, improving road safety in Western Australia are considered.

Associate Professor Brett Hughes took up his appointment as Director in 2010.
Human Factors

Human Factors is concerned with the application of what we know about people, their abilities, characteristics, and limitations to the design of equipment they use, environments in which they function, and jobs they perform. The Human Factors team applies models of system safety to the analysis of transportation and other safety-related issues to provide robust research outputs and policy guidance for our stakeholders and clients. Team members have backgrounds in experimental psychology, human factors, ergonomics, computer science, epidemiology, biomedical engineering, sports science, military and defence, and road safety policy.

MUARC’s Nebojša Tomasevic in the control room of the advanced driving simulator.
Expertise

Sound, theoretically-based models of system safety underpin our research, which focuses on a broad range of factors that shape and constrain operator behaviour, and how task, environmental and organisational factors influence performance.

Team projects in 2011 covered
- the road environment and its influence on speed selection and crash risk
- the safe system approach to collision investigation
- driver distraction
- road user situation awareness
- the design and evaluation of in-vehicle warning and information systems
- Human Machine Interface guidelines development
- motorcycle conspicuity and novice rider licensing systems
- speed and the effectiveness of speed countermeasures
- organisational influences on worker safety
- occupational safety
- safety of police vehicles
- perceptions and attitudes towards testing for alcohol and other drugs (AOD) in the aviation industry
- human factors and the safety of outdoor activities.

Resources

The team uses a variety of methods to support projects, including on-road testing, simulation, surveys, focus groups, structured interviews, stakeholder consultation, and human factors methods such as task and cognitive task analysis, and interface and usability assessment. While the MUARC suite of driving simulators (advanced, portable, and desktop varieties) continue to be the primary research platforms used by the team, the recent acquisition of on-road test vehicles has provided team members with the means to measure driver performance in naturalistic settings.

- The MUARC ORTeV (On-Road Test Vehicle) is a state-of-the-art mobile data acquisition system installed in a 2008 GM Holden VE Commodore sedan. Developed with the Cooperative Research Centre for Advanced Automotive Technology (AutoCRC), ORTeV collects data for both controlled and naturalistic studies. Vehicle, driver and eye tracking data are recorded via a sophisticated network of sensors and computers, while unobtrusive cameras record forward, peripheral, and rearward views of the road scene, and interior views of the driver and controls. A combined lane position and headway detection system has recently been implemented.
- The MUARC advanced driving simulator consists of a 2009 GM Holden VE Commodore sedan mounted on a three degrees-of-freedom motion base platform, with a curved projection screen providing a 180° horizontal and 40° vertical field-of-view. Forward vision is produced by three image generators using seamless blended projection onto a cylindrical screen, while a separate projection screen at the rear of the vehicle provides rear vision. Collection of driver performance and eye-tracking data is accomplished via a network of sensors and computers.
- The MUARC portable simulator is one of the world's most advanced portable PC-based driving simulators, featuring three forward scene LCD monitors, an adjustable vehicle seat, pedal assembly, dashboard and steering wheel. The simulator uses state-of-the-art 3D visuals creating an exceptionally detailed driving scene that can replicate the full range of driving conditions.
- The desktop simulator is a low-fidelity, PC-based system equipped with three 17-inch LCD monitors, a computer gaming steering wheel and brakes. It is well suited to methodologies that assess the driver distraction associated with performing in-vehicle tasks while driving, such as the lane-change test.

Highlights and Outcomes

In 2011 the team continued to refine its road safety human factors program while also strengthening its research in other areas of transportation and system safety.

National Competitive Grants

Level crossing research

Collisions between trains and vehicles at rail level crossings represent a significant issue that has safety, efficiency, and economic implications for the road and rail networks in Australia. In 2010 Mike Lenné, Paul Salmon and Tom Triggs (MUARC) and Neville Stanton (University of Southampton) received $560,000 over four years from the Australian Research Council for a study on level crossing safety which is supported by Victoria's key rail safety stakeholders including VicTrack, Public Transport Safety Victoria, Department of Transport Victoria, Transport Accident Commission, VicRoads and VLine. The team's research aims to provide an in-depth understanding of the road user, environmental and infrastructure-related factors that influence safety and performance at rail level crossings. The contracts were signed in 2011 and a number of studies began, many using our driving simulator and on-road test vehicles to better understand driver behaviour at passive and active crossings. Findings will be used to develop innovative countermeasures that will improve safety.
Situation Awareness Across Road User Groups
In 2011, Paul Salmon, Mike Lenné and Dr Guy Walker (Heriot Watt University, UK) obtained funding through the Australian Research Council’s Discovery program to explore situation awareness across drivers, cyclists, motorcyclists and pedestrians and how road design can better support awareness across these four distinct road user groups. The three-year research program involves the use of on-road and simulator-based studies to generate a model of situation awareness for road systems and produce and test new road designs, such as intersections, which facilitate awareness across all road users.

Motorcycle Safety
The 2-wheeler behaviour and safety (2-be-safe) project is a collaborative European Union study that aims to design and implement a broad-ranging research program that produces in-depth knowledge of motorcycle rider behaviour, performance, and safety. Funded by the European Commission, the project is coordinated by the French National Institute for Transport and Safety Research (INRETS) and administered by European Transport Research. It involves researchers from 26 European institutes and universities, all of whom have extensive experience with, and expertise in, motorcycle safety and access to existing motorcycle crash databases. MUARC involvement in the project is supported by an NHMRC-EU grant obtained by Mike Lenné in 2009.

MUARC involvement in two major activities was completed in 2011. The first was the report on effectiveness of a range of treatments to improve motorcycle conspicuity. The second work package, led by MUARC, involved the exploration of rider attitudes and experiences with on-board technologies. These reports are being finalised for delivery to the European Commission.

Prescription drugs and road safety
Collaborating with researchers at the University of Sydney and Royal Prince Alfred Hospital, Mike Lenné is a chief investigator on an NHMRC funded project that is exploring the effects of therapeutic doses of prescription codeine and benzodiazepines, alone and in combination with alcohol, on simulated driving performance. Analysis of the pilot study results from 2011 revealed significant impairment in driving performance in a dose-related manner and with poly-drug use. These preliminary results were presented at the Australasian Professional Society on Alcohol and other Drugs (APSAD) conference in Hobart in November.

Understanding and Preventing Led Outdoor Accidents Data System (UPLOADS)
Led by chief investigators Paul Salmon and Mike Lenné, and Erin Cassell and Caroline Finch from MIRI, the UPLOADS project is a collaboration between MUARC and the Australian led outdoor activity industry funded through the ARC Linkage program. The project, which began in 2011, involves the development and trial of an activity accident and injury surveillance system, the conduct of an in-depth study of led outdoor accidents and the development of a systems model of led outdoor activity accident causation. The overall aim of the project is to provide the led outdoor activity industry with a valid, theoretically...
underpinned system for collecting and analysing accident and injury data, the outputs of which will enhance the industry’s understanding of injury and injury causing incidents and inform the development of more effective accident and injury prevention efforts.

During 2011 the research team began to build the surveillance system by examining the potential use of various theoretical frameworks and accident analysis methods. This research was presented at the Australia Camps Association National Conference and also the International Camping Congress in Hong Kong.

**Monash Researcher Accelerator Program**

The Monash Researcher Accelerator Program (MRAP), which supports a cohort of Monash’s leading early career researchers, provided a valuable opportunity for Paul Salmon and Kristie Young to conduct fundamental research during 2011. Paul and Kristie conducted on-road studies to examine the relationship between driver distraction and driving

errors and the compatibility of situation awareness across different road users.

**Distraction and Driving Errors**

Despite an immense research effort devoted to studying driver distraction over the past two decades, there is still much to understand about its relationship with other aspects of human cognition and behaviour, such as its relationship with driving errors. Using MUARC’s advanced On-Road Test Vehicle (ORTeV), the project examined the types of driving errors that distraction contributes to and the role of system-wide factors (for example, road design) in moderating the distraction and error relationship. A total of 23 participants drove a pre-determined nine-kilometre urban route whilst their behaviour was recorded using methods including observation, verbal protocol analysis, FaceLAB eye tracking, and various driving performance measures. The study found that drivers were significantly more likely to make errors when distracted, although driving errors were also prevalent when not distracted. Interestingly, the nature of the errors made when distracted did not differ substantially from those made when not distracted, suggesting that, rather than making different types of errors, distracted drivers simply make a greater number of the same error types they make when not distracted.

**The Compatibility of Situation Awareness Across Road Users**

It is becoming evident that current approaches to road safety, road system design, and indeed research, are reductionist, individualistic, and do not acknowledge the fact that today’s road systems are used by a variety of diverse road user groups. Paul Salmon’s research is underpinned by the notion that further road safety achievements can only be made through a systems approach to road safety that considers all road user groups, not one in isolation. This study investigated the nature and compatibility of situation awareness across four road user groups: drivers, cyclists, motorcyclists and pedestrians. The aim was to test the assumption that different road users interpret the same road situations differently, and to explore the extent to which these interpretations are compatible with one another. The study involved participants from each group negotiating the same pre-defined route using an instrumented car/motorcycle/bicycle (pedestrians negotiated three intersections along the route on foot). Based on verbal protocols provided en-route, a network analysis procedure was used to describe and analyse participants’ situation awareness. The analysis revealed important differences both in the content and structure of each road user groups’ situation awareness, along with evidence of incompatibilities at intersections whereby drivers, motorcyclists and cyclists may come into conflict with one another.

**NHMRC Fellowship**

Paul Salmon was awarded an NHMRC post-doctoral training fellowship (public health) in 2010. This prestigious fellowship will provide the support for Paul to continue his innovative research into situation awareness and to explore its measurement and application across many areas in road transport. In 2011, Paul continued his fellowship research, which involved using on-road studies to examine situation awareness across a range of road user types.

**Simulation and On-Road Testing**

**Repeat Speeders Trial**

Another on-road trial continued in 2011 was the Repeat Speeders Trial, which was...
sponsored and coordinated by VicRoads. The project is due to be completed in the first half of 2012. The aim of the trial is to test and evaluate two interventions to assist recidivist speeders to reduce their speeding behaviour. The first intervention is the fitting of an advisory Intelligent Speed Adaptation (ISA) system, which is fitted along with a data logger to approximately 50 participant vehicles for three months. The data logger will remain in place for a further two months to assess if any effects of the ISA system persist after its removal. A control group comprising approximately 50 participants will also participate. These drivers will have their vehicle equipped with the data logger only for five months. The second intervention involves approximately 250 drivers attending a two-part behavioural intervention program to assist drivers to develop strategies and plans to reduce their speeding behaviour. A control group of approximately 250 drivers is being used to compare the effects of the behaviour change program on self-reported speeding. All participants involved in both interventions will complete pre- and post-intervention surveys designed to detect changes in self-reported speeding behaviour and attitudes as a result of the interventions.

Investigation into the effects of low-level blood alcohol content (BAC) on motorcycling performance
Throughout the year, the Human Factors team conducted research on behalf of Queensland’s Department of Transport and Main Roads looking at the effects of low-dose (e.g., less than .05% BAC) alcohol on motorcycling performance and the associated crash risks. The purpose of the overall research project was to investigate the effects of low doses of alcohol on motorcycle riding performance and behaviour, in order to explore the potential benefits of introducing a zero, or reduced, blood alcohol content requirement for all riders in Queensland. There were three components to the research: 1) a literature review and review of hospital emergency department admissions relating to low dose BACs, 2) a motorcycle simulator study and balance assessment with novice and experienced riders, and 3) the development of motorcycle rider crash risk curves and estimation of cost-benefits of introducing a reduced legal BAC requirement.

Strategic advice and consultancies

Police appointment belts, police vehicle seating systems and cabin layouts, and their roles in injuries to police – Phase Two
MUARC has been engaged by the Police Association of New South Wales over the past three years to conduct research into the contribution of police vehicle seat design, vehicle cabin layout, and police appointments to musculoskeletal injuries and pain in police officers who must travel in a vehicle for work. Work completed in 2011 included a literature review of vehicle cabin layouts and the placement of in-vehicle police equipment on driving safety and operational effectiveness, as well as a review of vehicle seat features in terms of their contribution to occupant comfort and safety. A survey of experts in vehicle seat design, ergonomics, and crashworthiness was also conducted to explore optimal features of driver and front passenger vehicle seat design, in order to best accommodate occupants’ carriage of police appointments, and minimise injuries from the interaction between vehicle crashworthiness features and police appointments in the event of a crash.

Operational Pilot of Electronic Work Diaries (EWDs) in heavy vehicles
The Human Factors team was engaged to provide both quantitative and qualitative research methodologies to address the broad aims of the Operational Pilot of Electronic Work Diaries (EWDs), which is being administered by NSW’s Roads and Maritime Services. The broad aims of the Operational Pilot are: 1) to assess the usability of the process and procedures for EWD systems by key user groups, including drivers, transport operators, enforcement officers, and back office auditors; 2) to investigate and inform the unresolved technical issues and questions related to the proposed specifications and policies; and 3) to assess the effectiveness, in terms of compliance to heavy vehicle driver fatigue regulations, of the EWD systems currently used by drivers and transport operators. During 2011, the Human Factors team conducted activities including: 1) attitudinal surveys of heavy vehicle drivers, operators, and enforcement officers, 2) focus groups with a selection of NSW and Victorian enforcement officers, 3) driver/operator/ EWD system provider targeted interviews with heavy vehicle drivers, operators, and EWD device manufacturers, and 4) an expert heuristic evaluation of available EWDs. In 2012, the team will continue work on the Operational Pilot, as it moves into the broader Stage Two.

Driver Distraction Regulatory Reform
In 2011, the team developed for VicRoads, a set of evidence-based recommendations for distraction regulatory reform in Australia to improve safety outcomes. This project used a range of methods to formulate evidence-based recommendations for regulatory change. These include a brief review of MUARC’s previous distraction reviews, a review of current distraction-based legislation in place in Australia, and consultation with representatives from state and federal jurisdictions, including members of the Australian Road Rules Maintenance Group (ARRMG), to discuss the suitability and enforceability of current legislation and the feasibility of proposed changes and additions to existing legislation.

Defence operations and training
The Human Factors team continued to conduct research and provide advice in support of the Australian Army, through the Land Operations Division of the Defence Science and Technology Organisation. Using our on-road test vehicle the team evaluated the impact of motion on the operation of in-vehicle touch screen battle management systems. Through understanding how motion influences operator interaction with the interface it was possible to make recommendations for enhanced use of the system and future design improvements. In a second activity the team conducted a preliminary analysis of the likely training gap between vehicle training programs and the projected new armoured vehicle capability. Through the application of contemporary human factors methods, and our own novel training technology model, it was possible to indicate where the training gaps would be, including the training requirements associated with new technologies and systems and the non-technical and teamwork skills required for crews to effectively operate. Due to various constraints imposed on training delivery this preliminary research indicates that training technologies, such as computer-based training and simulation, could play a key role in supporting training outcomes.

Presentations
Team members presented results from their research at many national and international conferences, including the 2011 Australasian Road Safety Research, Policing and Education Conference.
Team members have presented at a number of conferences on the prevention of accidents in led outdoor activities.
The collection, management, analysis, interpretation and presentation of data underpin a wide range of critical research areas in the safety sciences. The Injury Analysis and Data (IAD) Team comprises researchers with specialist training in the fields of numerical and behavioural sciences and has a strong focus on safety science research requiring a high degree of numerical acumen. The team focuses primarily on road safety research but also has broad experience in many other areas of safety research.

**Associate Director – MUARC**

Dr Stuart Newstead  
PhD, MSc, BSc(Hons)  
Senior Research Fellow

**Professor Max Cameron**  
PhD, MSc, BSc  
Adjunct Professor

**Dr Michael Fitzharris**  
PhD, BA, BSc(Hons)(Psych),  
Senior Research Fellow

Belinda Clark  
BA, BBSc(Hons)  
Research Fellow
Expertise

The IAD team has high-level specialist training in numerical sciences including applied statistics and applied mathematics as well as training in mechanical engineering and psychology. The team has specific topic-related expertise in:
- safety program and policy evaluation
- provision of policy and strategy advice, particularly in police enforcement programs
- vehicle safety rating evaluation and monitoring through analysis of real-world data
- the design, collection, management, linkage and high-level statistical analysis of injury data systems.

The team also has expertise in providing high-level statistical analysis and research design advice both within and outside MUARC.

Resources

The IAD team has physical and intellectual resources at its disposal to facilitate high-quality quantitative safety research. The team also has a range of high-level methodological expertise in safety research including:
- experimental design and sample size estimation
- design and conduct of surveys
- database design, management and processing
- database linkage
- high-level statistical analysis including the full range of modern statistical techniques
- economic analysis
- statistical consulting and statistical software.

The team also has significant topic-based expertise in a range of safety issues with particular focus on:
- road safety program evaluation
- vehicle safety evaluation, monitoring and policy setting
- police enforcement programs including policy and practice advice
- vulnerable and high-risk road user safety and countermeasures
- injury data analysis.

Databases

The IAD team holds or has used a wide range of databases relevant to road safety and broader public health research. Researchers have also developed an in-depth knowledge on the content, management, manipulation and analysis of these data sources along with a clear understanding of the strengths and limitations in the use of each for safety research. Databases include:
- comprehensive police reported road crash data from each Australian state and territory and road crash databases from New Zealand, United Kingdom, France, Germany, Finland and the United States. Police databases from Australia and New Zealand have been enhanced with detailed vehicle make and model information via an IAD team developed process of vehicle identification number decoding
- database of claims to the Transport Accident Commission for injury compensation from transport-related crashes. This data has been linked to the Victorian police reported crash data to enhance the capability to relate crash circumstances with detailed injury outcomes from the claims data
- driver licensing and infringement data linked to police reported crash data
- snapshots of vehicle registers from some Australian jurisdictions and New Zealand enhanced with detailed vehicle make and model information via the IAD VIN decoding process
- vehicle inspection data from the New Zealand Warrant of Fitness test that can be used to estimate vehicle travel through odometer readings and related to broad registered owner characteristics such as age, gender and broad postcode of residence. This data has also been enhanced with detailed vehicle make and model information from the New Zealand vehicle register
- the MUARC road safety countermeasure monitor data system, which collects information on key road safety activity outputs, socio-economic and exposure, factors in Victoria influencing road safety outcomes. Road safety activity output data covers major enforcement programs such as alcohol breath testing, camera-based automated enforcement and road safety-related publicity data. Socio-economic and exposure data include labour force statistics, an alcohol consumption index, population data and travel estimates derived from fuel sales data.

NB: Use of many databases is governed by approvals from the authorities supplying the data. Permission from the data supplier is generally required for use of any data in new research projects.

Highlights and Outcomes

Vehicle safety research
The Vehicle Safety Research Group Program
During 2011 the IAD team continued to conduct a strong program of vehicle
safety focused research, based on the
analysis of extensive real world data
sources including police crash reports
and injury insurance compensation claims
across Australia and New Zealand. The
program is supported by 15 sponsors
comprising federal and state government
agencies and motoring clubs across
Australia and New Zealand now working
under the title of the Vehicle Safety
Research Group (VSRG). Major 2011
outcomes include the annual Used Car
Safety Ratings, research into novice
drivers, and the Australasian New Car
Assessment Program.

The annual Used Car Safety Ratings
are a major output from the IAD Team
research program that provides consumer
advice on relative vehicle safety in the
event of a crash. The Used Car Safety
Ratings rate vehicles by make and
model on three major dimensions of
injury protection, (1) their ability to
protect their own occupant in a crash
(crashworthiness), (2) their ability to
protect other road users with which
they collide (aggressivity), and (3) the
total secondary safety index which gives
the combined crashworthiness and
aggressivity performance of a vehicle
with appropriate weighting given to
each component based on its relative
importance in leading to overall trauma
outcomes in a crash.

Australian and New Zealand road
authorities and motoring clubs make the
ratings available for consumers intending
to purchase a used vehicle to encourage
safety as a priority in selecting a vehicle.
In Victoria, the ratings contribute
significantly to the vehicle safety
information available at the Transport
Accident Commission’s howsafeisyourcar.com.au. The 2011 ratings update was
launched in July in Victoria by the State
Government Minister for Youth Affairs,
Ryan Smith, senior members of Victoria
Police and representative from RACV,
VicRoads and the TAC who jointly
sponsor the research program along with
the other 12 partner organisations from
across Australia and New Zealand.

Many Australasian jurisdictions
restrict novice drivers from driving high-
powered vehicles in their first few years
of driving, while those that do not, such
as Western Australia and New Zealand,
are considering the benefits of doing so.
To date, justification for imposing vehicle
restrictions on novice drivers has been
based on extremely limited evidence
as to the likely road trauma reductions
that would result from the initiative.
Using police reported crash data from
across Australia and New Zealand and
travel exposure data from New Zealand,
MUARC completed a comprehensive
evaluation of the likely road safety benefits
of restricting novice drivers from driving
high powered vehicles. It established
that the risk of a novice driver being

in a crash involving injury was almost
doubled when in a vehicle designated
as high-powered even after controlling
for the generally elevated crash risk of
high-powered vehicles when driven by
experienced drivers. Despite establishing
the elevated crash risk of novice drivers
in high-powered vehicles, the road safety
benefits of restricting novice drivers
from these vehicles was estimated to
be small due to the low prevalence of
novice drivers driving such vehicle in
jurisdictions currently without restrictions
and before introduction of the restrictions
in jurisdictions where they are currently
imposed. Both the Western Australian
and New Zealand Governments have
used key findings from the study in
deciding whether novice driver vehicle
restrictions will be implemented in these
jurisdictions.

The Australasian New Car Assessment
Program (ANCAP) is a key source of
information to consumers on the relative
safety of new vehicles available in the
Australasian market. It assesses relative
vehicle safety through conducting a series
of controlled laboratory crash tests using
anthropomorphic dummies in the vehicles
to assess injury outcomes. Significant
research has been undertaken to assess
the relationship between the ANCAP
assessments of relative vehicle safety and
those derived from the analysis of real
world data. A number of papers identified
the potential to improve the relationship
through changing the ANCAP scoring
protocol. Responding to this, the IAD
team completed a project during 2011
examining the different ways of re-scoring
the results of the ANCAP test procedures
to derive a summary measure that better
related with vehicle crashworthiness
assessments based on real world data.
Results of the analysis identified a new
summary ANCAP score that had a
substantially better correlation with real
world crashworthiness assessments but
also considered the potential conflicts
adopting such a scoring system might
have with the broader objectives and

The Used Car Safety Ratings brochure
provides consumers with information on the
safety of vehicles in the event of a crash.

Laurie Budd
MBiostat
Research Officer

Debra Judd
DipEd, BAppSci
Data Entry

Kim Woolley
CCRN, MN (Critical Care),
BN(Hons) Research Nurse

Ron Laemmie
Crash investigator
mechanisms of influence of the ANCAP program. Results of the research were presented to the ANCAP Board in July where they generated significant discussion about the future directions and marketing of the ANCAP program and its relationship with the Used Car Safety Ratings program.

Understanding key mechanisms influencing private buyer vehicle selection
Based on MUARC research (Newstead et al, 2004), the 2008-2010 action plan for the road safety strategy states that if all Victorian motorists updated their vehicles to the safest in market group, road trauma would be immediately reduced by up to one-third. Encouraging all new vehicle buyers to purchase the safest possible vehicle in each class, coupled with natural improvements in overall vehicle safety seen over time, offers the potential for vehicle safety improvements to contribute to over half the targeted savings in deaths and serious injuries aimed for in state and national road safety strategies.

In the past decade surveys have shown that there has been a significant increase in the level of private consumer interest in the safety performance of vehicles. This is likely to be at least in part due to campaigns such as ANCAP and the UCSRs along with associated campaigns and information. Despite this increased interest, the role that vehicle safety plays in consumers’ purchase decisions and the ultimate priority it is given is poorly understood.

This project aims to better understand the key mechanisms that drive consumer choice in vehicle selection and validate this against known profiles in vehicle ownership identified in vehicle registration patterns.

The project was conducted under the MUARC Baseline Research Program and was conducted in four phases:

Phase 1 was an analytical phase to establish the profile of new vehicle purchases by private buyers through the analysis of relevant registration and crash data sources.

Phase 2 involved a survey which targeted private new/used vehicle consumers both in the pre and post vehicle purchase phases to establish purchasing behaviours and priorities and how these change across the time of vehicle purchasing activity.

Phase 3 involved a review of the Swedish situation, where they appear to have achieved a good safety culture amongst private consumers, as well as manufacturers, to explore how such a culture might be established in Australia.

Phase 4, the final phase, was a further analytical phase to validate the results of the survey against real world consumer behaviour as well as examine the potential benefits of changing key buyer behaviours with respect to safety.

Results of the analysis have established some important disconnects between private vehicle buyer intentions and ultimate behaviour. Although private consumers often give high priority to vehicle safety in their pre-purchase priorities, all too often this does not translate into an actual safe vehicle purchase. The research results identify a number of priority areas for action in marketing vehicle safety information that will be fed into strategies being prepared by the key agencies.

Road safety data systems
Establishment of a Linked Road Safety Database with Serious Injury Measures for Victoria: This project involved MUARC collaboration with the TAC to establish a linked TAC claims and Victoria Police crash dataset for use in road safety research and for monitoring trends in serious injury in Victoria. Following specification of the content of the database, an ongoing linkage process by the TAC was established. In addition, a review of available measures of injury severity was completed and the most appropriate measures of serious injury that can be derived from the TAC linked dataset were identified. It was clear that more than one measure is required to properly articulate the full range of important injury outcome aspects and to monitor trends consistently over time.

Development of an Enhanced Road Safety Information System for Western Australia: This project focused on developing a framework for a road safety database system to inform the full range of data focused road safety questions. Specifically, the project aimed to define the content and scope of an ideal road safety data system based on the current “Safe System” paradigm for developing road safety policy and countermeasures, to compare this with the current road safety data systems available in WA and to map a path for translating the current system into the ideal one. As part of meeting these objectives, the team:

- developed a conceptual framework for defining an ideal, comprehensive and integrated road safety data system to support the Safe System paradigm
- determined specific road safety requirements for WA from the contextual framework

- previewed existing road safety data systems in WA including linkages between datasets
- identified key requirements for moving from the current WA road safety data system to the ideal system
- developed requirements for a multi-user database access system based on the ideal system proposed.

Moving towards a comprehensive and integrated road safety data system should result in improvement in the quality, completeness, relevance and timeliness of road crash and injury data collection, including the consistency of information from various sources and elimination of bias due to organisational responsibilities. Other benefits of an enhanced road safety information system as defined by this research include:

- the ability to easily monitor and report on key performance targets endorsed by Government as part of WA’s “Towards Zero” Road Safety Strategy 2008-2020
- facilitation of a range of new cutting edge research to inform Safe System practice capitalising on the enhanced scope and improved linkage of the available data
- assisting the development of new and highly informed road safety policy through the enhanced evidence base, additional reporting and improved data quality
- the capacity to answer ad hoc queries by key agencies, researchers, policy makers and members of the public
- the ability to use for specific planning and research purposes beyond road safety including infrastructure and transport planning.

Results of the project were presented to the Western Australian Road Safety Council in November and are already in use assisting the Office of Road Safety to identify a comprehensive list of intermediate outcome measures to give leading measures of road safety strategy performance in WA.

Countermeasure evaluation
Evaluation of the Crash Effects of the Fixed Digital Speed and Red Light Camera Program During 2011 the team completed a world-first evaluation of the crash effects of combined speed and red light enforcement at intersections using fixed digital technologies based on a sample of cameras operating at 79 intersections in Melbourne since the mid-2000s. Previous international studies had queried the
efficacy of camera-based red light only enforcement given they led to reductions in some crash types but increases in others. It was of interest in this study to see whether the combination of speed and red light enforcement at intersections produced more consistent benefits.

Analysis results estimated 26 per cent reduction in casualty crashes associated with the fixed digital speed and red light cameras and their associated signage across the whole intersections where they are located. Reductions on the intersection leg where the camera is located were estimated to be almost double this whilst a 44 per cent reduction in red light running related crashes specifically was also estimated. Importantly, the study identified no increase in any crash types, particularly rear end crashes as had been observed in the previous red light camera studies.

Results of the study were quoted extensively in the review of the Victorian traffic camera program undertaken by the Attorney General of Victoria. Results from the study have been directly responsible for a Government decision to expand the fixed digital speed and red light camera to a further 80 intersections.

Evaluation of the Crash Effects and Economic Benefits of Victoria's Safe Roads Infrastructure Program

In May 2004, the Victorian Government announced $130 million funding for the first stage of the Safer Road Infrastructure Program (SRIP1) to support the “Arrive Alive” road safety strategy that aimed for a 20 per cent reduction in fatalities and serious injuries by 2007. In recognition that SRIP1 alone would not achieve the 20 per cent target, in 2005, the Victorian Government announced $110 million funding for a second stage (SRIP2), focusing on intersection crashes. SRIP2 involved the treatment of 250 sites. Following the successful implementation of the Safer Road Infrastructure Program Stages 1 and 2, in May 2006 the Victorian Government announced the allocation of funds to implement the third stage of the Safer Road Infrastructure Program. SRIP3 is a 10-year program (2007-2017) with an indexed funding of $722 million. The IAD team has undertaken a comprehensive evaluation of the crash effects and economic benefits of each of the SRIP stages representing final evaluation for Stages 1 and 2 and preliminary evaluation of the initial projects in Stage 3. Evaluation has focused on estimating the effectiveness of SRIP by measuring the extent to which treatments were associated with reduced number of casualty crashes and serious casualty crashes at treated sites and comparing the monetary value to society of these crash savings to the cost of implementing and maintaining the SRIP treatments to derive net economic worth. As well as providing program level estimates of effectiveness, the study also estimated reductions in crash frequency for different types of specific treatments. Results have been presented to key VicRoads managers responsible for formulating and implementing the SRIP program. These managers will use the results to formulate future road infrastructure improvement programs, including the remainder of SRIP3, that deliver the largest crash reductions from the available funds.
A targeted review of the links between blood alcohol limits, alcohol sales and advertising on road trauma

The Royal Automobile Club (RAC) of Western Australia contracted the Curtin-Monash Accident Research Centre (C-MARC) to provide a critical review of the relevant literature on the links between blood alcohol limits, alcohol sales and advertising on alcohol-related road crashes. The aims of the review were 1) to document the effects of lower (less than the current legal 0.05 % BAC) doses of alcohol on road user performance and behaviour; 2) to document the effects of low doses of alcohol on road crash rates and outcomes; and 3) to review national and international published research studies linking the influence of alcohol trading hours, sales, and advertising on road crash rates and outcomes.

It was concluded that alcohol-related crash risk and the associated costs are significant and ongoing road safety issues in Australia. With the successful adoption of zero BAC limits for learner and probationary drivers and riders across Australia, it may now be an opportune time to consider a longer-term solution: to extend the zero BAC legislation for all drivers into their full licence period. Such a solution would only be effective, however, if the public were supportive of such legislation and if it was effectively enforced. Further research into appropriate social marketing messages would be needed before such restrictions could be put in place.

Policy advice on speed cameras

Professor Max Cameron was engaged by the NSW Audit Office to provide expert advice to the audit team during their 2011 review of speed cameras in NSW.

Presentations

- Clark, B, ‘Hooning’ around: A focus group exploration into the effectiveness of Vehicle Impoundment legislation, Presentation, Australasian Road Safety Research, Policing and Education Conference, November, Perth
- Newstead, S, Evaluation of the Effectiveness of Vehicle Side Impact Airbag Systems in Australasia, Presentation at the Monash Injury Research Institute Researcher Seminar, June
- Newstead, S, Potential for Improving the Relationship between ANCAP Ratings and Real World Data Derived Crashworthiness Ratings, Presentation to the ANCAP Board, July
- Newstead, S, Overview of the MUARC Injury Analysis and Data Team, Presentation to Indonesian Government Delegation, Monash Injury Research Institute, August
- Newstead, S, Quantifying the Effects of Safer Fleet Vehicle Purchases, Presentation to the Innovation Group Fleet Risk Seminar, August
- Newstead, S, Overview of the MUARC Injury Analysis and Data Team, Presentation to Chinese Government Road Safety Delegation, Monash Injury Research Institute, October
- Newstead, S., Potential for Improving the Relationship between ANCAP Ratings and Real World Data Derived Crashworthiness Ratings, Presentation, Australasian road safety research, policing and education conference, November, Perth.
- Newstead, S., Evaluation of Victoria’s Safer Roads Infrastructure Program: Stages 1, 2 and 3, Presentation to the TAC MARSCO Sub Board, November
- Newstead, S., Evaluation of Victoria’s Safer Roads Infrastructure Program: Stages 1, 2 and 3, Presentation to the Innovation Group Vehicle Safety – MUARC Perspectives Presentation to the 2011 VicRoads Vehicle Safety Planning Workshop, December
The Safe System Strategies and Infrastructure team strives to conduct high quality injury prevention research for translation into practical policies, programs and actions capable of delivering major reductions in severe trauma.

The safety performance of barriers is one of the team’s research interests.
The main areas of focus for the team's work in 2011 were:

- developing scientifically-based management systems for practical, efficient and strategic application of high-impact initiatives
- creating low-risk traffic environments for the most vulnerable road users, namely, pedestrians, motorcyclists and bicyclists
- identifying development and training needs for newly-licensed and returning motorcyclists.

The SSSI team comprises professional and administrative support staff spanning a variety of relevant backgrounds and areas of expertise including:

- road infrastructure design and operation
- psychology
- mechanical engineering
- biomechanics and vehicle safety
- industrial traffic management and safety
- statistical analysis
- physics, and
- strategy development and target setting.

Expertise

The SSSI Team is a multidisciplinary team comprised of a range of engineers (including transport, civil, vehicle safety and biomechanics), psychologists and statisticians. The team has experience in areas including identifying and understanding road safety injury mechanisms and risk factors, designing and evaluating countermeasure programs and translating new research knowledge into policy and practice. The team has specialist expertise in the areas of pedestrian and motorcyclist safety, and collaborates on in-depth crash investigations. Striving to meet the principles underpinning the Safe System vision ensures a high degree of innovation in the team's research outputs. The infrastructure development and Safe System approach adopted by the team has allowed many professional relationships to form. It has also allowed the development of international projects in countries including the Netherlands, New Zealand, Canada and Saudi Arabia.

Resources

The team typically utilises a variety of study methods including simulation, mathematical modelling, database development, survey administration and analysis, on-road countermeasure development and before-after evaluations of treatments.

A key strength of the team is its endeavours to develop practical ways to meet the aspirations of Australasia’s Safe System road safety vision. Opportunities continue to be developed in the areas of...
The team has worked on enhancing intersection design to meet Safe System standards.

road safety strategy development and target-setting, infrastructure design and the more effective management of travel speeds. Translating new research findings into practice also continues to receive special attention to assist decision-makers and system implementers derive the maximum safety value from their investments.

Highlights and Outcomes

The team’s focus on road safety strategy development and target-setting continued strongly in 2011, with work taking place at international, national and individual state and territory levels. Strategy development for the new Australian National Road Safety Strategy was completed mid-year. A process of modelling allowed a series of countermeasure packages to be compared in terms of cost and safety impact. Armed with this information, government stakeholders were well placed to make strategic decisions that helped to shape the strategy. A project was also completed for the New Zealand Transport Agency that involved the creation of a new subset of the METS model targeted specifically at optimising road and roadside safety investment strategies for the New Zealand national and local road networks. Finally, in conjunction with the George Institute in NSW, a strategy modelling exercise was carried out for the Northern Territory.

The SSSI team, in collaboration with the Human Factors team, has continued its work on enhancing intersection design and operation with a view to meeting Safe System standards. Having reviewed a number of current and new intersection designs to assess their compatibility with Safe System principles, work is well advanced on assessing several promising new designs, using MUARC’s driving simulator, as well micro-traffic simulation modelling to estimate operational impacts. Other designs already in use overseas have been endorsed for real-world trial and suitable trial locations are being sought. The trial will be evaluated according to the extent to which Safe System design criteria are being met.

Discussions have been held with representatives of the Capital Region Intersection Safety Partnership (CRISP) based in Edmonton, Canada on the SSSI team’s research activities in the area of Safe System intersection design. These discussions are expected to lead to the commencement of a research translation project with CRISP in 2012, the aim being to identify new designs capable of making a large and lasting reduction in injury risk at Edmonton’s many major urban intersections.

Together with Honda Australia Rider Training, the team continued to recruit motorcyclists for an on-road coaching program for new motorcyclists. The Motorcycle Safety Levy funded program was developed by the team for Victorian riders to assist in improving safety, and is the first of its kind in the world. The four-hour coaching program involves small groups of riders receiving feedback and advice on their riding by an experienced rider coach. The George Institute will evaluate the impact of the program on safety outcomes following completion of the trial in 2012.

Other team highlights in 2011 included

- significant editorial assistance to the OECD in the completion of a major report on making better provision for walking within the context of a sustainable transport system. The OECD funded project brought together the views of international experts from a number of highly motorised European countries. The report will make an important contribution to safe, healthy and sustainable forms of transport
- continuation of phase two of the Enhanced Crash investigation project. This five-year VicRoads-funded project entails in-depth investigation of motorcycle and passenger car crashes and focuses on the collection and assessment of potential contributory factors in crashes; collaborators on the project include Victoria Police, Ambulance Victoria, Country Fire Authority, State Emergency Service, Department of Health, local government authorities and VicRoads regional staff.

Strategic advice and consultancies

Members of the team continue to provide high-level advice on traffic safety to our clients and stakeholders in Australia and New Zealand, as well international visitors to MUARC. A number of such activities were undertaken in 2011 in NZ, with a particular focus on innovation in motorcyclist safety, and in road infrastructure design and operation in ways that will drive down the severe levels of road trauma across the country. Among the most promising opportunities to advise on road safety challenges within Australasia, was a collaboration with NZTA and Mr Torsten Bergh of the Swedish Transport Administration, who is an expert in applying ‘Vision Zero’ road design philosophy and practices. The outcomes of a series of workshops show great potential to cut road trauma if implemented on a system-wide scale.

Further expert advice was required of the SSSI Team for a major project funded by the Transport Accident Commission. Funds committed to the project amount to approximately $700 million over 10 years. It was deemed critical, therefore, that best practice is brought to bear in terms of effective innovative treatments and efficient implementation procedures. To this end, team members have continued to provide support to local road safety agencies based upon the best, most innovative and impactful measures known to be in use around the world.

Other activities, in addition to infrastructure investment strategies, included road safety strategy development and target-setting in two Australian
states, and speed management advice to agencies and interest groups, directly or indirectly, responsible for the achievement of road safety targets.

Presentations

- Candappa, N. Road Safety Presentation, Lecture, Presentation to second year civil engineering students, Melbourne
- Candappa, N. Wire Rope Barrier Effectiveness on Victorian Roads, Australasian Road Safety Research, Policing and Education Conference, Perth, 6-9 November
- Corben, B. Fast Facts for Road Myths: Speed limits are always safe speeds, RAdus Road Safety Science Public Event, Adelaide, 24 November
- Corben, B. Progress with Meeting Victoria’s Intersection Safety Challenge, Presentation to VicRoads, Melbourne,
- Corben, B. Safe Roads and Roadsides: A glimpse into the future, Australasian College of Road Safety National Conference’, Melbourne, 1-2 September
- Corben, B. Safe Roads and Roadsides: A glimpse into the future, Metropolitan Traffic Education Centre AGM’, Melbourne, 25 October
- Corben, B. The Critical Nature of Speed and Speeding, Presentation to VicPol, Melbourne, 14 July
- Corben, B. Towards a Safe Speed in Inner Melbourne, Monash University Accident Research Centre, Melbourne, 26 October
- Hillard, P. Managing Increasing Challenges in Motorcycle Safety: A motorcycle crash case control study, Australian Motorcycle Council Annual Conference, Melbourne, 13 -14 August
- Logan, D.B. Real World Crash Investigations, Lecture, Presentation to 3rd year Paramedic Studies students, Monash University Peninsula Campus, July
Expertise

As an Adjunct Professor based at Monash Prato Centre, Italy, Professor Brian Fildes was engaged in various European, North American and Middle East research and associated activities during 2011. Professor Fildes has a long history of research and teaching in vehicle engineering and driver behaviour. Since moving to the Monash Prato Centre, he has been involved in a number of international injury prevention research, evaluation and teaching activities in Europe.

Resources

MUARC Europe’s resources include people based in Prato, as well as others based in Melbourne who provide support for MUARC Europe’s research activities. The Italian team comprises Professor Fildes and local support and administration services in Italy with dedicated research assistance in Australia.

Highlights and Outcomes

Collaborative research

MUARC Europe aims to work collaboratively with other research organisations in Europe to enhance available resources and ensure that its activities are focused on critical issues in the region. A number of ongoing projects were undertaken and completed during 2011.

Benefits of ABS for Motorcycles: This project was undertaken in collaboration with Dr Jennie Oxley in Malaysia for VicRoads in Melbourne during 2010 to review likely effectiveness of Antilock Braking Systems (ABS) for motorcycles. Earlier research suggested ABS could provide a positive impact upon serious motorcycle accidents in Australia and elsewhere, and the study set out to explain the technology and the benefits already reported on its effectiveness at preventing crashes and injuries. A final report was presented to VicRoads early in 2011 containing study findings and recommendations including the need for further international research.

The MUNDS Study: Work continued on finalising the feasibility study analysis with additional data provided by other partners. In addition, a number of submissions were prepared and submitted for future funding through the ARC Linkage program in Australia and the FIA Foundation in France and the UK. Unfortunately, these submissions were unsuccessful and alternative sources of funding were explored for further technology analyses to be commenced in 2012.
Euro NCAP Review: The consumer advocacy group for new safer vehicles in Europe (Euro NCAP) commissioned Professor Fildes to undertake an analysis of the safety potential of their whiplash test protocol. A Stage 1 report was submitted to Euro NCAP outlining possible improvements and the need for additional research. This study is expected to continue into 2012.

UK Transport Study: Professor Fildes is a team member of the UK Collaborative Study aimed at ‘Improving Safety for Older Public Transport Users’. The study is managed by the Transport Safety Research Centre (TSRC) at Loughborough University and sets out to examine the scope of injuries to older people while using public transport. MUARC’s management of the Victorian Emergency Medical System has helped identify key issues of relevance in Australia and is especially useful for comparison with local data held in the UK.

Licensing Demerits: MUARC Europe is also a partner in the Canadian study examining young and older driver licensing issues internationally. Professor Fildes has provided a chapter of the report on a jurisdictional overview to the report to help guide the Ontario Ministry of Transport in their present deliberations in these areas.

Academic activities

A key strategy for establishing MUARC in Europe was to become engaged in a series of academic activities in Europe. Professor Fildes was offered a three-year Visiting Professorship at the TSRC at Loughborough to assist with research projects and their graduate studies teaching program in road safety. Consequently, he visits the TSRC three times each year and assists as required.

During 2011, Professor Fildes was involved in the supervision of international and local PhD graduate students. These comprised Matteo Rizzi in Europe, Moza Tahnoun in the UAE, and Clay Douglas and Carlyn Muir in Australia. Two of these students have since graduated.

Professor Fildes was involved in the establishment of a Masters degree course in automotive engineering at the University of Loughborough during 2011 and will be a guest lecturer in several of the course modules when it commences in 2012.

Conferences and meetings

Professor Fildes participated in a number of conferences during 2011 to engage with European and international networks. These included the Enhanced Safety of Vehicles (ESV) conference in Washington DC, the Association for the Advancement of Automotive Medicine (AAAM) Conference in Paris, France, the Canadian Multidisciplinary Road Safety Conference (CMRSC) in Halifax, Nova Scotia, and the 8th International Conference Protection of children in cars in Germany in December.

Professor Fildes was instrumental in helping to arrange a two-day Child Safety workshop at the Monash Centre in Prato, Italy, in conjunction with the Children’s Hospital of Philadelphia. The workshop involved more than 20 international experts from seven countries. The workshop aimed to identify research needs and priorities in child safety in automobiles. The findings from the report were presented as a keynote address at the 10th Child Safety conference in Munich in December.

Strategic advice and consultations

A research project was undertaken for the Australian Institute of Motor Sport Safety (AIMSS) to examine the potential safety benefits of new safety technologies for V8 Supercars in Australia and overseas. Several progress reports were submitted to AIMSS and FIA (France) and a final report was submitted to the client early in 2011 with a recommendation of the need for a full detailed benefit analysis to be conducted on the likely savings in injuries for proposed new safety technologies.

One of the benefits that MUARC Europe offered is to work with the local community on helping them achieve real societal benefits from rigorous scientific research and best practice solutions to priority safety problems. Professor Fildes and other MUARC officers met with the local Commune and Provence in Prato to help them develop a Strategic Safety plan for the region. While development has been slow given changes in government and councillors, steady progress towards this objective was achieved this year.

In addition, several meetings were held with officers of the Automobile Club of Italy (ACI) on obtaining access to national and local road crash databases, necessary to help the local community identify the scope and details of the safety problem in Italy. Consequently, a number of joint papers have now been prepared and published at local and European meetings, showing the problems to Vulnerable Road Users in the area.

Presentations

• Fildes; The Prato strategy, Provincial Offices, Prato, Italy, January
• Fildes & Keall; MUNDS Feasibility: ESC effectiveness, MUNDS Meeting, Brussels, January
• Fildes; Biomechanics of Injury, FORD Victoria, February
• Fildes, et al.; A Comparison of Older Pedestrian Safety in Australia, Canada, Italy and Malaysia CMRSC Conference, Halifax, May
• Fildes; Good to Great, Workshop presentation, Abu Dhabi, UAE May
• Fildes; Child restraint in a far side crash, Prato Workshop, September
• Fildes; A Review of Injury Scoring Systems, Injury Biomechanics course, AAAM Conference, Paris, October
• Fildes; Human Factors Research in Vehicle Safety, Guest Lecture, Chalmers Engineering students, Gothenborg, Sweden, November
• Fildes; Assessing the Benefits of Vehicle Safety Technologies, Guest Lecture, Chalmers Engineering students, Gothenborg, Sweden, November
• Fildes; Protection of Occupants in Far side Impacts, Invited Address, SAFER Centre, Gothenborg, Sweden, November
• Fildes et al; Child restraint in a far side crash, Child Conference, Munich, December
Since its inception in 2008, MUARC Malaysia has established itself as a research-intensive node of MIRI/MUARC in the Asian region. Through its formative years, MUARC Malaysia has established networks and collaborations with key stakeholders and has developed a suite of research activities that focus on achieving real improvements in the injury-related health of the population in the Asian region. 2011 has been a significant year for MUARC Malaysia in terms of growth, continuing high-impact research activities and outcomes, capacity building and enhancing partnerships and networks with key stakeholders, organisations and researchers.

Expertise

Our staff and students
MUARC Malaysia’s capacity building activities remain a core undertaking at the centre and have continued in 2011. During 2011 we welcomed a new staff member, Ms Ginarthini Pachalai, who joined our team as a Research Assistant. Gina holds a Bachelor of Biomedicine (Hons) (University College of Technology and Management Malaysia) and previously worked as a Research Assistant at Emergency Trauma Department, Hospital Tengku Ampuan Rahimah, Klang, on the National Trauma Database.

Our HDR students are continuing and are progressing well with their projects.

Dr Roszalina Ramli is in her final year of PhD candidature. Her study examines issues contributing to motorcycle injuries, particularly the effect of helmet design and wearing rates on craniomaxillofacial injuries, using a prospective case-series study design of injured motorcyclists presenting to major hospitals in the Klang Valley (Supervisors: Professor Rod McClure, Dr Jennie Oxley, Dr Peter Hillard, Professor Sadullah Farhan). Major achievements in 2011 include:

- completion of data collection
- data analysis underway
- visit to Melbourne
- presentation: AEA-PHAA Post-graduate Student Conference, Latrobe University. Winner of the best paper on translating research into policy and practice.

Ms Saraswathy Venkataraman joined the team as a PhD candidate in May. Saraswathy has a background in Occupational Therapy and her research interest is in falls in the elderly. Her research program examines the risk factors for falls and long-term consequences amongst the elderly, particularly those living in nursing and shelter homes in the Klang Valley. Saraswathy has commenced the first phase of her research, a survey aimed to understand the broad nature of nursing and shelter home facilities in the Klang Valley.

The outcomes of this phase will guide the development of subsequent phases of her research. (Supervisors: Dr Jennie Oxley, Professor Louise Farnworth, Dr Lesley Day, Professor Rusli bin Nordin).
Mr Edwin Sim also joined the team as a PhD candidate. He is enrolled in the School of Engineering, Sunway Campus and co-supervised by MUARC Melbourne academics. Edwin’s interest is vehicle safety and his research addresses issues surrounding design of Electronic Stability Control (ESC). Detection of the handling limit of the tri-dynamics effects of the three parameters is crucial. There is a need for substantial improvements to existing systems via integration of the driver, ESC, robust control technique using sliding mode observer and practical vehicle mode detection scheme to significantly increase the contribution to the main goal of crash prevention. (Supervisors: Dr Edwin Tan, Dr David Logan and A/Prof Yang Soo Siang).

Ms Wan Mahirah Balqis is an Honours student, enrolled in School of Community Health, Department of Medicine, Universiti Putra Malaysia. Balqis’s thesis addressed fatigue and sleepiness amongst truck drivers in Malaysia. She used survey techniques, a sleep log and measures of BMI and sleepiness amongst 86 truck drivers. The findings revealed some characteristics of truck drivers who may be at increased risk of crash involvement such as lack of sleep, poor diet, and driver experience. The thesis was examined and passed in July 2011. (Supervisors: Dr Kulanathan K C Mani, Dr Jennie Oxley)

Mr Mohammad Najmudin Bin Mansor also joined our team as a Masters student, enrolled at Universiti Teknologi Malaysia, Johor Bahru. Najmudin’s research project addresses cultural differences in behaviour and attitudes toward road safety and crash risk in JB. Najmudin commenced his studies in September and data collection is planned to commence early 2012. (Supervisors: Professor Megat Mohamed Ghazali, Dr Jennie Oxley)

## Highlights

During 2011, the MUARC Malaysia office made a significant move within Sunway Campus from the School of Engineering to the School of Medicine and Health Sciences, Global Public Health Unit. The support from the Sunway Campus Research Committee and the Schools has made this a smooth transition and has provided enhanced support and resources for our staff, students, research activities and outputs.

In addition, during 2011 MUARC Malaysia entered into a transition phase to be a wholly Sunway-based research centre, managed, staffed and funded within the Sunway Campus, and maintaining strong intellectual links with MIRI and MUARC Melbourne. This has involved development of strategic documents for the long-term success and viability of MUARC Malaysia, extensive discussions and agreements with the Campus Research Committees, and advertisement for a Sunway-based Head, Injury Prevention Unit.

This transition is ongoing and we anticipate that, in 2012, our critical mass will have increased, with the appointment of Head, Injury Prevention Unit, and we will continue to increase research income and research activities, staff and student numbers and capacity building activities with the development of high-impact lecture series and short courses.

Through our collaborations with key stakeholders and our research activities, we have been given access to a number of important injury databases, such as the M-ROADS, Police-reported crash database, maintained by the Malaysian Institute of Road Safety, the National Trauma Database, as well as a Child Injury Database developed by the Institute of Health Management, Ministry of Health.

## Research activities and projects

During 2011 work continued on existing projects and some new projects commenced.

**Evaluation of Child Injury Prevention Interventions in Viet Nam (UNICEF, Viet Nam):** UNICEF Viet Nam, in conjunction with the Vietnamese Government and non-Government organisations and community groups implemented a large-scale Child Injury Prevention (CIP) program in six selected Provinces. The CIP program addressed key injury priority areas in Viet Nam, using a human rights based approach within communities and engaging key national and provincial groups. The output of the CIP project involved four key areas of intervention, namely i) increased public awareness, positive attitude change and skill building, ii) strengthened capacity of national and local authorities, iii) development, improvement and enforcement of appropriate legislation, and iv) provision of a safer environment to mitigate injury risks.

MUARC Melbourne and MUARC Malaysia undertook an evaluation of the CIP initiatives with the overall aims to i) measure the effectiveness of the program in achieving its main aims and objectives, that is, to reduce the morbidity and mortality caused by injuries among children in Viet Nam, ii) understand the key facilitators and barriers in the process of implementation for each of the program phases (planning, implementation, delivery, capacity building, etc), and iii) provide recommendations for future programming of CIP interventions.

A two-staged evaluation was undertaken to assess the above aims and included i) a review of documents and publications outlining the implementation of the program and interviews with key partners and organisations, and ii) a comparative analysis of injury mortality and morbidity.
data, comparing injury data between the intervention and non-intervention communities pre- and post-intervention. The findings highlighted important information related to the effectiveness of the CIP program in Vietnam.


**Keeping children safe in vehicles** (Sunway Campus Major Internal Grant): This study addressed issues of child protection in vehicles, particularly the contribution of non-wearing of seatbelts and helmets amongst children, through observational and survey techniques. The findings revealed extremely low seatbelt and helmet use amongst young children in the Klang Valley as well as lack of knowledge amongst parents of the importance of and ways to protect children while travelling. Preliminary findings and recommendations were presented at the Injury Workshop, Ministry of Health Malaysia.

**Motorcycle-related crashes amongst children** (Australia-Malaysia Institute and Universiti Kebangsaan Internal Research Grants): This study, in collaboration with Hospital University Kebangsaan Malaysia (HUKM), was conducted to understand more fully the contributing factors to child injuries as a result of a motorcycle crash, by examining mass crash data between 2007-2010 (data provided by MIROS), extracting data from hospital records and interviewing parents of a sample of children admitted to hospital. Data collection and analysis is ongoing. MUARC ran a two-day short course: ‘Introduction to statistics – from principles to practice’ (Michael Fitzharris), held at Sunway Campus and attended by UKM clinical and research staff, MUARC Malaysia research staff and PhD students. A paper is in preparation analysing crash data.

**Development of videos on workplace safety issues** (SOCSO and FMM): These activities, in partnership with SOCSO, FMM and the Sunway Occupational Health and Safety Branch, involved the production of four educational videos targeting employees. The videos addressed three high-priority areas of workplace injuries in Malaysia, following examination of claims data and developed to raise the awareness of issues amongst employees and provide strategies and tips for improved policies, practices, behaviour and environments in the workplace with regard to i) slips, trips and falls, ii) motorcycle commuting crashes, iii) hazardous chemicals, and iv) ergonomic injuries.

- Video on motorcycle commuting crashes was submitted to the International Film and Multimedia Festival, 19th World Congress on Safety and Health at Work, Istanbul. From over 170 international entries, the video won second place. The team won a Sunway PVC Award for Excellence in Research, Teaching and Administration for the production of the first three videos.

**Contributing factors to young driver/ rider crash risk** (MIROS): In partnership with MIROS, this study addresses young driver safety and involves two phases: i) examination of mass fatality crash data 2007-2010, and ii) case-control study to understand contributing factors to crash risk.

- Paper in preparation analysing crash data
- Case-control study data collection to commence 2012

**Contributing factors to child pedestrian collisions** (Ministry of Higher Education, Fundamental Research Grant Scheme): This study addresses child pedestrian collisions and aims to understand contributing factors to crashes by analysing crash data and in-depth interviews.


**Effect of cultural differences on road safety, driving behaviour and crash risk** (Universiti Teknologi Malaysia [UTM] Internal Grant, Johor Bahru). This project, a collaboration between MUARC Malaysia, Business Department of Management, Faculty of Business and Economics Monash University and UTM, takes a first major step in addressing road safety in Johor Bahru. It will provide much needed information on cultural differences in attitudes to road safety, driving behaviour, crash experiences and crash risk and will identify high-risk populations. A major component of this project is for Monash University to provide a suite of short courses during 2012, including Ethics in Research, Interview Techniques and Introduction to Statistics.

**IPEN: International Study of Built Environment, Physical Activity and Obesity** (National Institute of Health, US): In collaboration with SHARM, Institut Sukan Negara (Sports, Health Activity Research Malaysia, National Institute of Sport), San Diego State University and international collaborators, we have attracted funds from NIH (US) to include Malaysia as a contributing country to this study which aims to examine the role of the built environment on level of physical activity amongst adults. Funding will be provided for the project to commence in 2013.

**Publications and presentations**

- Ramli, R, Ng, L, Ng, F, Rahman, N, &


Oxley, J 2011, ‘Fitness to drive and mobility’, [Invited presentation], National Convention on Forensic Medicine and Science: Road Safety, National Institute of Forensic Medicine, November, Kuala Lumpur.


Establishing networks

An important step in establishing the office has been to engage local groups to both support research activities financially and to collaborate as research partners. The office has continued to expand our collaborations with government, local organisations and stakeholders involved in various injury prevention activities. Establishing these solid networks has ensured a strong presence in the region, fostered clear partnerships and success in attracting funding sources. Some of the key organisations with which we have relationships are:

- Government: Ministry of Transport; Ministry of Health; Social Security Organisation; National Institute of Sport; Office of Road Safety; Malaysian Institute of Road Safety; Australia-Malaysia Institute; Standards and Industrial Research Institute Malaysia; and Johor State Investment Centre.
- NGOs and industry: UNICEF; Malaysian Global Road Safety Partnership; Federation of Malaysian Manufacturers; AAA; Shell Malaysia; Perodua; and Proton.
- University and other research bodies: Hospital Universiti Kebangsaan Malaysia; Centre for Vehicle Technology; Universiti Tunku Abdul Rahman; Iskandar Malaysia UTM Research Centre (IMREC); and Universiti Technology Malaysia (Johor); National Trauma Database and Sungei Buloh Trauma Hospital; General Hospital KL; Universiti Putra Malaysia, Universiti Sains Malaysia, University Malaya, Sunway Campus researchers (Schools of Medicine and Health Sciences, IT and Engineering), Monash Australia researchers (e.g., Child Abuse Prevention Research Australia, Department of Occupational Therapy).

Capacity building

Encouragement and promotion of MUARC’s Higher Degree Research program continues and the Malaysia office supports ongoing applications to undertake HDR candidature. A number of activities have been undertaken to achieve this including contributions to short courses, minor undergraduate research projects, and presentations to various organisations.

2012 and beyond

MUARC Malaysia has made good inroads in 2011 to consolidate itself as a collaborative injury prevention research unit in Malaysia, undertaking funded research activities in priority injury prevention areas in Malaysia and the region. This will continue and expand in the coming years. The goals for MUARC Malaysia in 2012 and beyond are to consolidate the progress we have made with the aim to become a fully functional, self-sustaining research centre comprising long-term research partnerships with local organisations and stakeholders, as well as translating these collaborations into large-scale research programs.
Since its establishment in mid-2008 on the Monash South Africa campus at Ruimsig (Johannesburg), the Injury Prevention and Safety Promotion (IPSP) Research Node of MUARC has been active in developing collaborations throughout southern Africa. Activities have been focused on the conduct of evidence-based road safety research and data systems strengthening.

While the IPSP entered a short hiatus after the return of its Foundation Associate Director, Dr Michael Fitzharris, to the Monash University Clayton Campus, the IPSP continued to receive significant support from the Deputy Pro-Vice Chancellor of Research, Associate Professor Dina Burger, and Monash South Africa more broadly.

During 2011 the IPSP was fully integrated into the newly established Monash Africa Centre. With this local commitment and engagement with MUARC in Australia, the academic program continued to develop, with priorities set around those identified during the Monash Africa Centre Road Safety Forum, held in late 2010.

Research activities and collaborations

Program in Tanzania
Following the signing of the Memorandum of Understanding with the Ministry of Home Affairs, the development of the research program remained the core focus. Collaborative project concepts were developed relating to areas of crash statistics, health data systems and enforcement. Funding is being sought to support these projects.

Program in Botswana
Research continued on a longitudinal study of the association between road laws and regulations and road traffic crashes. Much of the time was spent on data gathering with analysis to follow in 2012. Project partners include the University of Botswana Trauma Working Group (Dr Andrew Kestler, Dr Miriam Sebego) and the Botswana Police Service (Mr Brunoh Paledi, Director, Traffic Division). The program in Botswana was initially developed with the support of a Monash University International Strategic Grant, awarded to Dr Diana Bowman, Faculty of Law, and Dr Fitzharris, with further funding being sought from a range of international partners.

Program in Namibia
Following the success of the injury surveillance program pilot study conducted in 4 hospitals in Windhoek, further practical research programs aimed at informing road safety policy and the activities of the Motor Vehicle Accident Fund of Namibia were developed and prioritised for 2012. Dr Fitzharris continued to provide support to the MVA Fund in their annual reporting of crash statistics.

Community Relationships
During 2011, the IPSP and Monash University continued to support the activities of the Global Road Safety Partnership, which works with a range of stakeholders in South Africa to promote road safety.

2012 and beyond
The goals for 2012 are to secure research grants and commence a number of the identified projects in Namibia, Botswana and Tanzania, while continuing to develop educational programs through the Monash South Africa Campus and the broader Monash family. The enrolment of at least 2 higher degree students is expected in early 2012, underlining the commitment to building road safety knowledge capacity on the continent.
## Statement of Income and Expenditure

From 1 January 2011 to 31 December 2011

<table>
<thead>
<tr>
<th>Notes</th>
<th>$</th>
<th>$</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Balance as at 1st January 2011</strong></td>
<td></td>
<td></td>
<td>1,113,083</td>
</tr>
<tr>
<td>Add: Adjustment to Opening Balance</td>
<td>1</td>
<td></td>
<td>302,013</td>
</tr>
<tr>
<td>Adjusted Opening Balance:</td>
<td></td>
<td></td>
<td>1,415,096</td>
</tr>
<tr>
<td><strong>INCOME</strong></td>
<td></td>
<td></td>
<td>9,771,439</td>
</tr>
<tr>
<td>DEEWR</td>
<td>500,442</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research</td>
<td>6,452,810</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian Research Council</td>
<td>633,757</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Health and Medical Research</td>
<td>980,987</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State Government Research</td>
<td>3,761,872</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commonwealth Government Research</td>
<td>166,369</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Government Research</td>
<td>83,385</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry Australia Contracts</td>
<td>311,847</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry Australia Grants</td>
<td>106,992</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian Industry Donations</td>
<td>71,250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commonwealth Government Research</td>
<td>166,369</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry International Research</td>
<td>199,965</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry International Competitive Research</td>
<td>121,386</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-operative Research Centres</td>
<td>15,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>740,259</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal Grants (Mon Research Support/Strat Ini)</td>
<td>2</td>
<td>1,950,508</td>
<td></td>
</tr>
<tr>
<td>Other (Incl Sale of Assets, Student Fees, Transfers)</td>
<td>127,420</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EXPENDITURE</strong></td>
<td></td>
<td></td>
<td>10,051,150</td>
</tr>
<tr>
<td>Salaries and Related Expenditure</td>
<td>6,286,813</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial and Administration</td>
<td>632,871</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Related</td>
<td>109,261</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure Related</td>
<td>207,201</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central Support Services – Overhead Costs</td>
<td>2,072,966</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Operating Expenditure</td>
<td>742,038</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Balance as 31st December 2011</strong></td>
<td></td>
<td></td>
<td>1,135,385</td>
</tr>
</tbody>
</table>

Notes:
1. CAPRA funds as at 1 January 2011 transferred from Faculty of Medicine to MIRI
2. Accommodation and other services which were previously supplied as in-kind support have been replaced as Central Support Services-Overhead Costs. The University has also provided a transfer of funds to part offset these charges
3. Includes payments to consultants

The Institute’s Statement of Income and Expenditure has been certified to be in accordance with the University’s Accounting and Financial Reporting System by the Office of the Vice-President (Finance). Where required as a condition of funding grants, accounts will be audited by independent external auditors. They have been subjected to Government audit as part of the University’s annual accounts for the calendar year 2011.

Footnote: It should be noted that the Institute operates on a calendar financial year and its revenue and expenditure are, for the most part, project related and several projects cross fixed reporting periods and financial years. The apparent “surplus” mostly reflects grant and contract income received in 2011 for expenditure that will be incurred in 2012.

Certified Correct
JOEL CHIBERT
Director, Research and Revenue Accounting Services
MIRI would like to thank the following people for their valuable contribution to the research program as external members on Project Advisory Committees, Project Steering Committees and Project Working Groups.

**Assessing community attitudes to speed limits**
- Colin Anderson
  Department for Transport, Energy and Infrastructure, South Australia
- Samantha Cockfield
  Transport Accident Commission, Victoria (TAC)
- Angela Conway, David Edmiston, Jonathan McGuffie
  Department of Infrastructure, Energy & Resources, Tasmania
- Julie Holmes
  Department for Transport, Energy and Infrastructure, South Australia
- Sue Hellyer
  Office of Road Safety, Western Australia
- James Holgate
  VicRoads
- Damian MacDonald
  Department of Justice, Victoria

**Observers**
- Mike Hammer
  GM-Holden
- Steve Cutis
  GM-Holden
- Bill Bridgens
  Ford Motor Company of Australia
- Angela Conway
  Department of Infrastructure, Energy and Resources, Tasmania
- Craig Newland
  Automobile Association of Australia (AAA)
- James Hurnall
  Federal Chamber of Automotive Industries (FCAI)
- Mark Morarty
  Toyota Motor Corporation
- Robert McDonald
  Insurance Australia Group (IAG)
- Robert Judd
  Autoliv

**Baseline Program Committee**
- Robert Stork
  Victoria Police
- Antonietta Cavallo
  VicRoads
- Samantha Cockfield
  TAC
- Damian MacDonald
  Department of Justice

**Baseline: Consumer choice, nonfleet vehicles**
- Nick Platt
  RACV
- Samantha Cockfield, Jessica Truong
  TAC
- Chris Jones
  VicRoads
- Christine Livingstone
  Department of Justice

**Baseline: Road design factors and their interaction with speed and speed limits**
- Bob Stork
  Victoria Police
- Antonietta Cavallo
  VicRoads
- Samantha Cockfield
  VicRoads
- Ken Hall
  VicRoads
- Damian MacDonald
  Department of Justice
- Con Stasinos
  VicRoads
- Jessica Truong
  TAC
- Stuart McGregor
  Victoria Police

**Baseline: Strategy modelling and data systems**
- Antonietta Cavallo
  VicRoads
- William Gibbons, Damian MacDonald
  Department of Justice
- Wendy Kimber
  Victoria Police
- Michael Nieuwesteeg
  TAC
- Neil Richardson
  TAC

---

**Australian National Crash In-Depth Study (ANCIS)**

**Members**
- Michael Case
  RACV
- Michael Nieuwesteeg, Samantha Cockfield
  TAC
- Sue Freeman, Christine Baird
  Motor Accidents Authority of NSW (MAA)
- Chris Jones
  VicRoads
- Dan Leavy
  Roads and Traffic Authority NSW - Chair
- Mark Terrell, Thomas Belcher
  Department of Infrastructure and Transport (DIT)
Baseline: Toward zero pedestrian deaths

- Samantha Collins, Liz Knight  
  TAC
- Catherine Scott, Kenn Beer,  
  Antonietta Cavallo, Juliet Reid  
  VicRoads
- Kirsten Lynch, Fiona Strong  
  Victoria Police
- Mindy Coupe, Helen Poke,  
  Kathy Towsty  Department of Justice

- Marjan Hagenzieker  
  SWOV, The Netherlands
- Anders Lie  
  Swedish Road Administration
- Astrid Linder  
  VTI, Sweden
- Jean Pierre Medevielle  
  INRETS, France
- Laurie Sparke  
  L. Sparke Pty Ltd
- Pete Thomas  
  Vehicle Safety Research Centre, UK
- Claes Tingvall  
  Swedish Road Administration
- Alberto Tesi  
  University of Florence, Italy
- Andre Vits  
  European Commission, Brussels

Exercise for independent living

- Flavia Cicuttini, Damien Jolley,  
  Department of Epidemiology and  
  Preventive Medicine, Monash University
- Leon Flicker  
  University of Western Australia
- Keith Hill  
  National Ageing Research Institute and  
  La Trobe University
- Leonie Segal  
  University of South Australia

Multi-National National Vehicle Safety  
Mass Data Study

- Manuel Aviles, Anna Ferrer  
  Spanish Ministry of Transport
- Louis Fernique  
  French Ministry in charge of Transport
- Anders Kuligren  
  Folksam Insurance, Sweden
- Mike Keall  
  MUARC – Subcontractor
- Anders Lie  
  Swedish Road Administration
- Kalie Parkkari  
  Finnish Motor Insurers Centre, VALT
- Lucia Pennisi  
  Italian Automobile Association (ACI)
- Claus Pastor  
  Section Passive Vehicle Safety,  
  Biomechanics, BAST, Germany
- Esa Raty  
  Finnish Motor Insurers Centre, VALT

- Matteo Rizzi, Vectura Consulting
- Henk Stipdonk  
  SWOV, the Netherlands
- Pete Thomas  
  Loughborough University, UK
- Claes Tingvall  
  Swedish Road Administration
- Martijn Vis  
  SWOV, The Netherlands

Used Car Safety Ratings

Members
- Michael Case  RACV – Chair
- Samantha Cockfield  TAC
- Chris Jones  VicRoads
- Mark Borlace  RAA SA
- John Cartwright  DTEI, SA
- Jon Gibson  ORS WA
- Alex Forrest  RAC WA
- Jack Haley  
  NRMA Motoring and Services
- Dan Leavy  RTA NSW
- John Goldsworthy, Mark Terrell  
  Commonwealth DoTI
- Steve Spalding  RACQ
- Anant Bellary  TMR QLD
- Stella Stocks  AA NZ
- Paul Gimblett  ACC NZ

Observer
- Craig Newland  AAA

MUARC Europe Scientific Advisory Committee

- Loretta Baldassar  
  Monash University, Prato
- Anne Guillaume  
  Laboratory of Biomechanics &  
  Accidentology, (LAB), France
- Tom Genneralli  
  Medical College of Wisconsin, US
MIRI is committed to research training for the development of new leaders in the field of injury prevention. PhD students at MIRI study in an energising and collaborative environment with a diverse range of highly skilled researchers and injury prevention practitioners.

The program is vibrant and staff and students participate at all levels in mainstream Monash higher degree activities including MRGS Expert Seminar Series, awards and competitions (e.g. Three Minute Thesis), and the Monash Postgraduate Student Association services. The academic program reflects the unique multi-disciplinary nature of MIRI. Students pursue topics that reflect the breadth of research themes across the centre including road safety, occupational health and safety, injury prevention program evaluation, human factors, sports and recreation injury, injury economics and injury biomechanics.

State-of-the-art facilities and expert supervisory capacity in areas such as population injury and crash databases, simulation and instrumented vehicles, and statistical analysis/modelling provide students with wide scope for their choice of research methods and approaches. Through their research activities, many students have had opportunities to engage with the international research community in short courses, data collection, conferences and other exchanges. The PhD program has two components. The major component comprises research presented in the form of a thesis and a minor component involving participation in the MIRI Graduate Studies Seminar program, MIRI Research Seminars and Journal Club.

In 2011, the Institute welcomed five new postgraduate students, making a total of 26 postgraduate students enrolled through MIRI. Rachel Mance and Gemma Read were awarded Australian Postgraduate Awards – Industry with ARC Linkage grants in the Behavioural Safety Science team and Human Factors team, respectively. Rachel’s project focuses on managing older driver safety, with the OzCandrive Project while Gemma’s research addresses level crossing safety. Christina Ekegren holds a scholarship with the NoGaps NHMRC Partnerships Project. Christina’s research will examine the feasibility of online injury surveillance in community Australian football. Christine Mulvhill was awarded an Australian Postgraduate Award and will undertake her PhD research in motorcycle safety. Adding to our student group on the Sunway Campus, Saraswathy Venkataraman will study under the supervision of Dr Jennie Oxley in the area of falls risk factors in nursing home residents in Malaysia.

MIRI also celebrated a record number of PhD completions, with six candidates graduating during 2011.

Congratulations to MIRI 2011 graduates:

- Lyndal Bugeja ‘The role of coroners’ recommendations in injury prevention and control in Victoria’ (Supervisors: Joan Ozanne-Smith, Jennifer Coate, Joseph Ibrahim)
- Carlyn Muir ‘Vision and driving with Hemianopia’ (Supervisors: Judith Charlton, Brian Flides, Joanne Wood, QUT)
- Clay Douglas ‘Development of an occupant computer model for a far-side vehicle crash’ (Supervisors: Brian Flides, Tom Gibson)
- Marilyn Johnson ‘Cycling safety from the perspective of all road users’ (Supervisors: Judith Charlton, Jennie Oxley)
- Adam McKinnon ‘Optimising the utility of injury surveillance systems for injury control in active populations’ (Supervisors: Joan Ozanne-Smith, R Pope)
- Damian Morgan ‘Modelling risk factors for unintentional drownings of beach swimmers’ (Supervisors: Joan Ozanne-Smith, Tom Triggs)

The study program

The MIRI PhD program strives to deliver a well-rounded multi-disciplinary experience, with opportunities for connections with stakeholders (through seminars, scholarships and industry-based projects), international experiences (data collection and conferences) and broad career skills development (through seminars), ensuring that students complete their degree having achieved more than just a thesis.

Students are part of the academic community at MIRI and are actively engaged in centre-wide researcher meetings and writing workshops (organised by Associate Director, Research Dr Lesley Day), Journal Club (organised by PhD Candidate and Research Fellow Karen Stephan) and a multi-disciplinary HDR seminar series in Injury Prevention Research Issues. The HDR seminar sessions are interactive and involve a presentation and overview by a content area expert, selected student readings and discussion. Senior researchers facilitate sessions and topics cover the key disciplinary areas relevant to Injury Prevention Research. Other skills and career development topics such as communication, knowledge translation and ethical research practice are also included. Informal lunch meetings with
candidates and supervisors are held monthly and offer a regular forum for raising matters of concern and interest relating to postgraduate studies in general and career issues.

Seminar topics offered in 2011 were:

- **April**
  - Orientation to MIRI PhD
    - Dr Jude Charlton

- **June**
  - Knowledge Translation
    - Prof Caroline Finch

- **July**
  - Systematic Reviews
    - Prof Rachelle Buchbinder (DEPM)

- **August**
  - Human Ethics and Ethical Practice in Injury Prevention and Safety Research
    - Dr Lesley Day / Janet Cohen (SCERP)

- **September**
  - Qualitative Research Methods
    - Dr Paul Salmon

- **December**
  - Injury Research in Developing Countries
    - Prof Mark Stevenson

**PhD Student Publications**

MIRI candidates also make a significant contribution to the body of scientific evidence on safety issues and injury prevention through scholarly writing. In 2011, students authored nine peer reviewed scientific publications based on their PhD research. Trang Vu was awarded the MIRI Best Student Paper for her publication.

**Candidates and Thesis Topics**

**Hafez Alavi**

*Assessing pedestrian crash risk and injury severity in concentrated urban areas*

This research, adopting the underpinning philosophy of the Victorian Safe System, develops a systematic conceptual framework to investigate the pedestrian safety problem in concentrated urban areas. It applies the framework to identify pedestrian data needs for safety analyses, which in turn, informs the design of a pedestrian data system for the Melbourne CBD. An extensive interrogation of the existing data sources is designed to fulfil the needs of the pedestrian data system. Next a rigorous and generalisable methodology is developed to estimate pedestrian exposure, which is missing in the existing data. Pedestrian crash risk and injury severity are subsequently investigated to identify influential risk factors. Hafez expects to submit his thesis in mid-2012. (Australian Postgraduate Award).

**Miranda Cornelissen**

*How can they do it? A structured approach to capturing performance variability*

Varying performance is part of everyday activities and work. Performance variability was believed to be erroneous and thus a negative phenomenon but is now regarded to be a positive phenomenon as well. Therefore a shift is needed from restraining all variability to supporting and encouraging performance variability leading to positive outcomes, and discouraging performance variability leading to negative outcomes. Currently there are no structured

**Determinants of coroners’ recommendations on external cause death in Victoria, Australia**

This study examined the frequency, nature and determinants of coroners’ recommendations on external cause deaths in Victoria for the period July 2000 to June 2005. The research design comprised: a retrospective cohort study comparing recommendations cases to non-recommendations cases; in-depth analysis of recommendations cases; and key informant interviews. The findings showed that there were limitations with the frequency and formulation of coroners’ recommendations when examined in accordance with the principles of injury causation and prevention.

Results of this PhD research contributed in part to the rationale for legislative strengthening of the prevention role of the coroner in Victoria by providing an evidence base as to the significance of coroners’ recommendations as a vehicle for prevention. In addition, the research findings contributed to the establishment of the Coroners Prevention Unit at the Coroners Court of Victoria and furthered the consideration of public health and public policy principles to inform the development of coroners’ recommendations on public health and safety.

Lyndal was awarded the degree of PhD in 2011.
methods to determine the outcomes of performance variability a priori, and therefore it cannot be supported effectively. The aim of this PhD is to propose and evaluate such method based on Human Factors principles. Currently this method is being developed and tested studying performance variability of road users.

The resulting method will be a theoretical contribution to the Human Factors domain, but will also be a practical contribution to road safety providing insight into performance variability of road users, which consequently allows supporting performance variability for a safer road system. (Monash Graduate Scholarship & Monash International Postgraduate Research Scholarship).

Miranda coordinates the Honours and Student Vacation Scholar program at MIRe and was also appointed to the role of Student Affairs Officer for the Cognitive Engineering and Decision Making task group for a two-year term.

Clay Douglas
Supervisors: Professor Brian Flides and Dr Tom Gibson (Human Impact Engineering)

Modelling far-side occupants in side impact crashes
Regulations and interventions to protect far-side occupants in crashes do not currently exist, despite these occupants accounting for over 30 per cent of the seriously injured persons and harm in side impact crashes. Furthermore, no suitable crash dummies or mathematical models have been developed to investigate far-side occupant dynamics during such a crash. This study aimed to develop and validate a computer model capable of mimicking human response in far-side impacts. The model was then used to investigate the influence of seat belt properties, impact direction and potential countermeasures on occupant loading and injuries. Therefore, this model may aid researchers and designers in improving safety features currently in vehicles. The PhD fell under the umbrella of a larger study aimed at improving protection to far-side vehicle occupants. It was an ARC Linkage study involving a collaboration of universities in Australia and the USA as well as industry partners GM Holden and Autoliv. (Australian Postgraduate Award (Industry)).

Clay was awarded the degree of PhD in 2011.

Christina Ekegren
Supervisors: Professor Caroline Finch (Monash Injury Research Institute) and Associate Professor Belinda Gabbe (Department of Epidemiology and Preventive Medicine, Monash University)

Evaluation of an online injury surveillance system in community Australian football
The main objective of this project is to evaluate the implementation of an online injury surveillance system in community Australian football. Australian Football (‘Aussie Rules’) is one of the most high-risk sports played in Australia. Despite this, there is currently no ongoing injury surveillance system in place. As a result, we do not have sufficient information about football injuries to enable us to design effective injury prevention programs. Setting up an injury surveillance system at the community level is challenging because there is not as much funding and support as there is in professional sport.

An opportunity to implement an injury surveillance system arose with the recent launch of a large study in community Australian football. The ‘NoGAPS’ project is an NHMRC Partnership Project Grant-funded study about implementing injury prevention strategies with coaches. Five large Australian football leagues from Victoria have agreed to participate in the project and from these leagues, approximately 4000 players will be included. The NoGAPS project will provide an ideal context for trialling and evaluating an online injury surveillance system in order to determine its feasibility at a broader level. (NoGaps Project Scholarship).

Furthermore, the risk of re-fracture following a second fall is very high. The development of the external hip protector has served as a promising avenue for hip-fracture prevention; however, its effectiveness is limited by low wearer compliance in the target population. This PhD project investigates the feasibility of a novel implanted hip fracture-preventing device and also develops further specifications for a new generation of external hip protecting devices in an attempt to increase wearer compliance. The project includes an anatomical and surgical evaluation of potential implant sites, examination of hip musculature morphology using computed tomography and computer based imaging techniques and biomechanical testing of muscle tissue.

Robin Hutchinson
Supervisors: Emeritus Professor Tom Triggs, Dr Gavan Lintern (General Dynamics), Dr Paul Salmon

Supporting lane change behavior with an ecological interface
The high demands placed on drivers in the road environment can lead to errors in judgement and breakdowns in situation awareness. These deficits can lead to deleterious consequences. Lane changing is a particularly challenging driving manoeuvre because of the need to make simultaneous judgements concerning multiple vehicles located in polar directions. A variety of driver assist systems have been developed to aid the driver in monitoring the road way and to alert the driver to potentially hazardous situations. While these systems have been demonstrated to generally have a positive impact on driving, they are still in their infancy and require further development.

Ecological Interface Design (EID) is an approach to display development that may offer solutions to some of the limitations associated with current driver support systems. The aim of this project is to develop EID for the automotive domain and to use the principles of EID to develop a driver assist system to support lane change behaviour. This project aspires to enhance the design philosophy behind the development of driver assist systems and thereby positively impact road safety.

Naturalistic driving data is being analysed in order to better understand the dynamics of lane change associated headway. This information will inform the design of the interface. (Monash University Accident Research Foundation John Lane Memorial Scholarship)

A novel approach to the prevention of fall-induced hip fracture: the anatomical and functional basis to improve hip-fracture preventing devices
Hip fractures are one of the most serious health problems facing the ageing population. There is substantial evidence to suggest that most hip fractures are a result of a fall directly onto the ‘greater trochanter’, or top part of the thigh bone.
Cycling safety from the perspective of all road users
This research project aims to identify strategies to improve safety for cyclists who ride on the road. Investigations have included a series of fixed point observational studies at intersections across Melbourne and the development of a new methodology that involves attaching a compact video camera to commuter cyclists’ helmets to gain the cyclists’ perspective of riding on the road. The final data collection stage was a national online survey that was completed by Australian drivers and cyclists. Findings have focused on cyclist and driver behaviours, how both groups use cycling infrastructure and an in-depth analysis of risk factors involved in collisions and near-collisions. (Joint Monash University Accident Research Foundation and the Amy Gillett Foundation Safe Family Research Scholarship).

Awards
Monash University Postgraduate Publications Award (PPA) June 2011: The PPA supports high-achieving students to prepare publications arising from their PhD research while their PhD research is under examination. ARRB-Monash Transport Research Prize, September 2011: To promote excellence in postgraduate research in transport
Marilyn was awarded the degree of PhD in 2011.

The correlation between forensic toxicology and unnatural death
Injury is an important public health problem and a major cause of death, particularly in young people. Drug induced impairment and interactions are known to cause an increased risk of mortality. However, the full extent of involvement across the whole range of injury deaths is mostly unknown. Data on 7400 unnatural deaths reported to the Victorian coroner from July 2000 to June 2005 were extracted from the National Coronial Information System (NCIS) and cases with toxicology reports were analysed to determine the drugs, other than alcohol, detected at toxicology screening. Exclusion criteria were applied to minimise error in interpretation of the results.

Of the cases with attached toxicology reports (85%), half were positive for a drug. After exclusions, for example, of potentially post-injury administrations, the toxicological evidence indicates that benzodiazepines (24%), opioids (18%) and anti-depressants (14%) are the most frequently occurring in unnatural deaths. For all mechanisms, the most frequently detected drugs were at potentially poisonous and/or impairing concentrations in about 30% of cases. Drugs occurred most frequently in poisoning, fires/burns/scalds, intentional self-inflicted (ISH), and inflicted by other (violent) causes.

For the first time, with the use of NCIS, this study describes the extent of drugs involved in unnatural deaths in Victoria. Further research is needed to determine the risks and levels of impairment for the drugs detected. (Australian Postgraduate Award)

Optimising the utility of injury surveillance systems for injury control in active populations
The main objective of this project is to optimise the utility of injury surveillance systems for injury prevention in active populations. Expected outcomes of the research include: a qualitative examination of procedural and socio-cultural factors affecting injury surveillance systems in the Australian Army and the Victorian civilian community; the identification and evaluation of new methods of injury data analysis (for example, statistical process control charts, data mining techniques) to facilitate injury prevention; and the examination of user preferences towards current and innovative modes of information dissemination adopted by an injury surveillance system.

The results of this research will be particularly important to the Australian Defence Force and the Victorian civilian community as well as broader application across injury surveillance systems worldwide. (Australian Postgraduate Award (Industry), Department of Defence) Adam was awarded the degree of PhD in 2011.

Managing older driver safety
Rachel Mence commenced PhD candidature at MIRI in April 2011, taking up the Australian Postgraduate Award-Industry scholarship with the Ozcandrive project, a five-year prospective cohort study of older drivers aged 75+ years. The PhD project will focus on on-road driving performance, measured by the Driving Observation Schedule (DOS). The DOS driving task is designed to reflect a naturalistic driving experience, incorporating a 30-minute drive, conducted over routes familiar to and chosen by the driver and in the driver’s own vehicle. The PhD project will refine the methods for recording and quantifying on-road driving behaviours, providing a window on the way in which driving behaviours change over time. Rachel took maternity leave in the second half of 2011 and will return to her studies in May 2012. (Australian Postgraduate Award-Industry).

Self-Regulatory Practices by Older Adults
Self-regulation of driving (that is, reducing one’s overall driving exposure or avoiding specific driving situations) shows considerable promise as a strategy for helping older drivers compensate for functional declines and extend the time period over which they can safely drive. Study findings on the extent and nature of self-regulation have been mixed, due in part to differences in how self-regulation is measured, characteristics of study subjects, and inclusion of measures thought to influence self-regulation. This research aims to better understand the process of self-regulation and how it relates to perceived and actual impairments in functioning, and other driver characteristics such as gender and driving confidence. The research will be conducted in two phases. In Phase 1, a questionnaire instrument to measure self-regulation was developed and pilot tested with a sample of 137 drivers age 70 and older in the United States. In Phase 2, which commenced in late 2010, outcomes from the instrument will be compared with objective driving data from instrumented vehicle monitoring of real-life, naturalistic
driving, as part of the Ozcandrive study. (Partial support for this research comes from the Michigan Center for Advancing Safe Transportation throughout the Lifespan at the University of Michigan, US).

**Damian Morgan**  
Supervisors: Professor Joan Ozanne-Smith (Department of Forensic Medicine) and Emeritus Professor Tom Triggs

**Risk factors for unintentional drowning at surf beaches**

The PhD study identifies and assesses factors that contribute to the risk of drowning at surf beaches as well as providing estimates of exposure to that risk. Methods used include analysis of coronial data, observation of beach users, self-report, and expert risk assessment. Data gathered in this study is used firstly to develop a predictive model of exposure to drowning risk, and secondly, to quantify the risk posed to beach users according to swimming ability, surf beach experience and beach conditions. Selected results are published in Injury Prevention, The Journal of Science and Medicine in Sport, and the Australian and New Zealand Journal of Public Health.

Damian was awarded the degree of PhD in 2011.

**Carlyn Muir**  
Supervisors: Dr Judith Charlton, Professor Brian Fildes and Professor Joanne Wood (Department of Optometry, Queensland University of Technology)

**Visual attention in hemianopic visual field loss: Application to screening for fitness-to-drive**

Hemianopic visual field loss is blindness or reducton in one half of the visual field caused by damage to the visual pathways in the brain. There is limited evidence regarding the ability to drive safely with hemianopia, however some studies have suggested that hemianopic field loss may not impair driving ability enough to warrant licence refusal. Research suggests that individuals with hemianopic field loss appear to compensate for their deficit to varying degrees by employing altered scan paths and excessive fixation in the blind region. However, fixation does not necessarily imply attentional processing, therefore identifying whether these altered scan paths actually correspond to attentional processing in the blind region would provide evidence as to whether this is an effective compensatory strategy.

The primary aims of this PhD are to investigate the extent to which individuals with hemianopic field loss compensate on a visual attention task, and to investigate the relationship between performance on a visual attention task and cognitive and vision tests commonly used in driving assessment. Outcomes of this research will be useful for developing a suitable screening assessment for visual fitness-to-drive in individuals with hemianopic field loss. (Australian Postgraduate Award (Industry))

Carlyn was awarded the degree of PhD in 2011.

**Christine Mulvihill**  
Supervisor: Dr Michael Lenné, Dr Paul Salmon

**An examination of the nature and development of safety critical skills in motorcycling**

It is well known that motorcyclists are overrepresented in road trauma statistics, particularly inexperienced motorcyclists aged under 25. The elevated crash risk for inexperienced motorcyclists would suggest that rider experience is important in the development of factors that contribute to lower risk riding and that may assist in crash avoidance. Little systematic research has investigated skill differences between experienced and inexperienced motorcyclists that might contribute to their differential crash risk. Similarly, there is little understanding about how the skills develop (or decay) over time. The broad aim of the proposed research is to help address this gap in the research. Specifically, the research questions will be:

1. Are inexperienced motorcyclists deficient in vehicle handling skills compared to experienced motorcyclists?
2. Are inexperienced motorcyclists deficient in higher order cognitive and perceptual skills compared to experienced motorcyclists?
3. Are inexperienced motorcyclists more likely to encounter critical incidents during their riding than experienced motorcyclists?
4. How rapidly do vehicle handling skills develop or decay over time (if at all) in inexperienced motorcyclists?
5. How rapidly do higher order cognitive and perceptual skills develop or decay over time (if at all) in inexperienced motorcyclists?

It is anticipated that the results of the proposed research will enable recommendations to be made about the types of skills that could be included in future motorcycle rider training programs and when training for different skills is likely to be most beneficial.

**Roszalina Ramli**  
Supervisors: Professor Rod McClure, Dr Jennie Oxley, Dr Peter Hillard, Professor Ahmad Farhan Sadullah (MIROS)

**Effectiveness of motorcycle helmet for preventing craniomaxillofacial injuries**

Malaysia is a rapidly developing South-East Asian country. As part of this development, motor vehicle ownership is dramatically increasing, as is the burden of serious injury and death related to road traffic crashes. Crashes have become one of the major causes of mortality and morbidity and the second leading cause of deaths in males (Malaysian Department of Statistics, 2009). For the past 10 years, motorcyclists have registered the highest road deaths compared with other road users. In 2005, motorcycle fatalities represented approximately 60% of the total road fatalities in Malaysia (Radin Umar, 2006). Head injuries had been shown to be the most frequent fatal injuries (Kraus, 1989) while facial injuries were shown to occur in one-fourth of all injured riders (Kraus et al, 2003). Moreover, facial injuries tend to occur simultaneously with head injuries (Tsai et al, 1995; Pang et al, 1999; Ankarath et al, 2002).

This study aims to quantify the association between helmet wearing status and helmet design (controlling for impact speed and collision partner), and the incidence, distribution and severity of craniomaxillofacial injuries in motorcycle riders in Malaysia.

There are three components of this research. The first will involve a questionnaire on riding experience and behaviour and injury severity profile. The second will involve helmet analysis and finally, full crash investigation will be performed on a sub-set of participants.
The primary aim of this proposed study is to explore the relationship between theory and practice—how theory informs practice and practice informs theory—in sports injury prevention research. Sports injury prevention research, like many other fields, has experienced some difficulty translating empirical evidence-based theory into real-world practice. Historically portrayed as a ‘one-way’ knowledge transfer issue, the ubiquitous theory-practice gap has recently been conceptualised as a knowledge production problem, suggesting a mismatch between the strategies research and real-world practitioners use to deal with complexity and context. ‘Critical’ and ‘soft’ systems perspectives will inform an ecological investigation of the interactions between theory and practice throughout the research process aimed at injury prevention in female football.

(Australian Postgraduate Award)
Organisational resilience: a new model and study methodology

Led outdoor activity instructors operate in an environment that involves elements of risk and uncertainty. Outdoor education organisations, like organisations across many domains, attempt to mitigate these risks and ensure the safety of their staff and clients by developing, training, and enforcing standard operating procedures; however, despite organisations’ preparedness, situations will always arise for which no procedure has been developed, or existing procedures cannot be executed. In such situations the ability to improvise appropriately can be the difference between survival of staff and clients and catastrophic failure. Improvisation is the spontaneous and real-time conception and execution of a novel response to an event that is beyond the boundaries for which an organisation has anticipated or prepared. There is currently no clear conceptual model of the factors that support or hinder improvisation in complex sociotechnical systems. As a corollary, our understanding of how to support appropriate, efficient improvisation, whilst limiting inappropriate improvisation, is limited. This research examines the factors influencing improvisation in the led outdoor activities domain from a systems perspective, using cognitive task analysis methods, including critical decision method interviews, to elicit information about incidents involving improvisation from led outdoor activity instructors, supervisors, and managers. By understanding the relationships between improvisation and its influencing factors it will be possible to determine ways for organisations to support appropriate, effective improvisation so that when faced with novel, safety critical situations instructors, teams, or organisations, can improvise in appropriate ways that will prevent or minimise harm to those involved.

(Australian Postgraduate Award).

Risk factors for falls among older residents of nursing homes in the Klang Valley, Malaysia

The population of Malaysia is ageing. With the increasing numbers of the elderly in the population, we expect an increase in age-related functional disability, the incidence of falls and the need for aged-care facilities. Given the importance of reducing falls and their long-term consequences on the overall health and wellbeing of the elderly, it is important that a good understanding of risk factors for falling amongst the elderly living in aged care facilities is developed.

This qualitative research study aims to identify, determine and analyse the effects of possible risk factors that could contribute towards sustaining fall incidences among the older population seeking support from shelter homes or nursing care facilities in the Klang Valley area in Malaysia. It will identify the influence of perceptions towards ageing, engagement in functional abilities and other factors on risk of falls occurring among those residing long-term in shelter home or nursing care settings.

(Australian Postgraduate Award)

Fall prevention in community-living older people affected by co-morbidity: a targeted approach

This project is part of an NHMRC Partnership Grant Application entitled “Reducing falls among older people in Victoria” (which was subsequently funded). The thesis research examines the effects of co-morbidity on hospital resource use by community-dwelling older people hospitalised due to falls, using the Victorian Admitted Episodes Dataset for fiscal years 2005–06, 2006–07 and 2007–08. Co-morbidity has been found to influence health care resource utilisation and costs by a number of studies involving a diverse range of populations including people with trauma, hip fractures and diabetes mellitus. This finding has financial implications for resource-constrained health systems. It is this excess economic burden beyond what might be expected based on the primary diagnosis that this thesis will aim to investigate. The thesis will seek to demonstrate the potential value of a targeted risk reduction approach focusing on older people with co-morbidity.

(Australian Postgraduate Award)

Dog bite injury: an investigation into the effectiveness of regulation

In recent years, many state regulations in Australia have focused on restricting particular breeds, despite there being sparse scientifically-sound evidence to suggest that the targeted breeds feature disproportionately in dog bite injury statistics. Within Australia there are no reliable statistics available on the breed of dogs involved in injury events, mainly because breed identification based on phenotype is reported to be inaccurate, even when experienced observers are involved. Further, accurate breed denominator data are not available to allow estimation of breed-specific bite injury rates. The effectiveness of breed specific regulatory measures has not been clearly demonstrated, nor has any literature been identified where this approach has been examined for potential harmful effects. The evaluation of injury interventions is critical to ensure that health gains are made and finite public resources are used effectively. Breed-specific regulatory measures may reflect a simplistic and unrealistic appreciation of the causal factors.

It is well recognised that a dog’s reaction in any situation depends on at least six
interacting factors including heredity, early experience, socialisation and training (or lack of), health (medical and behavioural), current environment and victim behaviour. Current breed specific regulation removes responsibility for dog-biting incidents from dog owners and places the focus on dogs. It may also engender a false and dangerous perception that breeds not included will not show aggression. A fundamental principle of injury prevention is that the most effective solutions involve a multi-dimensional approach, which in the instance of dog bite injury would involve dog owners, parents, children, the community at large, local authorities and legislators.

This thesis will examine these issues relating to breed specific regulatory interventions, within a conceptual framework based on established injury prevention and health promotion principles using the Australian and Victorian context. (Monash Graduate Scholarship).

**MPHIL CANDIDATE**

**Will Kerr**

Supervisor: Dr Michael Lenné

**Review of level crossing data**

The responsibility for rail safety in Australia is shared by government and industry. As part of this process of shared responsibility, industry reports rail safety occurrences to the regulators. The regulators and operators use this data to assist with their safety analyses and programs. Rail regulators provide data to the Australian Transport Safety Bureau (ATSB) for national publications. In April 2010, the ATSB released the Australian Rail Safety Occurrence Data from 1 January 2001 to 31 December 2009. In this period there were 654 reported collisions with road vehicles at level crossings. While the Australian Rail Safety Occurrence Data suggests that level crossing safety is improving, it does not provide a sufficient evidence base and there is no clear understanding of what, why, when and to whom it is happening, and what countermeasures are effective. As a result the ATSB has established a research investigation with the aim of collating level crossing accident, incident and assessment data to provide an evidence base for further research and to improve the understanding of level crossing accidents and ultimately the improvement of level crossing safety. In summary, the conduct of this research will enable detailed national level crossing occurrence data to be collected and analysis of this data to be performed to provide an evidence base and potentially recommended where resources may be best targeted to reduce the risk of level crossing occurrences.

**STAFF CANDIDATES**

**Jim Langford**

To assess and manage older drivers’ crash risk

The mainstay of the thesis is a series of peer-reviewed publications, consisting of:

- an examination of older drivers’ distinct crash and driving patterns, especially to identify different exposure aspects and characteristic risk factors
- an evaluation of older drivers’ extent of crash involvement, their responsibility for crashes and the extent to which they represent a risk to other road users;
- an evaluation of licensing authorities’ and others’ options for determining older drivers’ fitness to drive, including detailed examination of the commonly used assessment protocols;
- the presentation of promising countermeasures aimed at maintaining acceptably safe driving. These countermeasures have been based on Safe System principles and include more accurate targeting of at-risk older drivers, more strategic licensing options, the promotion of more crashworthy vehicles and improved highway design tailored to older drivers’ needs.

**2011 SUPERVISED OR CO-SUPERVISED PHD CANDIDATES FROM OTHER FACULTIES AND INSTITUTIONS**

MUARC staff also co-supervise PhD candidates who are enrolled in other Monash faculties and departments as well as other Australian and overseas institutions.

**MONASH UNIVERSITY CANDIDATES**

**Kelly Bryden**

DPsych (Clinical Neuropsychology)
School of Psychology and Psychiatry, Faculty of Medicine, Nursing and Health Sciences, Monash University
Supervisors: Dr Judith Charlton, Dr Jennie Oxley and Dr Georgia Lowndes (Psychology)

**Wayfinding while driving: differences between age groups and with and without dementia**

This research project is investigating the changes in a driver’s ability to find their
way to unfamiliar areas with increasing age and with the onset of dementia. The researchers are also interested in the changes in cognitive functions that may predict difficulties with wayfinding. The overall project consists of three studies: a questionnaire to find out more information about those who report difficulty with wayfinding and the strategies they use to help; a stimulator study comparing wayfinding ability and driving safety when using a paper map and a passenger to help navigate; and a GPS utilisation study to determine whether senior drivers believe that navigational units are helpful when finding their way in unfamiliar areas.

Karen Scally
Faculty of Medicine, Nursing and Health Sciences, Monash University
Supervisors: Associate Professor Nelle Georgiou-Karistianis (Psychology), Emeritus Professor Tom Triggs and Dr Judith Charlton

Factors influencing driving performance in Parkinson’s Disease
Parkinson’s disease (PD) is a movement disorder that causes physical symptoms such as resting tremor and difficulty initiating and executing movement. Research has shown that driving ability is compromised by PD and in particular, cognitive changes in PD are linked to poor driving performance. No effective screening methods currently exist to assess and predict driving ability in PD. Previous research has shown that drivers with PD have significantly poorer driving performance than ‘non-PD controls’ and rely heavily on external cues (for example, static warning signals) to regulate driving performance.

This study aims to further investigate PD drivers’ responses to selected ‘ecologically valid’ external cueing conditions during simulated driving performance. The driving scenario for this study includes a flashing “prepare to stop” signal used at potentially hazardous intersections where there is a high speed zone or low visibility on approach to the traffic lights.

Mozah Tahnoon Al Nahyan
Faculty of Business and Economics, Monash University
Supervisors: Professor Amrik Sohal (Business and Economics) and Professor Brian Findlay (MUARC)

Management of transport infrastructure projects in the United Arab Emirates (UAE)
The overall aim of this research program is to develop a framework and guidelines for the effective management of transportation infrastructure projects to ensure their success in the UAE. Three key objectives have been identified to achieve this aim: (1) identify major management issues impacting on transportation infrastructure projects in the UAE; (2) identify aspects of communication, coordination and stakeholder relations that contribute to transportation infrastructure project outcomes; and (3) develop a framework for decision-making to enhance project success.

External candidates
Peta Hitchens
University of Tasmania
MUARC Co-supervisor: Dr Lesley Day

Epidemiology of falls to professional thoroughbred racing jockeys in Australia
The aim of this study is to investigate the epidemiology of jockey falls in Australia and to identify modifiable risk factors associated with them. It is estimated that between 25–40 per cent of all jockeys in Australia suffer a significant injury each year and that an average of two jockeys are killed annually, yet the evidence base from which to develop preventive strategies is minimal. This PhD has three main components: establish a national jockey falls database; analyse the database to describe the epidemiology of jockey falls and potential risk factors; and investigate the role of jockey physiology and performance characteristics in falls aetiology. Using data from the national jockey falls database, the epidemiology of flat and jumps racing in Australia has been described and published. Important contributing factors to falls by jockeys in flat and jumps racing included inexperience of the jockey, inexperienced or less accomplished horses, and competitive racing. In a pilot study, data were obtained on physiological attributes of jockeys and track-work riders. Important factors found to be associated with falls were lower aerobic and anaerobic fitness, greater muscular strength and power, and riding with the full foot in the stirrup irons compared to riding on the ball of the foot. Being a jockey carries a substantial risk of injury and death. This thesis identified a range of factors associated with falls to thoroughbred racing jockeys riding in flat and jumps races that adds to the evidence base for formulating strategies to improve occupational health and safety standards in the thoroughbred racing industry. Peta graduated in 2011 with her thesis receiving high commendations from the examiners.

Peta is now a postdoctoral scholar in the JD Wheat Orthopedic Research Laboratory at the University of California, Davis.

Michael Lucas
University of Western Australia
MUARC Co-supervisor: Dr Lesley Day

Injury among Australian veterinarians
This project is a component of the Health Risk of Australian Veterinarians (HRAV) study of a cohort of veterinarians who graduated from Australian universities from 1960-2000. The aim of the HRAV study is to determine whether this cohort is at increased risk of cancer, injury, zoonoses (diseases that are transferable from animals to humans) or adverse reproductive outcomes and to determine the risk factors for these conditions in veterinary practice. The aim of this PhD study is to identify the prevalence of, and risk factors for, injuries among Australian veterinarians and to develop a relevant prevention model for occupational settings. The study has identified that injury is extremely common among the cohort with about half reporting a significant work-related injury over their career, and a quarter reporting any injury in the previous 12 months. Only about half the respondents reported using safety precautions at the time of injury. Recent graduates were found to be more likely to report recent injury than earlier graduates. Veterinarians in large animal and mixed practices were found to be more likely to have sustained a significant injury. Facial injuries are more common than previously recognised, and have the potential to cause distressing physical and psychological consequences.

Honours and vacation scholar programs
Every year MIIRI hosts a number of undergraduate students. This allows undergraduate students to gain experience in research as well as get familiar with the injury prevention domain. MIIRI hosts honours, engineering 4th year projects and a vacation scholarship programme.

Students who are enrolled in their honours year can apply for co-supervision with MIIRI and thus chose injury prevention as their topic of research for the year, and perhaps their future career.

In 2011 MIIRI welcomed honours student Genevieve Hughes from the Faculty of Psychology. Genevieve conducted a driving simulator study to investigate how singing while driving affects driver performance. Students in the senior years of their
undergraduate programs can apply for a summer vacation scholarship. Top students are selected to undertake a twelve week position at MIRI in order to gain research experience and decide whether a research career is something they would like to pursue. This year MIRI welcomed Jerome Le, Justin Carroll, Ben Tilley, Cara Dawson, Kevin Mascarenhas and Johan Davydov. Jerome, Justin, Kevin, Johan and Cara all joined the Behavioural Safety Science team and provided invaluable assistance on a naturalistic cycling study identifying risk factors for cyclists in the ACT, the Ozcandrive older driver study and the Child safety in Cars study. Ben worked with the Australian Centre for Research into Sports Injury and its Prevention on National guidance for Australian (football) Partnerships and Safety (NoGAPS).

All 2011 honours and summer vacation students were successful in their endeavours and are looking forward to a great career in research. Both programmes were very successful for 2011. The vacation scholarship proved more successful than ever thanks to the enthusiasm of supervisors in proposing and supervising projects and the high number of quality applicants who showed an interest in spending the summer gaining research experience at MIRI. We are looking forward to hosting students for both programmes as well as engineering 4th year programs again in 2012.

Honours program

In 2011, Dr Missy Rudin-Brown and Dr Kristie Young co-supervised an Honours student from the Monash School of Psychology, Ms Genevieve Hughes. Throughout the year, Genevieve conducted a driving simulator study to investigate how singing while driving affects driver performance. Participant completed three trials of a simulated drive concurrently while performing a secondary task; each trial was conducted either without music, with participants listening to music, or with participants singing along to music. As expected, singing while driving was rated more mentally demanding, and resulted in slower and more variable speeds, than driving without music. Listening to music was associated with the slowest speeds overall, and fewer lane excursions than the no music condition. Collectively, results suggest that singing while driving impairs driving performance and hazard perception while at the same time increasing subjective mental workload. However, singing while driving does not appear to affect driving performance more than simply listening to music. The results have been submitted to the peer-reviewed journal, Accident Analysis and Prevention.

Vacation scholarship program

Cara Dawson

Singing while driving has been shown to impact on driving performance.

“Spending an entire summer working at uni might not be what everyone anticipates for their holidays, but when within 10 minutes of arriving on my first morning I was already out having coffee with some other researchers, I knew I would survive. During my time at MUARC I have had the opportunity to work on a range of different research projects, which has allowed me to gain an understanding of the type of work that goes on at MUARC. I have been involved in Ozcandrive, a collaboration of Australian and Canadian researchers working with older drivers, as well as a younger driver study and also research involving the safety of children in cars and as pedestrians.

Working at MUARC over summer has been a great way to learn about the entire research process. Being involved in more than one project, I’ve been able to jump in at each step and learn about what happens at the various stages of research. I have completed literature searches for all the projects I’ve been working on and also helped prepare an ethics application. I have been involved in the data collection stage, which has included both telephone interviews and face to face assessments with participants. Meeting participants who are interested and willing to be a part of the studies has helped show me that our community believes in the importance of transport research.

Once data is collected, but before it can be analysed, it needs to be cleaned. As well as learning that a lot of people do not know the make and model of their
own car, this assignment confirmed for me that data cleaning is not a step that should be skipped for successful data analysis. Although I did have to pull out and dust off my stats text book during some data analysis, it was a great opportunity to work with a large data set to see what findings I could come up with.

Not only have I survived the summer, but I have also enjoyed it! I would like to thank all those researchers at MUARC who have allowed me to be a part of their projects. For anyone interested in further study, or if you are just unsure about how to spend your summer, I would definitely recommend trying three months in the life of a researcher.

Ben Tilley

I was fortunate enough to be accepted into the summer vacation student program. I had the privilege of working with Dr Alexander Donaldson (a Research Fellow for ACRISP and MIRI) and Dr Jill Cook (a Principal Research Fellow in musculoskeletal injuries), as well as spending time with members of their respective research teams. With Alex, I was able to be involved in the exciting launch of the NoGAPS FootyFirst program at the Geelong Football Club, refining the exercises in the program, researching various principals and ideas that will help with its implementation, preparing data sheets and surveys for the collection of the results and organising the images that were to be in the final copy of the program. Alex was a fantastic colleague and mentor, allowing me to be involved in all aspects of the program, to sit in on important meetings and always finding something interesting for me to work on. Jill showed me how to scan an Achilles tendon with a new ultrasound machine called a UTC, as well as being able to perform a detailed analysis of the tendon. I also was involved in recruiting people to be involved in certain studies and completing work on a Quality Assessment Score as part of a systematic review. Jill also allowed me to sit in on important team meetings and always ensured I understood the discussions. Jill also introduced me to Dr. Jeremy Lewis, a leading musculoskeletal researcher in the UK.

I thoroughly enjoyed my time with both Alex and Jill and would like to thank them for giving me this incredible opportunity. I have learnt research skills that are going to be of significant advantage as I continue my Bachelor of Physiotherapy as well as beginning my work in the Honours stream. I urge anybody with an interest in this field to apply for any vacation scholarships that arise.

Research Training

Researcher meetings

Convenor: Dr Lesley Day

The aim of the Researcher Meetings is to provide an internal forum for the presentation of current and future projects, facilitating discussion on methodological issues, study interpretation, and policy and practice implications. Every second meeting takes the form of a journal club. Presentations included:

- Evaluation of the WorkSafe Victoria Employer Performance Management (Lesley Day)
- Program – preliminary results (Lesley Day)
- Experiences from a sabbatical at SWOV (Dutch National Road Safety Research Institute) (Michael Lenne)
- From battlefields to freeways: distributed situation awareness and road safety (Paul Salmon)
- SWOV projects, outcomes, benefits (Nimmi Candappa)
- Assessing vehicle side airbag effectiveness in Australia and New Zealand (Stuart Newstead)
- How do children really behave in restraint systems when travelling in cars? (Jude Chartlon)
- Heavy vehicle crash study: a case-control study investigating risk factors for crash in long distance heavy vehicle drivers in Australia (Mark Stevenson)
- Managing increasing challenges in motorcycle safety: a case-control study investigating factors associated with speed in motorcycle crashes (Trevor Allen)
- The development of a delivery plan for the NoGAPS lower leg injury prevention program in community-level Australian football (Alex Donaldson)
- Predictors of sustained return to work after work-related injury or disease: insights from workcover claims records (Janneke Berecki-Gisolf)

Writing workshops

Writing skills development among students and early career researchers was facilitated through three workshops covering turning a report into a journal article, dealing with rejection of manuscripts by journals, and grant writing for NHMRC project grant applications.
Emily Kerr staffing the MIRI booth at the Tenth National Conference on Injury Prevention and Safety Promotion conference in Brisbane.

Professor Caroline Finch, PhD candidate Trang Vu and Dr Lesley Day.
Publications

MUARC report series


Books


Book chapters


Peer review journal articles


Publications


Ramli, R, Ng, L, Ng, F, Rahman, N & Oxley, J 2011, 'Helmet use among injured and non-injured motorcyclists in Malaysia', Journal of the Australasian College of Road Safety, (Special Issue: Road Safety in Asia), vol. 22, no. 2, pp. 71-76.


Stanton, NA & Salmon, PM 2011, 'Planes, trains and automobiles: contemporary ergonomics research in Transportation Safety', (editorial), Applied Ergonomics (Special Issue: Transportation Safety), vol. 42, no. 4, pp. 529-532.


Dr Jennie Oxley presented a paper on risky street-crossing decisions in older pedestrians at a California conference in June.

**Peer review conference papers**


Langevin, S, Dommes, A, Cavallo, V, Oxley, J & Vienne, F 2011, ‘Cognitive, perceptual and motor decline as predictors of...
Publications


Salmon, PM, Lenné, MG & Young, KL 2011, ‘Experienced and novice driver situation awareness at rail level crossings: an exploratory on-road study’, (Special session on situation awareness and transportation safety), Engineering Psychology and Cognitive Ergonomics, Orlando, FL.


Walker, GH, Stanton, NA & Salmon, PM 2011, ‘Cognitive compatibility of motorcyclists and drivers’, (Special session on situation awareness and transportation safety), Engineering Psychology and Cognitive Ergonomics, Orlando, FL.


Other conference presentations and publications


Ashby, K 2011, ‘Call back study investigating child dog bite injury that occurs in the domestic setting’, (oral presentation) to the 10th National Conference on Injury Prevention and Safety Promotion, November, Brisbane.


Charlton, J 2011, ‘Naturalistic Driving: Insights from the Australian experience, ‘Staying focused at the wheel: Driver
inattention, distraction and fatigue’, AA Research Foundation Inaugural Symposium, September, Wellington.


Frederick, J & Goddard, C 2011, ‘The need for multi-professional cooperation between government authorities and experts in Non Government Organisations (NGOs)
Publications

... to effectively meet social needs’, ISPCAN regional conference, September, Finland.


Haines, T, Day, L, Finch, CF, Hill, K, Clemson, L, Thomas, M & Thompson, C 2011, ‘Good for others but not for me: why older adults who see the value of group exercise to prevent falls choose not to participate’, Physiotherapy Conference, October, Brisbane.


Oxley, J, Charlton, JL, Venkataraman, S, Yusoff, R, Bagat, F & Rashid, S 2011, ‘Comparison of older driver crash risk and
travel patterns: Malaysia and Australia emerging issues in safe and sustainable mobility for older people', *Transportation Research Board Conference on Emerging Issues on Safe and Sustainable Mobility of Older People*, August, Washington DC.


Salmon, PM 2011, ‘Understanding and preventing accidents during led outdoor activities in Australia: Where have we been, where are we now, and where are we going?’, *Australia Camps Association Conference*, June, Bacchus Marsh, Victoria.

Salmon, PM 2011, ‘Understanding and preventing accidents during led outdoor activities in Australia’, *CC Congress*, November, Hong Kong.

Salmon, PM, Young, KL & Cornellissen, M 2011, ‘Connect 4?: The compatibility of driver, motocyclist, cyclist and pedestrian situation awareness’, *HFES Euro*, October, Leeds, UK.


Other reports


Budd, L, Scully, J & Newstead, S 2011, ‘Final evaluation of the $130M Safer Road Infrastructure Program Stage 1 (SRIP1)’, (Research Consultancy Report to VicRoads), *Monash University Accident Research Centre*.

Budd, L, Newstead, S & Scully, J 2011 ‘Final evaluation of the Safer Safer Road Infrastructure Program Stage 2 (SRIP2)’, (Research Consultancy Report to VicRoads), *Monash University Accident Research Centre*.

Budd, L, Scully, J & Newstead, S, ‘Phase 1 evaluation of the Safer Road Infrastructure Program Stage 3 (SRIP3)’, (Research Consultancy Report to VicRoads), *Monash University Accident Research Centre*.


Clark, B, Rudin-Brown, CM & Newstead, S 2011, ‘A targeted review of the links between blood alcohol limits, alcohol sales and advertising on road trauma’, *Royal Automobile Club of Western Australia*.


Edquist, J & Rudin-Brown, CM 2011, ‘Pedestrian noncompliance at level crossing gates’, (Report to *PTA WA*). *Curtin-Monash Accident Research Centre*.


Publications

of zero BAC for all motorcycle riders in Queensland Simulator and balance studies report’, (Report to Queensland Department of Transport and Main Roads). Monash University Accident Research Centre.


Johnson, M and Oxley, J 2011, Clearway trial along Beach Road: an analysis of cyclist behaviour before and during the trial. (Contract research report for VicRoads), Monash University Accident Research Centre.


Mudaly, N 2011, ‘It takes me a little longer to get angry now – A preliminary evaluation of an animal-assisted education and therapy group for homeless traumatised by family violence’.


Rudin-Brown, CM & Young, KL 2011, ‘Operational pilot of electronic work diaries (EWDs) interim report, survey results’, (Report prepared for TCA), Monash University Accident Research Centre.


Other presentations to community and professional groups


Charlton, JL 2011, Investigators’ and partners’ meeting for the ARC Linkage OzzieDrive Older Driver Cohort Study, November, Melbourne.


ACRISP’s Peter Richardson in Monaco at the International Conference on Prevention of Injury & Illness in Sport.

Corben, B. 2011, ‘Managing older driver safety’, (Presentation to Aged Care Assessment team, Eastern Health), May, Melbourne.

Corben, B. 2011, ‘Cross-Cutting Research’, (Seminar), Older and Impaired Road Users, November, Monash University.

Corben, B. 2011, ‘Progress with meeting Victoria’s intersection safety challenge’, (Presentation to VicRoads), Melbourne.


Finch, CF 2011, ‘NoGAPS: The design and evaluation plan of a large-scale implementation study’, Global Implementation Conference, August, Washington DC.


MUARC investigators regularly inspect and assess crash scenes.
The Monash Injury Research Institute addresses the causes of both intentional and unintentional injury, including workplace incidents.

Contact us
Monash Injury Research Institute (MIRI)
Building 70, Clayton Campus, Monash University, Victoria 3800 Australia
Phone: (+61 3) 9905 4371    Fax: (+61 3) 9905 4363
Email: miri-enquiry@monash.edu
Web: www.monash.edu/monash

Compiled by Allison Harding, Deft Write Media
Designed by Rachel Bullard, Deep Blue Design Studio
Printed by Geon