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

It is grounded in scientific and academic excellence, while producing research which has real-life implications that are often translated into policy – whether it’s dealing with falls among older people or studying the use of braking systems on motorcycles.

MIRI incorporates the highly respected Monash University Accident Research Centre (MUARC) and other key Monash researchers and groups.

Because of the breadth of our research, MIRI has a strong national profile and an increasingly prominent international one. The institute identifies emerging injury problems, monitors progress, determines and evaluates solutions and advises on safety strategies.

MIRI is designed to encourage our experts to actively collaborate in solving pressing, practical problems – a collaboration that allows our external partners access to expertise across their field of interest.

Our main research focus covers:
- Disaster resilience
- Home, sport and leisure safety
- Injury outcomes
- Patient safety
- Transport safety
- Violence and suicide prevention
- Work place safety

These research areas are designed to meet the range of challenges that comprise injury prevention, targeting the causes of both intentional injury (violence and suicide prevention) and unintentional injury (transport safety, home, sport and leisure safety, workplace safety and transport safety).

We have already made Australia and Australians safer. Now, we are harnessing Monash University’s global perspective and presence on four continents to help meet the challenges of public health around the world.

We strive to become an international solution to the problems of health and safety.

This Annual Report shows our many achievements in 2015, building on past achievements, we continue to grow.
# 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>Our Board</td>
<td>6</td>
</tr>
<tr>
<td>Acting Director’s Message</td>
<td>8</td>
</tr>
<tr>
<td>PhD candidates</td>
<td>10</td>
</tr>
<tr>
<td>Injury Outcomes Research Unit</td>
<td>11</td>
</tr>
<tr>
<td>Victorian Injury Surveillance Unit</td>
<td>12</td>
</tr>
<tr>
<td>Disaster Resilience Initiative</td>
<td>14</td>
</tr>
<tr>
<td>MUARC</td>
<td>17</td>
</tr>
<tr>
<td>Traffic Engineering and Vehicle Safety (TEVS) Consortium</td>
<td>21</td>
</tr>
<tr>
<td>Behavioural Science for Transport Safety</td>
<td>22</td>
</tr>
<tr>
<td>Human Factors in Transport Systems</td>
<td>24</td>
</tr>
<tr>
<td>Regulation and In-Depth Crash Investigations</td>
<td>26</td>
</tr>
<tr>
<td>Statistical Analysis and Transport Data Systems</td>
<td>28</td>
</tr>
<tr>
<td>Statement of income and expenditure</td>
<td>30</td>
</tr>
</tbody>
</table>
THE end of 2015 marked a significant change to the Monash Injury Research Institute (MIRI). The Institute was formed in 2011, encompassing the already successful and highly regarded Monash University Accident Research Centre (MUARC) and a number of units and teams engaged in injury prevention and safety research across a diversity of settings. Importantly, the injury research and graduate education activities of the Institute will continue under the newly reinstated MUARC, a discrete entity within the office of the Senior Vice Provost (Research), effective January 1 2016.

During 2015, Monash University proposed the establishment of the Monash-Alfred Injury Network (MAIN) to more broadly integrate and enhance its activities in injury research across the University. MAIN is a consortium which brings together the collective strengths of Monash University and Alfred Health in trauma, rehabilitation, disability and injury research, education and training. The consortium will enhance the University’s global capacity to facilitate solutions to the problem of injury. MIRI researchers have played a key role in the development and establishment of this initiative and will continue to contribute into the future. As part of the reconfiguration of injury-related research activities at Monash, it was determined that MIRI be disestablished to allow the University to pursue the broader MAIN model with its hospital and government partners.

Consequently, I am pleased to announce that as of 1 January 2016, the Monash University Accident Research Centre (MUARC) was re-instated as a discrete entity with specific focus on its three injury prevention research domains of: • Transport • Workplace • Home & Community

For almost three decades, MUARC has been a world leader in injury prevention research and training. The Centre has made major contributions in reducing the incidence and impact of injury serious injury in Victoria and across the world. Key to MUARC’s success is stakeholder engagement and delivery of relevant research with real-world solutions and impact.

I would like to take this opportunity to thank the staff and students of the Patient Safety and Child Abuse Prevention groups whose research and activities will continue in new academic homes outside MUARC. My thanks too, to the MIRI Board for their valued support of the Institute’s staff and activities over the past 5 years.

We are confident the Centre’s impact in the field of injury prevention will continue to grow under the leadership of Acting Director, Associate Professor Charlton. With the expertise of our dedicated and expert staff, MUARC is well placed to continue to serve the research needs of your organisation and the broader injury prevention context in 2016 and into the future.

Professor Pauline Nestor
Chair, MIRI Board
Senior Vice Provost and Vice Provost (Research) Monash University

www.monash.edu/miri
Our Board

The MiRI Board is committed to ensuring the institute stays focused on addressing the prevention of injury in all settings.

Professor Pauline Nestor
Senior Vice Provost and Vice Provost Research, Monash University. Professor Nestor attended Oxford University as a Rhodes Scholar and completed her Masters and Doctorate degrees in nineteenth-century English literature and culture. She was a foundation board member of the Victorian Registration and Qualification Authority and a member of the Victorian Higher Education Accreditation Committee, and has been a member of the ARC College of Experts.

Professor John Thwaites
is a Monash Professorial Fellow and Chair of ClimateWorks Australia, the Monash Sustainability Institute and Melbourne Water. He is a consultant at Maddocks Solicitors and he chairs the Australian Building Codes Board.

Professor Kate Smith-Miles
is an ARC Australian Laureate Fellow and Director of MAXIMA at Monash University. She is an applied mathematician, internationally recognised for her work in optimisation, data mining, and applying mathematics to tackle interdisciplinary problems from diverse fields including the biological sciences and engineering and economics applications.

Professor Maria Garcia De La Banda
is the Deputy Dean of the Faculty of Information Technology at Monash University. She is internationally recognised for her research in Declarative Programming Analysis & Modelling, has been Chief Investigator in nine national competitive grants, is Area Editor of the Journal of Theory and Practice of Logic Programming, and has many highly cited publications.

Professor Bryan Horrigan
is Dean of the Faculty of Law at Monash University. He holds a doctorate in law from Oxford University as a Rhodes Scholar and has both academic and professional experience in public and corporate law and governance from Australian, transnational, and cross-disciplinary perspectives.

Professor Gary Magee
is Deputy Dean (Research), Professor of Economics and Director of the Centre for Global Business in the Faculty of Business and Economics. He is a former Director of the Asian Economics Centre at the University of Melbourne, Head of the School of Economics and Finance at La Trobe University, and Associate Dean (Graduate) in the Faculty of Business and Economics at Monash.

Jude Charlton
is Acting Director at the Monash Injury Research Institute (MiRI), Monash University. Jude is a behavioural scientist with expertise in ageing, cognition and movement science. She leads the Behavioural Science for Transport Safety at MiRI and her team is recognised as the leading research group in Australia on the safety of older and impaired drivers, pedestrians, cyclists and child passengers.

Professor Cristina Varsavsky
holds an education focused position and is currently Deputy Dean of the Faculty of Science. Her interests in the scholarship of learning and teaching include broad areas of mathematics and science education, and science and mathematics teacher education.

Professor Ross Coppel
is Deputy Dean and Director of Research of the Faculty of Medicine, Nursing and Health Sciences at Monash University. He is internationally recognised for his work in the fields of malaria and primary biliary cirrhosis. He is a Fellow of the Academy of Health and Medical Sciences and chair of the Wellcome Trust Translation Fund.

Professor Pauline Nestor
Senior Vice Provost and Vice Provost Research, Monash University. Professor Nestor attended Oxford University as a Rhodes Scholar and completed her Masters and Doctorate degrees in nineteenth-century English literature and culture. She was a foundation board member of the Victorian Registration and Qualification Authority and a member of the Victorian Higher Education Accreditation Committee, and has been a member of the ARC College of Experts.

Professor John Thwaites
is a Monash Professorial Fellow and Chair of ClimateWorks Australia, the Monash Sustainability Institute and Melbourne Water. He is a consultant at Maddocks Solicitors and he chairs the Australian Building Codes Board.

Professor Kate Smith-Miles
is an ARC Australian Laureate Fellow and Director of MAXIMA at Monash University. She is an applied mathematician, internationally recognised for her work in optimisation, data mining, and applying mathematics to tackle interdisciplinary problems from diverse fields including the biological sciences and engineering and economics applications.

Professor Maria Garcia De La Banda
is the Deputy Dean of the Faculty of Information Technology at Monash University. She is internationally recognised for her research in Declarative Programming Analysis & Modelling, has been Chief Investigator in nine national competitive grants, is Area Editor of the Journal of Theory and Practice of Logic Programming, and has many highly cited publications.

Professor Bryan Horrigan
is Dean of the Faculty of Law at Monash University. He holds a doctorate in law from Oxford University as a Rhodes Scholar and has both academic and professional experience in public and corporate law and governance from Australian, transnational, and cross-disciplinary perspectives.

Professor Gary Magee
is Deputy Dean (Research), Professor of Economics and Director of the Centre for Global Business in the Faculty of Business and Economics. He is a former Director of the Asian Economics Centre at the University of Melbourne, Head of the School of Economics and Finance at La Trobe University, and Associate Dean (Graduate) in the Faculty of Business and Economics at Monash.

Jude Charlton
is Acting Director at the Monash Injury Research Institute (MiRI), Monash University. Jude is a behavioural scientist with expertise in ageing, cognition and movement science. She leads the Behavioural Science for Transport Safety at MiRI and her team is recognised as the leading research group in Australia on the safety of older and impaired drivers, pedestrians, cyclists and child passengers.

Professor Cristina Varsavsky
holds an education focused position and is currently Deputy Dean of the Faculty of Science. Her interests in the scholarship of learning and teaching include broad areas of mathematics and science education, and science and mathematics teacher education.

Professor Ross Coppel
is Deputy Dean and Director of Research of the Faculty of Medicine, Nursing and Health Sciences at Monash University. He is internationally recognised for his work in the fields of malaria and primary biliary cirrhosis. He is a Fellow of the Academy of Health and Medical Sciences and chair of the Wellcome Trust Translation Fund.

www.monash.edu/miri
IN 2015, the Monash Injury Research Institute (MIRI) embraced a number of changes, challenges and noteworthy achievements.

Early in the year the Institute farewelled Professor Lesley Day, who served as Acting Director through 2014. Lesley was Head of the Falls Prevention Research Unit and the Victorian Injury Surveillance Unit over many years. Her leadership was marked by a generosity of spirit, integrity of decision-making and dedication to supporting the next generation of injury prevention researchers. Lesley commenced at Monash in 1991, after a career in nursing, and via a science degree, a PhD and an MPH at Johns Hopkins. Lesley’s research ranged across farm injury, falls prevention and motorcycle safety and her influence is evident in positive change in safety practice and health outcomes for the community at large and in particular the farmers and older Australians who were the focus of her research.

We all wish her safe but exhilarating adventures on the high seas, and we’re pleased that she will remain with us as an Adjunct Professor.

The Institute also farewelled Professor Mark Stevenson, Director of MUARC from 2012, as he departed Monash to take up a position at the University of Melbourne. Mark’s interest in the intersection of urban design and transport resulted in increasing collaboration with researchers at the University of Melbourne, and this new position will give him the opportunity to establish a program of work in urban design, transport and population health. Mark will continue his involvement with MUARC through student supervision and several projects.

As well as some notable departures, there were some significant inclusions to the Institute. We were pleased to welcome Tim Horberry as Professor of Human Factors, who joined us in March 2015. Tim will provide strategic direction for MUARC’s simulation facilities and has already expanded the team’s focus from road transport to areas such as mining, medical settings, defence and other workplace settings. Tim retains his position as Visiting Senior Research Associate at Cambridge University, England.

The Enhanced Crash Investigation Study (ECIS) entered its second year as the Institute’s largest Transport Accident Commission (TAC)-funded project. This is an immensely exciting collaboration, aimed at understanding the causes of serious injury due to motor vehicle crashes. The project provided an opportunity to host leading scientists at the second MUARC-TAC Road Safety Symposium.

The Institute continued its important partnership with the Victorian Country Fire Authority (CFA). Led by Associate Professor Stuart Newstead, the research seeks to contribute to evidence-based policy and practice in community fire safety and grew in scope over the 12 months of 2015. A highlight of the research program in 2015 was the
completion of a project establishing a data conceptual framework to guide data system design and development for fire and emergency management within the CFA.

The Monash University Accident Research Centre held its fourth innovative Road Safety Management Leadership Program at the Monash University Law Chambers in November, attended by 26 participants from across Australia, South Africa, India and New Zealand. The program is designed to develop and nurture the next generation of road safety leaders tasked with achieving improvements in road safety performance over the coming decades. This five-day intensive program addressed road safety leadership and management challenges, equipping participants with tools to respond to the circumstances which apply to countries all over the world.

The Monash University Disaster Resilience Initiative (MUDRI) hosted its 10th annual Skip Burkle Lecture, presented by Dr Caroline Spencer, announcing Australia’s First Compendium Of Community-Led Resilience Initiatives. The Compendium is a joint initiative between MUDRI and Emergency Management Victoria (EMV), represented at the Forum by Joe Buffone, Deputy Commissioner and Director, Risk, Resilience and Preparedness at EMV.

The success of MIRI is largely attributable to the excellence and determination of all its staff and graduate students and I thank them for their support through 2015. MIRI is committed to rewarding both professional and academic excellence. We celebrated a number of promotions through the year: Jennie Oxley to Associate Professor, Amanda Stephens to Research Fellow Level B, and Lesley Rees to Operations Coordinator. Best Graduate Student Paper was awarded to Karen Stephan for her paper entitled Characteristics of the Road and Surrounding Environment in Metropolitan Shopping Strips: Association with the Frequency and Severity of Single-Vehicle Crashes, published in Traffic Injury Prevention (Stephan & Newstead, 2014). Nimmi Candappa received the Best Early Career Researcher Paper for her Traffic Injury Prevention paper entitled Raised Crosswalks on Entrance to the Roundabout – A Case Study on Effectiveness of Treatment on Pedestrian Safety and Convenience (Candappa, Stephan, Fotheringham, Lenné and Corben, 2014).

2015 also marked a significant milestone as Institute staff reassessed how we can best position ourselves in the University and contribute to the broader University-wide injury activities. As the year drew to a close, Professor Pauline Nestor announced the disestablishment of MIRI. Importantly, the injury research and graduate education activities will continue under the reinstated Monash University Accident Research Centre (MUARC), a discrete entity within the office of the Senior Vice Provost (Research), effective 1 January 2016.

There were, however, two changes to the organisational structure of the Centre. As part of the broader reconfiguration of injury-related activities at Monash, the Patient Safety group have been relocated to the Centre of Excellence in Patient Safety in the Department of Epidemiology and Preventive Medicine. Collaborations between Patient Safety and MUARC will continue, particularly through the graduate student program and supervision. Similarly, the Child Abuse Prevention Research Australia team will no longer be under the MUARC umbrella.

For most, 2016 will be ‘business as usual’, as teams reconvene under the new MUARC organisational unit, with activities focused around three injury research domains: Transport, Workplace, and Home and Community. MUARC staff will also contribute through a new consortium – Monash Alfred Injury Network (MAIN) – which will more broadly integrate and enhance injury research activities across the University.

I am confident that the Centre’s long-held reputation for high-impact injury research will continue to grow under the reinstated MUARC and will continue to serve the research needs of its stakeholders with real-world solutions and effects.
The Injury Outcomes Research Unit aims to help injured people receive better healthcare by researching how people react to, respond to and cope with injury and trauma.

Researchers within this unit have expertise across numerous fields, among them medicine, epidemiology, statistics, psychology, health promotion and population health. They work closely with the Institute for Safety, Compensation and Recovery Research (ISCRR), WorkSafe Victoria and the Transport Accident Commission (TAC), as well as maintaining collaborative networks with similar groups throughout the world.

In 2015, a five-year evaluation of the TAC 2015 Claims Management model came to a conclusion. This program of research commenced in 2010 and involved a large number of individual research projects. The final stage of the project examined the implementation of the TAC Independence Model, particularly the Independence Plan. This involved interviews with allied health practitioners led by Sara Liu, surveys of staff, as well as an examination of how other compensation systems interact with their most seriously injured clients and their families.

The final piece was an overarching strategy document, including an examination of the processes and effects of the TAC 2015 program implementation. This strategy report involved information gathering from key TAC claims managers through one-on-one interviews with Associate Professor Michael Fitzharris, in addition to reference to our previous research. In addition to a number of reports, led by Professor Alex Collie, a paper on the TAC 2015 evaluation was published in the online journal, BMJ Open.

Di Sheppard received a Motor Accidents Authority of New South Wales Injury Management Grant in November, 2015. The grant will allow MUARC Injury Outcomes researchers to develop ‘Fast-Track Recovery’, an app that will facilitate recovery from non-catastrophic motor vehicle accident injury. This project, to be carried out over a 24-month period, will endeavour to minimise the risk of prolonged disability for those who have sustained such injuries.

RESEARCHERS within this unit have expertise across numerous fields, among them medicine, epidemiology, statistics, psychology, health promotion and population health. They work closely with the Institute for Safety, Compensation and Recovery Research (ISCRR), WorkSafe Victoria and the Transport Accident Commission (TAC), as well as maintaining collaborative networks with similar groups throughout the world.

In 2015, a five-year evaluation of the TAC 2015 Claims Management model came to a conclusion. This program of research commenced in 2010 and involved a large number of individual research projects. The final stage of the project examined the implementation of the TAC Independence Model, particularly the Independence Plan. This involved interviews with allied health practitioners led by Sara Liu, surveys of staff, as well as an examination of how other compensation systems interact with their most seriously injured clients and their families.

The final piece was an overarching strategy document, including an examination of the processes and effects of the TAC 2015 program implementation. This strategy report involved information gathering from key TAC claims managers through one-on-one interviews with Associate Professor Michael Fitzharris, in addition to reference to our previous research. In addition to a number of reports, led by Professor Alex Collie, a paper on the TAC 2015 evaluation was published in the online journal, BMJ Open.

Di Sheppard received a Motor Accidents Authority of New South Wales Injury Management Grant in November, 2015. The grant will allow MUARC Injury Outcomes researchers to develop ‘Fast-Track Recovery’, an app that will facilitate recovery from non-catastrophic motor vehicle accident injury. This project, to be carried out over a 24-month period, will endeavour to minimise the risk of prolonged disability for those who have sustained such injuries.

The TAC and WorkSafe Medicare linkage studies (ISCRR) were finalised, reported and presented. Two spin-off projects, by Sara Liu (Prevalence of mental health conditions pre- and post-road trauma) and Dr Minoo Farhadi (Impact of pre-existing health conditions on productivity loss and cost of recovery from occupational injury) moved into their final stages.

Additionally, ISCRR funding for the WorkSafe hospital data linkage was approved. Over the next two years, Voula Stathakis, Behroz Hassani-Mahmooei and Dr Janneke Berecki-Gisolf will be working on the project. In total, 48,812 WorkSafe claims have been linked with hospital records dating from eight years pre-injury through to two years post-injury. This linked dataset will be analysed and expanded with further linkages to alcohol and drugs data, mental health data and death data.

Also in 2015, the unit continued its evaluation of WorkSafe Victoria’s Streamlined Treatment Approval (STA) policy initiative. Introduced in 2014, the STA policy initiative established decision-making criteria to expedite the approval of treatment requests by case managers. Led by Dr Sjaan Koppel, Dr Janneke Berecki-Gisolf and Associate Professor Stuart Newstead in collaboration with the Institute for Safety, Compensation and Recovery Research (ISCRR), this evaluation aimed to determine whether the STA policy initiative had improved the claims experience of injured workers, their healthcare providers, and the claims agent staff who manage their claims.

The findings of the evaluation suggested that while the STA policy initiative has positively benefited the work of staff at the front lines of compensation service, there has been no notable effect on healthcare providers’ experiences of the claims process.

PhD student, Khic-Houy Prang, who is working on the influence of perceived social support in compensable injury, attended two conferences where work was presented. She attended the Australasian Society for Behavioural Health and Medicine conference in Perth and the 9th Health Services and Policy Research conference in Melbourne. Khic also published two papers on recovery from musculoskeletal injury sustained in road crashes, including the role of social support in that recovery.
High-quality injury surveillance data is crucial to preventing injuries and promoting safety. The Victorian Injury Surveillance Unit (VISU) analyses, interprets and disseminates data on injury deaths, hospital admissions and emergency department presentations in the state of Victoria.

VISU provides quarterly reports to the Victorian Department of Health. Data and separate reports are also published for professional and community audiences, such as government departments and agencies of all levels, health and injury prevention organisations, media, business and industry, education institutions, research groups and the community.

In March, VISU published the eleventh in a series of e-bulletins that provide an overview of the injury profile for Victoria. More than 340,000 Victorians were treated in hospital for unintentional injury during 2013/14.
- Males were overrepresented, accounting for 58% of all hospital-treated injury cases
- Falls were the leading cause of injury for admissions and emergency department (ED) presentations, accounting for 38% of all hospital-treated injury cases, followed by hit/struck/crush (17%), cutting and piercing (8%) and transport (7%)
- The home was the most common setting for injury (24% of hospital admissions and 39% of ED presentations)
- Fracture to upper limb was the most common injury for both admissions and ED presentations (17% and 11%).

In October, VISU published the twelfth edition, which focused on injury deaths in Victoria between 2010 and 2012. In the three-year period, 6,194 Victorians died as a result of injury.
- Sixty-seven percent of these deaths were unintentional, 28% were intentional (suicide or homicide) and the remaining 5% were classified as undetermined intent

In October, VISU published the twelfth edition, which focused on injury deaths in Victoria between 2010 and 2012. In the three-year period, 6,194 Victorians died as a result of injury.
- Sixty-seven percent of these deaths were unintentional, 28% were intentional (suicide or homicide) and the remaining 5% were classified as undetermined intent
- The overall average annual injury death rate was 37.2 per 100,000 population
- Males were overrepresented,
Surf Life Saving Australia have introduced helmet and lifejacket wearing safety policies and practices.
Disaster resilience is an evolving field of study and research around the globe. MUARC plays a crucial part in the field through the Monash University Disaster Resilience Initiative (MUDRI), launched in 2012 (although the unit dates back to 2005 and has its roots in the Faculty of Medicine, Nursing and Health Sciences).

THE MUDRI higher degree by research (HDR) program in 2015 comprised 13 candidates in the Masters by Research and five scholars in the PhD Program. In addition, MUDRI hosted 37 Coursework Students in First Semester and 16 in Second Semester from the Master of International Development Practice and Master of Nursing. Due to a change in University regulations, MUDRI was required to arrange for ownership of its masters by coursework MIR units to be transferred to a faculty. We were pleased to have the support of the Faculty of Arts who facilitated the new arrangements and invited MUDRI to continue to deliver these unique and important units.

The Claire Zara Inaugural Memorial Lecture was held at the 2015 Emergency Services Foundation Conference. Air Chief Marshal Sir Allan Grant ‘Angus’ Houston and Ms Elizabeth Broderick, Sex Discrimination Commissioner, presented keynote presentations.

The international exposure of MUDRI continued to grow. The unit made seven presentations at the World Association for Disaster and Emergency Medicine (WADEM) World Congress in Cape Town, South Africa. During the event, it was announced that Australia (Brisbane) would host the 2019 WADEM Congress. Professor Frank Archer was a member of the bid presentation team and MUDRI are members of the Congress Regional Committee. Dr Caroline Spencer was re-elected to WADEM Regional Oceania Chapter Council. Professor Archer and Joe Cuthbertson continue to co-chair WADEM Sections on Disaster Metrics and EMS respectively.

During 2015, members of the MUDRI team worked on a number of research grants. They included:

- An Australian Government Attorney General’s Department-funded National Emergency Management Project including measures of recovery, recent disaster reviews in an Australian context and a literature review on bottom-up approach to community resilience.
What is a disaster?

A disaster is a “serious disruptions of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.”

“Disasters are often described as a result of the combination of the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences.”

“Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation.”

(UNISDR, 2007)
### PhD candidates

<table>
<thead>
<tr>
<th>Student</th>
<th>Thesis topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Katherine Bone</td>
<td>Wellbeing Impacts of Precarious Employment: Perspectives of young academics</td>
</tr>
<tr>
<td>Karen Broadley</td>
<td>The role of women in contact and online child sexual abuse</td>
</tr>
<tr>
<td>Samantha Buckis</td>
<td>Young drivers and crash risk factors: Event data recorders shedding new light on speeding behaviour</td>
</tr>
<tr>
<td>Anna Butlinski</td>
<td>The adoption of children from out-of-home care in Victoria: A qualitative study investigating the understandings of key decision makers'</td>
</tr>
<tr>
<td>Angela Clapperton</td>
<td>The presence, nature and contribution of mental illness to Victorian suicides, 2008-2012</td>
</tr>
<tr>
<td>Belinda Clark</td>
<td>Unlicensed driving in Australia</td>
</tr>
<tr>
<td>Suzanne Cross</td>
<td>Influence of out of position status on the safety of children travelling in child restraint systems</td>
</tr>
<tr>
<td>Joseph Cuthbertson</td>
<td>Disaster risk and the social determinants of health</td>
</tr>
<tr>
<td>Susan Davie</td>
<td>How prepared is Australia to protect children in emergencies?</td>
</tr>
<tr>
<td>Sarah-Louise Donovan</td>
<td>Safety culture and leadership: Examining the influences for improved safety outcomes in high risk organisations</td>
</tr>
<tr>
<td>Shannon Gray</td>
<td>Injury risk management in the fitness industry</td>
</tr>
<tr>
<td>Anne Jamaldin</td>
<td>Accidental vs non-accidental injuries amongst children in Malaysia: Addressing the ‘grey’ area of underlying cause and intent of injuries</td>
</tr>
<tr>
<td>Mohammad Ibrahim</td>
<td>Scientific approach for road safety strategy framework</td>
</tr>
<tr>
<td>Nayomi Kannangara</td>
<td>Protecting children in emergencies</td>
</tr>
<tr>
<td>Jonny Kuo</td>
<td>Effects of child behaviour on driver distraction and performance</td>
</tr>
<tr>
<td>Tim Lathlean</td>
<td>Training loads, recovery and sleep on injury risk in junior elite Australian Football (AF) players</td>
</tr>
<tr>
<td>Brendan Lawrence</td>
<td>Understanding the nature of unreported bicycle incidents</td>
</tr>
<tr>
<td>Dianne McGregor</td>
<td>Understanding human performance and shaping factors in land vehicle systems</td>
</tr>
<tr>
<td>Vicky Marshall</td>
<td>Domestic violence in contemporary China</td>
</tr>
<tr>
<td>Heather Moody</td>
<td>Humanitarian guidelines and frameworks within the Australian disaster management context</td>
</tr>
<tr>
<td>Sin Ki Ng</td>
<td>The influence of workload and fatigue has in crew-operated land vehicles</td>
</tr>
<tr>
<td>Steven O’Hern</td>
<td>Urban cyclist safety: An investigation of how the urban road environment impacts cyclists safety</td>
</tr>
<tr>
<td>Heather Ploeger</td>
<td>Issues arising from child death injuries</td>
</tr>
<tr>
<td>Angelika Poulsen</td>
<td>Less severe forms of corporal punishment: a comparative study between Denmark and Australia</td>
</tr>
<tr>
<td>Khic-Houy Prang</td>
<td>The influence of perceived social support in compensable injury</td>
</tr>
<tr>
<td>Gemma Read</td>
<td>Application of systems-based methods to reduce trauma at pedestrian level crossings</td>
</tr>
<tr>
<td>Fiona Roberts</td>
<td>Investigation into measuring Disaster Resilience Recovery</td>
</tr>
<tr>
<td>Maatje Scheepers</td>
<td>Early identification of mental health conditions, the efficacy of remote health interventions and the resultant health services of TAC clients</td>
</tr>
<tr>
<td>Raphaela Schnitker</td>
<td>Investigation and prevention of fixation errors during airway management</td>
</tr>
<tr>
<td>Tiffany Too</td>
<td>An investigation into neighbourhood factors for railway suicide in Victoria</td>
</tr>
<tr>
<td>Jessica Truong</td>
<td>Safe systems and safety culture – How to move Towards Zero</td>
</tr>
<tr>
<td>Amanda Warmerdam</td>
<td>Work related road traffic injury: Managing the risk</td>
</tr>
<tr>
<td>Diana Wong</td>
<td>Disaster health evaluation</td>
</tr>
<tr>
<td>Claire Zara</td>
<td>Interpreting men’s responses to natural disaster through a masculinity lens</td>
</tr>
</tbody>
</table>

### MPhil Students

<table>
<thead>
<tr>
<th>Student</th>
<th>Thesis topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Janne Bowen</td>
<td>Building and strengthening resilience in communities prior to emergencies</td>
</tr>
<tr>
<td>Joanne Briggs</td>
<td>The impact of simulation training on skills acquisition and retention in a military context</td>
</tr>
<tr>
<td>John Coleman</td>
<td>Does collaborative planning for General Practices contribute to a more resilient emergency response?</td>
</tr>
<tr>
<td>Craig Ferguson</td>
<td>Defining the capability profile for leading major disasters in Australia</td>
</tr>
<tr>
<td>Karen Flanagan</td>
<td>An international history of “child protection” in Save the Children</td>
</tr>
<tr>
<td>Frances Haire</td>
<td>Analysing perceptions of floods in Australia to inform behaviour change</td>
</tr>
<tr>
<td>Roger Jones</td>
<td>Developing a practical tool to help individuals and communities in assessing and managing emergency risk</td>
</tr>
<tr>
<td>Dudley Mcardle</td>
<td>The community’s contribution to the shared responsibility for national disaster resilience</td>
</tr>
<tr>
<td>Blanca Ostein</td>
<td>A comparative study of the emergency response to mass casualty incidents and disasters between Israel and Australia</td>
</tr>
<tr>
<td>Matthew Pepper</td>
<td>Disaster resilience and emergency response</td>
</tr>
<tr>
<td>Suresh Pokharel</td>
<td>Multiple stresses and urban vulnerability: Why and how building resiliency should be a focus</td>
</tr>
<tr>
<td>Mark Potter</td>
<td>Examining the response and recovery interface with the aim of improving community resilience</td>
</tr>
<tr>
<td>Adam Poulter</td>
<td>Professionalisation of the international humanitarian workforce – what are the barriers and opportunities</td>
</tr>
<tr>
<td>Kate White</td>
<td>An investigation of the changing nature of “community resilience” as a contemporary issue in the Victorian emergency management sector for shared understanding and shared responsibility</td>
</tr>
<tr>
<td>Richard Young</td>
<td>Disaster resilience for all – what developed countries can learn from other countries</td>
</tr>
</tbody>
</table>
MONASH University
Accident Research Centre
A centre within the Monash University Injury Research Institute
The Monash University Accident Research Centre (MUARC) is Australia’s largest and most respected transport safety research centre. The Centre conducts research into, consults on and undertakes training in safety across all modes of transport.

FOUNDED in 1987, MUARC transitioned into the transport arm of the Monash Injury Research Institute from 2011, where it has continued to develop research-based solutions that make Australian roads safer.

MUARC has built a reputation on excellence in research, independence in its recommendations and engagement with the communities it serves. It has many Australian and international clients, and has forged long-term relationships with VicRoads, the Transport Accident Commission, the Department of Justice and regulation, and Victoria Police.

MUARC’s work is conducted across five priority areas:
- Behavioural science for transport safety
- Human factors in transport systems
- In-depth crash investigations and transport regulation
- Statistical analysis and transport data systems
- Traffic engineering and vehicle safety.

The Centre has also established a continuing research partnership with Western Australia’s Curtin University. The Curtin-Monash Accident Research Centre (C-MARC) is supported by the government of Western Australia.

Underpinning MUARC’s research, education and training is a commitment to Vision Zero: that is, a vision of zero deaths and serious injuries across our road transport system. There is an urgent need to shift the emphasis away from blaming drivers for errors that lead to crashes on our roads. Rather, we need to focus more effort on building a “safe system” that accepts that people make mistakes, and design roads that reduce crash and injury risks as much as possible.

Unquestionably, we are moving towards higher levels of sophistication in transport technologies and many have hailed the self-driving car as an important part of the solution for achieving a safer transport system. We are also experiencing
a growth in demand for more sustainable transport modes and, with this, a growth in use of bicycles, e-bikes and various ride share options. While technologies hold considerable promise, there are many issues that warrant attention, including a more thorough analysis of safety benefits, regulatory barriers, insurance implications, infrastructure needs, as well as human factors concerns regarding drivers’ consumption of control. Importantly, as researchers, government, industry, transport managers and road users wrestle with the challenges of a more autonomous transport era, there is an opportunity to re-conceptualise the way that we can achieve a safer transport system, while at the same time achieving better outcomes for community mobility, health and environmental sustainability.

This has been another successful year in funding, research and collaborations. Noteworthy activities in 2015 included:

- Continuation of the $8 million Enhanced Crash Investigation Study (ECIS) funded by the Transport Accident Commission (TAC). The study will examine more than 400 serious injury crashes to gain a detailed understanding of what causes such incidents. The study findings will be used to develop recommendations for strategies to support the Victorian State Government in achieving its road safety targets.

- The release of the 2015 update of the Used Car Safety Ratings. MUARC analysed records from millions of vehicles in police-reported road crashes in Australia and New Zealand between 1987 and 2013. This is a unique tool and every major road authority and motoring club in Australia and New Zealand is a stakeholder. A supplementary report examined trends in crashworthiness of the New Zealand vehicle fleet by year of manufacture: 1964 to 2013. You can read more about the 2015 release in the section on the Statistical Analysis and Transport Data Systems on page 28 of this Annual Report.

- Holding the fourth Road Safety Management and Leadership Program, involving 26 senior
members of police forces and road and transport agencies from India, South Africa, New Zealand and Australia. The program is now a regular fixture on the global road safety calendar. A strong feature of the program is its integration of road safety management and science topics, with an emphasis on contemporary leadership and management challenges and how they can be met to enable effective implementation and delivery of improved safety outcomes.

- The departure of Professor Mark Stevenson as Director of MUARC. Mark took up a professorial position at the University of Melbourne, following his growing interest in the intersection of urban design, transport and population health. Mark continues his involvement with MUARC through ongoing student supervision and collaborative projects.

- The expansion of the human factors and simulation laboratory, thanks in no small part to the commencement of Associate Professor Tim Horberry as head of the human factors team, and our partnership with Dr Giovanni Savino, a visiting academic from the University of Florence with expertise in motorcycle autonomous braking systems. You can read more about the advances made in our simulation capabilities in the section on the Human Factors in Transport and Workplace Safety team.

- Publication of an important new report for Austroads on ‘Options to Extend Coverage of Alcohol Interlock Programs’. Led by Associate Professor Michael Fitzharris, this report for Austroads developed options to extend the coverage of alcohol interlock programs to a wider segment of drink-driving offenders, other high-risk groups, corporate fleets and, if appropriate, the broader driving population on a voluntary basis.

- Commencement of Australia-first research into everyday driving behaviour, the $4 million Australian Naturalistic Driving Study (ANDS). Its objective is to determine how drivers encountered in everyday driving. Through this research MUARC will learn how people avoid collisions and deal with hazards including busy intersections and other situations in their day-to-day driving. The study will also reveal new information about human factors such as distraction, inattention, speeding, aggression and tiredness, which are implicated in many collisions. The results will provide critical new insights for improving driver training, licensing procedures, as well as vehicle and road infrastructure design. You can read more about ANDS in the section on the Behavioural Science for Transport Safety team.

- Publication of Winter and Summer editions of The Big Impact newsletter – bringing stakeholders up-to-date information on the Centre’s activities and transport safety research.

- MUARC researchers regularly provided comment for news and opinion articles and items in Australian and international media.

- Contributing to global road safety initiatives: In conjunction with the Bloomberg Initiative for Global Road Safety and the Mayor of the City of São Paulo, the World Resources Institute (WRI) Brazil for Sustainable Cities, hosted a seminar on ‘Impacts of implementing safe speeds in cities’. Dr Jennie Oxley presented as a keynote speaker at the seminar which was attended by World Health Organisation delegates, the Mayor of the City of São Paulo, local and federal administration, community representatives, local and international academics, and the media. The workshop created an important debate about the benefits of speed limit reduction for sustainable safety in urban areas and implementation of best-practice initiatives for enhancing public acceptance of lowering speed limits. Further, this has provided MUARC with opportunities to strengthen partnership and engage in ongoing road safety initiatives in the region.

- Submission to a federal parliamentary inquiry on ‘Aspects of road safety in Australia’. Commissioned by the Senate Standing Committee on Rural and Regional Affairs and the Transport References Committee, the inquiry focused on the social and economic cost of road-related injury and death, the importance of design standards on imported vehicles, the influence of new technologies and advancements in understanding of vehicle design and road safety, as well as the different considerations affecting road safety in urban, regional and rural areas.
Traffic Engineering and Vehicle Safety (TEVS) Consortium

Led by Professor Brian Fildes, the Traffic Engineering and Vehicle Safety (TEVS) Consortium is made up of research engineers with industry and academic experience in civil and mechanical engineering. The team comprises Dr David Logan, Ms Nimmi Candappa, Mr Brendan Lawrence, Mr Steve O’Hern and Mr Mohammad Nabil Ibrahim. It focuses on work related to the development and evaluation of safe road infrastructure, particularly research around intersection design, roadside barriers and vehicle safety.

Dr Jennie Oxley is also a key observer with the group.

A MAJOR multi-year study into intersection safety came to a conclusion in 2015. The VicRoads-funded large-scale intersection project was completed with an Australia-first intersection design trialled in Geelong and evaluated by Ms Nimmi Candappa. The design is currently in use at a number of specific-suitable intersections.

Dr David Logan concluded his long-term work on reducing serious road trauma, which focused on developing a better model for the prediction of the benefits of road safety strategies. His eMETS model, based on the pioneering METS model, aims to bring new levels of sophistication to the modelling of casualty savings achieved from combinations of countermeasures implemented as part of government road safety strategies. eMETS draws upon the most robust evidence from the research literature to assist road safety stakeholders direct major investment programs targeting key crash areas.

Professor Brian Fildes, with the support of Associate Professor Stuart Newstead and other academics, successfully completed two major international reports during the year:

- Evaluation of the Effectiveness of Anti-Lock Braking Systems on motorcycle safety in Australia.
- Evaluating Camera Effectiveness in Back Over Collisions With Pedestrians.

They provide the basis for state and federal governments, in Australia and overseas, to introduce new regulations for vehicle manufacturers’ compliance. These studies are likely to reduce deaths and serious injuries on our roads if the recommendations are implemented.

In 2015 several academics closely involved with the TEVS Consortium reached major career milestones:

- PhD candidate Brendan Lawrence was successful in his mid-term assessment and is now working towards his completion. His PhD research is exploring the role the urban road environment plays in cycling safety. His research largely involves instrumenting the bikes of 100 Melbourne cyclists with forward and rearward facing video cameras, along with a GPS tracking device. The data from these instruments are used to capture the road environment in which the cyclists commonly ride. Collection of these data has been completed, and his research is now focused on describing this road environment in depth, and examining how it compares to the road environment at known crash sites across Melbourne.
- PhD candidate Steve O’Hern was also successful with his confirmation of candidature and is now working on his research program.
- Nimmi Candappa has been successful in her application for PhD and will commence her studies early in 2016.
- David Logan has completed a number of successful projects during the year, both locally and overseas.
- Dr Giovanni Savino completed his two-year exchange program focussing on motorcycle autonomous braking technologies and returned to his home country to finalise the program.

Professor Fildes is also a member of an international consortium evaluating the real-world benefits of vehicle safety technologies. The technique uses meta-analysis to bring together data from various external sources to speed up these evaluations. This year, the consortium successfully published the results of an evaluation of low speed autonomous emergency braking, showing significant savings in rear-end crashes and associated injuries.

Brendan Lawrence, Steve O’Hern, Nimmi Candappa, Jennie Oxley, David Logan, Brian Fildes.
A HIGHLIGHT in the past year was the team’s five-year celebration event for the Ozcandrive project. Ozcandrive is a world-first longitudinal study, tracking health and real-world driving measures of older drivers as they age. The broad aims are to reduce vehicle-related injuries and death and improve the quality of life of older people by extending their safe mobility.

Ozcandrive was funded (2010-2015) through an Australian Research Council Linkage grant in partnership with La Trobe University, VicRoads, the Victorian Department of Justice and Victoria Police, the Transport Accident Commission, New Zealand Transport Agency Community Road Safety Fund, Ottawa Hospital Research Institute and Eastern Health. Together with its Canadian partner, Candrive, the study involves 928 drivers in Canada and 302 drivers (aged 75 years and older) in Australia and New Zealand. A key outcome will be the development of an objective screening tool to assist clinicians to identify at-risk older drivers.

The study is generating a rich volume of data, including naturalistic driving patterns recorded through a device installed in participants’ vehicles and annual measures of functional ability, medical conditions and self-reported driving practices. The findings will answer questions about how older drivers’ driving changes over time and how declining health and functional ability can influence driving.

At the five-year celebration event, Federal Member for Chisholm, Ms Anna Burke launched the next phase of the project: Ozcandrive II, which will extend the study into a sixth year and beyond.

A new project focusing on ageing road users commenced in 2015 with a two-year collaborative study led by Dr Sjaan Koppel and Associate Professor Michael Fitzharris, with Associate Professor Jude Charlton, Associate Professor Stuart Newsom and Angelo D’Elia. The program, commissioned by the MUARC Baseline Research Program, will examine the occurrence, severity and associated costs of older road user crashes. Findings will be used to guide targeted road safety policy and action plans to reduce older road user crash-related injuries and deaths.

Another research focus for the team was child passenger safety. The Children in Cars project uses innovative naturalistic driving methods to observe children as rear seat occupants during real-world car trips. Child restraint systems for vehicles are designed to provide specialised protection for child occupants in the event of a crash. However, children do not sit perfectly still or behave like a crash test dummy while travelling in vehicles. This may lead to inappropriate seating positions which may compromise children’s safety if a crash were to occur, and may also distract the driver.

The project involves a large scale international collaboration through the Australian Research Council Linkage Scheme and brings together researchers from Monash University, the Children’s Hospital of Philadelphia Research Institute, University of Michigan Transportation Research Institute and Chalmers University of Technology. Outcomes will be used to optimise vehicle and child restraint system design and develop targeted safety education strategies to mitigate injury to children in the event of a car crash.

Led by Associate Professor Judith Charlton, the Behavioural Science for Transport Safety team conducts research into vulnerable road users using a safe systems framework. The unit studies seniors, youth and children who use the road system as drivers, passengers, pedestrians, cyclists and motorcyclists.
In 2015, project partners at the Children's Hospital Philadelphia led the team's activities to quantify children’s out-of-position status. These findings will provide critical input for the sled tests to be conducted by the project partners Autoliv (Sweden) and Britax (Australia), planned for the next phase of the study. Using child crash test dummies, the sled tests will explore potential injury implications of children’s out-of-position status. PhD candidates Suzanne Cross and Jonny Kuo also progressed their respective components of the project with commencement of video coding of children’s position and behaviour and analysis of parent/driver distraction using novel automated processing of speech and driver head position data. Jonny presented two papers at international research forums in Sydney and Nanjing.

In September, Dr Sjaan Koppel travelled to Gothenburg in Sweden to participate in a two-day workshop as part of the International Future Agenda for Child Occupant Protection Committee. The Committee includes a wide field of experts including behavioural scientists, biomechanists, manufacturers of child restraints, engineers, epidemiologists, government researchers, paediatric clinicians, safety researchers, system suppliers and vehicle manufacturers. The workshop aimed to:

- Critically review the state of international knowledge
- Translate the Decade of Action framework into child-specific priorities
- Identify high-priority research topics and develop strategies for implementation, and
- Plan the future agenda for child occupant protection.

The Behavioural Science for Transport Safety and Human Factors teams were key participants in another Australia-first study into everyday driving behaviour, the Australian Naturalistic Driving Study (ANDS). The project is a ground-breaking new national collaboration which will use advanced sensors and data-logging technologies to study the behaviour of drivers, their cars and other road users in the real world.

ANDS data will allow researchers to study how drivers deal with hazards including busy intersections that have no traffic lights and difficult driving situations such as pedestrians unexpectedly crossing the road or other drivers engaging in risky behaviour. Through this research we will learn how people avoid collisions or other safety-related incidents in everyday driving. The study will also reveal new information about human factors such as distraction, inattention, speeding, aggression and tiredness, which are implicated in many collisions. The results will provide critical new insights for improving driver training, licensing procedures, as well as vehicle and road infrastructure design.

A total of 380 volunteer drivers aged between 20 and 70 (in Victoria and New South Wales) will participate in the research and have their cars fitted with a Data Acquisition System (DAS) to record their driving over a four-month period. The DAS is a unique device comprising sensors and data loggers including video, acceleration in multiple axes, gyroscope motion, indicator status, speed, radar and GPS position that allows the continuous recording of vehicle- and driver-based data.

Professor Charlton heads the MUARC-based ANDS team with Dr Kristie Young and Technical Officers, Yi-Xing Hue and Andrew Lyberopoulos, and Research Assistant, Rachel Osborne. The project receives funding from the Australian Research Council through the Linkage Scheme and is led by the University of New South Wales in collaboration with Monash University, Queensland University of Technology, the University of Adelaide and Virginia Tech (USA). Government and industry partners include the Centre for Road Safety at Transport for NSW, NRMA, the Transport Accident Commission, VicRoads, the Motor Accident Commission in South Australia, the Western Australian Office of Road Safety, Seeing Machines and Hyundai Australia.

Cycling safety assumed an increasingly important place within MUARC’s research portfolio, in response to the growth of commuter and recreational cycling activities on Australia’s road system. Dr Jennie Oxley leads the four-year study funded through an ARC Linkage Grant in partnership with Main Roads Western Australia, VicRoads, Transport Accident Research Centre, Amy Gillett Foundation, Cycling Promotion Fund, Monash’s Institute of Transport Studies (Civil Engineering), and Emergency and Trauma Research Unit, and the Curtin-Monash Accident Research Centre.

This study is the first comprehensive study in Australia that combines academic, government and community efforts to enhance cycling activity while addressing key safety concerns. The study takes an innovative, multi-disciplinary approach to understanding the issues contributing to cyclist injury. The study will develop new road designs to improve the urban cycling experience. Australia’s first cycling simulator (BikeSim) has been built and validated as part of this study and will be used to evaluate the safety and amenity of new road prototypes which will be designed to improve cyclist safety and maintain the efficiency and mobility of vehicles.

The four-staged project is run in Melbourne and Perth: the first two stages (in-depth study of crash-involved cyclists and naturalistic cycling study of non-crash-involved cyclists) are being undertaken to describe the contributing factors to cyclist crashes and identify features of the urban road environment that increase risk of collision. The second two stages (prototype development and bicycle simulator studies) will be undertaken to develop and evaluate effective urban prototypes that have the potential to achieve large reductions in numbers of cyclist collisions.

With the increasing popularity of cycling generally and availability of new bicycle child carriers there is an emerging interest in the safety of child bike carriers. However, very little is known about the nature and extent of injuries to child bicycle passengers. A study led by Jennie Oxley, conducted in partnership with the Centre for Automotive Safety Research (University of Adelaide) and funded by the ACT-NRMA Road Safety Trust, found that over 10 years there were 18,000 emergency department presentations and 4,800 hospital admissions for child bike passengers. The study found that younger children are more likely to sustain severe injuries compared with older children, especially head and neck injuries. This is likely the result of being constrained in a seat or trailer with little protection or opportunity to mitigate injuries.

Jennie Oxley also led a study funded by Victoria Walks and VicHealth, examining falls in public spaces; a hidden contributor to pedestrian injury. The study identified an average of 1,680 hospital admissions and 3,545 emergency department presentations each year. Older pedestrians were significantly over-represented amongst fall-related injuries requiring hospital admission and had the highest rate of emergency department presentations when adjusting for age.
Human Factors in Transport and Workplace Safety

The Human Factors team applies in-depth understanding of people - their abilities, characteristics and limitations - to the design of the equipment they use, the tasks they perform and the environments in which they function. The team applies models of system safety to the analysis of transportation and other safety-related issues providing strong research results that can be used to guide policy direction. Team members have backgrounds in experimental psychology, human factors, computer science and engineering. The team leader is Associate Professor Tim Horberry, who returned to MUARC in March 2015.

IN 2015, the work of the unit began to shift somewhat. Although road transport – a traditional focus – remained a central concern, a new emphasis was placed on safety in areas such as mining, medical, defence and the workplace. With that shift came a change in name. What had once officially been the Human Factors in Transport Systems unit became the Human Factors in Transport and Workplace Safety unit.

Projects this year once again highlighted the importance of conducting research that applies human factors principles to system design. Major achievements were underpinned through expertise in the measurement of behaviour using on-road testing, driving simulation, surveys and focus groups, and human factors methods such as task and cognitive task analysis.

Driving and riding simulation remains a vital part of the Human Factors team’s work and in 2015 the unit significantly added to its strength in this area, so that its vehicle types, facilities and capabilities remain unmatched in Australia:

- A new motorbike simulator was developed in conjunction with Italian rider safety researchers
- A full car (Holden) simulator received new software and functionality
- A defence crew simulator helped researchers understand crew performance, training and workload in a multi-crew army-style vehicle.

In addition to upgrading its simulation facilities, the unit also undertook important practical research using those facilities. In partnership with TransUrban, the Human Factors team conducted research on driver distraction and road user behaviour.
Factors team, used instrumented vehicles to test tunnel design and safety. They measured optimal sign arrangement for speed management and safety in different traffic scenarios and made recommendations, which have been adopted by TransUrban.

As well as working on immediate challenges to road users, the team also works on transport challenges of the future. Automated vehicles, once the stuff of science fiction, are now used throughout the world and are perhaps years away from becoming mainstream consumer vehicles. In 2015, the Human Factors unit, in collaboration with Austroads, the federation of Australasian road transport and traffic agencies, began what will be a continuing project identifying emerging technologies and assessing the safety benefits of automated vehicles. The project is assessing what is happening in the field of automated technology around the world (particularly in the United States and Europe) and at crash scenarios in driverless vehicles.

Also in the field of automation, the team did work for the Defence Science Technology Group, looking at how new army vehicles might be fitted with new technologies and how those new technologies might affect teamwork, performance and crew workload. The work was in preparation for trials in 2016.

Similar work was done for the mining industry, with Human Factors considering how mining might take lessons learned from the road transport industry and apply them in areas like design and design systems.

- Automation for defence vehicles
- Smart technologies in mining vehicles.

Professor Horberry commenced an international research project funded by the National Institute for Occupational Safety and Health (NIOSH) in the USA. Collaborating with ergonomists from NIOSH and the University of Queensland, the work will produce a roadmap for human-centred design of mining equipment. The mining industry has traditionally been very technology-centred rather than human-centred, and the work, which will continue into 2016, will help to produce a paradigm shift in this domain.

The project will aim to:

- Disseminate human-centred safe design (HCSD) material via a NIOSH published ‘Information Circular’. This will include how mining equipment needs to be designed with an explicit focus on the end users, their work tasks, and the likely use context
- Create detailed HCSD case studies, one focusing on new technology and one on traditional mining equipment
- Develop HCSD education and training materials for ultimate use by American-based mining groups
- Work with the NIOSH project leader to develop a roadmap for integrating an HCSD approach into NIOSH projects and more broadly across the global minerals industry.
Led by Associate Professor Michael Fitzharris, the Regulation and In-Depth Crash Investigation team is interested in matters relating to road and vehicle safety regulations, such as how decisions are made, formulated and supported through evidence-based science. The team creates and uses comprehensive in-depth crash data, as well as data from hospitals, police and compensation systems to identify safety concerns.

IN 2015, the Regulation and In-Depth Crash Investigation team examined a diverse range of road safety issues, including passenger vehicle crashes, motorcycle crashes, the role of alcohol and other drugs, and the role that technology can play in reducing road trauma.

Of note was the central role that the team’s research played in the adoption of the new Pole Side Impact Regulation, both in the UN forum but also as Australian Design Rule 85, which was passed by the Parliament of Australia in late 2015. This new rule, in the form of a pole side impact crash test, will transform vehicle side impact safety and is expected to save thousands of lives and prevent serious head and chest injuries in particular.

Research into the safety of motorcycles was a major theme for the team in 2015. In collaboration with Dr Julie Brown at Neuroscience Research Australia and Associate Professor Nigel Taylor, University of Wollongong, work continued on examining the association between thermal strain and the safety and comfort of motorcyclists. Findings from this Australian Research Council Discovery project were published in Ergonomics, with a key policy implication being that the heat dissipation capabilities of motorcycle clothing needed to be improved for use in hot climates without compromising impact protection.

MUARC is also a participant in the European Union COST (Cooperation in Science and Technology) Action Safe2Wheels, a large collaboration bringing together motorcyclist safety academics and industry to address contemporary and future motorcycle safety technologies.

Visiting academic, Dr Giovanni Savino, continued his work under the auspices of an EU Marie Curie Fellowship on the ABRAM (Autonomous BRAking for Motorcycles) Program. Dr Savino focused his efforts on developing an idealised autonomous emergency braking system for motorcycles, conducting field testing with the assistance of Bosch, and using in-depth data to examine the likely safety benefits of the application of motorcycle autonomous emergency braking.

The team also undertook extensive research into the effects and consequences of driving while under the influence of drugs and alcohol. Publication of the Austroads report titled Options to expand the coverage of alcohol interlock programs received widespread media coverage. The report was the product of a number of years of research and found a strong case for both the use of alcohol interlock technologies across the vehicle fleet and different driver sub-groups. The report made recommendations for the refinement of existing offender-based alcohol interlock programs in Australasia.

Following this theme, the team had a continued focus on the role of alcohol in road crashes, and is working to understand the relationship between different levels of alcohol consumption, including alcohol dependency and road safety.

In 2015, the team commenced a three-year project examining drugs and driving. The study, sponsored by the TAC, VicRoads, and the Department of Justice is a collaborative program with the Burnett Institute (Professor Paul Dietze) designed to understand the incidence and circumstances of drug-related driving.

Through the International Spinal Cord Society (ISCoS), the team examined the global incidence of spinal cord injury (SCI) mechanisms of injury. This led to the Sujanie Peiris, Sara Liu and Associate Professor Fitzharris’ work being published in two chapters in the Textbook on Comprehensive Management of Spinal Cord Injuries. Research also focused on the economic cost of SCI to the community.

The team continued its collaboration with South Africa’s Road Traffic Infringement Agency (RTIA) and Associate Professor Fitzharris delivered an address at the National Road Safety Advisory Council Launch held in Johannesburg.

MUARC was also represented by Associate Professor Fitzharris at the Second Global High-Level Conference on Road Safety hosted by the WHO, and associated events hosted by the FIA Foundation held in Brasilia. This meeting served as the mid-point Ministerial meeting of the UN Decade of Action for Road Safety, where Australia also had Ministerial representation.
THE TAC-funded Enhanced Crash Investigation Study (ECIS) continued its research in 2015. ECIS aims to provide the TAC with the evidence-based road safety countermeasure options to specifically target and reduce the number of serious injury crashes in Victoria.

The ECIS program involves a comprehensive examination of 400 crashes that resulted in serious injury. Commencing with an interview with an injured driver, or their family, the ECIS team then examines the vehicle and the scene of the crash with a view to understanding how the crash occurred, how future crashes could be prevented, and how the severity of injuries sustained can be minimised. The study also includes a ‘control arm’ where drivers who safely pass through locations where a crash has occurred are invited to complete a survey. These two parts of ECIS are designed so that a greater understanding of crash risk can be achieved.

By the end of 2015, the ECIS program had examined the crash circumstances of 204 drivers involved in crashes that resulted in them being admitted to hospital. Two out of three eligible drivers approached by the ECIS nurses agreed to participate in the study. ECIS had also received completed surveys from 841 drivers who safely passed through 97 locations where a crash had occurred as part of the control study.

An important part of the ECIS program is community outreach. As part of ‘ECIS week’, the MUARC-TAC Road Safety Seminar, held at Docklands, attracted over 225 participants. Featured at the seminar were presentations from the local and international study investigators, including Professor Ray Bingham (University of Michigan Transportation Research Institute) who spoke on young driver safety, Associate Professor Diana Bowman, who addressed the legal implications of driverless vehicles (Michigan) and Professor Clay Gabler (Virginia Tech) who spoke on the safety performance of roadside guard-rails. Local speakers addressed post-crash trauma care (Professor Gruen, The Alfred) and the impact and importance of serious injury (Associate Professor Fitzharris, MUARC). The day also featured a panel session moderated by Samantha Cockfield (TAC).

ECIS also plays an important role in creating dialogue and an improved understanding of the safe system philosophy as it applies to road safety. Eight Melbourne CBD-based Panels and four Regional Panels (Warragul, Geelong, Otway, Shepparton, and Mornington), with 325 participants representing 39 organisations involved in road safety across Victoria attended.

The ECIS team also had the opportunity to present its research at international and national conferences, with Ms Samantha Buckis, publishing a paper on the lifetime cost of young driver crashes to Traffic Injury Prevention and presenting this work at the Association for the Advancement of Automotive Medicine annual conference in Philadelphia. ECIS was prominent at the Australasian Road Safety Conference in Brisbane (2015) with four papers and presentations in its own symposium. Topics included the role of event data recorders in understanding crashes, lower extremity injuries and attitudes to speed.
IN 2015, the major trial of alternative mobile speed camera scheduling operations in three Victoria Police divisions designed by Professor Max Cameron and Associate Professor Stuart Newstead continued. Run throughout the year in conjunction with three ‘control’ divisions to provide a scientific comparison, the trial aims to identify the road safety benefits of the alternative scheduling. Trends in scheduling patterns and speeding driver detection rates in both trial and control divisions continue to be monitored and a final crash analysis will be conducted for Victoria Police early in 2016.

Research carried out by the team to inform vehicle age limits for taxis and hire cars in Victoria was completed and released by the Taxi Services Commission (TSC). The work is being used by the TSC to develop a comprehensive strategy for taxi and hire car safety, which will consider not only vehicle age limits but also safety specification of taxis and driver safety performance.

This was the 23rd year of publication of the Used Car Safety Ratings (UCSR), produced by Associate Professor Newstead and Linda Watson. The comprehensive guide gives consumers information on the safety of their current vehicle and any used vehicles they are considering buying. The unique feature of this ratings system is that the information has been collected from real incidents, using police reports and injury compensation claims data. This year the ratings were launched via a social media campaign supported by crash test footage of two used cars (in which there is significant continuing interest).

Transport for New South Wales extended the application of the UCSRs by producing a Safe Cars List for Older Drivers highlighting those vehicles that are particularly safe for older drivers. And the New Zealand Accident Compensation Corporation launched a new differential vehicle insurance levy for its road crash insurance scheme during 2015. The levies are based on the UCSR data with the aim being to encourage the purchase of safer vehicle through discounted the insurance levy for those people with safer cars.

Associate Professor Newstead, Laurie Budd and Associate Professor Mike Keall completed a project estimating the impacts of vehicle safety improvement on overall road trauma in Australia and New Zealand over the past decade. The project estimated the likely future impacts of vehicle safety improvements, including the potential additional benefits in increased uptake of new crash avoidance technologies such as Autonomous Emergency Braking and Lane Departure Warning Systems. Results of this study have been pivotal in assisting state government agencies across Australasia to set vehicle safety strategies.

Associate Professor Newstead and Laurie Budd also completed a project examining the potential benefits crash avoidance technologies for heavy vehicles including auto emergency braking and fatigue monitoring. These technologies...
were found to be highly cost effective for
the heavy vehicle fleet due to the high
exposure of these vehicles in conjunction
with typically severe injury outcomes in a
crash. Results of the study were presented
by Ms Budd to a heavy vehicle fleet
managers’ conference at the end of 2015.
Data collection for the Managing
Increasing Challenges in Motorcycle
Safety (MICIMS) in-depth crash study was
completed. The analysis phase, led by Dr
Trevor Allen and Karen Stephan is now
underway and will consider the role of
rider, motorcycle and environmental factors
in determining motorcycle crash risk.
Results from the study will be available
in early 2016. A number of side studies
have also been conducted, including an
investigation of the characteristics single
and multiple motorcycle crashes and an
investigation of travel speeds and traffic
positioning of motorcycles.
Angelo D’Elia and Associate Professor
Newstead completed work to estimate
trends in baseline road safety performance
in Victoria that was used as a basis for
development of the new Victorian road
safety strategy. They also continued to
Collaborate with government agencies in
Victoria and New South Wales to define
and calculate new injury severity metrics
for road crashes that will form the basis
of monitoring progress in preventing
serious but non-fatal road trauma in these
jurisdictions.
The team continued to conduct a
substantial program of research into
police traffic enforcement and its impacts on
road safety outcomes. Highlights
included the development of a Traffic
Enforcement Resource Allocation Model
by Professor Cameron, which provides
quantitative evidence on the benefits
of investment in various road policing
activities and technologies to reduce
Victorian road trauma.
Associate Professor Newstead,
Belinda Clark, Kathy Diamantopoulou
and Brendan Lawrence also completed
a comprehensive evaluation of the
automated speed enforcement program in
Western Australia as part of the C-MARC
work program. This project examined
the crash effects of fixed intersection and
freeway speed cameras and the mobile
speed camera program in the state to
give a picture of the road safety benefits
of each camera type. It provided information
on the potential benefits of various planned
expansions of the camera program.
Associate Professor Newstead, Dr
Carlyn Muir and Angelo D’Elia continued
their collaborative research program
with the CFA. In addition to completing
a project that will support an outcomes-
based focus for fire and emergency
management within the CFA, the team
also commenced work on a series of
projects relating to residential fires. The
team established a methodology to
estimate the cost of residential fires in
Victoria, undertook a literature review
to identify effective countermeasuresto
prevent residential fires and analysed
CFA fire incident data to establish factors
affecting both the risk of residential fire
occurrence and the severity of outcomes
from the fire.
The team also continued its work in
novice driver program evaluation, including
the New South Wales Safe Driver Course,
and the P Drivers Project in Victoria and
New South Wales.
Statement of Income and Expenditure

From 1 January 2015 to 31 December 2015

<table>
<thead>
<tr>
<th>Notes</th>
<th>$000s</th>
<th>$000s</th>
<th>$000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance as at 1st January 2015</td>
<td></td>
<td></td>
<td>2,927</td>
</tr>
</tbody>
</table>

**INCOME**

DEEWR | 1,513 |

Research:

- Australian Research Council | 1 | (176) |
- National Health and Medical Research Council | 228 |
- State and Local Government | 5,620 |
- Commonwealth Government | 2,451 |
- Industry Australia | 285 |
- Industry International | 111 |
- Competitive Non-Government | 45 |
- Co-operative Research Centres | 10 |
  **Total Research** | 6,368 |
  Commercial | 976 |
  Internal Grants (Monash Research Support/Strategic Initiatives) | 2 | 2,868 |
  Other (Including Sale of Assets, Student Fees, Transfers, Donations) | 226 |
  **Total Income** | 11,951 |

**EXPENDITURE**

Salaries and Related Expenditure | 6,116 |

Financial and Administration | 3 | 398 |

Student Related | 286 |

Infrastructure Related | 163 |

Central Support Services – Overhead Costs | 2 | 2,700 |

Other Operating Expenditure | 712 |

Capital Expenditure | 45 |

  **Total Expenditure** | 10,420 |

**Net Balance for the year** | 1,531 |

**Balance as 31st December 2015** | 4,458 |

**Notes:**

1. Includes $477,000 paid to other HEP institutes upon transfer of projects.
2. The University has provided a transfer of funds to cover the Central Support Services - Overhead Costs
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 Senior Vice-President and CFO. Where required as a condition of funding grants, accounts will be audited by independent external auditors. The Institute’s accounts have been subjected to Government audit as part of the University’s annual accounts for the calendar year 2015.

Footnote: It should be noted that the Institute operates on a calendar year and its revenue and expenditure are, for the most part, project related and several projects span multiple reporting periods and calendar years. The apparent ‘surplus’ reflects grant and contract income received in 2015 and prior for expenditure that will be incurred in 2016.

JOEL CHIBERT
Director, Research and Revenue Accounting Services
Office of the Senior Vice-President and CFO