



Journal of the Australasian College of Road Safety

Formerly RoadWise – Australia's First Road Safety Journal



Special Issue: Taking Action Together - ARSC2015 Conference

Peer-reviewed papers

- Building new partnerships to improve road safety risk
- Drink driving among Indigenous people in Far North Queensland and Northern New South Wales: a summary of the qualitative findings
- Building community capacity for road safety – are we doing it?
- An analysis of driver behaviour through rural curves: exploratory results on driver speed

Contributed articles

- How a diamond made trucks glow in the dark
- Study of current factors affecting road safety for 16 – 18 year old novice drivers in the Wingecarribee Shire
- Developing a new index for comparing road safety maturity: case study of the ASEAN community
- Enhancing South Australia's Graduated Licensing Scheme through road safety partnerships and a strong evidence-base
- Expanding the Victorian Alcohol Interlock program to all convicted drink-drivers
- Tracking serious injury to improve road safety



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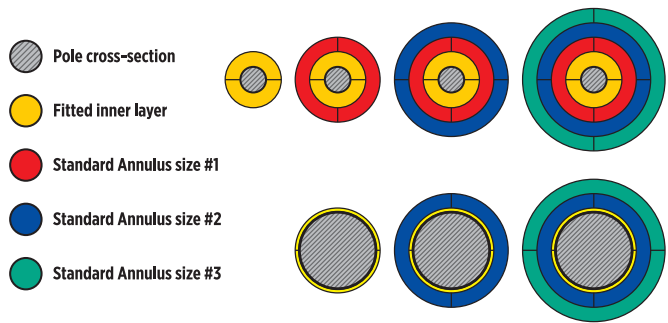
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Cover image

Winner of the 2014 3M Diamond Award, the Amy Gillett Foundation have partnered with Toll and 3M to improve the visibility of trucks to cyclists and other road users. The contributed article section of this issue of the ACRS Journal contains a more in-depth discussion of this successful project.

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The Journal of the Australasian College of Road Safety
(published as **RoadWise** from 1988-2004) ISSN 1832-9497.
Published quarterly by the Australasian College of Road Safety.

Managing Editor:

Laurelle Tunks, ACRS, PO Box 198, Mawson, ACT 2607
Phone +61 (0)2 6290 2509 Fax +61 (0)2 6290 0914
journaleditor@acrs.org.au

Peer-Reviewed Papers Editor: Prof Raphael Grzebieta,
Professor of Road Safety, Transport and Road Safety (TARS)
Research, UNSW, West Wing, 1st Floor, Old Main Building
(K15), University of NSW, Sydney NSW 2052
Phone +61 (0)2 9385 4479 Fax +61 (0)2 9385 6040
r.grzebieta@unsw.edu.au

Road Safety Literature Editor: Andrew Scarce, Road Class,
6 Oasis Gardens, Bendigo, Victoria 3550.
Phone +61 (0)3 5442 5226, Mobile 0429 198 314
Andrew@roadclass.com.au

Editorial board

Dr Jennifer Clark	University of New England, NSW
Dr Soames Job	Head, Global Road Safety Facility, Washington DC
Dr Nadine Levick	Objective Safety LLC, New York, US
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The College encourages interested persons and organisations to submit articles, photographs or letters for publication. Published letters would normally show the name of the writer and the state or territory of residence. The journal provides the opportunity for researchers to have their work submitted for peer review, in order to improve the quality of their research papers. However, peer review cannot guarantee the validity of research nor assure scientific quality. The publisher reserves the right to reject submissions or, with approval of the author, to edit articles. No payment is offered for articles published. Material in this journal may be cited with acknowledgement of the full reference, including the author, article title and the year and volume of the journal. For permission to reprint articles, please contact the Journal Managing Editor.

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Contacts: Mrs Claire Howe, Executive Officer, eo@acrs.org.au
Ms Laurelle Tunks, Managing Editor,
journaleditor@acrs.org.au
Ms Christine Bethwaite, Finance and
Administration, faa@acrs.org.au

Mailing address: PO Box 198, Mawson, ACT 2607 Australia
Phone: (02) 6290 2509

Head office: Pearce Centre, Collett Place, Pearce ACT Australia
Office hours: Tuesday 9.00am – 5.00pm; Wednesday and Thursday 9.00am – 3.00pm. Closed Monday and Friday.
Messages may be left on voicemail when the office is unattended.

From the President



Dear ACRS members,

In reducing road trauma we are always looking for something new. Hopefully, a “silver bullet” will be found: some simple and all-encompassing magical solution to the complicated problems of road safety. It may seem an impossible task, but equally a magical solution will not come without a lot of hard work.

Our recent inaugural Australasian Road Safety Conference is a great example of the hard work taking place to improve old ideas and develop new ones, to help us not only with one all-encompassing solution but many - within the Safe Systems framework.

One of the features of this brand new conference is the drive to involve the broader road safety community, to cross-pollinate ideas and solutions in the road safety conundrum. We have been delighted with the interest in the conference evidenced by the nearly 300 abstracts submitted – the keenness to participate evident in all. With the assistance of around 100 reviewers we have ensured a process is being put in place to provide all delegates with a high degree of certainty that papers presented at the conference are the ‘best of the best’. These papers provide the ideas, evidence and methods to expedite road trauma reductions, and for all those who were not able to attend the conference we will have these available shortly on the ACRS website.

We had many, many high quality papers prepared and presented at ARSC2015, discussed and questioned by the many sectors represented. There were many new ideas considered and there will be more hard work to follow these up – hard work which is informed by the outcomes of the conference.

Cooperation within the College between the members, and collaboration with many others outside the College, are concepts I am keen to encourage.

The high attendance of over 600 delegates at the Conference, from both members and non-members, demonstrates that the concepts are being practiced. But there is more to do.

Seat belts were seen to be a “silver bullet” in our quest to reduce road trauma over the last 40 years, as were technologies to measure speed and alcohol.

Recently we have seen the emergence of collision avoidance technology into new cars, where early research has already shown major reductions in crash rates of vehicles equipped. While one of these technologies has been mandated for trucks in Europe, a recent collaborative announcement by the US Government, the Insurance Institute of Highway Safety, and ten car manufacturers to equip all new models in the USA with this technology before regulation; is a great example of what can be achieved if everyone works together. Let’s hope we can add it to our list of “silver bullets” with a similar, collaborative effort in Australia.

*Lauchlan McIntosh AM FACRS
ACRS President*

Diary

5-6 November 2015

International Driverless Cars Conference
Adelaide, South Australia
<http://dpti.sa.gov.au/driverlesscars>

11 November 2015

4th International Conference on Driver Distraction and Inattention
Sydney
<http://wired.ivvy.com/event/DD2015/abstract/request>

15 November 2015

World Day of Remembrance for Road Traffic Victims
<http://worlddayofremembrance.org/>

16 - 18 November 2015

8th International Urban Design Conference
Brisbane, Queensland
<http://urbandesignaustralia.com.au/>

17 – 19 November 2015

National Local Roads and Transport Congress:
Connecting Communities, Driving the Nation
Ballarat, Victoria
www.alga.asn.au

18 November 2015

Fatal Distraction Symposium
Royal Australian College of Surgeons
250 Spring Street, Melbourne
<http://www.surgeons.org/member-services/interest-groups-sections/trauma/trauma-week/>

18 - 19 November 2015

Second Global High Level Conference on Road Safety
Brasilia, DF Brazil
<http://www.roadsafetybrazil.com.br/en>

25 - 27 November 2015

12th Australasian Injury Prevention and Safety Promotion Conference “Impact and Innovation: Preventing Injury in a Changing World”

University of Sydney, Sydney

<http://event.icebergevents.com.au/injuryprevention2015>

30 November 2015

Heavy vehicles access and safety

ARRB webinar

<https://www.arrb.com.au/Information-services/workshop-seminar-details.aspx?id=196>

8 December 2015

Operators Insights: managing the realities of heavy vehicle speed

Boral, Scott’s Group of Companies and Simon National Carriers webinar

<https://www.arrb.com.au/Information-services/workshop-seminar-details.aspx?id=191>

28 January 2015

Safety ramps for heavy vehicles

ARRB webinar

<https://www.arrb.com.au/Information-services/workshop-seminar-details.aspx?id=194>

2016

May 2016

Road Safety on Five Continents (RS5C)

Rio de Janeiro, Brazil

<http://www.vti.se/en/road-safety-on-five-continents>

2 - 5 August ICTTP2016: The Sixth International Conference on Traffic & Transport Psychology, Brisbane Convention and Exhibition Centre, Queensland, Australia.

Website: <http://ictp2016.com>,

Email: ictp2016@qut.edu.au

6-8 September 2016

ARSC 2016

Australasian Road Safety Conference

National Convention Centre, Canberra

<http://australasianroadsafetyconference.com.au>

Safety 2016: 12th World Conference on Injury Prevention and Safety Promotion

Tampere, Finland

<https://www.thl.fi/en/web/injury-prevention/safety-2016>

T2016: 21st International Council on Alcohol, Drugs and Traffic Safety (ICADTS) Conference

Gramado, Brazil

<http://www.t2016.org/>

Autonomous vehicle technology

By Gavin Smith

President, Robert Bosch (Australia) Pty Ltd

For as long as the automobile has existed, it has been a regrettable fact that injury and death of occupants, pedestrians and other road users has been considered unavoidable.

With more than 90% of all crashes caused by human error, it is clear that people are at the core of the problem. To mitigate the risks, various “in vehicle” safety technologies have evolved. Firstly with a focus on “occupant protection” in the event of a collision, but later, and as technology

permitted and consumers demanded, safety technologies that “automatically intervened” when a collision was likely. But even with the most sophisticated of systems, we can’t change the laws of physics.

Notwithstanding the importance of the safe system approach to road safety, it is clear that:

- 1) we can’t change the laws of physics, and
- 2) humans don’t always learn from their mistakes.

Looking to the future, it is expected that the biggest benefit to road safety will likely come from removing human decision making in the driving activity wherever possible.

Bosch is developing technologies for an intelligent forward thinking vehicle, making the vision of injury and accident-free driving a reality. But further, automated driving will synchronise traffic flow, reduce travel times, lower fuel consumption and reduce emissions.

Given the road safety and economic benefits that such vehicles will afford, it is important that Australia is able to adopt the technology as early as possible. Regulatory changes should therefore be pre-emptive rather than reactive.



Report from the ACRS2015 Conference, Gold Coast 14-16 October, 2015

On behalf of the Queensland Chapter of the Australasian College of Road Safety, I would like to say thank you to all the delegates who participated in the inaugural Australasian Road Safety Conference.

Over the three days, the theme of “taking action together” really shone through and highlighted

Message from the Minister

*The Hon Michael McCormack MP
Assistant Minister to the Deputy Prime Minister*

(Mr Michael McCormack represents the electorate of the Riverina in southern New South Wales, is the Assistant Minister to the Deputy Prime Minister and holds responsibility for Road Safety. As an honoured guest, he provided the following address at the Australasian Road Safety Conference dinner).

It is a pleasure to be here in my new role as the Assistant Minister to the Deputy Prime Minister. It's a great privilege to be part of the Deputy Prime Minister Warren Truss' team - he is a man who stands for honesty and integrity in government.

Warren Truss has made significant achievements in the Infrastructure portfolio within two years in government, including the \$50 billion commitment to infrastructure investment – a record amount, designed to lift national productivity. This is the largest commitment ever made by any Government in Australia's history.

In my new role as Assistant Minister I am responsible for road safety and I acknowledge the excellent work that has been achieved before me. To begin, I extend my appreciation and congratulations to everyone involved in organising the inaugural Australasian Road Safety Conference.

This conference heralds a new era - bringing with it the energy, passion and drive needed to work towards the vision championed by the National Road Safety Strategy that **no** person should be killed or injured on Australia's roads.

It's an ambitious target, but the objective is self-evident.

Australia has come a long way over many decades in terms of road safety, and under the current strategy there has been a 16 per cent reduction in annual road deaths.

the collaborative nature of road and transport safety, and the multi-disciplinary nature of the work we are doing across Australasia.

I'm sure you all had a fantastic experience and are looking forward to ARSC 2016.

*Kerry Armstrong
Queensland Chapter Chair*



Even so, I am genuinely amazed that with all the work and all the technological know-how, **still 1,189 lives were lost** during the 12 months to September. I'm also aware that this is a slight increase on the previous 12 months.

A key aim of the strategy is to create a safer transport system that can efficiently move transport and freight, but does not cause death or injury.

The Australian Government's investment in critical transport infrastructure not only has positive impacts on productivity and the economy; it also contributes to road safety outcomes.

The statistics are striking. The NSW Government has estimated that upgrading the Pacific Highway will avoid 1,000 fatalities; 7,400 injuries and 5,400 non-injury accidents in the 43 years between 2007 and 2050.

There's a similar story on the Bruce Highway where the Royal Automobile Association estimates that 60 per cent of road deaths in Queensland occur, and that without further upgrades an additional 350 people will die and 5,000 will be injured in the next decade.

We are also continuing to fund specific programmes we know are helping to reduce deaths and serious injuries on our roads.

The vital Black Spot Programme - which I now hold responsibility for - targets road locations where crashes are occurring.

Since its introduction in 1996 the Black Spot Programme has provided more than \$1 billion for around 7,400 essential road safety projects.

By funding measures such as traffic signals and roundabouts at dangerous locations, research has found that fatal and casualty crashes have been reduced by 30 per cent. This translates to one life saved for every 84 Black Spot projects.

Roads to Recovery is another popular programme designed to help local governments to maintain more than 650,000 kilometres of local roads. Over the next two years Local Councils will receive an additional \$1.105 billion boost in Roads to Recovery funding for local road and street repairs.

Unfortunately, heavy vehicles are involved in many serious accidents, often related to fatigue. Apart from trying to reduce the number of trucks on our roads through building better rail infrastructure, the Government is contributing more than \$51.4 million for 34 new or upgraded rest areas through the Heavy Vehicle Safety and Productivity Programme.

Nationally, this programme will improve safety and productivity outcomes of heavy vehicles operating on our roads.

Getting ahead of the curve with vehicle and road technology advances and reducing the regulatory burden on business and consumers are also key Government objectives.

The initiatives I have outlined are all good, and they are all working, but statistics tell us there is much more to be done. The Australian Government is committed to strengthening its contribution in areas where we have direct responsibilities. We ask state, territory and local governments and the community and business sectors to join us in that commitment.

And whilst we are doing well nationally in reducing fatalities, the picture is not quite so clear for serious injuries.

This is another challenge - to work together across states and territories and all levels of government to come up with a reliable way to monitor serious injuries from road crashes, at the national level. I know it is a complex issue and it has been part of your discussions for the past two days.

It is also a matter that needs recognition at the global level. Australia will be raising it at the Second Global High Level Conference on Road Safety to be held in Brazil next month.

I look forward to hearing the outcomes of this conference and I hope to see many of you again in Canberra next year at the second Australasian Road Safety Conference, if not before.

Thank you for listening, travel safely.



"Researched statistics suggest that as many as 40% of all fatal front and side vehicle impact crashes into safety barriers (guard-rail), occur at night and are into the 'faces' (as opposed to 'ends') of these barriers".

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ARSC2015: Award winning papers

The following people were awarded prizes for their high quality contributions to the conference.

John Kirby Award for Best Paper by a New Researcher

**A road safety risk prediction methodology for low
volume rural roads**

Dale Harris ^a, Paul Durdin ^a, Colin Brodie ^b, Fergus Tate ^b
and Robyn Gardener ^c

^a Abley Transportation Consultants, Christchurch New
Zealand; ^b New Zealand Transport Agency, New Zealand; ^c
Accident Compensation Corporation, New Zealand

Peter Vulcan Award for Best Research Paper

**Drink driving among Indigenous people in Far North
Queensland and northern New South Wales: a summary
of the qualitative findings**

Michelle S Fitts ^a and Gavan R Palk ^a

^a Centre for Accident Research and Road Safety –
Queensland (CARRS-Q),
Queensland University of Technology

Road Safety Practitioner's Award

Enhancing South Australia's Graduated Licensing Scheme
through road safety partnerships and a strong evidence-base

Paula Norman ^a, Nicole Middleton ^a and Carol Nightingale ^a

^a Department of Planning, Transport and Infrastructure,
South Australia

Road Safety Poster Award

**Mobile in Moreton - Raising the profile of mobility
scooter and motorised wheelchair use through
community education and awareness**

Joanna Broughton ^a, Kerrie Doherty ^b and Helen Scifleet ^c

^a Queensland Police Service; ^b Moreton Bay Regional
Council; ^c Queensland Department of Transport
and Main Roads

Conference Theme Award

**Building community capacity for road safety -
are we doing it?**

Andrea Smithson ^a and Terri-Anne Pettet

^a WA Local Government Association's RoadWise Program

3M Diamond Awards

Winner

**Queensland Government's Bruce Highway Wide
Centre Line Treatment**

Team Leader: Mr David Bobberman, QLD
Department of Transport and Main Roads

Highly Commended Prizes awarded to:

2015 Yellow Ribbon National Road Safety Week

Success in creating a national road safety symbol

Team Leader: Mr Peter Frazer, Safer Australian
Roads and Highways

"Stay on Track Outback"

*Road safety awareness of the unique hazards of
driving in the 'Outback'*

Team Leader: Senior Constable Sarah Grayson,
Queensland Police Service

Truckright: Trucks and Road Safety

*A working truck to promote the road transport
industry and road safety.*

Team Leader: Mr Rod Hannifey, Truckright

Emergency Vehicle Pre-emption

*Reducing the response times of emergency vehicles
in Queensland through Emergency Vehicle
Pre-emption (EVP)*

Team Leader: Mr Chris Fullelove, Transmax Pty Ltd

3M-ACRS Diamond Road Safety Award

The 3M-ACRS Diamond Road Safety Award recognising exemplary innovation and effectiveness to save lives and injuries on roads has been awarded to a project delivered by the Queensland Government to expedite road trauma reductions on the Bruce Highway.

The award was presented by the Assistant Minister to the Deputy Prime Minister, the Hon Michael McCormack MP, the Australasian College of Road Safety President, Mr Lauchlan McIntosh AM and Mr Cade Turner representing 3M Australia.

The award ceremony was attended by over 550 of Australasia's foremost road safety professionals and advocates at the Gold Coast Convention and Exhibition Centre.

ACRS President, Mr Lauchlan McIntosh AM, said "Our 2015 winner represented by David Bobberman from the Queensland Government demonstrates an effective and innovative approach to reducing road trauma on the 1600kms of the Bruce Highway.

"The project saw the rapid implementation of a range of key road safety treatments including the widening of the centre line for one third of the highway, with the saving of 30 lives per year."

Bruce Highway Centre-Line Widening Treatment

"The Queensland Government is being congratulated through this award for driving such a transformative project involving around 100 team members.

"This formula to produce such a rapid roll-out of effective life-saving improvements is expected to be used across our region.

"The benefits of this safety legacy will be felt by our entire society for many years to come."

Judges considered the specific features of the many projects submitted, particularly in terms of innovation in thinking and technology, problem-solving as well as the real benefits in reducing trauma. Cost-effectiveness and transferability to other areas were other key criteria.

Finalists for this hotly-contested award came from many areas. These included new ideas and actions from local and state government groups, collaborative programs led by local and regional police groups, individuals passionately pursuing specific projects to reduce risk, industry associations and transport companies implementing programs with targets to ensure safe operations, news programs, and specific education for specialist groups.

"In 2010, 3M took the pledge of the Decade of Action for Road Safety, and it was clear that we could do more", said Cade Turner, Sales and Marketing Manager, 3M Australia.

"Our commitment to improving, protecting and saving lives extends far beyond our products and technologies. We are a company driven by the passion to improve every life through our unique approach to innovation. This award is modelled on that process - creating an environment where innovative ideas can come together, be shared, collaborated, celebrated, and most importantly, replicated in other regions or capacities to make a much bigger impact on road safety."

The team leader from the winning project will travel to the USA to attend and present their project at America's largest road safety conference in New Orleans, USA, and will also visit 3M Global Headquarters and Innovation Center in St Paul, Minnesota.



Winner and highly commended recipients of the 3M Diamond awards with Lauchlan McIntosh (left) and the Hon Michael McCormack (right)

ACRS Fellowship awarded to Rob McInerney

Leading international road safety advocate, Mr Rob McInerney, CEO of the International Road Assessment Program (iRAP), was presented with the prestigious 2015 ACRS Fellowship at the glittering ACRS Award Ceremony on the Gold Coast. The ceremony took place in front of 550 of Australasia's foremost road safety professionals and advocates, and is recognition of Mr McInerney's deep commitment to the reduction of road trauma.

The award was presented by Hon Michael McCormack, Assistant Minister to the Deputy Prime Minister, and ACRS President Mr Lauchlan McIntosh AM, during the inaugural Australasian Road Safety Conference (ARSC2015) at the Gold Coast Convention and Exhibition Centre.

In detailing the award, ACRS President Mr Lauchlan McIntosh AM, said "Rob McInerney continues to be an outstanding advocate for road safety across the globe. Rob is a qualified engineer and worked with the ARRB Group (previously the Australian Road Research Board) culminating in the role of Regional Manager in 2007. Rob's communication and leadership abilities then took him to his current role as CEO of the International Road Assessment Program (iRAP), where for the last eight years he has been instrumental in leading the charge for safer roads globally".

During Rob's term as CEO of iRAP, Rob has considerably strengthened partnerships with governments, development banks and civil society to help save lives through safer road infrastructure. iRAP assessments have been undertaken in over 70 countries worldwide with more than 900,000

kilometres of road already risk-mapped or star-rated globally. Under Rob's leadership, many countries are now setting targets to maximise travel on 3-star or better roads.

Rob has also worked tirelessly for the inclusion of road safety targets in the United Nations Sustainable Development Goals (SDGs). This work has culminated in world leaders setting a target to "halve the number of global deaths and injuries from road traffic accidents" by 2020 during the recent UN meetings attended by Foreign Minister, Hon. Julie Bishop in New York.

"The urgency to address road safety as part of the UN Global Goals highlights the significant burden of road trauma in every country worldwide. Road crashes are the biggest killer of young people globally and typically account for more than 40% of major trauma in high-income country hospitals and some 70% of spinal injury in Africa as an example. With the UN announcement we now have the political will for action; we have the vaccines for roads already and now all we need is the scale of the response" Rob said.

"It is an honour to be awarded the ACRS Fellowship and I look forward to continuing to support the great work of the College as we aim to halve road deaths and injuries by 2020."

With the award of Fellowship, Rob joins an elite group of eminent road safety professionals who have all been bestowed the honour of an ACRS Fellowship. The College first instituted the award of Fellow in 1991 to enable colleagues to nominate a person recognised by their peers as outstanding in terms of their contributions to road safety.



Rob McInerney, CEO of iRAP was awarded Fellowship of the ACRS (Lauchlan McIntosh – left – the Hon Michael McCormack – right – presented the award)

ACT-ACRS Road Safety Forum

On 23rd September the ACT and Region Chapter of the College presented the first ACT Road Safety Forum, with the support of the ACT Government and NRMA – ACT Road Safety Trust. ACT Minister for Justice, Shane Rattenbury MLA, joined ACRS President, Lauchlan McIntosh AM and ACRS ACT and Region Chapter Chair, Mr Eric Chalmers, along with around 70 delegates last

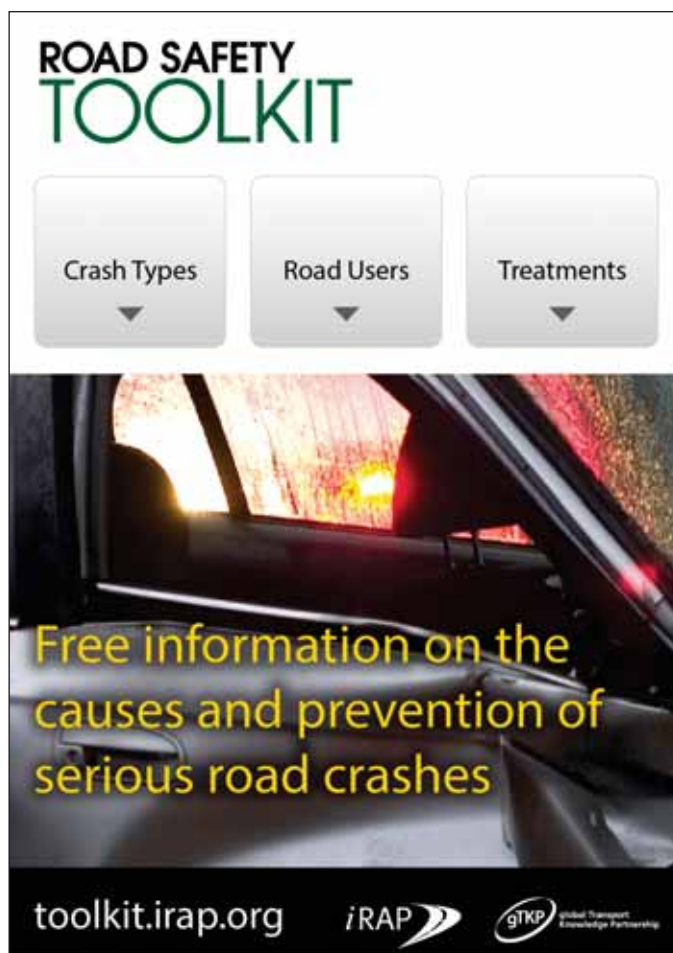


Minister Shane Rattenbury MLA
ACT Minister for Justice

Wednesday, to discuss ‘Moving Forward Together’ across the ACT region.

“Road trauma is not inevitable. In fact, most of the deaths on our roads are preventable and we need to share the responsibility for road safety as a community,” said Mr Rattenbury. “The philosophy we are applying to road safety in the ACT is called ‘Vision Zero’, which means we strive for zero deaths and zero serious injuries on ACT roads”.

Mr Rattenbury said “It’s important to apply this Vision Zero filter to all our decision making. It might mean, for example, that we lower speed limits, which some people find inconvenient. But the rationale is that these slower speeds translate directly into road safety outcomes. Before the end of this year, I will release a new ACT Road Safety Action Plan 2015–2018 that will include a range of innovative measures across each of the safe system pillars of safer speeds, safer roads, safer vehicles and safer people.”

A graphic for the 'ROAD SAFETY TOOLKIT'. At the top, the title 'ROAD SAFETY TOOLKIT' is displayed in black and green. Below the title are three grey rectangular buttons with rounded corners, each containing a label and a downward-pointing arrow: 'Crash Types', 'Road Users', and 'Treatments'. The bottom half of the graphic features a photograph of a car's interior, showing the dashboard and a bright light source, possibly a headlight or a fire, creating a dramatic effect. Overlaid on this image is the text 'Free information on the causes and prevention of serious road crashes' in yellow. At the very bottom, there is a black bar containing the website 'toolkit.irap.org', the 'iRAP' logo, and the 'gTKP' logo with the text 'Global Transport Knowledge Partnership'.



ACT Forum Report from the ACRS President

By Lauchlan McIntosh

The “*Moving Forward Together*” Forum held last week in Canberra was very well received by the participants. The Minister emphasised the unfortunate sadness of road trauma, a fact which always brings together the community in trying to find more solutions.

From my perspective as College President, it was useful to learn from the variety of people present, and to participate with them in breakout sessions. The high level interest in the Forum from the ACT Government was a strong positive; with a commitment to the Vision Zero concept and an outline of the developing road safety strategy for the next three years.

Geoff Davidson from the ACT Government touched on the beneficial impacts of new in-car and on-road technologies, which opened a conversation on how to encourage early introduction.

Key ideas included the importance of reducing crashes by ensuring safe alternative transport options, which would be facilitated by a range of infrastructure and education programs. These ideas included recognition of the associated health benefits of unnecessary vehicle travel.

While the Forum reinforced the importance and continued refinement of many well-known trauma reduction programs, there was recognition of the need to create more streamlined avenues for translation of diverse road safety research findings into action. Also acknowledged by stakeholders were the benefits of taking a preventative public health approach to finding solutions, as well as the potential of a multi-stakeholder knowledge base with mechanisms for ongoing engagement by stakeholders.

More simply put, there is potential for the College to build and maintain a knowledge database to assist with translation of road safety research outcomes into practice, and to provide further avenues for stakeholder engagement and collaboration.

In exploring what worked and what didn't work in alliances with the various road user groups, delegates saw the potential of expanding the alliance concept into broader community interest portfolios - so that road safety is not completely left in a “silo”, but is seen as a broader community well-being issue with important public health outcomes. Delegates also discussed the benefits of evidence and the risks of anecdotal ‘social media’ solutions.

Don Aitken, in a report on the winding up of the NRMA-ACT Road Safety Trust by June 2016, set out a case for the ACT to have its own ACT-based road safety policy and demonstration centre, potentially linked to a University with strong connections across the region. Also recognised by Don was the importance of building capacity to encourage improved research resulting from alliances, including through international connections.

In summary, the Forum brought together many people from different backgrounds and in doing so will help them in their work in meeting the daily imperatives of dealing with current issues to reduce crashes. It also introduced the emerging potential for innovation and the potential of new ideas and new solutions.

In closing the Forum, I felt very positive about the energy of the delegates in wanting to continue to develop their networks, their interest in sharing knowledge, and the emerging recognition that there is a revolution underway in the way we will travel around in a range of modes, with a focus on the Towards Zero vision for death and injuries.

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College News

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Chapter reports

ACT and Region Chapter

As discussed in a previous item (see page 10) the ACT and Region Chapter has been involved in the preparation and delivery of the First ACT Road Safety Forum on 23 September for the Road Safety Unit of the ACT Justice and Community Safety Directorate. A total of 70 people attended, representing the major road safety organisations in the ACT and surrounding areas.

This was the first of annual events for road safety organisations and practitioners. It has also established a firm relationship between the Chapter and the ACT Government. Relationships with surrounding New South Wales local government were also reinforced.

The Forum was very successful and provided the opportunity for everyone to come up to date with the new ACT Road Safety Action Plan, the activities of the organisations present and an opportunity for them to come together to develop projects of common interest.

The Chapter has also been successful in obtaining funding from the final round of NRMA-ACT Road Safety Trust grants. This grant has to be used by 30 June 2016 and as such, the development of an appropriate project is the next priority for the Chapter.

Other news

World Bank announcement

The announcement has been made of the appointment of **Soames Job** as the new Global Road Safety Lead and Head of the Global Road Safety Facility; a multi donor partnership hosted by the World Bank.

Soames brings a wealth of road safety experience and expertise, having held many key road safety leadership roles, including Executive Director of the National Road Safety Council of Australia; National President (and Fellow) of the Australasian College of Road Safety; Chair of the Australian National Road Safety Executive Group; Director of the New South Wales Centre for Road Safety; and Director of the Health and Safety Psychology Research Unit at the University of Sydney. He is currently Adjunct Professor for Transport and Road Safety at the University of New South Wales and Managing Director of Global Road Safety Solutions. Besides leading road safety work in Australia he has consulted extensively for many governments and international organisations, including the World Health Organization, the International Standards Organization, the United Nations, the Global Road Safety Partnership, the OECD, the World Bank, and the multilateral development banks; in many countries worldwide. Soames holds a PhD in Psychology from the

University of Sydney with a thesis focusing on learning and motivation and he has published comprehensively on many aspects of road safety and psychology.

Soames will be leading the World Bank's engagement in the area of road safety. He will shape the framing and outreach of the World Bank's renewed effort to advance the reduction in road deaths and injuries and will oversee the work program to achieve measurable progress on this agenda. This work program will be operationalised in the context of the UN Decade of Action for Road Safety, the Sustainable Development Goals and other current initiatives.

Soames will be based in HQ in Washington D.C. starting with the full take-up of his appointment on January 1, 2016. During the remainder of this calendar year, Soames has assumed his role with a part-time commitment while transitioning to the World Bank.



Peer-reviewed papers

Building New Partnerships to Improve Road Safety Risk

by Robyn Gardener^a, Dr Fergus Tate^b, Colin Brodie^b, Ron Minnema^b, Paul Durdin^c and Dale Harris^c

^a Accident Compensation Corporation, ^b New Zealand Transport Agency, ^c Abley Transportation Consultants

Paper presented at the Australasian Road Safety Conference 2015.

Abstract

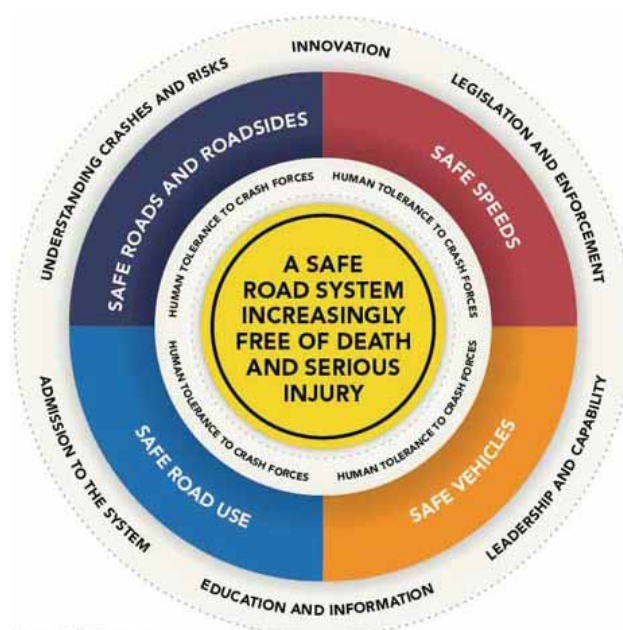
In 2012 New Zealand's KiwiRAP partners (NZ Automobile Association, NZ Transport Agency, NZ Police, Ministry of Transport, Accident Compensation Corporation), in conjunction with Auckland Transport, Tauranga City, Christchurch City and Dunedin City, took part in a national trial to more fully understand the extent of the crash problem on the urban network. As part of this trial, the successful KiwiRAP crash risk methodology was developed further for use in the analysis of the urban network and entitled Urban KiwiRAP. The Urban KiwiRAP methodology confirms that, generally, approximately 50% of death and serious injury crashes are occurring on around 10% of the urban roading network in each of the trial local authority areas.

To address death and serious injury costs and numbers by putting tools in place to identify the greatest risk of occurrence was a very new approach to injury prevention for the Accident Compensation Corporation (ACC). This organisation generally approached injury prevention from a behaviour change perspective. Changing the lens on the way injury prevention is addressed has opened the doors for new opportunities to partner with Local Authorities in the roading infrastructure space; a new direction for ACC.

This paper discusses the next steps in rolling out this new methodology to a group of Local Authority roading partners and the positive benefits that are expected from both the newly developed partnerships and the use of the Urban KiwiRAP methodology.

Background

Safer Journeys 2010-2020, New Zealand's road safety strategy (*Safer Journeys*), identified that a paradigm shift was required in the way New Zealand (NZ) viewed and approached road safety initiatives. The strategy adopted a new "Safe System" approach - a step change in thinking for road safety professionals (Figure 1).



Source: Safer Journeys

Figure 1. The Safe System (Source: Safer Journeys)

Previous road safety practice was based on education, enforcement and engineering – the “3Es”. Investment and organisational processes to address safety were based around these three work-streams. Safety engineering interventions were generally reactive and based on social costs of crashes, resulting in “after the fact” engineering solutions every few years. Safety improvements on the network were slow and were often completed in isolation to education and enforcement initiatives. The general public saw the social cost ranking for safety projects as “waiting for someone to die” before the funding of improvements could be justified.

The Safe System approach required a different way of looking at the problem of crashes and how to address them. It identified that transport system designers and influencers share responsibility for safety along with the users of the system. It aims for “a safe road system increasingly free of death and serious injury”. Integrating initiatives across all

pillars of the system could be expected to provide a road system with safe roads and roadsides, safe speeds, safe vehicles and safe road use.

The Accident Compensation Corporation's (ACC) Statement of Intent 2015-2019 has injury prevention activity as one of four key areas of focus to achieve the organisational vision and values. To meet return-on-investment (ROI) goals, ACC works with partners to understand areas where injury prevention programmes can produce the greatest impacts on the severity and incidence of injury for New Zealanders. Programmes are generally developed with partners and use social marketing, community activity and learning approaches to change behaviour. Programmes also develop incentive products where appropriate behaviours are supported by levy reductions. Using passive behaviour change models, where infrastructure design moderates or influences driver behaviours or use of the road, is a new approach for ACC and not without challenges.

Introduction of new analytical approaches

Safer Journeys signified a shift in focus from reducing the number of crashes and fatal injuries to minimising the likelihood of high-severity crash outcomes. In order to give effect to *Safer Journeys*, new analytical approaches have been implemented to develop programmes that prioritise sites on their likelihood of future fatal and serious casualty occurrence and risk.

iRAP

The International Road Assessment Programme (iRAP) is a programme of road assessment projects being implemented in more than 70 countries around the world. The programme has a goal to reduce death and serious injury by targeting interventions to areas of the greatest risk.

KiwiRAP

In 2007-08 KiwiRAP, a development of iRAP for NZ conditions, was implemented on high speed rural State Highways. ACC was one of the partners in this project along with NZAA, MOT, NZTA, and Police.

Urban KiwiRAP

In 2012, the Transport Agency, Auckland Transport, Tauranga City, Christchurch City and Dunedin City took part in a pilot project to develop a crash risk methodology for the analysis of the local roading network based on the successful KiwiRAP. This model, Urban KiwiRAP, confirmed that, generally, approximately 50% of fatal and serious crashes were occurring on around 10% of the road network in each of the pilot local authority project areas.

The relative rarity of fatal and, to a lesser extent, serious crashes occurring at the same site is evidenced in the analysis of the crash data from the Auckland network in

2013. A study of intersection crashes showed that 79% of fatal and serious crashes occurred at sites with no fatal or serious crashes in the previous five years, and 64% occurred at sites with two or fewer injury crashes in the same period (Brodie et al, 2015). Brodie et al (2015) found that previous fatal and serious crashes were not a strong indicator of the underlying risk of future high-severity crashes for a site.

In the meantime, progress results were released for the State Highway (SH) safety improvements project, a five-year programme of safety works completed between 2007 and 2011 (see Figure 2). The results were compelling, with reductions of 15% and 13% in death and serious injury on rural and urban SH environments respectively, compared to the previous five years, as a result of using KiwiRAP to prioritise sites and their intervention selection. In contrast, the local road network, which was not using the model, experienced reductions of just 1% and 3% respectively.

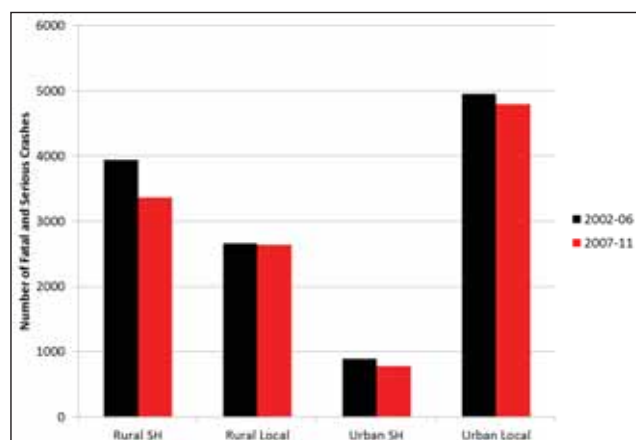


Figure 2. Comparative safety performance of state highways and local roads in urban and rural environments (Source: NZTA)

These positive results encouraged another five “early adopter” Local Authorities to undertake their own risk mapping analysis using Urban KiwiRAP, alongside those in the pilot project, bringing the number of local authorities using the methodology to nine.

Urban KiwiRAP rollout – ACC project rationale

The Urban KiwiRAP pilot project had demonstrated that, similar to KiwiRAP on rural state highways, the urban model would identify the 10% of the urban network where 50% of death and serious injury crashes were more likely to occur. For ACC, the opportunity to partner with local authorities and assist them by providing the information they needed to target their safety spend to this identified risk, had the potential to assist ACC with its own goal of reducing claims costs resulting from road crashes.

Four local authorities implemented Urban KiwiRAP on their networks as part of the pilot project; a total of approximately 12,500 kilometres of road. A further five local authorities have since completed risk maps (but

not star rating) on approximately 10,000 kilometres of road. There are a total of 73 local authorities across NZ covering approximately 85,000 kilometres in length. Of the remaining 62 Local Authorities, a further 13, covering 10,000 kilometres of road network, were identified as generating higher costs for ACC (see Figure 3) (top group of local authority/clusters).

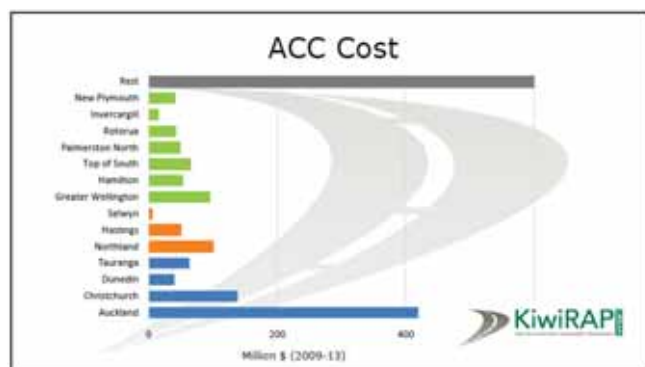


Figure 3. Cost of claims to ACC by local authority/cluster

While ACC has participated in general road safety education projects alongside NZTA, Police and local authorities for many years, ACC has not worked with local authorities in the past on infrastructure projects, despite the vast length of road in the local networks.

Despite interest in the trial project, most local authorities did not have the financial resources to take part in the Urban KiwiRAP programme. It was also assessed that not all local authorities would have enough crashes and traffic volumes on their networks to ensure the validity of this analysis and so the methodology would only be relevant to a proportion of those remaining.

Taking this into account, ACC's Urban KiwiRAP rollout project proposed extending the reach of the existing work to this next highest risk group of local authority clusters (Figure 4) (top group). This would bring the number of local authorities working proactively to treat their risk-

prioritised safety issues to 22 covering approximately 32,500 kilometres of network and ensuring a statistically significant segment of data to evaluate the benefits of the programme.

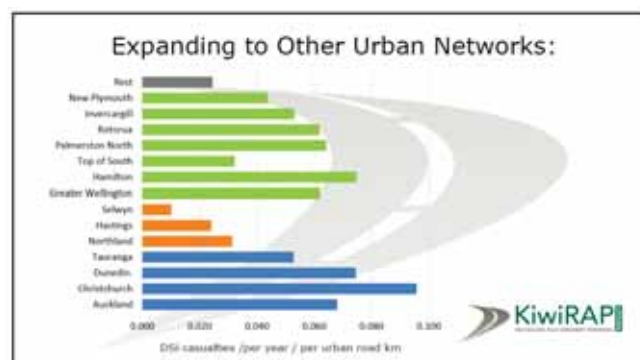


Figure 4. Next highest risk group of local authorities by DSI casualties/year/urban road km

The local authorities were each to be provided with a set of risk maps for personal and collective risk on corridors and intersections, prioritised spread sheets of intersections and corridors for future work programme guidance, personal and collective risk for active road users and motorcycles, and approximately 100-150kms of star ratings per local authority.

ACC proposed offering this information as a partnership project – an offer of information in return for an agreement to make use of the information and allow ACC to monitor the utility and results of using the methodology.

Road injury in the context of the Accident Compensation Scheme

While road injury contributes a small number of claims in comparison to other injury categories, the costs of these are high in the bigger picture of ACC's no-fault accident compensation scheme.

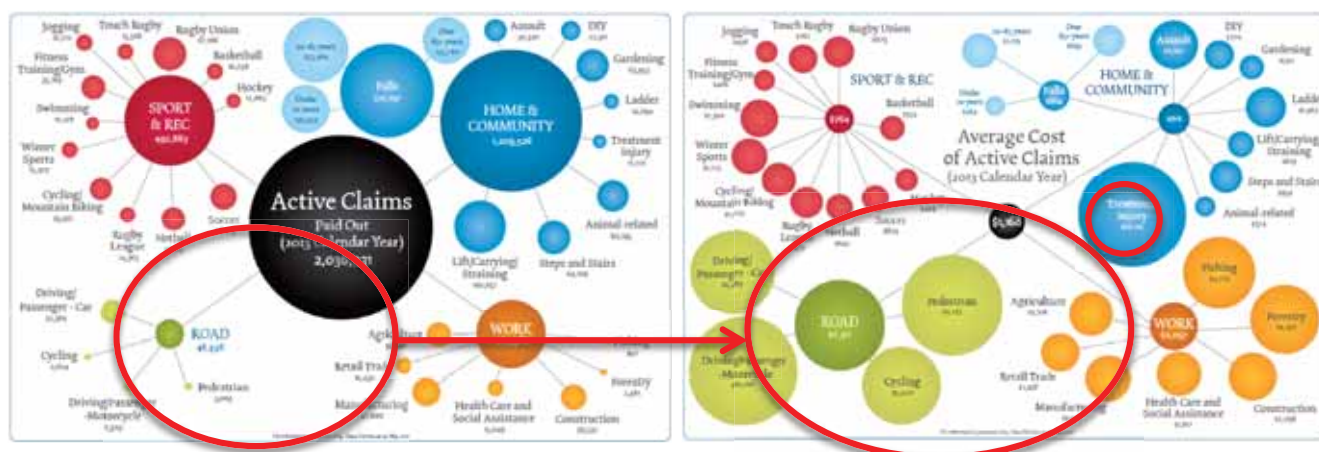


Figure 5. Significance of road claims to ACC – 2013 calendar year, indicative graphical representation of number of claims compared their average costs

Figure 5 shows a graphical representation of the significance of road claims to ACC compared to other injury categories. On the left of the diagram, the number of active claims for the 2013 calendar year is 48,556 out of a total of 2,036,931 – road is by far the lowest contributor of active claims, at 2.4% of the total. (Active claims include those receiving ongoing payments from an injury incurred during previous years.) The cost of road claims to the scheme during 2013 was \$354,976,856 of the total \$2,378,885,865 – 15% of the costs to the scheme. The average cost of each active road claim is \$7,311 compared to the overall scheme average of \$1,168 per claim – just over six times the average injury cost to the scheme; see Figure 5.

The type of trauma sustained as a result of a road-related crash can result in lifelong debilitating injuries, both physical and mental, and high costs to ACC over the lifetime of the person. This serious lifelong trauma also results in ongoing costs to families and society.

Urban KiwiRAP project methodology

ACC (representing the KiwiRAP partnership of Ministry of Transport, NZ Police, NZ Transport Agency, NZ Automobile Association, ACC) undertook to lead and fund a rollout of Urban KiwiRAP to the identified highest risk Local Authorities. Potential partnership criteria included interest in the methodology, demonstration of leadership in the road safety area and acceptance of a partnership sealed with a Memorandum of Understanding to give clarity to the parties.

A partnering model was chosen to best represent a community development injury prevention model where people are assisted to progress at their pace to achieve their goals and, at the same time, those of partner organisations. The premise was that ACC could expect to see claim reductions become evident as partnering Local Authorities used Urban KiwiRAP to manage their road safety improvements.

The first step was to recruit Local Authority partners and an approach was made to the Transportation Managers of the higher risk local authorities identified (Figures 3 and 4) to offer a partnership with ACC. Support for the project was

expected to be around 60%. At this lower response level, ACC anticipated the use of the methodology would still be likely to produce a positive return on investment over time. Instead, support was overwhelming and 100% of the identified local authorities came on board with the project (13 Local Authorities in seven clusters).

Local Authority Transportation Managers and their engineering teams were given a short presentation about the project and how the outputs (Figure 6) could be used to their benefit. They agreed to use the Urban KiwiRAP information to assist with their forward work programme prioritisation. Risk maps and analysis would be updated as the yearly crash data became available, so the Local Authority could monitor the progress of the risk on their network.

The Urban KiwiRAP project provides each local authority with risk analysis for their networks in the following categories: collective and personal risk maps for corridors, intersections, and motorcycles; active road user and all-NZ motorcycle heat-maps; and a publicly viewable “averaged” layer for corridors. Additional heat maps for a variety of crash related behaviours can also be generated and are useful for assessing clusters of risk for pedestrians, cyclists, alcohol, speed, wet weather and darkness.

The outputs also provide a listing of all corridor links and intersections, in order of risk, in a spreadsheet format. This provides a basic screening tool for a work programme that can be done on the desktop by experienced safety practitioners.

Use of the personal and collective risk scores provides guidance for the type of infrastructure improvement selection. Figure 7 indicates best-practice safe system treatments as recommended by NZTA’s best-practice guidance in their High Risk Guides series (NZTA website). This figure shows how the measured collective-vs-personal risk output directs a treatment methodology that reflects the risk. The highest cost items are in the “safe system transformation” section and these are focussed on corridors or intersections with both med-high/high risks for both personal and collective risks. The majority of investment should be targeted at sites of higher collective risk.



Figure 6. Urban KiwiRAP risk map outputs

Collective risk relates to the number of fatal and serious crashes occurring on a stretch of road (crash density); and personal risk is the likelihood a driver will be involved in a fatal or serious crash on a stretch of road. Collective risk is the most interesting to funding agencies whereas personal risk is of more interest to the public as it shows the risk to the individual road user.

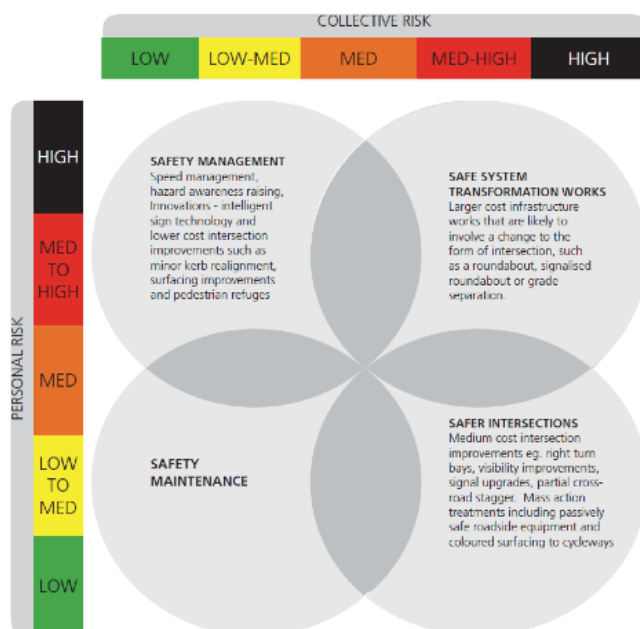


Figure 7. Infrastructure treatments to risk

The personal risk variable is of most interest for ACC. In these areas, where traffic volumes are low, spend on roading improvements can be difficult to justify, but from a claims perspective areas with high personal risk may be where the greater costs to ACC are occurring.

Risk outputs from this project could potentially indicate lower cost safety management and safer intersection interventions, with safety maintenance being an increased focus for network operating or maintenance contracts. Where sites have higher personal risk but low collective risk, treatment methodologies would reflect a focus on low cost treatments such as signage improvements. All local authorities approached were interested in the new methodology because they had seen good safety outcomes on the State Highways and were expecting similar reductions on their own networks.

A refined targeted-to-risk work programme has potential to provide greater opportunities for safety improvement funding. The use of the analysis may have indications for the current funding model for local authority roads if the highest-risk roads are identified but remain unfunded.

Benefits to ACC

The real value in the analysis is that, with around 50% of crashes occurring on 10% of the network, knowledge of what that looks like for a local authority and its community

and politicians should translate to an increased focus on refined targeted-to-risk safety improvements. If more people are presented with clear information about risk on their roading networks, a quite different conversation could be expected at roading decision-maker meetings and community consultation.

Widening the reach of visual tools that assist understanding of Safe System infrastructure treatments also has the potential to create more drive to seek safe system solutions within communities. Taking the road safety conversation to new levels, over time, should influence a reduction in road user injury due to a more normalised safety culture in the community.

The Urban KiwiRAP methodology can be seen as a piece of the strategic jigsaw needed to make the over-arching change in the thinking required for a safe system approach to road safety. It can also be viewed as a fundamental screening tool identifying risk to underpin any sound investment proposal.

For ACC, there is unlikely to be an immediate quantifiable death/serious injury reduction as a direct result of this project. But over the medium term, influencing the way road safety initiatives are prioritised to target the riskiest portions of the road network will result in a reduction in injury and, therefore, claims to ACC. Based on results achieved by the Transport Agency on the State Highways over the five year period, there is potential for ACC to be seeing results by 2020. It is conceivable that ACC could calculate a reduction in claims into the future if infrastructure work programmes were developed using this methodology.

Sector-wide information sharing is critical to getting the paradigm shift needed to ensure a Safe System approach is adopted and the *Safer Journeys* vision of “a safe road system increasingly free of death and serious injury” is delivered. As the road system becomes “increasingly free of death and serious injury”, costs to ACC for road user injury would be expected to decrease and levies reduce for the general public.

Conclusion

Adding Value

For ACC, this project is about partnerships and capability/capacity building in the transport sector. It is an opportunity for ACC to improve its perceived value to key partners Police, NZAA, MOT, NZTA, and to build new partnerships with local government by championing innovative methodologies that will provide good safety outcomes.

Urban KiwiRAP is a leverage vehicle to assist in positioning ACC in the area of trust and confidence, improving the attractiveness of partnership with ACC for road network owners and increasing the influence of ACC in the roading infrastructure space.

This project is also an opportunity for ACC to understand more about passive injury prevention projects related to infrastructure; an untapped area with potential benefits for ACC. Advocating for change in funding models and partnering with local authorities to implement projects that might not ‘cross the line’ in the current investment climate has benefits not just for the local authority and ACC, but also for the wider travelling public – customers of ACC.

ACC has not traditionally worked in the area of assisting with infrastructure improvements. Moving to a position of influence in the planning, prioritisation and funding of infrastructure improvements for safety could be expected to benefit ACC, as a significant shift nationally to prioritised treatment of the highest risk local authority roads will accelerate a reduction in death and serious injury on the road throughout the country.

Next Steps

Of interest are other ways that Urban KiwiRAP is being increasingly used by the pilot project local authorities to assist in transport and district planning. A few of the many examples include:

- A Local Authority updating its Liquor Licensing policies used an alcohol-related crash heat map to identify where crashes were occurring in proximity to licensed premises and assist with its policies relating to alcohol related harm, host responsibility and licensing hours.
- A Local Authority updating its District Plan integrated the risk maps into the traffic impact assessments required for subdivision. Where a subdivision occurred on a high/med risk corridor and had further traffic implications, the subdivider was required to mitigate the traffic issues to medium risk.
- Risk maps have been used for cycleway planning. Examples include shifting a cycle route from a high-risk route to a medium-risk parallel route.
- Local Authority led Road Safety Action Planning processes are referring to Urban KiwiRAP maps and Police are using the information to target enforcement to risk.

- A Local Authority Temporary Traffic Management team is focusing their work site auditing on the higher collective risk routes.
- Risk prioritisation is benefitting business case development for funding of road safety improvements.
- Visual maps are allowing engineering staff to “push back” when community boards or the public advocate for low risk sites to be upgraded.
- Passenger transport route planners are able to identify less “safe” routes for pedestrians and vehicles.
- Network operating contractors and maintenance teams are using the risk maps to target maintenance priorities.

These innovative initiatives were reported from the trial group of four local authorities, with Urban KiwiRAP data being used to assist community decision-making in ways not considered when the analysis was being designed.

Underlying all of these initiatives are the discussions that have arisen from the visual representation of safety risk by Urban KiwiRAP. Cross-organisational teams are talking in a way that was not occurring in the past. Discussions like these have the potential to shift the culture of road safety to a true safe system approach and reduce the risk of serious and fatal injury on the road network.

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Drink driving among Indigenous people in Far North Queensland and Northern New South Wales: a summary of the qualitative findings

by Ms Michelle S. Fitts^a and Dr Gavan R. Palk^a

^a Centre for Accident Research and Road Safety – Queensland (CARRS-Q), Queensland University of Technology

Winner of the Peter Vulcan Award for Best Research Paper at the Australasian Road Safety Conference (ARSC 2015).

Abstract

In response to the threat that drink drivers pose to themselves and others, drink driving programs form an important part of a suite of countermeasures used in Australia and internationally. Unlike New Zealand/Aotearoa, United States and Canada that have programs catering for their First Peoples, all Australian programs are designed for the general driver population. The aim of this study was to identify the factors that contribute to Indigenous drink driving in order to inform appropriate recommendations related to developing a community-based program for Indigenous communities. Broader drivers licensing policy recommendations are also discussed.

A sample of 73 Indigenous people from Queensland and in New South Wales with one or more drink driving convictions completed a semi-structured interview regarding their drink driving behaviour. Participants were asked to disclose information regarding their drink driving history, and alcohol and drug use. If participants self-reported no longer drink driving, they were probed about what factors had assisted them to avoid further offending.

Key themes which emerged to maintain drink driving include motivations to drink and drive, and belief in the ability to manage the associated risks. Factors that appeared to support others from avoiding further offending include re-connecting with culture and family support.

A range of recommendations regarding delivery and content of a program for regional and remote communities as well as other policy implications are discussed.

Introduction

Drink driving has serious consequences for the health and wellbeing of Aboriginal and Torres Strait Islander communities in Australia (referred to as Indigenous people in this paper). Alcohol involvement has been identified as one of the main reasons Indigenous Australians are fatally and seriously injured in road crashes (Boufous, Ivers, Martiniuk, Senserrick, and Stevenson, 2009). According to the latest figures, Indigenous road users are fatally-injured in road crashes at a rate 2.8 times higher than the general Australian population. Indigenous Australians also sustain

serious injuries due to road crashes more often than other road users (30%) (Henley and Harrison, 2013), leaving many with serious disability or long-term conditions, such as acquired brain injury or spinal cord injury. Apart from the direct physical effects of road crashes, there are also the psychological effects, as families have to try and cope with the death or disability of a family member (Ferguson and Segre, 2012). The majority (70%) of approximately 450 fatal injuries per year in Australia and 60% of around 1600 serious injuries per year are suffered by Indigenous residents of 'outer regional', 'remote' and 'very remote' localities (Henley and Harrison, 2013), signifying targeted attention in these geographical areas is required to reduce the road-related health burden experienced by Indigenous Australians.

The majority of the penalties received by Indigenous drivers convicted of drink driving are based on deterrence theory (Homel, 1988). Studies have identified such penalties, including financial penalties and licence suspension, as having limited success in shifting attitudes and behaviour amongst Indigenous drink drivers. A loss of a drivers' licence for Indigenous drink drivers often leads to further driving offences such as driving while disqualified. Consequently, the courts impose more severe punishments such as increased fines and/or imprisonment.

Various policy initiatives including the National Safety Strategy (ATC, 2011) have recognised the importance of improving the safe driving practices of Indigenous road users. Indigenous injury prevention is a relatively novel area, with commentators in Australia considering this to be because of the high social and physical health burden Indigenous Australians present (Ivers et al., 2008). There is limited literature available in Australia regarding the cultural, contextual or social underpinnings supporting Indigenous drink driving. Without this level of understanding it is difficult to design interventions that meet the realities and values of both the driver and community and reduce the contact Indigenous people have with police and the court system for drink driving. In response to the threat that drink drivers pose to themselves and others, drink driving programs also form part of a suite of countermeasures used in Australia and internationally.

Existing countermeasures and drink driving programs

A review of current Australian programs to address the problem of drink driving indicates that they are underpinned by values and contextual factors that meet the needs of mainstream non-indigenous drink drivers (see Table 1).

All of these programs appear to be underpinned by the principles of deterrence theory (Homel, 1988) and include both punitive and educational components as a means to encourage participants to complete the program and become educated about the negative consequences of drink driving. It is envisaged that through a process of education and punishment, drink drivers will be deterred from

Table 1. Overview of existing drink driving programs offered to Indigenous people in Australia, New Zealand, United States and Canada

	Under the Limit, QLD	Sober Driver Program, NSW	Drink Driver Education, NT	First Offender, San Juan, USA	One for the Road, New Zealand	Saskatchewan IDTC
Length	11 weeks	9 weeks; condensed version offered	1 week	28 days, residential	Session One (6 hours) Session Two (4 hours)	21 days, residential
Offender Type	Repeat	Repeat	First time and repeat	First time	Repeat	Repeat
Indigenous Audience	N/S	N/S	N/S	70%	30%	65%
Target Audience	Urban, Regional	Urban, Regional	Regional	Regional	Urban, Regional	Regional
Pre-Assessment	✗	✗	✗	✗	LDQ, AUDIT	ADS, DAST, AUDIT, IDTS
Theory	Stages of Change	Stages of Change	Stages of Change	CRA, Motivational Interviewing	Stages of Change	Social learning model of addiction; Stages of Change
Other Health Issues	✗	✗	✗	Health and nutrition Domestic violence HIV/AIDS prevention	✗	Diabetes, Gambling and Sexual Health workshops
Support provided post program	Completed as part of probation order	Completed as part of probation order	✗	3-12 month follow-up: weekly monitor meetings, AA meetings, vocational education.	Can be completed with probation order	Referred to probation or alcohol and drug counselling
Cultural Component	✗	✗	✗	Sweat Lodge; Talking circles	Inclusion of family attendance	Elder support; Sweat Lodge Ceremony

N/S – Not Stated; LDQ - Leeds Dependency Questionnaire; AUDIT- Alcohol Use Disorders Identification Test; DAST – Drug Abuse Screening Test; IDTS - Inventory of Drug-Taking Situations; CRA – Community Reinforcement Approach

future drink driving. Most of these mainstream Australian programs have been developed based on the meta-analysis of 215 evaluations of all types of drink driving programs by Wells-Parker, Bangert-Drowns, McMillen and Williams (1995). According to the authors of the study, drink driving interventions including a combination of education, counselling and probation supervision were more effective than interventions that did not have all of these components (Wells et al., 1995).

The majority of the Australian programs are part of the sentencing process and completion in some cases is a mandatory requirement prior to re-licensing. Process and/or outcome evaluations have demonstrated that these types of programs can be both educationally beneficial and effective in reducing recidivism among the mainstream population of drink drivers (Dwyer and Bolton, 1998; Mills, Hodge, Johansson and Conigrave, 2008; Mazurski, Withneachi and Kelly, 2011; Siskind, Sheehan, Schonfeld and Ferguson, 2001; Sheehan, Watson, Schonfeld, Wallace and Patridge, 2005). Some programs such as the Queensland Under the Limit Drink Driving Rehabilitation Program (UTL) (Palk, Sheehan and Schonfeld, 2006) and the Victorian Drink Driver Education (Sheehan, Watson, Schonfeld, Wallace and Patridge, 2005) program also assess for risky alcohol consumption and encourage participants to undertake more in-depth alcohol treatment where appropriate. However, none of the existing Australian programs consider the impact of alcohol on other health issues or take into account in a meaningful way the cultural context and factors that contribute towards drink driving among Indigenous people.

In an effort to treat Indigenous participants, program providers in the United States, Canada and New Zealand/Aotearoa recognise the value of including additional components dedicated to cultural values and traditions, and which include the principles of community re-integration, healing, inclusion of family in the program (Dawber and Dawber, 2013) and discussion with Elders and sharing circles (Woodall et al., 2007). The San Juan DWI program also takes a holistic approach towards the treatment of drink driving by addressing alcohol use, abuse, and dependence, health and nutrition, psychological effects of alcohol abuse, drinking-and-driving awareness, stress management, goal-setting, family issues and alcohol, domestic violence and HIV/AIDS prevention. Program participants who are employed can continue with employment through a work release program. An evaluation of the program demonstrated that participants were less likely to be re-arrested compared to non-program drink drivers and after five years post program completion, treated drink drivers were 16.7% less likely to be re-arrested than non-treated drink drivers (Kunitz et al., 2002).

In view of the benefits that the San Juan DWI program has provided for America's Native American people and the limited culturally appropriate Australian Indigenous drink driving programs it is timely to identify the most appropriate drink driving program content and delivery style for Indigenous drivers in Australia. The Centre for Accident Research and Road Safety – Queensland was funded by the National Drug Law Enforcement Research

Fund to explore the psycho-social, cultural and contextual factors contributing towards Indigenous drink driving. The study aims to fill the current gaps in the literature to inform a treatment program and future policy measures to reduce drink driving. This project is specifically focused on Indigenous Australians in rural and remote communities as a large proportion of the injury-burden is experienced in non-urban areas (Henley and Harrison, 2013).

Methods and materials

This project incorporates three independent but linked stages of quantitative and qualitative research designed to comprehensively investigate drink driving behaviour among Indigenous people in Queensland and Northern New South Wales. The paper will discuss a summary of the key findings from interviews with drink drivers. For more information in relation to the other stages of the project, the reader is referred to the full report (Fitts and Palk, 2015).

In stage two, primarily qualitative methods are used to capture information about the drink driving histories of Indigenous drink drivers and the psycho-social, cultural and contextual factors that contributed towards their drink driving. Qualitative methods are a familiar and comfortable style for Indigenous peoples who feel included through talking and sharing, often referred to as 'research yarning' (Bessarab and Ng'andu, 2010). The research was conducted in Cairns Region and Cape York, Far North Queensland, and the Clarence Valley, Northern New South Wales. Indigenous persons familiar with the communities provided support to the research team to assist with liaison in the communities and identifying volunteer participants. Participants were recruited by word of mouth about the research project and the snowballing approach. This approach allowed for community members to become familiar with the aims of the project and to feel comfortable about the aims of the research and talk to the researcher. Participants for the project were provided from a number of community organisations including: the Indigenous justice group, health services as well as from key individuals in community groups (for example, the men's and women's groups). Approval to conduct this program of research was obtained from the QUT Human Research Ethics Committee and Queensland Corrective Service Research Committee.

A sample of 73 Indigenous drink drivers was identified (see Table 2), and following a discussion about the aims and requirements of the research consent for participation was obtained. Participants completed in-depth interviews, in respect of their drink driving behaviour, and an assessment of their level of alcohol consumption and cannabis use was also undertaken. In regards to participants who self-reported they no longer drive after drinking, participants were probed about the protective factors that assisted them to desist from further drink driving episodes.

Thematic analysis (Braun, 2006) of the interview transcripts was conducted by the first author using an interpretive framework. This began by reading through all transcripts and identifying broad patterns of experience that appeared across the interviews both in relation to the specific research

interests, as well as other, unanticipated or emergent issues. These were labelled the themes. Material, in the form of sentences and/or paragraphs, was then coded manually into the themes, with multiple codes being used if the text fit into more than one theme. This was in order to ensure that data and meaning were not lost. To ensure validity, the independent analysis of the material was carried out by the co-author and another CARRSQ senior researcher experienced in qualitative analysis and the content of the

themes. Subsequent discussion among the authors clarified minor points and allowed for agreement on the labelling of the themes. In addition, the first author sought input on the interpretation of the culturally related themes from two other sources: an Indigenous academic with knowledge of the issues relevant to Indigenous drink driving in regional and remote communities, and senior, respected community members from the study communities.

Table 2. Description of the participants

	Cape York, Queensland	Cairns, Queensland	Clarence Valley region, New South Wales
Gender			
Male	26 (90%)	17 (85%)	21 (87%)
Female	3 (10%)	3 (15%)	3 (13%)
Age groups			
>25	6 (21%)	4 (20%)	4 (17%)
26-39	14 (48%)	9 (45%)	14 (58%)
40+	9 (31%)	7 (35%)	6 (25%)
Highest level of education			
Year 7	0	1 (5%)	1 (4%)
Year 8	2 (7%)	1 (5%)	4 (17%)
Year 9	18 (62%)	14 (70%)	10 (42%)
Junior high school (year 10)	7 (24%)	1(5%)	6 (25%)
Senior high school (year 12)	2 (7%)	1(5%)	3 (12%)
Self-reported number of drink driving offences			
1 conviction	16(55%)	1	14 (58%)
More than 1conviciton	13 (45%)	19	10 (42%)
Other driving offences			
Unlicensed driving	11 (38%)	6 (30%)	8 (33%)
Theft of a vehicle	6 (21%)	4 (20%)	7 (29%)

Key findings

Below is a summary of the pertinent findings from the second phase of program of research.

- Participants reported a strong sense of ‘family obligations’ which referred to situations where they described pressure from members of their extended families to drive after drinking. The underlying responsibility for transporting family members appeared to be difficult to avoid and related to cultural values that involved responding to family needs as a priority.

“There is a lot of pressure. You can’t say no to family sometimes when people ask you to drive.” (Man, age 30).

Exclusion from peer or family networks was a common occurrence for participants who had refused family member demands. One respondent spoke about how she had been previously requested by her older sister to drink drive to purchase alcohol. She refused to drive her sister, which resulted in, “she [sister] didn’t speak to me for weeks” (Woman, age 26). Emotional coercion by family members was also used to influence people to drink and drive.

- Some young participants were also motivated by a bravado mentality, referred to as ‘being the hero’ in the narratives. This involved situations where participants insisted on being the person who would take the risk of being caught by police for drink driving and hence protect other members of the group. These participants despite having, on some occasions, the opportunity to avoid drink driving (e.g. another person offering to drive) still insisted on ‘being the hero’ and taking the risk. Furthermore, in many cases, excerpts from the narratives of younger participants captured under this sub-theme talked about attempting to “show off” with an audience of peers while drink driving within the community only, and without an intended destination:

“Lot of people, most boys, some boys find it [drink driving] funny. Yeah well that’s what the young generation here now do. They thinkin’ yeah “the people [are] watching me. I go fly through the street. There’s a bunch of young girls watching us, you know?” That’s what’s the thinking [is] today, [they are] showing off, styling up, being hero.” (Man, age 28)

- Participants were generally aware that drink driving increased the risk of being involved in a road crash and that it was dangerous. However, there was a perception amongst some drink drivers that the known risks could be managed through speed reduction and group decision making including nominating the person who was least intoxicated to drive. There appeared to be a belief that there are degrees of drunkenness and this corresponds to one’s ability to drive the vehicle:

“Well whoever’s going to pretty much sober. The other fella is drunk but not really, really drunk. He’ll end up saying, “I’m more straighter than you two, I think it’s best if I drive”. But they’re still in the risk anyway ‘cause they’re over the [legal] limit.” (Man, age 28).

- Some drink driver participants said the existing penalties were not generally a deterrent because they provided the offender with limited understanding of their offending behaviour or strategies to avoid offending it. Many of the participants also had a history of imprisonment.

“Same with fines and jail. Most time guys don’t learn why they are doing it.” (Man, age 34).

“I’ve been, I’m thirty, I’ve been in and out of jail through me twenties so it didn’t really worry me.” (Man, age 30)

- Several drink drivers reported learning to drive prior to the legal driving age. The youngest reported age was seven years. This was at a similar time when they were being exposed to drink driving during their childhood or adolescent years by older family members:

“young, like thirteen [when I learnt to drive]. I worked at a wrecking yard in Newcastle, so I was driving cars around the wrecking yard from a young age....Um, always been around drinkers, yeah, and I yeah you could say that, yeah, around drink driving yeah when I was young. I used to say it’s not the license that drives the car.” (Man, age 30)

One participant reported young children take on the driving responsibilities after their parents have been drinking: “Where I’m from little kids they drive their parents’ car around. When their parents are drinkin’ and that.” (Man, age 36) Many participants felt that it was important to implement drink driving education awareness from school age.

- There were many drink driving who engaged in cannabis use before driving:

“The first car accident I had there. I be drunk and stoned too as well. I be coming around the corner and just lost control there.” (Man, age 38) Some considered that it was also important to include a drug driving component in the program: “Gunja is also a problem. They should be taught about gunja and driving.” (Man, age 37)

- Most of the participants had been convicted of other driving-related offences including unlicensed driving and dangerous driving.
- Participants did not appear to understand what constituted a standard alcoholic beverage as defined by the Australian ‘standard drink’ guidelines. For participant who self-reported no longer drink driving, education regarding this was considered to be

important in understanding the effect drinking was having on their health and ability to drive safely:

“Standard drinks was a real insight for me. I tried drinking standard drinks for a while there. Teach you about your health and what this substance does. I think to myself ‘wow I been over pouring, not like standard drinks’.” (Man, age 51)

- Re-connecting with family or developing new support systems was important for those drink drivers who were able to avoid relapse:

“[We talk about] what you going to do, how you going to change, how you going to it again if you end up back in the same cycle. [We] have plans to achieve change. We do fishing, making spears, going out bush and all that and spending a day out there, We talk about alcohol and drugs, speed [amphetamines] and all that.” (Man, age 33)

Discussion and recommendations

The aim of the paper was to identify psycho-social, cultural and contextual factors from interviews with drink drivers to help develop program and broader policy recommendations for Indigenous regional and remote communities. Firstly, the findings suggest some of the program delivery styles and content already being utilised in programs for other Indigenous populations (Table 1) may be appropriate for Indigenous communities here. For example, the San Juan DWI and Saskatchewan-based programs recognise the value of cultural elements (sweat lodges, talking circles and ceremonies) and traditions in treating alcohol and drink driving (Woodall et al., 2007). Cultural participation through different avenues including the men’s groups was considered an important element to men in reducing both their alcohol use and further drink driving behaviour. Men’s groups were originally designed to encourage and empower men to review and re-establish their roles in the family and in their communities. Equally important, these groups provide cultural elements whereby the role demands and rewards of other behaviours are rewarding beyond the realms of the social reinforcements that drinking provides.

Taking the findings reported here and existing literature together, recommendations regarding program content and related-licensing measures for regional and remote communities include:

- A community wide approach, with the inclusion of family and other community members in the program to change community perception and attitude towards drink driving,
- Comparable delivery style to that of the Saskatchewan (personal communication), and New Zealand-based (Dawber and Dawber, 2012) programs outlined in Table 1. Presence of community leaders and Elders in the facilitation of the program is recommended,

- Rather than capture drink drivers after re-offending (Mills et al., 2008), it recommended Indigenous drivers attend a program after their first drink driving conviction. Treatment early in their trajectory may assist the treatment for the various psychological, lifestyle, cultural and contextual factors that maintain drink driving,
- Education on the impact of driving under the influence of alcohol, cannabis and other drugs, and prescription medication,
- Developing a relapse prevention plan for the drink driver that includes a support person to encourage safer driving and the strengthening of protective factors. The drink driver should also be encouraged to connect with other existing services such as the local men’s/women’s group and community-based drug and alcohol services,
- A mandatory component in which convicted drink drivers are ordered by the Court to participate in the program and attend the introductory day session and weekly sessions,
- The fee for Court mandated participation in the program should be similar to and in lieu of the fine they would receive for the drink driving conviction, and,
- Fees for voluntary non-convicted drinker’s participation in the program to be waived.

Consideration must be afforded to providing drink drivers the opportunity to re-apply for a learners permit upon successful completion of an extensive treatment program, particularly in the ‘very remote’ region, where a driver’s licence is a necessary requirement for access into the workforce (Forrest, 2014). Alternatively, upon successful completion of the program Indigenous people living in remote communities could be granted a restricted licence to drive within the Indigenous community. This would reduce the incidents of arrests for unlicensed and/or driving while disqualified which often result in terms of imprisonment and over representation of Indigenous people, particularly in regional prisons.

Outside of a drink driving program, the findings of this study also indicate that there are other strategies required for reducing drink driving in regional and remote Indigenous communities including community-based initiatives to encourage parents to be active in their child’s driving during the pre-licence period. During their formative years, participants here recalled being exposed to drink driving behaviour. Moreover, some participants reported children taking on the role of driving when their parents were intoxicated, possibly normalising illegal and dangerous driving practices. Parents have a pivotal role in their child’s road behaviour as most young people will learn to drive through emulating their parents’ behaviour, with little to no formal training or education available in regional and remote communities. Parents need to be aware of the considerable role they play in the road safety of young

drivers, from being a model and source of driving attitudes, behaviours, rewards and punishments.

Lastly, future research should focus on understanding the trajectory of drink driving among Indigenous youth, as well as exploring the extent of driving under the influence of cannabis among Indigenous drivers.

A number of limitations in regards to this research are worth noting. For example, the current program of research was based on self-reports from a small sample of Indigenous residents convicted of drink driving from three regions and may not be transferable to other communities. Moreover, the sample consisted largely of male participants. While drink driving is predominantly an offence perpetrated by men, their opinions of the program may not apply to their female counterparts. Another limitation relates to language and cultural differences between the researcher and participants. In respect to the interviews conducted in Far North Queensland, English was sometimes not the language used at home. If the interviews had been conducted in a local dialect, this may have produced more in-depth responses. Although participants were asked if they would prefer to complete the interview in their local language with the assistance of an Elder to translate, all participants decided to complete the interview in English.

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Building community capacity for road safety – are we doing it?

By Andrea Smithson^a and Terri-Anne Pettet^a

^a WA Local Government Association's RoadWise Program

Winner of the Conference Theme Award at the Australasian Road Safety Conference 2015

Abstract

Capacity building is a familiar term. But what does it mean in a particular context, and can it be measured? This challenge was faced by the WA Local Government Association in exploring more inclusive methods of evaluating the RoadWise Program, with the aim of better reflecting the role of community road safety in the safe system framework.

Following extensive research and consultation, members of the RoadWise community road safety network were invited to participate in a survey which examined the following five key capacity building domains:

- Participation and community ownership;
- Opportunities for leadership;
- Community structures – with a focus on the health and functioning of RoadWise Committees;
- Access to resources for effective road safety activity; and
- Strengthened individual skills.

The results of the survey provided benchmarks, in each domain, for the RoadWise Program along with opportunities to address any gaps in delivery. Overall, the findings revealed a healthy, functioning and enthusiastic road safety network. Members of the network firmly believe they can make a difference, utilising the tools and programs offered for road safety action at a local level.

This process has helped redefine the activity of the RoadWise Program and value the role of community capacity building. It has given capacity building shape as a framework for future planning and delivery.

Background

The Western Australian Local Government Association's (WALGA) RoadWise Program works with Local Governments, community groups, private businesses and individuals to support the implementation of Towards Zero, the road safety strategy for Western Australia 2008-2020. The Program aims to achieve this by supporting local road safety committees, providing access to resources and training and increasing road safety skills and knowledge, which all contribute to building the capacity of the network to make an effective contribution to improving road safety

in Western Australia. The RoadWise Program receives funding through the Road Trauma Trust Account and the State Government Funds to Local Roads Agreement.

The RoadWise Program supports the road safety network across eleven regions, encompassing metropolitan, regional and remote areas of Western Australia. A Regional Road Safety Advisor is based in each of these regions, with the exception of the Pilbara and Gascoyne regions which are serviced, in addition to the Metropolitan South region, by a Senior Road Safety Consultant based in Perth. Project staff provide additional support through research and the development of new resources. The Program also includes the coordination of the Type 1 child car restraint fitting service, which involves the training of new Type 1 fitters and the provision of information for both Type 1 fitters and the general public regarding the correct use of child car restraints.

Community road safety programs such as RoadWise are recognised as playing an important role in generating the community support, partnerships and engagement in road safety that is integral to achieving a safe road transport system. However it is difficult to assess the effectiveness of such programs due to the challenges associated with small population sizes, relatively low numbers of crashes in individual communities, and the difficulty in separating the effects of local activities from broader campaigns or projects (Cairney, 2009).

Traditional evaluation efforts, which have focussed primarily on delivery and processes, do not provide a complete picture of the contribution of community road safety programs in the safe system. Evaluations of other broad scale community based injury prevention programs have found that a narrow view of success (for example, using only the criteria of reduction in hospitalised injuries) did not account for other broader measures of success, such as developing partnerships or increased community capacity to address safety issues (Nilson, Ekman, Ekman, Ryan, & Lindqvist, 2007).

Currently the RoadWise Program reports on a range of program delivery results to meet the requirements of funding received from the State Government. However this reporting regime does not provide a 'big picture' view of the impact of the program, which is central to driving future development.

Why community capacity building?

A brief review of relevant literature was undertaken to explore how similar community based programs have been evaluated, and to identify alternative means of defining the work done by the program and the network. Laverack (2007) refers to a continuum of community based concepts, ranging from community readiness (a state of community preparedness to engage in a series of stages and partnership with an outside agent to implement a program), to community empowerment (a process by which communities gain control over the decisions and resources that influence their lives). Along this continuum, community capacity building provides the best fit with the aims of the RoadWise Program.

Community capacity building can be considered as the combined influence of a community's commitment, resources and skills, that enables people to work together to make decisions and take action towards a positive future (Gibbon, Labonte, & Laverack, 2002). The benefits to the community of working in a capacity building approach include better reach of the target population, improved use of resources, increased levels of local participation, engagement and commitment to health action (Liberato, Brimblecombe, Ritchie, Ferguson, & Coveney, 2011).

The literature indicates that a number of different domains have been used to describe the characteristics of community capacity building and to enable the assessment of levels of capacity. Liberato et al (2011) undertook a review of capacity building domains which had been developed or utilised by other authors. The review sought to describe the attributes of each domain, and develop a set of agreed broad domain areas which could serve as a foundation for other practitioners working in this area. The authors reassembled the information to form nine domains of capacity building:

- Learning opportunities and skills development;
- Resource mobilisation;
- Partnerships/linkages/networking;
- Leadership;
- Participatory decision making;
- Assets-based approach;
- Sense of community;
- Communication; and
- Development pathways.

Six sub-domains were also identified, which were shared vision and clear goals; community needs assessment; process and outcome monitoring; sustainability; commitment to action; and dissemination.

The domain areas identified by the authors provide a guide to considering the assessment of capacity building, with the expectation that sub-components of the domains can

and should be adapted and modified to suit the context and purpose of particular projects. Subsequently, the domains were reviewed to ensure they were applicable to the context of the RoadWise Program, and consolidated into the following five domains:

- Participation and community ownership;
- Opportunities for leadership;
- Community structures – with a focus on the health and functioning of RoadWise Committees;
- Access to resources for effective road safety activity; and
- The facilitation of skills and knowledge development within the network.

Method

A study of the RoadWise network was proposed to further explore the concept of community capacity building and its potential implications for future planning and development.

The goals of the study were:

1. To identify the capacity within the network to deliver effective road safety activities and initiatives,
2. To identify opportunities for WALGA's RoadWise Program to develop and deliver future capacity building within the network, and
3. To enable WALGA's RoadWise Program to more effectively engage with our network and stakeholders.

In 2013, Research Solutions were appointed to undertake the study on WALGA's behalf. Given the geographical diversity of the network, an online survey was determined to be the most appropriate approach. To inform the development of the survey, one focus group was held in the metropolitan area, along with thirteen in-depth phone interviews with members of the road safety network (eight from regional/remote areas, five from the metropolitan area).

The survey was distributed using the Local Government and community road safety network database that is maintained by the RoadWise Program. The database includes the contact details of approximately 2500 RoadWise Committee members, Type 1 restraint fitters, Local Government staff and Elected Members with an involvement with road safety, and other individuals and organisations who have been involved with the RoadWise Program in some way (for example, applied for a road safety grant). An email was sent by the RoadWise Program to all contacts on the database, informing them about the purpose of the survey, and that an email with a link to the questionnaire would be sent to them by Research Solutions in the near future. As well as making people aware of the survey in advance, this initial step also provided an opportunity to 'clean' the database by investigating or

removing any emails which bounced back. The survey was emailed to a final sample of 1920 individuals.

To maximise responses, a survey reminder email was sent approximately 7-10 days following the initial survey invitation. A series of telephone reminder calls were also made following the three week survey administration period, and provided the opportunity for a potential respondent to be re-sent the online survey or to complete the questionnaire over the phone.

Results

The survey returned a sample of 384 respondents, representing a response rate of approximately 20%. It explored each of the five community capacity domains, with a series of questions in each part of the survey designed to examine each concept in detail.

Participation and community ownership

This domain explored the active involvement of people in the activities and decisions of the road safety network, along with the commitment of individuals to working together towards a shared road safety vision.

Individuals who responded to the survey (n=384) came from all regions in WA, and represented the full range of membership categories including Local Government officers and elected members, community members, State Government agency employees, Type 1 child car restraint fitters, and the private sector. Almost half of respondents (49%) had been involved with the road safety network for between two and ten years, while an additional 17% had been involved for more than ten years. On average, respondents contributed an average of nine paid hours and three unpaid or volunteer hours per month to RoadWise network activities, including implementing road safety initiatives, attending road safety meetings, providing technical advice and educating target groups.

Respondents were asked what motivated their initial involvement in the RoadWise network (more than one response was allowed). For a majority (69%) of respondents, being involved with RoadWise was a part of their employment, while other major motivators included being passionate about road safety (44%) and a desire to make the community a safer place to live in (38%). This indicates that for many members of the network, their participation goes beyond a sense of obligation as part of their job and extends to a sense of personal purpose.

Survey respondents reported a strong need for a coordinated approach at a state level (83% agree/strongly agree), along with placing a high level of importance on the effectiveness of local initiatives (74%) and the empowerment of local communities (70%). Two thirds (66%) of respondents felt that by being a part of the RoadWise network, they were making a contribution towards the vision of Towards Zero. However it is interesting to note that only around half of respondents (53%) felt that their efforts were valued at a local level, and less than a third (28%) felt that they were valued at a state level.

Leadership

The survey explored the domain of leadership, particularly in terms of where leadership comes from within the network, and whether individuals considered themselves to be leaders in local road safety. The results, while not overwhelmingly strong, were nonetheless encouraging. More than a third (38%) of respondents considered themselves to have developed leadership qualities as a result of their involvement with the network, and just under half (45%) reporting that strong road safety leaders exist in their community. There was some feeling however that additional leadership and direction could be provided by RoadWise (36%), along with more support from Local Government (30%).

Community structures

RoadWise Committees (and other road safety groups) form a framework for generating local road safety activity, and provide an opportunity to bring people together for a common purpose. Respondents who had indicated that they were a member of a RoadWise Committee or group (n=135) answered a series of questions exploring the 'health' and functioning of such group.

More than half (58%) of respondents were either satisfied or very satisfied with how their particular group operates, which high levels of satisfaction reported for functional tasks such as record keeping (81%) and meeting conduct (78%). The level of leadership (64%), diversity (61%), respect (80%) and cooperation (74%) were also high. Levels of satisfaction were lower for more strategic activities such as advocacy (53%), sourcing funding (37%) and attracting local volunteers (18%).

Access to resources

The ability of the community both to mobilise resources from within and to negotiate resources from beyond itself is an important factor in its ability to achieve success. For the RoadWise Program, the effectiveness of local road safety activity is reliant on the ability of the network to access appropriate resources.

Almost two thirds (62%) of respondents reported that they needed more road safety resources and materials to assist them in spreading the road safety message. The same number (62%) also felt that it would be beneficial to have stronger links to other RoadWise or road safety activities and programs happening in other parts of the state. Just under half (48%) of network members reported difficulties in attracting local volunteers to assist with their road safety activities and programs.

Strengthened individual skills

Individual skill development is an important element of community capacity building, with the level of contribution to the network increasing as individuals develop new skills and expertise. The survey provided an opportunity to explore how well the RoadWise Program had facilitated

opportunities to develop and apply new knowledge and skills.

The results showed that for 72% of respondents, being part of the RoadWise network had opened up new opportunities for them as an individual. Sixty percent of respondents also reported that being part of the network enabled them to learn or know things that helped in other parts of their lives. More than half (59%) said that their involvement in the network has led to an increase in knowledge and understanding of road safety.

Smaller numbers of respondents reported that they had been able to develop and apply new road safety skills, with 19% stating that they had gained new skills through professional development opportunities arising from their involvement with the network.

Future intentions of the network

At the conclusion of the survey, respondents were asked to indicate if they anticipated staying involved with the RoadWise road safety network, with the vast majority (92%) reporting that they did intend to stay involved in the future. Respondents were also asked to note the one most important thing that WALGA's RoadWise program could do to assist them as an individual or their committee/group to address road safety issues in the future. Responses to this question were diverse, but were summarised as relating to:

- Additional funding or improved access to funding
- The introduction of new road safety campaigns
- Additional engagement between RoadWise committee/groups across the state to facilitate sharing of ideas
- An extended role for Local Government and RoadWise Regional Road Safety Advisors, and
- Additional advocacy for road safety at a State Government level.

These issues are broadly reflective of the results in other parts of the survey.

Discussion

The key findings of the survey are:

1. Membership of the road safety network is driven by employment and being interested and passionate about making a contribution to the overall vision of zero deaths and serious injuries on the WA road network. Aligned with personal motivators, members of the network are committed to the cause and aware of the importance of local involvement and actions. They do feel that they can make a difference. However there is a need to address the lack of value that is felt by members of the network at both a local and state level.
2. On average, members of the network devote nine paid hours and three volunteer hours to the RoadWise road safety network each month, performing a wide range of activities including implementing road safety initiatives, attending meetings, providing technical advice, educating target groups, and providing support for road safety events. With two thirds of respondents reporting that they needed more resources to assist in the delivery of these activities, more investigation is required to determine the additional tools and resources that are required.
3. Network members strongly believe in the value of community empowerment and the effectiveness of local initiatives, linked with state-level coordination. This suggests that the model of generating road safety activity through a local RoadWise Committee structure is an appropriate one, and is providing a means of interpreting Towards Zero for local communities.
4. There is significant scope for the RoadWise Program to provide support for network members to increase and apply road safety skills and knowledge through professional development and networking opportunities.
5. The community structures associated with the network are perceived to be sound and appropriate, with individual RoadWise committees/groups also perceived to be performing well. However there is an opportunity for the RoadWise Program to provide additional strategic guidance to enhance the functioning of such groups.
6. The overall health of the network is strong, with the vast majority intending to stay involved in the future. This is particularly encouraging given the range of interests and causes that compete for the time and energy of individuals and organisations.

Overall, the feedback from the network paints a clear picture of a committed and passionate group of people who, through their involvement with the RoadWise Program, feel that they are making a real contribution to reducing deaths and serious injuries in their communities. The network is the greatest strength of the RoadWise Program, and there is a clear need to continue to provide support, resources, recognition and encouragement to the network to enable the continued generation of local level activity in support of Towards Zero.

Does this mean that the RoadWise Program is building capacity? As this is a first step in a significant change of thinking, it is still a difficult question to answer. Capacity is not something that can be assigned a number or percentage to ascertain success or failure. The literature suggests that an appropriate method of assessing the overall success or otherwise of a program whose aim is building capacity, is to use a process of self-reflection, assessment and ranking by those involved in delivering the program. Program staff assign a rating to each area or theme, which are then

visually represented utilising a ‘spider web’ approach (Gibbon, Labonte, & Laverack, 2002) (Bush, Dower, & Mutch, 2002). Such a process would provide an overall assessment of how the program is progressing towards the goal of building community capacity, along with a benchmark for the future. Repeating the survey will also provide the necessary feedback from the network, and will enable a comparison of data in each of the domains. These two steps will be undertaken by the RoadWise Program in the future.

This research represented a significant step for the RoadWise Program in the way it considers and values the way in which it operates. The process of identifying community capacity building as the best fit with the goals of the program, and then clarifying and defining the relevant domains, has in some ways been just as important as the findings of the survey itself. It had led to a significant change of thinking within the program, which is reflected in the restructure of the Program’s action plan to reflect the five capacity building domains. Understanding what community capacity building means and how it is relevant to the RoadWise Program has provided a strong basis for developing the Program in the future.

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An analysis of driver behaviour through rural curves: exploratory results on driver speed

by Blair Turner^{a,b}, Jeremy Woolley^b and Peter Cairney^a

^a ARRB Group Ltd, ^b Centre for Automotive Safety, University of Adelaide

Paper presented at the Australasian Road Safety Conference 2015

Abstract

Speed, whether above the speed limit or too fast for the conditions, is a significant contributor to fatal and serious injuries at curves on rural roads. The driving behaviour of 40 motorists was assessed using an instrumented vehicle. This vehicle tracked driver behaviour around 200 curves on a set driving route. Factors including speed, acceleration, side force and lane position were recorded for each driver. Details regarding the design elements of the route were also collected, including curve severity, direction (left or right), horizontal alignment, grade and cross slope. This paper provides initial results for driver speed behaviour through different types of curves, and discusses the implications of the findings.

Introduction

Road crashes result in a significant number of deaths and serious injuries every year. The high incidence of crashes on rural roads has been identified in various countries. IRTAD (2010) report figures for fatal crashes, including those outside urban areas in many countries. These range from a low of 46% in Japan, to a high of 79% in Spain, with the average of all countries providing data being 62%. In the UK 58% of all deaths, and 41% of deaths and serious injuries occurred on rural roads (King and Chapman 2010). In the US, rural crashes accounted for 57% of fatalities, despite less than a quarter (23%) of the population living in rural areas (NHTSA 2007). The rate of crashes (per km travelled) was 2.5 greater than for urban roads.

The situation is also similar in Australia. In a review of road safety on rural roads, Tziotis et al. (2006) calculated that 60% of fatal crashes in Australia occur on the rural high speed road network resulting in over 1,000 fatalities per year in Australia, and more than 22,000 injuries. A number

of road environment factors were identified as contributing to these crashes, including the road condition, road design, the roadside environment and speed. The predominant crash types identified were vehicles travelling ‘off path’ (i.e. run off road) followed by vehicles travelling in the same direction (e.g. side swipes, lane changes and rear end crashes), and opposite direction (i.e. head-on) crashes.

Curves appear to have an elevated level of risk, producing a significant amount of all rural crashes. For example, Steyer et al. (2000) report that around half of all rural road crashes in Germany occur at curves. Retting and Farmer (1998) report that around 40% of fatal roadside crashes in the US are at curves. A report by the OECD (1999) suggests that relatively high numbers of crashes on rural roads occur at curves when compared to tangents and that run-off-road and head-on crashes at these locations are a particular problem. It was suggested that isolated curves or the first curve in a series are of greatest danger particularly as the result of inappropriate speed and lane position. Cenek et al. (2011) identified that in New Zealand, loss of control on curve crashes represented around half (49%) of all injury crashes in 2009 on rural state highways. That study identified that around 26% of the rural state network is curved (defined as having a curve radius of 500 m or less), meaning that crashes at these locations are vastly over-represented.

Charlton and de Pont (2007) discuss three causative factors that may have an influence on crashes at curves. It is suggested that attentional demand may be higher at curves than on straight roads, and that this is exacerbated by higher speeds. Misperception of speed and curvature, especially on approach and at curve entry, was suggested as another factor in crashes at curves. Charlton and de Pont provide evidence to suggest that misperception of curvature is ‘relatively common’. Wooldridge et al. (2003) also suggest that crashes may occur at curves when there is a disparity between the perceived safe speed of the curve, and the actual speed at which the curve can be safely negotiated. They suggest that driver expectation based on prior experience plays a large part in safe curve negotiation, and that fewer crashes occur at curves that conform to driver expectations. The third cause suggested by Charlton and de Pont is that motorists have difficulty maintaining lateral position through a curve, leading to a loss of control.

Turner (2009) identified that speed was thought to be a major contributor to crashes at curves. This study reviewed the types of crashes on rural roads that were thought by police to be caused by speed (typically defined as ‘too fast for the conditions’ or above the speed limit). This is a relatively coarse measure of causality as often police do not attend the scene of a crash, or when they do, they may have a limited amount of information available to form an accurate judgement of crash causation. However, the most common crash types in order of occurrence were:

- Off path on curve (i.e. running off the road while negotiating a curve)
- Off path on straight

- Vehicles travelling in opposing directions colliding
- Overtaking.

Off path on curve was by far the most common crash type, with around 80% of all rural speed related crashes. Compared with ‘non speed related’ crashes (i.e. where speed was not indicated as a contributing factor) this crash type is also over-represented. In non-speed crashes, off path on curve crashes accounted for only 20% of crashes.

Despite many years of research on this topic, crashes at curves still occur in significant numbers, and as identified above, many are related to speed. In order to explore this issue, a study was undertaken to determine behaviour of drivers through curves. A number of such studies have been undertaken over the last few decades (e.g. Johnston, 1982; Fildes, 1986; Campbell et al., 2008), but advances in data collection technologies now allow more detailed and comprehensive information to be collected. This study utilised an instrumented vehicle to collect continuous data on speed and other behaviour through multiple curves. A number of different variables were collected, creating a rich data source which will enable a range of hypotheses relating to driver curve negotiation to be tested.

The study upon which this paper is based assesses broader issues based on the variables collected, including road design elements, traffic management, driver lane position etc. However, this current paper focuses on initial results obtained on driver speed through high risk and low risk curves.

Method

Data on driver behaviour was collected using an instrumented vehicle. Each driver travelled a set route on their own in this vehicle. A total of 40 male subjects were included, 20 with limited driving experience (less than three years) and 20 with more experience (15 years or more). Males were selected to reduce study variance, but also because this is a higher risk group of drivers. All recruited drivers were unfamiliar with the test route.

The vehicle was fitted with devices to measure speed, acceleration/deceleration, side force, GPS location (all collected using ARRB’s GipsiTrac and associated devices; see ARRB, 2015), lane position, and distance to vehicle in front (collected using a Mobileye device; see Mobileye, 2015). Video images of the view in front of the vehicle were also collected.

Subjects were recruited using a variety of means, including social media, and other sources of advertising. Information was collected for each driver, including details on driving experience (including on rural roads), and type of vehicle normally driven. Information was also collected on attitudes to driving through the Driver Behaviour Questionnaire (DBQ; Parker et al., 1995).

The study commenced with subjects travelling 13 km along an urban arterial route to the start of the test route.

This allowed a period of familiarisation with the vehicle. Journey time to the start of the route was approximately 16 to 18 minutes. This route had various types of delineation, including centre and edgeline marking throughout the route, and a mixture of advance warning signs and curve advisory speeds at more severe curves. The semi-rural test route itself was 21.9 km, taking approximately 30 minutes. At the end of the route, drivers negotiated a roundabout and returned along the same route. The journey to the start of the test route, route negotiation, and return to the starting point took around 1 hour and 35 minutes.

The route was a hilly area on the edge of Metropolitan Melbourne, and involved a mixture of speed environments. In some locations it passed through small townships, while in others it was quite rural. With the mixed nature of development along the route, the speed limit varied between 80km/h and 60 km/h. A higher speed environment would have been preferred, but this was not possible given study constraints (particularly travel time to the starting point).

There were many curves along the route, some of which were quite severe with high speed approaches. There were 101 curves for each direction of travel, giving a total of 202 curves over the whole route. The start of a curve was defined as the point on the road where the curve radius fell below 1000m, or where the curve changed direction when the radius was already below 1000m. The end of a curve was defined as the point at which the curve increased above 1000m, or where it changed direction.

Data was categorised by the point within the curve. Data for the 40m prior to curve commencement was classed as the 'approach'; the point at which the radius fell below 1000m was the 'start'; the segment between the start and point of curve minimum was the 'to minimum'; the point of minimum radius was 'minimum'; the segment between the minimum and curve end was the 'departure'; and the point at which the curve finished was the curve 'end'.

Calculations were made for each curve (based on data collected) of curve start point, point of minimum radius (i.e. the most severe point of the curve in terms of curvature), curve length, and curve direction. An estimate of curve risk was also calculated. This risk assessment was based on previous literature on this topic. The measure used for this study was based on a calculation of the difference between approach speed and speed at minimum curve radius. This was identified by several prominent studies (Turner and Tate, 2009; Krammes et al., 1995) as the most sensitive measure of crash risk for curves. The 20 highest risk curves, and 20 low risk curves were identified, and included in this study for analysis.

Data was excluded where drivers were following another vehicle, during periods of rain (defined as when the wipers were in use) or when roadside activity was likely to influence behaviour (e.g. pedestrians, road works).

Results

The results presented here relate to driver speed through the different curves, and at different points on approach and through the curve. This includes an assessment of speed against some design elements of the curve; and speed through high risk and low risk curves. An assessment was also made of difference in driving speed between young and experienced drivers. Other factors of interest are being evaluated and will be published separately.

All results relating to group differences are statistically significant at least to 0.05 level unless indicated otherwise (based on t-tests, applying a Bonferoni correction for use of multiple tests).

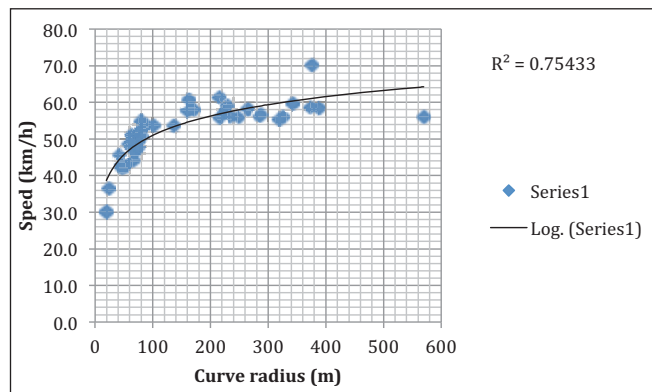


Figure 1. Mean speed by curve radius

The first analysis shows the relationship between curve radius and speed (Figure 1). This presents the average speed for each curve (across all drivers). It is clear that as the curve radius decreases, the mean speed reduces. This finding is as expected based on road design guidance, where the relationship between vehicle speed, curve radius, pavement superelevation, friction between tyre and road surface and gravity is well documented (see Austroads, 2010). It is only really below a 100m radius that speeds fall consistently below 55 km/h. From this point there is a sharp

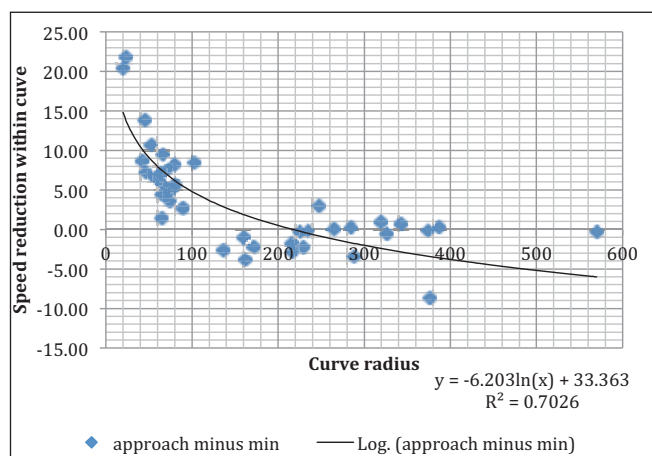


Figure 2. Mean speed reduction by curve radius

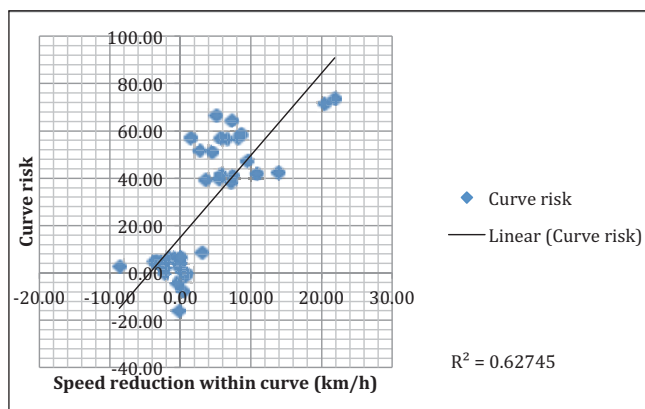


Figure 3. Mean speed reduction by curve risk

reduction in speeds, to a low of 30 km/h with a radius of 20m (quite a severe bend).

Figure 2 shows the speed reduction that occurs from the start of the curve to the point of minimum curve radius. Again, there is a clear relationship between radius and the speed behaviour, with the greatest reduction in speed occurring for the most severe curves.

Figure 3 shows the reduction in speed based on the calculated crash risk of the curve (defined as the difference in approach speed, and the speed at the point of minimum curve radius).

Although there is a broad trend for greater speed reduction with higher risk, the relationship is less clear than for curve radius. The two categories of curves (low and high risk) can be clearly observed. Within each of these two groups there is a degree of variance, indicating that although there is a relationship between speed reduction and risk, this is not clear-cut within the two types of curve.

The next set of analyses show speeds at different points throughout curves, comparing high and low risk curves. Mean speeds were lowest through the high risk curves (52.3 km/h compared with 58.5 km/h). Speeds are lower at all points through the curve, with the minimum speed coinciding with the point of minimum curve radius, as shown in Figure 4.

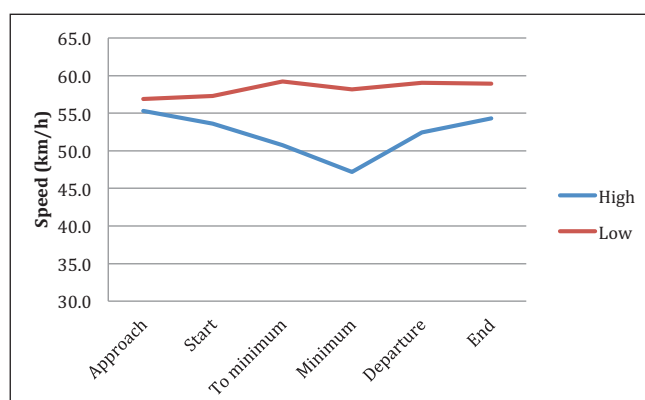


Figure 4. Mean speed by curve risk type

On closer analysis, several things are apparent. For the high risk curves, it appears that speed reduction may have commenced in advance of the 40m buffer used in this analysis, given the mean speed at approach is lower than for low risk curves. It is also apparent that speeds had not returned to the pre-curve level at the end of the curve (10m beyond where the curve radius exceeded 1000m).

A separate analysis was conducted for left versus right curves. This can be seen graphically in Figure 5.

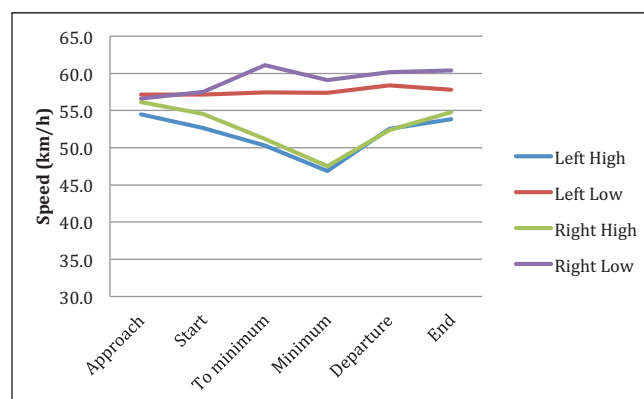


Figure 5. Mean speed by curve risk type and direction

The driving behaviour for both left and right curves was similar, although it is clear that speeds are higher for right curves than for left for both high and low risk curves. For high risk curves, the higher speeds occur when approaching the curve minimum (differences were not statistically significant at minimum, departure or curve end).

Given that speed data is continuous (i.e. gathered every few metres along the roadway) and information was also available on elapsed time for each driver, it was possible to make an accurate calculation of vehicle acceleration and deceleration. Figure 6 shows the result for acceleration (a value above 0 m/s/s) and deceleration (values below 0 m/s/s) through different types of curves.

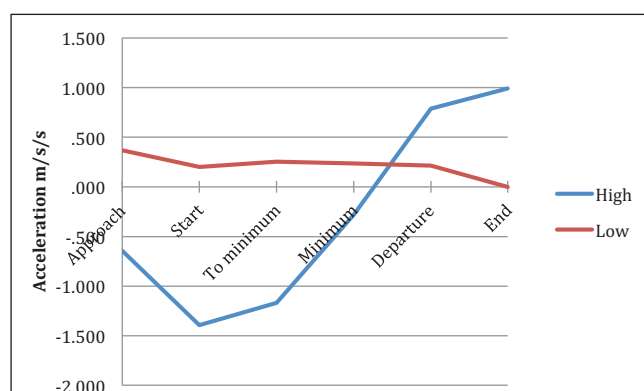


Figure 6. Mean acceleration/deceleration through curves of different risk

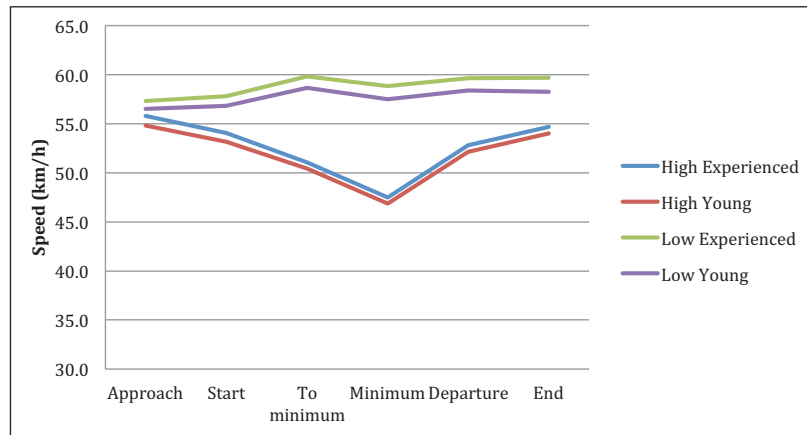


Figure 7. Mean speed by driver experience

It is clear that deceleration has commenced in advance of the curve approach point for high risk curves, and is at its maximum level at curve start. Deceleration continues on approach, and beyond the point of curve minimum. Vehicles are accelerating at curve departure, and continue to do so through curve end.

Lastly, a comparison was made between driving speeds of young drivers and experienced drivers. Figure 7 shows that there is no clear difference in speeds based on driver experience. Although the results were statistically different (except at the point of curve minimum), the results were not at all substantive, particularly for the high risk curves.

Further analysis has been undertaken on difference by driver experience for other driving behaviours, and will be reported in future.

Discussion

It appears that driver selection of speed through curves is highly correlated to curve radius. Drivers seem highly attuned to this element of curve design when making decisions about an appropriate speed. However, it was also noted that these reductions only really commence below a curve radius of 100m. This is interesting, as although risk is greatest for curves below this radius (Veith et al., 2010 suggest the risk is six times greater than for straight roads), there is still a greatly elevated risk for curves with a greater radius (i.e. a less severe curve). The risk for curves with a radius of less than 400m is double that of straight roads, and as highlighted by Levett (2005), curves in this band are far more common, and may (in aggregate) form the greater risk for drivers. Measures to highlight the risk for curves of less than 400m, and the requirement for speed reduction, would be desirable. Jurewicz et al (2014) suggest that categories of curve should be defined based on risk, and differential forms of delineation used for individual curves depending on this category. The findings from this study tend to support this approach, with different curves likely to require different methods for highlighting severity and the appropriate speed.

Speed reduction based on curve risk was less clear-cut within the two broad risk bands (high risk and low risk curves). Within the high risk curves, the amount of speed reduction from curve start to curve minimum was relatively independent of curve risk. This may be because speed reduction had already commenced well in advance of the curve. It would be possible to assess this issue with further analysis.

Speed patterns within curves were as would be expected. Speeds were lower at all points for high risk curves, and the lowest speeds (at least when broadly banding curve segments) occurred at the curve minimum. The result indicating higher speeds through right curves is interesting. Right curves are known to have higher risk (Kloeden et al., 1997; Levett, 2005), a finding that was confirmed from an analysis of crashes on the test route. In an analysis of crashes from the VicRoads crash database (VicRoads, 2014) it was identified that 55% of crashes at curves occurred at a right hand bend. The higher speed at right hand curves therefore deserves further attention to determine additional risk factors, and to help to identify the means to address these.

One particularly interesting finding from this study was that deceleration continued through and beyond the curve minimum point for high risk curves. Given this is a high risk location it is highly desirable that drivers will have already fully decelerated by this point. Although there are some indications from previous research confirming this finding, road design standards assume that speed reduction is complete at curve start, let alone at this point later in the curve (Austroads, 2010). This finding could have implications for design guidance. Further analysis is required to determine the situations (e.g. the types of curves) where this issue is most prevalent. Given the data set created through this study, this is very feasible. Mechanisms to ensure speed reduction is completed before curve minimum would most likely reduce crash risk. Options need to be explored regarding how this might best be achieved. Such options might include signs located further in advance of curves.

The result indicating no substantive difference for different drivers with different levels of experience is interesting. It could have been expected that young drivers would have exhibited higher speeds, especially through high risk curves, given the higher risk of this group. The opposite was observed in this sample, as young drivers showed lower speeds at all points through both low and high risk curves (the only exception being at the point of minimum curve radius for high risk curves where there was no statistically significant difference). It may have been that young drivers were more cautious in this sample because they were being monitored, or that they are more cautious in selection of speed through curves in general (at least from short exposures to rural driving). Given that some quite extreme behaviours were observed in the sample (e.g. very high speeds and side force by individual drivers through individual curves) despite being observed, it is possible that both situations may be true. It is possible that issues in addition to speed selection are significant in the elevated crash risk of young drivers.

There are a number of limitations to this study. These include that drivers were driving in an unfamiliar vehicle, and were being 'observed'. Despite a period of familiarisation prior to reaching the test route (and some settling of behaviour towards 'normal'), it is possible that drivers were not performing as they normally would. Secondly, the driving route in this study was a constrained hills environment with a maximum speed limit of 80km/h. Although some quite severe curves (in terms of the required speed reduction) were able to be included in the study, analysis of a higher speed environment would be desirable. Thirdly, there are a number of elements that differ between curves, including traffic management and delineation (such as presence of advance warning signs and chevron alignment markers). Although the large number of curves included in this study will compensate for such differences to some extent, it could be expected that these elements will also have an impact on driver selection of speed. Further analysis including these elements is required to help determine their actual impact.

Due to these limitations, generalising of the findings from this study to other contexts should be done with caution.

The data set created through this study will continue to be explored, including the analysis of other behaviours. Assessment of side force and lane position will be important to more fully understand driver behaviour through curves, as will the relationship between these variables and speed. This additional analysis will be presented in future.

Acknowledgements

This study is based on data collected as a requirement of a PhD, conducted through the Centre for Automotive Safety Research at the University of Adelaide. The lead author would like to thank the contributions of the supervisors for this study, Jeremy Woolley, Mary Lydon and Peter Cairney. The lead author would also like to acknowledge the

contributions of friends and colleagues at ARRB, including in the financial and other support for this study. The useful comments made by reviewers are also acknowledged.

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Contributed articles

How a diamond made trucks glow in the dark

by Marilyn Johnson^{a,b}, David Lee^a, Cade Turner^c, Bob Lovf^l and Ross Longmire^e

a. Amy Gillett Foundation, G02, 616 St Kilda Road, Melbourne 3004, b. Institute of Transport Studies, Civil Engineering, Monash University, Wellington Road, Clayton 3800, c. 3M Australia, Building A, 1 Rivet Road, North Ryde, NSW 2113, d.,e. Toll Group, Level 7, 380 St Kilda Road, Melbourne, VIC, 3004

Abstract

In 2015, Toll Group is trialling the addition of 3M™ Diamond Grade™ Reflective Tape to the sides and rear of truck trailers to increase trailer visibility at night, with a view to making this a national requirement across its fleet in 2016. It is a simple, fast, cost-efficient and immediate road safety action. This new collaboration between 3M and Toll is a direct outcome of the Amy Gillett Foundation (AGF) winning the 3M-Australasian College of Road Safety Diamond Road Safety Award. In November 2014, the Amy Gillett Foundation was awarded this prestigious Award for road safety innovation for *Cycle Safe Communities*. *Cycle Safe Communities* is an online platform created to enhance collaboration with local councils and community groups to deliver high-quality, consistent cycling safety messages nationally.

After receiving the Award, David Lee, Head of Partnerships AGF, visited 3M's Innovation Centre in Sydney, presented at the American Road Safety Conference (ATSSA) and toured 3M's Global Innovation Centre and Headquarters in the USA. These visits sparked ideas on how 3M's reflective technologies could improve cyclist safety in Australia and led to the collaboration with AGF corporate partner, Toll.

The Amy Gillett Foundation is Australia's leading bike rider safety organisation. Its mission is to create a safe cycling environment however, safety benefits from linking 3M and Toll will benefit all road users not just cyclists. AGF is in discussion with 3M about increasing bike riders' visibility and with Europcar to explore how 3M technology can be applied to their vehicle fleet to improve safety for all road users.

3M-ACRS Diamond Road Safety Award – Amy Gillett Foundations' Cycle Safe Communities

Across Australia, cycling safety messages were repeatedly being reinvented. Councils, organisations and community groups have limited resources available for safety campaigns and often a large proportion of available resources (people, finances and time) are spent researching and developing new content. This creates two significant issues, 1) limited delivery as resources are expended in message development leaving limited capacity for delivery and 2) re-inventing messages and conflicting inter and intra-community messages lessen the impact.

To address this issue for cycling safety messages, the Amy Gillett Foundation (AGF) developed Cycle Safe Communities. As the lead Australian cycling safety organisation, the AGF has centralised bike safety messaging with a central repository of campaigns that community groups and the public can use. This minimises production and content development costs and maximises the delivery and impact of the road safety messages. Cycle Safe Communities material is available through the AGF website and was developed with the support of VicRoads and the TAC. From the website, the community (individuals and organisations) can access substantial bike rider safety campaigns including *a metre matters*; *It's a Two-Way Street*; and *Sharing Roads and Paths*.

In November 2014, the AGF was awarded the 3M-ACRS Diamond Road Safety Award for the Cycle Safe Communities initiative. Following the presentation, the award also included a tour of the 3M innovation centres in Sydney and the USA.

3M-ACRS Diamond Road Safety Award – tours and conference presentation

David Lee Head of Partnerships AGF, visited 3M's Innovation Centre in Sydney and discussed how 3M technology solutions could be potentially modified and applied in order to help improve visibility of bicycle riders both in terms of clothing and the bike itself. This was followed by David's visit to the 3M Global Innovation Centre in Minnesota; an extensive tour of the 3M Headquarters; and discussions of 3M solutions and how product innovation directly contributes to road safety. Specifically, demonstrations and discussion focused on how 3M safety solutions help to reduce incidents using reflective sheeting to increase vehicle visibility; and the importance of wet visibility of pavement markings.

This was followed by attendance at the 45th Annual US Convention and Traffic Expo: themed "Connect. Collaborate. Create." David presented to the Safety and Public Awareness committee meeting about the Amy Gillett Foundation's work to reduce serious injuries and deaths of bike riders in Australia. This included an overview of geographic and cultural challenges; and advancements in legislative review and change; in supporting the Foundation's mission and vision.

New partnership for improved road safety

Following the travel component of the award, the AGF connected 3M with a key AGF partner, Toll Group, which led to discussions about the application of reflective tape to the perimeter and rear of its long haul heavy vehicle fleet. This tape, that reflects the outline of the truck trailer to alert other road users to the size of the heavy vehicle, is mandated in the US. Since these initial discussions, Toll has implemented the white and red Diamond GradeTM Reflective Tape to the side and rear of a prototype vehicle. Through 2015, Toll will continue to apply the tape to 23 of its B-double heavy vehicles with a view to roll this out

across a further 200 vehicles within its fleet over the next two years.

Toll Linehaul and Fleet Services General Manager Ross Longmire said Toll places a priority on the safety of its people and the communities in which it operates.

"As the largest mover of freight in Australia we have a responsibility to lead by example and help to educate people to share the road more safely," Ross said.

Conspicuity of road users at night is a key road safety issue that impacts all road users. This new partnership, facilitated by the 3M-ACRS Diamond Road Safety award will have a lasting impact on the visibility of heavy vehicles to other road users at night.

Conclusion

Winning the 3M Diamond Road Safety Award has led to positive outcomes for the Amy Gillett Foundation and for road safety more broadly. Recognition of the AGF's work has helped to increase the profile of the Foundation and, more importantly, increased the awareness of the need for more action to improve safety for bike riders. The award provided the AGF with opportunities to develop a new working partnership with 3M which in turn led to opportunities with 3M and Toll, Europcar and Subaru. The Award provided a way to enhance existing relationships with corporate partners from within the road transport and automotive sectors that has already led to direction action for safer outcomes on Australian roads.

"We could never have afforded to send one of our team overseas for something like this without the opportunity offered to the Foundation through winning the 3M Diamond Road Safety Award" said Belinda Clark, Interim CEO Amy Gillett Foundation. "We are very grateful to the ACRS and to 3M for this investment in us, and in safety for cyclists in a very practical way" she said.

Acknowledgements

The authors wish to thank the Australasian College of Road Safety and the 2014 selection committee for recognising the Amy Gillett Foundation with the 2014 3M-ACRS Diamond Road Safety Award. In addition, particular thanks are extended to 3M for their vision in creating and sponsoring the Awards and to the executive and management team of the American Traffic Safety Services Association.

Study of current factors affecting road safety for 16-18 year old novice drivers in the Wingecarribee Shire

By Sue Tyler

Highlands Drive Safe, member ADTA and ACRS, Rotary Club of Moss Vale

Abstract

Young novice drivers in the first six months of their provisional licence phase have higher crash and fatality rates which are disproportionate to other road users (Bates, Watson and King, 2006). The 'Rotary U Turn the Wheel' road safety program was developed to educate novice drivers of these risks, changes in attitude and behaviour, and to support the school curriculum in this area of road safety. Approximately 822 Year 11 students across the Wingecarribee Shire whose ages range from 16 – 18 were surveyed during the 2013 – 2014 period at the annual 'U Turn the Wheel' event. The survey aimed to benchmark issues and factors that impact both positively and negatively on road safety for 16 – 18 year old novice drivers. The survey was anonymous which allowed students to candidly discuss issues that affected their driving experiences as well as personal issues that may also affect road safety in this vulnerable group without fear of any negative consequence. Factors discussed in the survey included their involvement in accidents or infringements; high risk behaviours; media advertising and its effect; personal drug use; medication; as well as any medical issues that could affect their driving ability. The study results will form the basis of an educational review of the U Turn the Wheel program to ensure best practices are employed in the program and teaching content is current and relevant to the target audience.

Keywords

Road safety, novice, drivers, U Turn the Wheel, young driver issues, road safety education, risk factors, student survey.

Introduction

Driver education programs are often developed through community response to local road trauma and have been the subject of various studies to establish the effectiveness of the programs' ability to reduce a driver's crash risk. Little evidence has been established to link driver education attendance to lowered crash risk for participants (Bates et al. 2006) and may contribute to the short term nature of the program which has a dilution effect on participants when compared to the extended influence of supervising drivers and/or parents. Drivers aged 17 – 24 years are three times more likely than other road users who are over 21 to be involved in a serious crash (NRMA, 2015).

This preliminary study identifies the factors that affect the road safety of young novice drivers who attended the *U Turn the Wheel* program during 2013-14. It uses the information obtained to perform an educational review of the road safety program and also compares program content with actual audience needs.

The Rotary Club of Moss Vale together with the Wingecarribee Shire Council Road Safety Officer established the initial *U Turn the Wheel* program which is now duplicated in many other areas. The program was based on the principle that "road safety is a community problem which demands a community solution" (Faulks et al. 2008). The program relies on the commitment of the Roads and Maritime Services, local council road safety officers, schools, road safety experts as well as the wider community of volunteers that make it a success. In 2005, Redshaw reviewed local programs including *U Turn the Wheel* and found that overall "students are receptive to information that they see as directly relating to them". It was necessary to compare what this age group thought was important in regards to road safety and what was actually being taught during the sessions of *U Turn the Wheel*. For any educational program to be effective, it is necessary to establish relevance of the content to the participants and their current situation. The survey allowed participants to voice their current concerns and issues in relation to road safety issues relevant to their needs.

Methods

The current *U Turn the Wheel* program in the Wingecarribee Shire is a compulsory program for the local high schools. The program is run once a year from August to November and all Year 11 students are required to attend. In late 2013 and early 2014 schools were given a copy of the survey to be completed during the program and its inclusion was added to student information sheets.

The survey was developed to cover a wide range of road safety issues and was then reviewed by a research and marketing consultant to ensure the wording and questioning style was clear, concise and measurable. The survey was anonymous which allowed students the freedom to express their honest views and opinions to questions. Results could not be attributed to any particular school, gender, socio economic group or locality other than the broader Wingecarribee Shire area.

The hard copy survey was distributed and students were given time to complete and hand it in during the final plenary session of the day. Participants had just completed

five hours of road safety seminars and had developed an initial understanding of the issues and effects within the community. Surveys were collected and collated without bias.

Participants ($n=822$)

The participants in the survey were Year 11 high school students from a wide variety of socio economic backgrounds, ethnicities, gender and localities within the Wingecarribee Shire. The participants were 16 – 18 years of age. A high percentage of participants held a current learner or provisional 1 drivers licence, class C. No participants held a provisional 2 class C licence.

Survey areas:

Students were asked a range of questions both in multiple choice/ tick the box as well as short answer responses. The questions were grouped into the following categories:

- Licencing: type held, time period, offences, logbook compliance, driving lessons
- Low risk strategies: head checks, indicators, speeding, CAS, seat belts, mobile phones
- Drugs: medications taken, medical issues
- Road safety advertisement: memorable advertising

Results

Licencing

Year 11 students ranged from 16 – 18 years of age. It was expected that the majority of students would hold a learner licence. The 822 participants were classified into licence type.

The survey results were further subdivided into the length of time the participant held the current licence class. The results showed the largest group of participants had held a learner licence for 6 – 12 months and provisional 1 licence holders had held the licence for 1 – 6 months.

The program achieved the aim of delivering a road safety message to the most vulnerable group of novice drivers – learners and provisional 1 licence holders. Provisional 1 drivers are at higher risk than any other road user group in

the first six months of driving. The program has achieved a capture point of learners holding the licence for six months or more and provisional 1 licence holders in their first six months of solo driving experience. (Table 1)

Licence holders were asked if they had received any traffic offences during their learner or provisional phase up to and including the day of the program being held. The main fines and/or penalties listed were for the following offences:

- Speeding 9.2%
- Driving without a supervisor 5.3%
- Not displaying their P plates on the vehicle 3.4%
- Accidents (minor) 3.3%

A small percentage of participants had been fined for negligent driving which could be attributed to the identified minor vehicle accidents in which they had been involved.

The participants had been asked how many demerit points they had lost whilst on their licence; the results did not correspond with the previous answers relating to offences which all carried a demerit point penalty. This may be due to the participant's limited knowledge of the current demerit point system and how offences can carry a financial penalty and a related number of demerit points.

The opportunity was taken to question participants on their compliance to logbook requirements. Currently in NSW learner drivers under the age of 25 years must complete 120 hours of driving experience on road, with a minimum of 20 night hours. Learner driving hours are recorded in a Roads and Maritime Services (RMS) logbook which is signed off by their supervising driver to verify the learner has actually completed this time. Non-compliance or defrauding the logbook constitutes an offence which if caught, will incur a penalty, possible criminal charges as well as being refused a driving test for a set period of time.

In order to clarify their actions and demonstrate what happens in reality, participants were asked "When you sat your P1 test did you actually complete the full 120 hours in your logbook?" They were given a Yes/No selection. Those who answered 'No' were asked to identify if they had completed 80 – 120 hours, 50 – 80 hours or less than 50 hours in their logbook.

Table 1. Main capture point of participants by licence type

Percentage per Licence class	No licence 15%	Learner 75%		P1 10%		P2 0%
Capture point		First 6 months	Last 6 months	First 6 months	Last 6 months	
	15%	26.5%	48.5%	7.8%	2.2%	0%

The majority of drivers on provisional licences answered ‘Yes’ to completing the required 120 hours. Of the drivers who did not complete 120 hours, the results were listed as either 80 – 120 hours or under 50 hours. No participants had answered 50 – 80 hours. The majority of participants had completed between 80 – 120 hours in their logbook before sitting the practical driving test.

Learner and provisional drivers were also asked if they had undertaken paid driving lessons with a professional driving instructor. (See Table 2)

Table 2. Hours of professional driving instruction undertaken

No lessons	1-5 hours	5-10 hours	10 or more hours
48%	26.5%	14.8%	10.7%

The majority of participants holding a licence had not yet undertaken formal professional driver training. Of those participants who had undertaken professional lessons the highest percentage had completed 1 – 5 hours of professional training. Overall, the time learners were exposed to professional training was less than 5% of total training time (120 hours). This left parents/supervisors to ‘fill the gap’ of 95% of training with limited support of correct training methods, current information and road rule knowledge. This skills gap for both the learner and the supervisor needs to be addressed as a priority to reduce the potential transfer of incorrect knowledge and skills to new novice drivers which may affect the road safety of this vulnerable group of road users.

Low risk strategies

Participants were asked a variety of questions that related to the implementation and compliance of low risk strategies whilst driving. The main areas were seat belt compliance, head checks or blind spot checks, indicating off roundabouts, implementing a three second safety gap (crash avoidance space – C.A.S.), speeding and mobile phone usage.

Whilst seat belt compliance is relatively high in Australia, recent years with increased immigration from countries where seat belts are not heavily enforced has seen the compliance figure reduce slightly. An educational campaign has been developed to educate these immigrant groups to ensure their understanding of the safety benefits and risks are fully understood.

Ethnic background was not questioned within the scope of this survey and therefore no result can be obtained for non-compliance to any specific ethnic background. Participants were asked “Have you ever driven without a seatbelt?”

Compliance within the participant group was relatively high at 80% but a further 14.1% did not answer this question. The participants that answered ‘Yes’ to the question were asked if they did this frequently (0.6%), occasionally (4.2%), always (1.1%). The small number of non-compliant drivers not wearing a seatbelt would be considered too high a risk as these potential accidents have a high risk of fatalities.

Participants were asked if they performed necessary blind spot checks when driving; 51% answered always, 27% sometimes, 9% never and 3% not completing the question. The issue of positive enforcement for novice drivers to comply with this low risk strategy needs to be explored as well as the influence of parental non-compliance. Blind spot checks are heavily weighted in the RMS practical driving test in NSW. A learner driver must complete the driving test with two or less blind spot check errors. The third error constitutes a fail item. Learner drivers are motivated to perform these checks to ‘pass the test’: there is little motivation to comply with this after the driving test. Blind spot checks or observation checks are performed to observe the area where the side mirrors do not cover.

Indicator usage on roundabouts has recently been the subject of an advertising campaign in NSW to increase compliance. The participants were asked, “Do you put your left indicator on when exiting a roundabout?” A total of 51% of participants answered ‘Yes’ they did indicate off a roundabout where 29% answered sometimes and 15% never. Of those participants that answered never the main reasons given were “didn’t know they had to” and “it is confusing”.

Speeding is the major cause of death and injuries in accidents for novice drivers in the 16 – 25 year old age range. A total of 28 % of participants answered ‘Yes’ to driving over the speed limit with 50% of these responses listing they did this regularly. Participants that answered ‘Yes’ to speeding, 70% stated they felt more at risk when they did speed in a motor vehicle.

Mobile phone use is prohibited for learner drivers and provisional drivers in NSW. When asked “do you operate a mobile phone while you drive, including hands free or text?” 9.7% of participants answered ‘Yes’. Further questioning revealed 7.4% occasionally, 0.9% frequently and 1.4% always operated a mobile phone while driving.

Participants were asked as a novice driver what are the main hazards you experience whilst driving, and what worries you the most? (See Table 3)

The main single issue that concerned young drivers was other drivers. They felt the behaviour of other drivers towards learners and provisional drivers was frightening and often did not know how to deal with this aspect of learning to drive. This raised a general question of why do learners have to do comply with rules when other drivers break the law all the time.

Table 3. Main concerns of young novice drivers

Main hazard/ worry: common response	No. of participants
Other drivers	78
Road and traffic conditions	38
Animals	31
Inexperience	30
Speeding	28
Pedestrians	23
Fatigue	19
Crashes	16
Other – peer pressure, tailgating, parking a car	29

Drugs and medical issues

As the survey was anonymous it was an ideal opportunity to ask participants about drug use, both legal and illegal, prescription and non-prescribed medication. To gain a wider perspective of issues that may increase a young drivers risk on road the survey also asked if they had a range of medical conditions that could impact on road safety if uncontrolled. (Table 4)

Young drivers and parents need to be aware and educated on the affect certain drugs have on driving ability; to help reduce the impact on road safety. Some of the medical conditions outlined have the potential to delay a young driver's ability to gain a provisional driver's licence such as epilepsy where a mandatory non-drive period is enforced until symptoms have settled. With the additional factor of peer influence in this age group there is a potential for young drivers to ignore exclusion periods or not report the

Table 4. Drug use and effect on driving within young novice drivers

Drug Name	Common usage	Effect on driving	No of participants
<i>Anti-psychotics</i>			
Rixadone Respiradone	Anti-psychotic	YES	2
	Bipolar, Schizophrenia	Interacts with alcohol	
Seroquel	Anti-psychotic	YES	3
Quetiapine fumarate	Bipolar, Schizophrenia	Avoid alcohol	
Carbomazapine Sandoz	Anti-convulsing,	YES	1
	Bi polar		
Lithium	Manic depression	YES	2
Ablify	Anti-depressant,	YES	1
Aripiprazole	Bipolar		
Anti-depressant (not listed)	Depression	YES	6
Venlafaxine	Anti-depressant	YES	2
Lovan	Anti-depressant SSRI	YES	5
Fluoxetine			
Cymbalta	Anti-depressant	YES	1
duloxetine hydrochloride		Interacts with MAOI drugs and alcohol	
Zoloft / Sertraline	Anti-depressant SSRI	Yes can interact with alcohol	1
Pristiq	Anti-depressant SNRI	Yes	1
Desvenlafaxine succinate			

Drug Name	Common usage	Effect on driving	No of participants
Cipramil Citalopram hydrobromide	Anti-depressant SSRI	YES Avoid alcohol	1
Escitalopram Escitalopram oxalate	Anti-depressant OCD, Anxiety SSRI	YES	5
Seretide	Asthma	NO	4
Asmol	Asthma	NO	1
Ventolin	Asthma	NO	6
Flixotide	Asthma	NO	1
Epilim/xyprexol	Epilepsy	YES	1
Lamotrigine	Epilepsy	YES Avoid alcohol	4
Ritalin Methylphenidate hydrochloride	ADHD Narcolepsy	YES Negative interaction with alcohol	3
Concerta Methylphenidate hydrochloride	ADHD	YES	2
Insulin	Diabetes	YES if not controlled	1
Metaformin	Diabetes	NO	1
Ixprim Opioid, Tramadol	Pain killer	YES	1
Celebrex Celecoxib	Arthritis/menstrual cramps	Possible side effects	1
Hypothyroid drugs		UNKNOWN	1
Roaccutane Isotretinoin	Acne	NO	2
Doxycycline	Antibiotic	NO	2
Unknown drug		UNKNOWN	3
Crystal meth		Yes	1
Marijuana		Yes	1

medication or condition to the RMS; increasing their risk factor on the road.

Drummer argues that ‘the role of prescribed medication in road trauma is uncertain. In general, most drugs tend not to be significant risk factors on the road when the drugs are used as prescribed.’ (Drummer, 2008)

It is however a risk factor when medication is not taken as prescribed, particularly in the earlier stages of

treatment such as depression. Many medications impair necessary skills required to operate heavy machinery with specific effect on attention, concentration, visual acuity, coordination and reaction times. Drugs in general, other than alcohol, have been implicated in approximately 30% of Australian driver fatalities (Gowing, Holmwood & Edmonds 2005).

Road safety advertisement

Participants were asked to describe the most memorable road safety advertisement and if they felt it improved their behaviour when driving. There was a high nil return rate on this question which could be attributed to advertising not connecting with this target audience. The following are the most popular three responses for advertisement recall in this age group.

- Dr Owler multiple choice advertisement – Take the slow down pledge
- RBT Plan B – What's your Plan B
- Speeding – No one thinks big of you: Roads Traffic Authority (RTA NSW)

Although many answers listed in the surveys could not name the specific advertisement they did describe them accurately. Plan B was the most recognised by name and therefore held more recall potential to this audience group.

Overall findings

The survey was a necessary first step in benchmarking the issues young novice drivers faced in the regional areas of NSW. For many years the program has relied on road safety information, research and local knowledge to convey an important underlying principle of attitude and behaviour change to tackle road trauma. These are all necessary components to ensuring an effective education program. However, one area that had been omitted was the young driver's perspective of what issues they faced as novice drivers. Their active involvement was needed (Faulks et al. 2008). The survey allowed this road user group to voice the areas that concerned them in relation to road safety. For a solution to be effective in reducing road trauma in this vulnerable road user group it is essential that all key stakeholders contribute to the solution. A collaborative approach that was inclusive of young drivers needs was necessary to begin the process of ownership of the issues and being instrumental in allowing the young drivers to help solve the problem.

The data highlighted a need for changes to the current curriculum of the *U Turn the Wheel* road safety program to ensure key information is given to this road user group to help prevent and reduce road trauma. The information gained also allowed key stakeholders the opportunity to review the skill and knowledge gaps within this road user group. By a coordinated approach, road safety governing bodies such as the RMS; educational groups such as schools, driving instructors, road safety officers, course providers; and more importantly parents/supervisors and learner drivers; will increase awareness of the issues faced by this age group and develop effective training to help reduce the negative effects of these risk factors (OECD/ECMT, 2006).

The main areas that were found in this survey for an urgent review within the educational program included:

- *Prescription drug use and effect on driving*: the main drugs used within this group were anti-depressants, anti-psychotics and ADHD medications. All categories affect a driver's ability to operate a vehicle safely if the medication is not controlled. Evidence suggests more education is required for this age group on drug use/interaction and driving, as well as RMS exclusion requirements and AUSFIT compliance.
- *Demerit point system and how it works*: young drivers had little knowledge of the demerit system or how it operates. For the young driver to be aware of negative consequences when driving it is important they are familiar with the scheme to encourage compliance.
- *Further support for medical and learning issues in relation to learner drivers*: as the incidence of autism spectrum disorders and learning disabilities increases a coordinated structured approach to supporting these young drivers is necessary to decrease their risk factors on road.
- *Choices we make when driving – low risk driving strategies and why they are used*: there was limited knowledge on current low risk strategies that can be employed whilst driving and how these can decrease a driver's risk. There was also a general feeling amongst participants that compliance to these strategies was only necessary to pass the test. Reinforcement through parents and supervisors needs to be explored further. The main aim of driver education is to produce safer drivers, defined in terms of accident involvement - not how to pass a driving test (OECD/ECMT, 2006). This paradigm change is a necessary one for all key stakeholders involved in road safety if real change is to be made.

The survey results are currently being used to review the content of the *U Turn the Wheel* program and this will form the basis of an educational review. The *U Turn the Wheel* committee has already implemented one recommendation by Redshaw (2005) and has included a plenary session open for discussion to ensure all sessions have been linked together with a unifying message (Faulks et al, 2008).

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Developing a new index for comparing road safety maturity: case study of the ASEAN Community

by Oviedo-Trespalacios, Oscar^a and Haworth, Narelle^a

^aCentre for Accident Research and Road Safety – Queensland (CARRS-Q), Queensland University of Technology, Brisbane, Australia

[Note: This paper was peer reviewed and presented at the Australasian Road Safety Conference 2015 (ARSC 2015)]

Abstract

As part of the development of the ASEAN Regional Road Safety Strategy, a new index for measuring road safety maturity (RSM) was constructed from numerical weightings given to measurable factors presented for each of the pillars that guide national road safety plans and activities in WHO Global Road Safety Report 2013: road safety management, safer road and mobility, safer vehicles, safer road users and post-crash response. The index is based on both a content analysis approach and a binary methodology (report/no report) including measures which have been considered pertinent and not redundant. For instance, the use of random breath testing and/or police checkpoints in the national drink driving law are combined in the enforcement index. The value of the index per pillar ranges from 0 to 100%, taking into account whether there is total, partial or non-implementation of certain actions. In addition, when possible, the self-rated level of enforcement is included. The overall ratings for the 10 ASEAN countries and the scores for each of the pillars are presented in the paper. The extent to which the RSM index is a valid indicator of road safety performance is also discussed.

Introduction

Transport plays a critical social and economic role, but failures of the system can have severe consequences for quality of life, including death and severe injuries (Ra'ed & Keating, 2014; Salmon, McClure, & Stanton, 2012). The social and economic losses associated with road trauma are enormous. According to the WHO Global Road Safety Report (2013) about 1.24 million people are fatally injured each year in road traffic related incidents. In addition, between 20 and 50 million non-fatal injuries are reported every year; with many people incurring disability as a result of their injury (Al Turki, 2014). It is clear that these numbers could be significantly higher if the effect of under-reporting is taken into account, particularly in low and middle-income countries.

One of the lessons of the recent literature in road safety is that road trauma is not equally distributed worldwide, with the incidence differing according to the level of economic development of the countries (Kopits & Cropper, 2005). To illustrate, it is estimated that 91% of road fatalities occur in low-income and middle-income countries (WHO, 2013). High-income countries have reported decreasing trends in deaths on their roads when compared with the increasing fatalities in low and middle-income countries. Developed

Regions such as Europe experience approximately 10.3 deaths per 100,000 inhabitants annually, whilst Africa and Asia have higher rates of 24.1 and 18.5 respectively (WHO, 2013).

The overall road fatality rate of the countries belonging to the Association of South-East Asian Nations (ASEAN) is 18.5 per 100,000 inhabitants; however the individual rates for countries differ substantially from 5.1 in Singapore to 38.1 in Thailand (WHO, 2013) with a median of 17.5. The variability in road trauma rates reflects underlying socioeconomic differences among the countries. Table 1 shows the distribution of ASEAN countries by socioeconomic level and fatalities per 100,000 population. It is apparent from this table that at the regional level, high income countries have lower rates of fatalities while middle and low income countries usually have higher fatality rates. This is consistent with similar studies that have found that in low income countries, the combination of poor road infrastructure, regulations, and emergency response expose drivers to more complex situations beyond their training and experience resulting in collisions; while a slow emergency response potentially increases the severity of the original injury (Forjuoh, 2003; Huicho et al., 2012). It is hypothesised that economic differences among countries in the ASEAN region may lead to differences in road safety management and, therefore, in road safety outcomes.

Road safety management includes the participation of governmental and organisational bodies in the provision of road safety strategies such as agreed targets and goals to be achieved; proposal of actions; regulation of vehicle safety standards; road design standards; and the organisation of a road crashes database (Bezerra, Kaiser, & Battistelle, 2015). At a regional level, evidence-based policy making requires data for monitoring the performance of the transport system segregated by country. However, qualitative and quantitative measures of the effectiveness of road safety management are difficult to integrate and the availability of these measurements varies across countries. So far, there has been little discussion about how to integrate the indicators established in five pillars outlined in the Global Plan for the Decade of Action for Road Safety 2011-2020.

This integration is required to measure and compare road safety maturity and so to identify opportunities for improvement.

Following the theoretical rationale of this paper, economic development is a major determinant of a region/country's maturity level and the outcomes of the road safety management systems. Worldwide the five-pillar model defined in Decade of Action for Road Safety 2011-2020 has been used as a surveillance tool for the independent outcomes but so far there is no global concept of road safety maturity. The aim of this paper is to commence the development of a new index for comparing road safety maturity, integrating the five pillars model. This novel index has the potential to serve as a diagnostic tool of the road traffic system for detecting disparities and improvement opportunities. The index makes use of the WHO Global Road Safety Report (2013) as the most consistent and complete source of road safety indicators. The ASEAN region will be used as a case study in this paper due to different socio-economic and road safety patterns across its countries. This paper has been divided into four parts. The first part explains the Road Safety Maturity Index. This is followed by the case study of the ASEAN region. Finally, the discussion and conclusions of the case study and performance of the index are presented.

Road Safety Maturity Index

The Road Safety Maturity Index uses a content analysis approach and a binary methodology (report/no report) to integrate road safety outcomes. The main advantage of implementing this methodology is the flexibility for integrating qualitative and quantitative data, as is quite common in practice. This methodology has been widely used in other areas such as accounting/finance (Zorio, García-Benau, & Sierra, 2013), corporate social responsibility (Jain, Keneley, & Thomson, 2015) and management (Eugene Fibuch & Arif Ahmed, 2013), among many others. It is important to note that this proposal is a preliminary test of a concept and how it is best operationalised; therefore further refinements of the model need to be explored.

Table 1. Socio-economic level and fatalities per 100,000 population in the ASEAN region

Fatalities per 100,000 population	Socioeconomic Level			
	Low income	Lower middle income	Upper middle income	High income
Low (<10)		Philippines		Brunei Singapore
Medium (10-15)	Myanmar			
High (>15)	Cambodia	Indonesia	Malaysia	
	Laos PDR	Viet Nam	Thailand	

*Adapted using data from the World Bank and World Health Organization

The Index assigns numerical weighting to the indicators in the five pillars of the WHO Global Road Safety Report 2013 (WHO, 2013): road safety management, safer road and mobility, safer vehicles, safer road users and post-crash response. The value of the index per pillar ranges from 0 to 100%, and takes into account whether there is total, partial or non-implementation of certain actions. In addition, when possible, the rating of effectiveness of enforcement is included. Table 2 shows the final weightings and possible values for each of the indicators in the five pillars. In this preliminary version, the indicators of each pillar are equally weighted, in order to obtain a 100%, based on the total number of indicators. In the Pillar 1, for instance, each of the five indicators is assigned a 20%. Using the value criteria in Table 2, a value between 0 and 1 will be assigned based on the conditional rules developed with the

binary methodology. If a country receives value 1 in each of the five indicators for Pillar 1, then these values will be multiplied by their respective weighting factor (20%), resulting in a perfect score of 100%. The possible overlap between indicators was avoided by including just a single indicator in the ranking. For instance, the uses of random breath testing and/or police checkpoints in the national drinking law were combined in the enforcement score. The overall level of maturity was obtained by averaging the score of each pillar by country. The levels of maturity by country or pillar are assigned using the scale described in Figure 1. To the best of our knowledge, the proposed Road Safety maturity index is a novel approach to comparing commitment to improving road safety across all countries listed in the Global status report on road safety 2013.

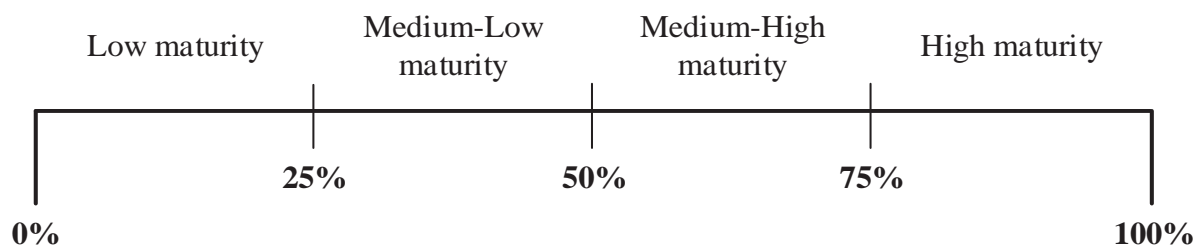


Figure 1. Scale for level of road safety maturity

Table 2. Road Safety Maturity Index indicators and weightings

Indicators	Weightings*	Value
Pillar 1. Road Safety Management	100%	
<i>Lead Agency</i>	20%	(1 if yes, 0 if no)
Funded in national Budget	20%	(1 if yes, 0 if no)
National road safety strategy	20%	(1 if yes, 0 if no)
Funding?	20%	(1 if fully 0.5 if partially, 0 if no)
Targets	20%	(1 if yes, 0 if no)
Pillar 2. Safer Road and Mobility	100%	
Formal audits required for new road construction	20%	(1 if yes, 0 if no)
Regular inspections of existing road infrastructure	20%	(1 if yes, 0.5 if partially, 0 if no)
Policies to promote walking or cycling	20%	(1 if yes, 0.5 if subnational, 0 if no)
Policies to encourage investment in public transport	20%	(1 if yes, 0.5 if subnational, 0 if no)
Policies to separate road users to protect VRUs	20%	(1 if yes, 0.5 if subnational, 0 if no)

Indicators	Weightings*	Value
Pillar 3. Safer Vehicles	100%	
Subscribes to UN World Forum on Harmonization of Vehicle Standards	25%	(1 if yes, 0 if no)
New car assessment programme	25%	(1 if yes, 0 if no)
Front and rear seat-belts required in all new cars	25%	(1 if yes, 0 if no)
Front and rear seat-belts required all imported cars	25%	(1 if yes, 0 if no)
Pillar 4. Safer Road Users	100%	
Penalty/demerit point system in place	14.3%	(1 if yes, 0 if no)
National speed limits	7.1%	(1 if yes, 0 if no)*(Enforcement/10)
Local authorities can set lower limits	7.1%	(1 if yes, 0 if no)*(Enforcement/10)
National drink driving–driving law	14.3%	(1 if yes, 0 if no)*(Enforcement/10)
National motorcycle helmet law	4.8%	(1 if yes, 0 if no)*(Enforcement/10)
Applies to drivers and passengers	4.8%	(1 if yes, 0 if no)*(Enforcement/10)
Helmet standard mandated	4.8%	(1 if yes, 0 if no)*(Enforcement/10)
National seat-belt law	7.1%	(1 if yes, 0 if no)*(Enforcement/10)
Applies to front and rear seat occupants	7.1%	(1 if yes, 0 if no)*(Enforcement/10)
National child restraint law	14.3%	(1 if yes, 0 if no)*(Enforcement/10)
National law on mobile phones while driving	-	-
Law prohibits hand-held mobile phone use	7.1%	(1 if yes, 0 if no)*(Enforcement/10)
Law also applies to hands-free mobile phones	7.1%	(1 if yes, 0 if no)*(Enforcement/10)
Pillar 5. Post-crash Response	100%	
Vital registration system	16.7 %	(1 if yes, 0 if no)
Emergency Room based injury surveillance system	16.7%	(1 if yes, 0 if no)
Emergency access telephone number(s)	16.7 %	(1 if yes, 0.5 if subnational/multiple, 0 if no)
Seriously injured transported by ambulance	16.7 %	% of Seriously injured transported by ambulance
Emergency medicine training for doctors	16.7 %	(1 if yes, 0 if no)
Emergency medicine training for nurses	16.7 %	if yes, 0 if no)

* Values rounded to 0.1%

Case Study of the ASEAN countries

The ten member countries of the Association of Southeast Asian Nations (ASEAN) are: Brunei, Indonesia, Malaysia, the Philippines, Singapore, Thailand, Viet Nam, Laos PDR, Myanmar, and Cambodia. In 2011, it was estimated that more than 75,000 people died in road crashes in ASEAN countries and many more sustained long term injuries (Turner, McIntosh, & Ogden, 2011). Figure 2 shows the

distribution of fatalities across the ASEAN countries. Given that an estimated 630 million people live in this region (Clemente, 2015), improving road safety outcomes in ASEAN is not only important for the welfare and economic benefit of the populations of these countries, but also for the attainment of global goals for improved road safety.



Figure 2. Road fatalities per 100,000 population in ASEAN

Across ASEAN the motorisation rates (including 2 and 3-wheelers) are high in Brunei and Malaysia (>700 per 1,000 population) but low in Myanmar and the Philippines (<100). Motorized 2 and 3-wheelers comprise the majority of vehicles in most ASEAN countries and this is unlikely to change because of their advantages in congested cities (See Figure 3). Yet reliance on these vehicles is associated with higher road fatality rates as shown in Figure 3. The pattern of use of these vehicles – often as family transport – makes it even more imperative that the road safety strategy should focus on addressing the vulnerability of users to road trauma (WHO, 2013). Figure 4 shows the strong relationship between fatalities and the prevalence of motorised 2 and 3-wheelers in the ASEAN region.

Methodology

The methodological approach for the development of this case study was a discussion of the five pillars proposed by The Decade of Action for Road Safety through a literature review. The road safety outcomes across the ASEAN countries were gathered directly from the WHO Global Road Safety Report (2013). The data by country were transformed using the proposed Road Safety Maturity Index. Independently, values for each pillar with an overall score by country were calculated and ranged from zero to approximately 100 percent.

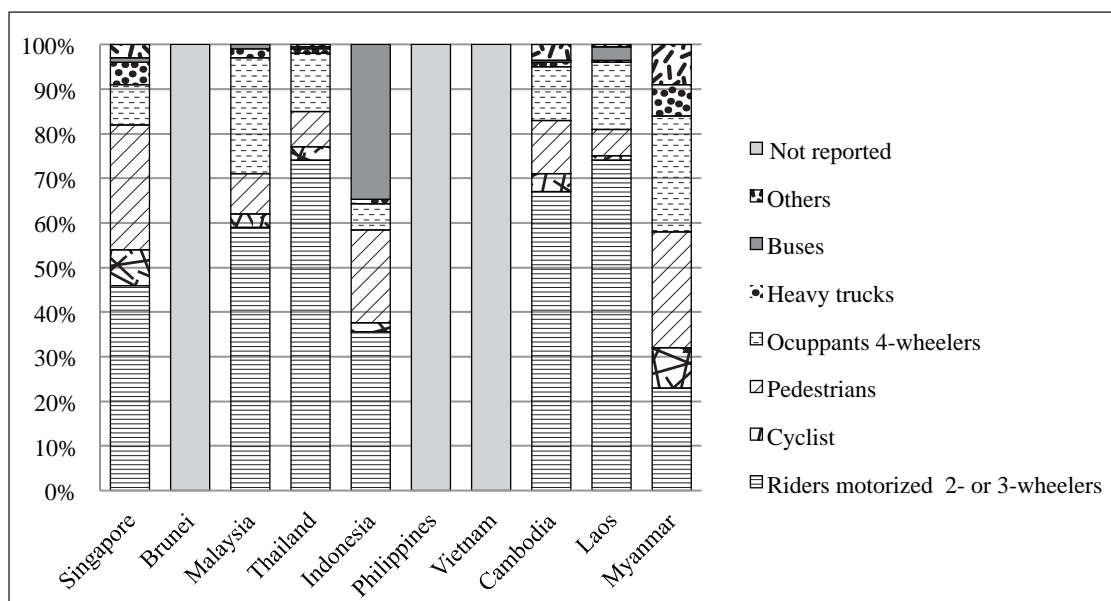
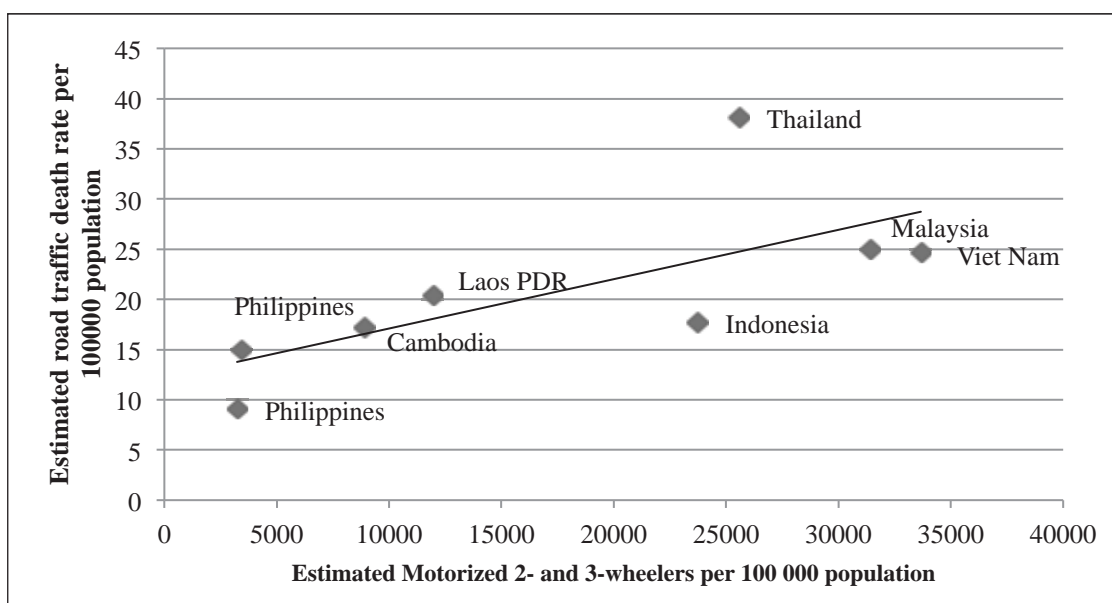


Figure 3. Vehicle composition in the ASEAN community



*Adapted from World Health Organization (No data available for Singapore and Brunei)

Figure 4. The number of road fatalities and the number of motorized two- and three-wheelers per 100,000 population

Results and Discussion

In Figure 5 the scores for each of the five pillars and the overall index by country are presented. The discussion of the main results related to each of the five pillars and its implications for the ASEAN countries are presented in the following sections.

Overall, the results showed that the ASEAN region has a medium-high road safety maturity level (62%). At a country-level, Malaysia ranks first (76%) owing to its consistent performance across the five pillars. Philippines (73%) and Viet Nam (72%) rank second and third respectively. The single most striking observation to emerge from the data comparison was that the overall score on the index did not seem to correlate well with the fatality rate. To illustrate, Singapore (71%) and Brunei (49%),

both countries with the lowest road fatalities per 100,000 population, rank fourth and eighth, while Thailand, with the worst performance in fatalities, ranks sixth.

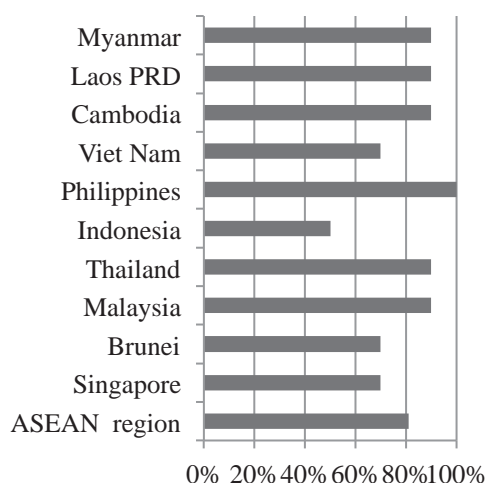
Looking more closely at individual pillars, it can be seen that the Pillar 4 “Safer Road Users” (39%) receives the lowest score among all of the pillars for the ASEAN region. This result was expected given that 80% of the countries are in the low to middle level of economic development. This is particularly true for Singapore; the country with the highest Per Capita Income (PCI) has the best performance in this pillar (74%). This finding is consistent with those of other studies that indicate the need to intensify the intervention on road users for countries in the early stages of economic development (Nantulya & Reich, 2003). However, these findings cannot be extrapolated to other high income countries like Brunei Darussalam; which has one of the lowest scores for enforcement (19%) but still a low level of fatalities per population. It should be noted that although the PCI values of Brunei Darussalam and Singapore were similar, the values of registered vehicles per 1,000 population and road density were very different. In estimates from the The World Bank (2014), Singapore has 230 vehicles per 1,000 population (2011 est.) while Brunei has only 46 vehicles per 1,000 population (2011 est.). Also, Singapore has 481 km. of road per 100 sq. km of land area (2011 est.) while Brunei has only 54 km. of road per 100 sq. km of land area (2011 est.). These differences are the most probable reasons for the low rate of road fatalities in Brunei Darussalam (Haque, 2011).

Pillar 1 “Road safety management” (81%) has the highest score among the pillars. The most common reason for losing points was because, generally, the national road

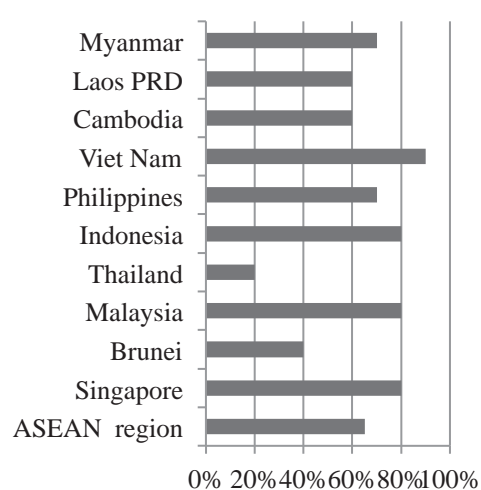
safety strategy was only partially funded. Only Philippines (100%) has a perfect score in the Pillar 1, which may have influenced the low number of fatalities registered, by regional standards. This is supported by evidence showing that a road safety strategy for prevention will reduce road trauma (Bener, Abu-Zidan, Bensiali, Al-Mulla, & Jadaan, 2003). On the other hand, Indonesia (50%) has the worst score in the Pillar 1, because of the lack of a lead agency and only a partially funded road safety strategy. This situation has also been recently criticised by WHO (2015).

Pillar 2 “Safer road and mobility” (65%), Pillar 3 “Safer Vehicles” (55%), and Pillar 5 “Post-crash response” (69%) show a medium-high maturity level. As shown in the Figure 4, Thailand scored poorly on Pillar 2 (20%), and this is a feature that has been reported by other researchers as one priority for the country (Islam & Kanitpong, 2008). Safe infrastructure, public transport promotion and protection of vulnerable road user have been frequently linked with lower fatalities (Turner & Smith, 2013; Vesper et al., 2013); a challenge that is particularly urgent in Thailand at a regional and international level. The score on Pillar 3 was particularly low in Indonesia (0%) with no vehicle standards applied or vehicle regulations for seat-belts. However, with the recent creation of the ASEAN NCAP, some improvements have been achieved in this matter (Ward, 2014). Finally, performance on Pillar 5 “Post-crash response” was poor in low-income countries such as Laos PDR and Myanmar. This inequality in post-crash services due to economic development is frequently reported in the literature (Fleiter & Senserrick, 2015) and particularly in Myanmar (Thwe, Kanitpong, & Jiwattanakulpaisarn, 2013).

Pillar 1 - Road safety management



Pillar 2 - Safer road and mobility



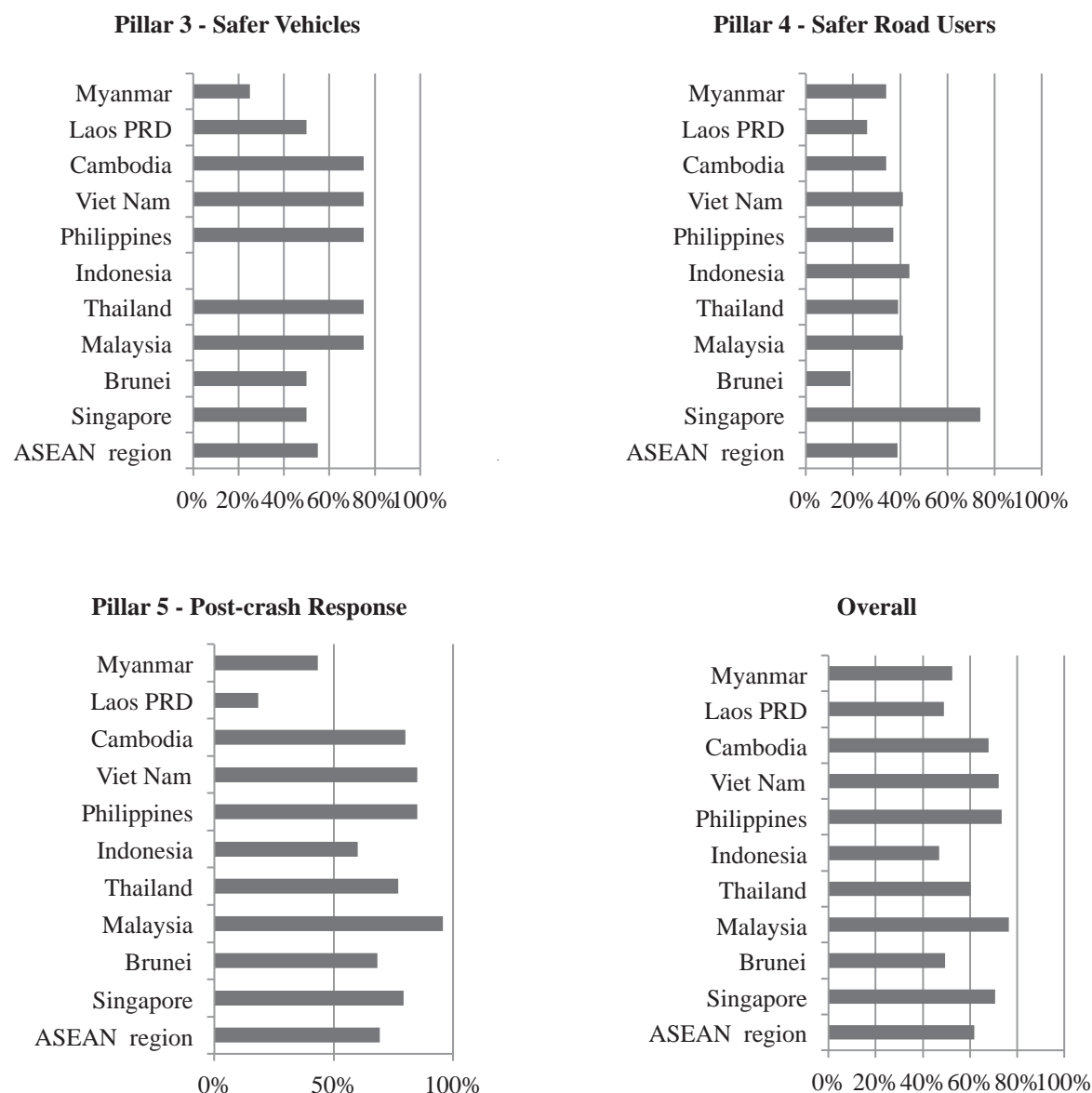


Figure 5. Road Safety Maturity Index values in ASEAN countries

Conclusions

A new index for comparing road safety maturity was developed and applied in a case study of the ASEAN countries. The Global status report on road safety 2013 provided the data for the index. This is the most consistent and complete source of road safety indicators world-wide. The results allowed differences to be identified, performance compared among countries, and improvement opportunities to be detected. Overall, the region has a medium-high maturity level; however, there are profound differences between countries. Some of these differences are explained by socio-economic factors that should be utilised in combination with the road safety outcomes (Klungboonkrong & Faiboun, 2014).

The results of the road safety maturity index were used to compare the performance across countries and across pillars. Generally, the results were justified with the literature and no inexplicable findings were reported. However, the lack of consistency between the index and fatality rates needs to be considered in detail in future research. A possible explanation for this might be that the most of the pillars only include the existence of policies. This is insufficient since it ignores the two vital aspects of public policy: formulation and implementation (Egonmwan, 1984). A reasonable approach for tackling this issue is to start measuring degree of implementation and compliance with the policies and include this information in the later editions of the Global status report on road safety.

The benchmark results allow different jurisdictions to learn from others as a basis for developing measures and programmes which are aimed at increasing their own performance (Wegman & Oppe, 2010). The index could also be used to compare road safety developments over time between countries. Two main subjects for further research are identified throughout this paper. Firstly, it is necessary to examine the explanatory power of the index for fatalities, this could be achieved with a theory-base weighting for the variables inside and among pillars. Secondly, single measurements using binary methodology (report/no report) need an estimation of the degree of implementation.

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Enhancing South Australia's Graduated Licensing Scheme through road safety partnerships and a strong evidence-base

by Paula Norman^a, Nicole Middleton^a and Carol Nightingale^a

^aDepartment of Planning, Transport and Infrastructure, South Australia

Winner of the Road Safety Practitioner's Award at the Australasian Road Safety Conference 2015

Abstract

New rules to protect P-platers were introduced in South Australia on 28 July 2014. The changes are the most significant made to the Graduated Licensing Scheme in this State, applying both peer-passenger and night-time driving restrictions to P1 drivers and extending the time on a provisional licence from two to three years. The reforms represent almost three years of work, including a major public consultation process, the drafting of legislation and passage of the Bill through Parliament. An inter-agency project group was responsible for successfully implementing the changes. While reforms of this nature are never easy, the consultation process at each milestone was critical to success. It concentrated on the fact that the proposed reforms reflect international best practice, are evidence-based and that individual components were already in place in other parts of the country. In addition, an extensive crash analysis was undertaken to work out the casualty savings if the laws had been in place during the previous five years, presenting a compelling case to Parliamentary members and the community. Much work was done to ensure these initiatives had the backing of major stakeholders, many of whom were strong advocates for the new laws throughout the process. This partnership approach, together with sound evidence and a commitment to bringing the community along has meant a relatively smooth and successful implementation of these reforms. Most importantly, this achievement will have real and long lasting benefits for young South Australian drivers, their parents and the wider community.

Introduction

Despite significant reductions in South Australia's road toll over the past decade, young drivers have continued to be over-represented in road deaths and serious injuries, much more so than older drivers. In South Australia, young people aged 16 to 24 make up 12% of our population; however, they account for 22% of road deaths and 24% of serious injuries (South Australian Road Crash Database, 2009-2013).

Similar to other jurisdictions both interstate and overseas, South Australia manages the risks to young drivers through a graduated licensing scheme (GLS). The GLS allows novice drivers to gradually acquire safe driving experience with supervisory influences and restrictions progressively lifted as drivers progress through the stages of holding

a learner's permit, followed by a provisional (P1 and P2) licence and finally graduating to a full (unrestricted) licence.

South Australia has been working diligently to improve the safety outcomes for young drivers in this State over the past ten years. Following the introduction of minimum supervised driving hours requirements for learner drivers, provisional P1 and P2 stages and the Hazard Perception Test in 2005; mobile phone restrictions for learner and P1 drivers in 2009; the GLS in South Australia was last amended in 2010. Of most significance was the increase in the minimum time required on a learner's permit from six to 12 months for drivers aged under 25 years as well as an increase in the minimum supervised driving time for learner's permit holders from 50 hours (including 10 at night) to 75 hours (including 15 at night).

While South Australia's GLS had been significantly improved over the years, the launch of *South Australia's Road Safety Strategy 2020 – Towards Zero Together* (Government of South Australia, 2011) placed a high priority and renewed focus on considering further measures to reduce the number of road deaths and serious casualties for young South Australians.

At the time, South Australia had the second worst fatality rate per population for 16-19 year olds of all Australian states and territories. Those jurisdictions that were ahead of South Australia such as Victoria, New South Wales, Queensland and Western Australia had already enhanced their graduated licensing schemes to reflect a number of 'best practice' findings.

International research evidence and comparisons with schemes in other Australian jurisdictions indicated that peer passenger restrictions, night driving restrictions, increasing the time on a provisional licence and raising the minimum age for a provisional licence all warranted further consideration.

Discussion

Consultation process

On 14 October 2011, the South Australian Government released South Australia's Graduated Licensing Scheme - Initiatives to Protect Young Drivers Discussion Paper

(Government of South Australia, 2011). The initiatives proposed in the Discussion Paper included:

1. A passenger restriction for all P1 drivers allowing no more than one passenger under 21 for the duration of P1 (with exemptions for immediate family members or for employment, or if a Qualified Supervising Driver (QSD) is present).
2. A restriction on driving between midnight and 5am for all P1 drivers for the duration of P1 (with exemptions for work-related driving or if a QSD is present).
3. Raising the minimum age for a provisional licence from 17 to 18 years.
4. Extending the total minimum provisional licence period from two to three years.
5. Removing regression to a previous licence stage following a disqualification period.

The Discussion Paper presented the community with factual information showing the need to further protect young drivers, particularly in rural areas of the State. Supporting evidence that the initiatives being proposed were in line with international best practice, were proven to work and that individual components were already in place in other parts of the country was also provided. It indicated that for some of the proposals exemptions would be considered for employment and possibly for other purposes, although the detail of the proposed exemption scheme had not yet been determined.

Importantly, the Discussion Paper also included the expected reductions in young driver fatalities and serious injuries for each initiative based on modelling done by the Centre for Automotive Safety Research (CASR). The estimated crash reduction for each initiative was a powerful tool to promote open discussion with the community over the value of adopting such measures in South Australia and was very appealing to the media.

The consultation process ran for an eight week period until 8 December 2011. The proposed initiatives generated significant interest and public debate, and 1079 responses were received from people of all ages across the state. In addition to members of the public, responses were submitted from a variety of road safety stakeholders including those representing motorists, the health sector and youth interests, Members of Parliament, local government and community road safety groups.

A detailed report on the public consultation outcomes (Government of South Australia, 2012), including the views expressed by key stakeholders, was released in August 2012. It showed the level of support or non-support for each initiative, and also where responses were not clearly either supportive or non-supportive (see Table 1).

Analysis was undertaken according to the age, gender, licence type, location and parental status of the respondents. Not surprisingly given young people were most likely to be affected by the changes, there was not support by people aged under 25 for the proposed night driving and passenger restrictions, whereas they received general support from older age groups. The proposal to raise the provisional licensing age to 18 received the least support, despite evidence that it would bring the greatest trauma reductions for South Australia. Due to the strong community feedback, the South Australian Government decided not to proceed with this initiative.

Many respondents cited concern about the possible impact of raising the licensing age to 18 on young workers and students, particularly those living in rural and regional areas who have limited access to public transport. There was also a belief that the proposal would delay the crash statistics to a higher age bracket, despite the information being provided that the first year crash rate of new P1 drivers aged 18 would not be expected to be as high as that for 16 or 17 year olds.

Some respondents were concerned that the proposed initiatives would “punish the majority for the mistakes of a few,” indicating a belief that the young driver crash rate

Table 1: Level of support by respondents for each GLS initiative

Initiative	Supportive	Non-supportive	Not clearly supportive or non-supportive
Passenger restriction	38%	45%	16%
Night-time driving restriction	39%	40%	21%
Raising the minimum licensing age from 17 to 18 years	20%	67%	13%
Extending provisional licence from 2 to 3 years	35%	36%	29%
Removing regression	42%	33%	23%

could be attributed to risk taking by a small number of drivers. Responses on the proposed passenger restriction included concern about the possible impact on car-pooling and designated driver programs where one person in a group of friends agrees to not drink alcohol. Another common concern was the possible effect on regional people who rely on others when travelling to work, school, sport or other social functions. Similar concerns were expressed about the proposed night driving restriction, and some respondents requested more detail about the exemption scheme.

There were also respondents, including parents and young people, who supported the proposed restrictions on the basis that they would reduce the peer pressure on young people to drive late at night or with passengers and assist parents to enforce a curfew or reduce worry about them driving unsafely if encouraged to do so by others. Many respondents who supported the restrictions tended to simply indicate their support, although some said they agreed the changes were likely to reduce the youth road toll.

The proposed initiatives were supported by the Royal Automobile Association (RAA), the Motor Accident Commission, CASR, South Australia Police (SAPOL), emergency services and the health sector. Throughout the process of developing the GLS changes, these key stakeholders had an important role advocating for the proposals. All worked cooperatively to ensure that consistent messages were imparted to the community, helping to achieve increased awareness, understanding and support for the proposals.

After work had begun on drafting the new legislation, the Department of Planning, Transport and Infrastructure (DPTI) offered briefings to organisations that had either expressed concern or requested further information during the initial consultation phase. They were provided with a detailed briefing on the proposed changes, including

how the proposed exemption model would work and what it would mean for their members, as well as for young drivers. These briefings, along with those that followed with Members of Parliament, were particularly important in gaining support for the Bill. The majority of organisations who received a briefing and were presented with the evidence supported the changes going forward, and assisted with disseminating information about the new laws after they were passed by Parliament. The Youth Affairs Council of South Australia did not support the GLS initiatives on the basis that they would impact on young people's mobility.

Evidence-based approach

There was strong evidence to support the introduction of passenger and night driving restrictions for young P1 drivers, and it was important to convey this to people in a way that could be easily understood. A variety of visual aids were used to explain the information, ranging from a simple flyer through to detailed graphs and tables.

While the visual aids were refined over time, the key facts presented were the same in the Discussion Paper right through to the final communication strategy leading up to implementation, almost three years later. The data sets shown below, which were updated as time progressed, were key to getting the GLS initiatives through Parliament and implemented in South Australia.

Age and population representation

People aged 16 to 24 years are over-represented in serious casualties in South Australia. For the years 2009-2013 they made up 12% of the population, but accounted for 22% of all fatalities and 24% of all serious injuries as shown in Figure 1 (South Australian Road Crash Database, 2009-2013).

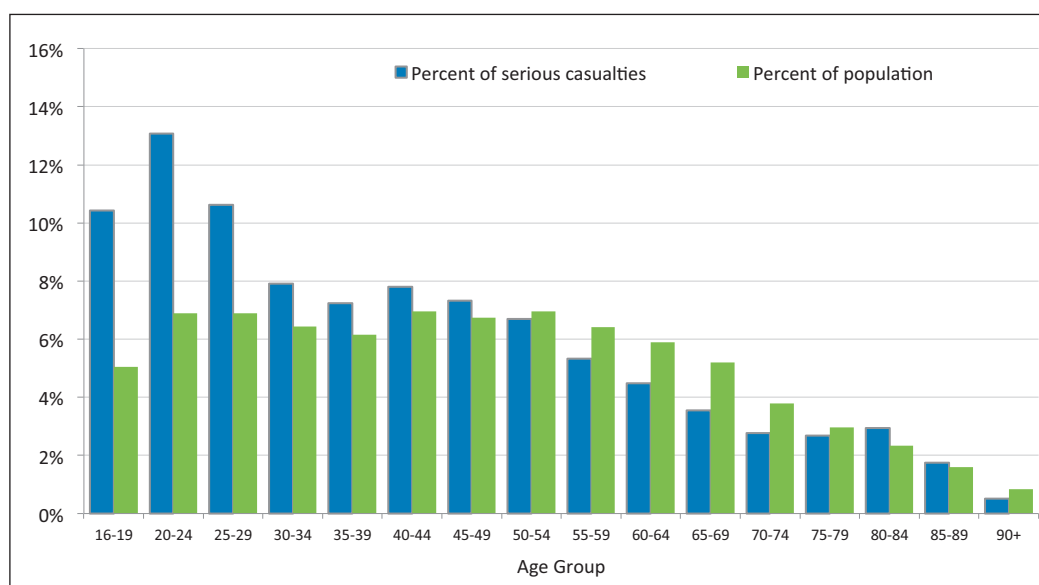


Figure 1: Fatal and serious casualties by age and population distribution, South Australia, 2009 - 2013

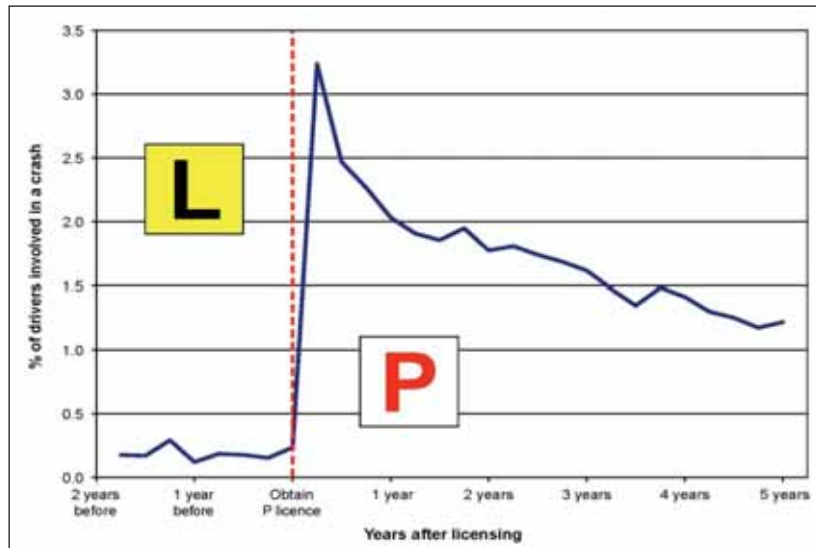


Figure 2: Percentage of drivers involved in a crash five years after licensing

Need to protect P-platers

Young drivers are more likely to crash in the first twelve months of holding a provisional licence, when the driver is least experienced and driving unsupervised. Figure 2 shows that upon gaining a provisional licence and beginning to drive unsupervised, the percentage of young drivers involved in crashes rises eleven times (Austroads, 2008).

Interstate comparison

Until recently, South Australia has had the second worst fatality rate per population for 16-19 year olds of all Australian states and territories. While 2009-2013 figures show South Australia has moved up to be ahead of the Northern Territory and Tasmania, the Government's goal is for South Australia to have the lowest fatality rate per population for 16 -19 year olds in the country. The information in Table 2 clearly demonstrated that there was more that could be done in South Australia to improve the safety of young drivers (Bureau of Infrastructure, Transport and Regional Economics, 2013).

Table 2: 16 – 19 year old fatalities per 100,000 population by jurisdiction

State	Fatalities 2008-12 Avg	Fatality Rate	State	Fatalities 2009-13 Avg	Fatality Rate
ACT	1	5.0	ACT	1	4.1
Vic	28	9.7	Vic	25	8.7
NSW	36	9.8	NSW	35	9.4
Qld	31	12.6	Qld	29	11.6
WA	18	14.4	WA	15	12.0
Tas	4	14.0	SA	11	12.8
SA	14	16.0	Tas	4	14.8
NT	4	32.1	NT	2	18.4
Aust	136	11.6	Aust	122	10.3

Regional Vs metropolitan drivers/riders

The information that young rural drivers were two and half times as likely to die or be injured in a crash than their peers in metropolitan Adelaide is seen in Figure 3 (South Australian Road Crash Database, 2009-2013). This was confronting information for many rural stakeholders who had not realised that young rural drivers were at much greater risk of dying or being seriously injured in a crash. It also showed that young rural drivers could receive a disproportionate safety benefit from the proposed initiatives, which was crucial in gaining support when they were also less likely to have access to public transport options than young people in the city.

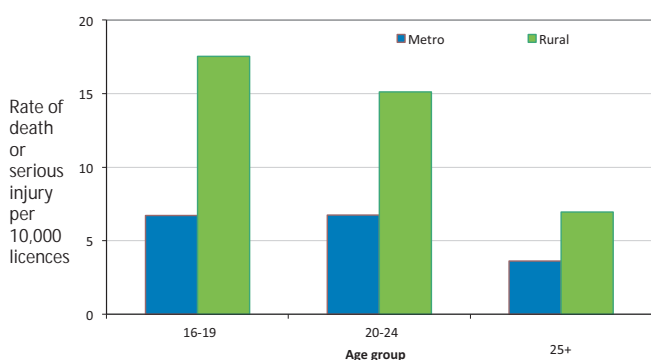


Figure 3: Rate of death or serious injury per 100,000 licences held for drivers/riders by residence, South Australia, 2009-2013

Night driving restriction

Figure 4 shows the over-representation of young drivers in fatal crashes between 10pm and 5am as a percentage of total crashes in South Australia between 2009 and 2013. Of the 16-19 year old drivers/riders involved in a fatal crash, 30% crashed between the hours of 10pm and 5am. This compared to 12% for drivers/riders involved in fatal crashes aged 25 years or over (South Australian Road Crash Database, 2009-2013).

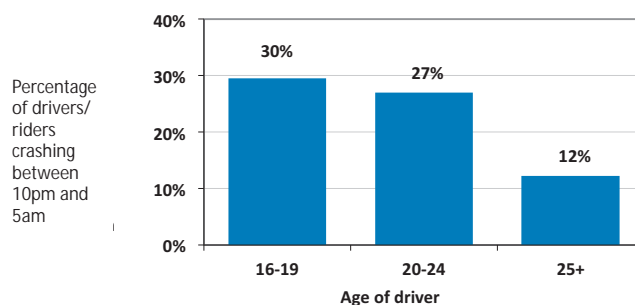


Figure 4: Drivers/riders involved in fatal crashes between 10 pm and 5 am as a percent of total crashes, South Australia, 2009-2013

Figure 5 also shows that P1 licence holders involved in fatal and serious injury crashes are more prevalent at night than holders of a full licence.

Passenger restriction

Figure 6 shows the over-representation of young drivers in fatal crashes involving two or more passengers as a percentage of total crashes in South Australia between 2009 and 2013. In this case, 25% of 16 – 19 year old drivers involved in fatal crashes are carrying two or more passengers. This compared to 12% of drivers involved in fatal crashes over the age of 25 carrying two or more passengers (South Australian Road Crash Database, 2009-2013).

Crash analysis

DPTI undertook an extensive crash analysis to provide further evidence that the proposed changes could save lives and prevent serious injuries (Noack et al, 2013). The analysis examined individual crashes of all P1 licence holders aged 16-24 that were involved in casualty crashes between 2008 and 2012. All casualty crashes that fell into one of the proposed restrictions were considered and the ages of injured passengers were determined where possible, as was the time of the crash. The casualties that resulted

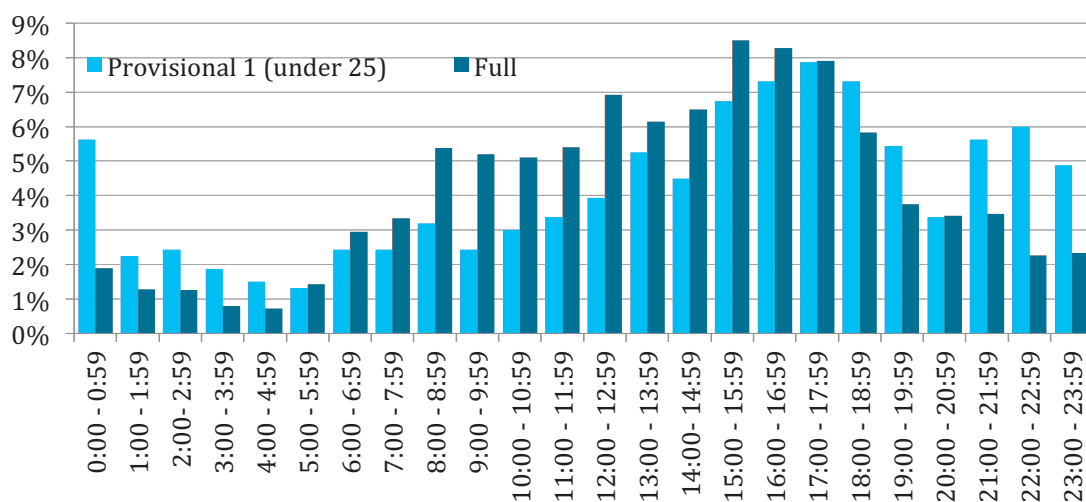


Figure 5: P1 and Full licence holders involved in fatal and serious injury crashes by time of day, South Australia, 2009 – 2013

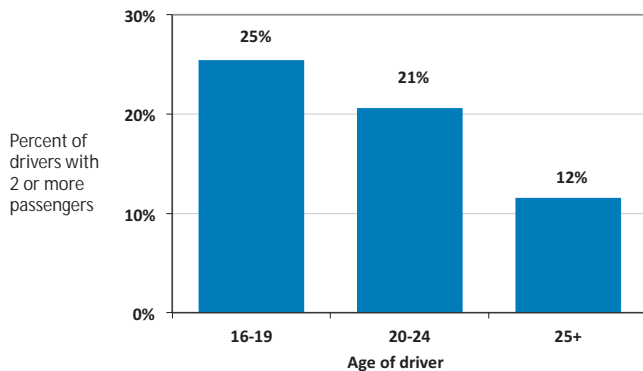


Figure 6: Drivers involved in fatal crashes with 2 or more passengers as a percent of total drivers, South Australia, 2009-2013

from these crashes were then calculated. From this analysis it was found that the overall total number of fatalities and injuries that had the potential to be prevented if these restrictions were in place in 2008 was:

- 22 fatalities (an average of 4 per year)
- 240 serious injuries (an average of 48 per year)
- 1397 minor injuries (an average of 279 per year)

The Department's analysis, along with existing key statistics provided during the consultation process, was used to provide the community with a real understanding of the lives that could potentially be affected as a way to communicate the safety benefits of the proposals. Presenting the statistics in an interesting and easy to read format that has an impact on young people, their parents, the business sector and parliamentarians has been crucial to obtaining support for the GLS changes (see Figure 7). It was also another opportunity to present a united front between key road safety stakeholders in support of the proposals.

Exemption scheme

The exemption scheme was a key factor in gaining support for the changes. The final scheme allows young drivers to drive between midnight and 5am to participate in employment, education and training, as well as sporting, artistic, charitable, religious, scientific and volunteer commitments, addressing significant community concern that young drivers should not be seriously disadvantaged by the new laws, particularly in rural areas where there are limited public transport options. Drivers are able to carry more than one peer passenger if they are driving for employment purposes or driving on duty as an emergency services worker.

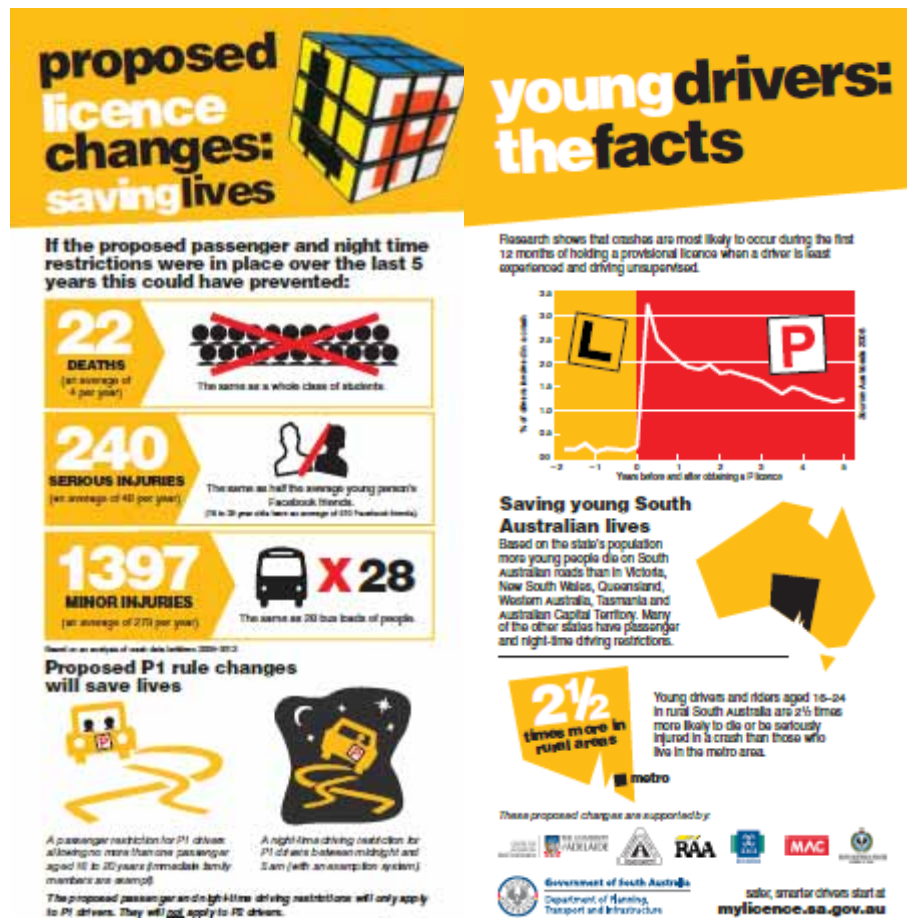


Figure 7: An example of one of the many GLS Brochures

Driving to participate in a sporting activity was included after feedback was received from the community that young people may need to drive to attend swimming or rowing training prior to 5am. The activity must be provided by an organisation, association or club and driving during the restricted hours to watch a sporting event is not allowed.

Following amendments to the Bill while it was in Parliament, the exemption grounds for the night driving restriction were expanded to include driving to participate in artistic, charitable, religious and scientific activities provided by an organisation, association or club.

Considerable thought was given to selecting an exemption model, particularly as large numbers of people would potentially be seeking an exemption. DPTI worked closely with SAPOL to develop a workable proposal. The model that was chosen was based on the approach taken in Western Australia, where an automatic exemption from the night driving restriction is available for employment or education/training purposes. The model places the onus on the driver to satisfy police at the roadside that they are driving under one of the exemption grounds. It caters to the needs of young people who may frequently change the circumstances of their employment and often at short notice. It was decided that a formal application process where each application must be individually assessed against the relevant criteria may result in delays for drivers who urgently needed an exemption.

It is recommended that drivers carry evidence that they meet the exemption criteria while driving, for example a letter from their employer, education or training institution; or sports club or association. To assist drivers, a voluntary P1 Driver Exemption Form was developed in conjunction with SAPOL and made available on www.myllicence.com.au. The form contains the recommended information for young drivers to complete.

Implementation and communication strategy

Citing the evidence behind the restrictions strongly assisted with getting the message through about the safety benefits for young drivers. It was also very important that key messages were developed and communicated throughout the process, and this helped to dispel some of the myths that exist about young drivers - for instance that the crash statistics are the result of extreme behaviour by only a few drivers. It was also important to let people know that the initiatives were already in place in other jurisdictions and that they were shown to work.

The following are examples of the key messages that were used:

- Despite steady falls in South Australia's road toll over the past decade, young drivers continue to be over-represented in road trauma statistics compared to older age groups.

- Crashes are most likely to occur during the first 12 months of holding a provisional licence when the driver is least experienced and driving unsupervised.
- Young drivers in rural South Australia are two and a half times more likely to die or be injured in a crash than their peers in metropolitan Adelaide.
- South Australia has the second worst fatality rate for this age group of all Australian states and territories – almost double that of Victoria, New South Wales and Queensland.
- The initiatives reflect international best practice, are evidence-based and are already in place in other parts of the country.
- The initiatives are not about making life tougher for young drivers. They're about protecting them and will result in fewer deaths and injuries among young drivers, their passengers and other road users in South Australia.

Upon passage of the Bill, a significant communications campaign was prepared to accompany the new laws. This was the final stage in the commitment to bringing the community along with us to achieve a relatively smooth and successful implementation of the reforms, and it was important to convey both the detail of the changes and the reasons behind the new restrictions.

A state-wide advertising campaign involved press, radio, digital and bus shelter advertising. In addition, a letter and an information brochure were sent to all Learner's Permit and P1 drivers across the State (approximately 100,000). Some 500 letters were also sent to employer and volunteer groups, education/training institutions and relevant clubs and associations to advise them of the detail of the changes, how the exemption model would work and what it would mean for them. These organisations were encouraged to assist young drivers by recognising that the restrictions exist to reduce the risk of a serious injury or fatality and if asked, to provide a letter or sign a form as evidence of their need to travel. A specific page on the mylicence website was also dedicated to the new laws. More information is available at <http://mylicence.sa.gov.au/gls/home>.

The GLS changes were successfully implemented by an inter-agency project group including representatives from DPTI, Service SA, SAPOL and the Courts Administration Authority. This group was established following passage of the Bill through Parliament, and it required a six month period to ensure that the changes were successfully implemented.

The GLS changes introduced on 28 July 2014 include:

Passenger restriction

P1 licence holders aged under 25 must not carry more than one passenger aged between 16 and 20 (excluding immediate family members) unless they have a qualified supervising driver sitting beside them or they meet one of the exemption criteria below:

- driving in the course of employment; or
- a police or emergency services officer on duty.

Night driving restriction

P1 licence holders aged under 25 must not drive between midnight and 5am, unless they have a qualified supervising driver sitting beside them or they meet one of the exemption criteria below:

- driving between home and work or driving in the course of employment;
- driving between home and education/training or driving in the course of education/training with a school, university, TAFE, apprenticeship or other formal training provider;
- driving between home and formal volunteer work or driving in the course of performing formal volunteer work;
- driving between home and an activity to participate in sports, artistic, charitable, religious or scientific activities; or
- a police or emergency services officer on duty.

Learner motorcyclists under the age of 25 without a P2 or full licence for a car are also subject to the night driving restriction.

Extending the total minimum provisional licence period from two to three years

The total length of time a new driver must hold a provisional licence was extended from two years to three. This means one year on a P1 licence and two years on a P2 licence. This in turn would extend the duration of conditions such as the zero blood alcohol limit, speed and high power car restrictions and a lower demerit allowance. Extending these conditions will help to keep our young drivers out of high-risk situations without impinging on their mobility.

Removing regression to a previous licence stage following a disqualification period

Regression to a previous licence stage has been removed. This will mean that disqualified L and P drivers will return to the licence stage they were at when they committed the offence resulting in the disqualification.

The Hazard Perception Test (HPT) being a requirement from L to P1, rather than P1 to P2

The Hazard Perception Test has become a requirement to progress from L to P1 rather than P1 to P2.

Throughout this process, the GLS initiatives have generated significant community interest and public debate. However, once the new laws had passed Parliament and the community were advised that they were coming into effect in July 2014 the comments received from the public generally moved from “these initiatives are unfair/not workable” to “how will these new laws affect me personally” with many parents and young drivers enquiring about their own situation and how the exemption criteria might apply. Once the laws had come into effect, the enquiries subsided significantly supporting the notion that the community was now aware of the new laws and had come to accept them. The evaluation of the communications campaign also showed a high level of community awareness about the new laws.

Interim Results

In South Australia, while young people are over-represented in fatalities and serious injuries, crash data shows that in the last five years the number of young lives lost has decreased. In the 11 month period until 1 July 2015 there have been five P1 drivers/riders under 25 years of age involved in fatal crashes compared to an average of 11 per year for the years 2009-2013.

In the nine month period until 1 May 2015, preliminary figures show that 42 P1 drivers/riders aged under 25 were involved in serious injury crashes and 402 in minor injury crashes. On average (for the years 2009-2013) 96 P1 drivers/riders aged under 25 were involved in serious injury crashes and 869 in minor injury crashes per year. An independent formal evaluation on the GLS changes will be undertaken once sufficient crash data is available.

Conclusion

Improving young driver safety has been an emerging priority for South Australia over the last decade. While continuing to push for more significant reforms over the longer term, our strategy has been to accept smaller safety improvements, thereby enhancing the GLS in this State incrementally over time. This has required constant review and evaluation of the evidence so as to be able to persuade the Government and the community of the changes needed to further protect young South Australians.

The new rules for young Provisional (P1) licence holders represent almost three years of work including a major public consultation process, the drafting of legislation and passage of the Bill through Parliament at the end of 2013, followed by a six month implementation period which included a significant public communication campaign. In around five years' time when there is sufficient crash data,

an independent formal evaluation on the GLS changes will be undertaken.

These latest reforms are the most significant changes made to the GLS in South Australia, and this package means that we now have one of the best GLS in the country. The new laws have now been in place for 11 months and with no significant issues reported in that time, there is a level of confidence that the laws have been accepted by the community and are working well.

This result would not have been achieved without the combined effort of road safety stakeholders who worked together to develop and implement changes that will be of lasting benefit to young people in South Australia. Crucial support was also gained by providing the evidence for change in a variety of ways, so that the community and key stakeholders understood the road safety risks facing younger drivers, the reasons for the changes, and the evidence that the restrictions could save lives.

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Expanding the Victorian Alcohol Interlock program to all convicted drink-drivers

by Chris Freethy

VicRoads, Christopher.Freethy@roads.vic.gov.au

Abstract

The Victorian Alcohol Interlock Program was established in 2003 and expanded in 2006. In 2014 the Victorian Parliament passed legislation to significantly extend the mandatory requirement for alcohol interlocks. This initiative came into force on 1 October 2014. All drink-drivers in Victoria whose driver licences or learner permits are cancelled must now fit an alcohol interlock to any vehicle they drive once relicensed. Alcohol Interlocks are required for all:

- Probationary and learner drink-drivers at all BAC levels;
- First time drink-drivers with a BAC over 0.07;
- First time drink-drivers with a BAC under 0.07 whose driver licences are cancelled;
- All repeat drink-drivers;

- Drivers committing offences such as refusing to provide a breath or blood sample, or culpable driving under the influence of alcohol.

The minimum cancellation period is three months and the minimum alcohol interlock condition six months. VicRoads is now managing first-time drink-drivers whose driver licence or learner permit is cancelled and who record a BAC reading of less than 0.10. Courts continue to manage all other drink-drivers. As part of the changes, concrete criteria have been introduced for the removal of alcohol interlock conditions. Both VicRoads and the Courts will use these criteria. A new IT system supports the program. This article outlines the policy decisions behind the new legislation and the challenges in implementing the expanded alcohol interlock program.

Introduction

Despite the introduction of extensive countermeasures, drink-driving remains a major contributor to road trauma.

In Victoria, approximately 25% of drivers killed and 11% of drivers seriously injured are alcohol impaired. Repeat drink-drivers comprise 30% of all drink-drivers detected by Victoria Police.

Following earlier successes in reducing drink-driving brought about by reducing BAC limits, including a zero BAC requirement for novice and commercial drivers; extensive Random Breath Testing activities; strong licence sanctions, fines and potential imprisonment; and the introduction of alcohol interlocks; the number of drink-driving crashes has stabilised.

In this context, the previous Victorian Parliament determined to take further action to tackle drink-driving. This included expanding police powers to impound the vehicles of drink-drivers; introducing a new offence of driving under the influence of both alcohol and drugs; and requiring all convicted drink-drivers to fit an alcohol interlock to any vehicle they operated.

This paper addresses the last of these measures: expanding the Victorian Alcohol Interlock Program.

The Victorian Alcohol Interlock Program

Alcohol interlocks are a proven drink-driving countermeasure, with international evidence suggesting they are highly effective in reducing drink-driving episodes while fitted (e.g. Elder, Voas, Beirness, Shults, Sleet, Nichols, and Compton R, 2011; Goodwin, Kirley, Sandt, Hall, Thomas, O'Brien, Summerlin, 2013).

The Victorian Alcohol Interlock Program was legislated in 2002 and became operational in 2003. The Road Safety (Alcohol Interlocks) Act 2002 granted Courts the power to impose alcohol interlock conditions on drink-drivers with a first offence of 0.15 BAC or higher. Courts were required to impose an alcohol interlock condition on repeat offenders at this level. Minimum fitment periods were generally six months in duration, however a minimum three year fitment period was required for serious offences such as very high range repeat drink-driving.

Removal of an alcohol interlock condition was also managed by Courts. Offenders were required to obtain a Compliance Assessment Report from their alcohol interlock suppliers and an alcohol assessment from a drink-driving education and assessment agency. Magistrates were to take into account the offender's alcohol consumption during the alcohol interlock condition period, their 'physical and mental condition' and the wellbeing of the community in reaching a decision to remove the alcohol interlock. No set standards for these criteria were established.

The alcohol interlock program was expanded in 2006. The new legislation required alcohol interlock fitment for:

- First offenders under 26 years of age with a probationary driver licence and a BAC reading of 0.07 or more;
- First offenders aged 26 or more with a BAC reading of 0.15 or more;
- All repeat offenders with the exception of low level BAC offences;
- Refusing a blood or breath test; and
- Repeat serious alcohol-related vehicle offences under the Sentencing Act 1991, such as culpable driving

The operation of the alcohol interlock program remained largely as it was established under the 2002 legislation. By 2014, approximately 5,400 alcohol interlock conditions were being imposed each year and the Victorian Alcohol Interlock Program had 7,500 active participants.

Commitment to expand the Victorian Alcohol Interlock Program

The Road Safety Amendment Bill 2014 included a commitment to extend the mandatory requirement for alcohol interlocks to all drink-drivers in response to the continuing contribution of drink-driving to road trauma. VicRoads was also requested to identify the means to expand the alcohol interlock program without increasing the burden on Courts created by managing additional alcohol interlock condition impositions and removals.

These two factors, accelerated implementation and no net increase in Court burden, created policy challenges that needed to be resolved quickly in order to achieve a successful rollout of the expanded program.

Key policy challenges

1. Scope of drivers and riders included in Stage 1

Planning for the accelerated implementation of this initiative quickly revealed concerns about community readiness, complexities in the Victorian legislation and limitations in IT systems that together indicated a staged approach was warranted. Surveys and consultations conducted in Victoria to inform the development of road safety strategies and action plans consistently indicate strong community support for measures to address drink-driving, including alcohol interlocks. However, it is a commonly held view that low level infringements by fully licensed drivers represent errors of judgement or inadvertent offending. By implication, the community believe penalties for this behaviour should not be unduly harsh.

It was felt that quickly introducing alcohol interlocks for low level BAC offences committed by full licence holders (including commercial drivers) may be poorly supported and could undermine efforts to address drink-driving. Greater community understanding that a low detected BAC reading does not correlate well with prior drinking behaviour or future offending is required, as is comfort with the widespread use of alcohol interlocks. Further work is now being conducted in Victoria to assess community support for additional drink-driving countermeasures.

Overlaying this issue, Part 5 of the Victorian Road Safety Act 1986, dealing with alcohol and drug offences, has become increasingly complex due to multiple additions and revisions since it was first drafted. This creates challenges for Victoria Police, Courts and lawyers in understanding, interpreting and applying the Act.

Addressing the complexities in the Act was outside the scope of this initiative and the compressed timeframe. To attempt to remedy this complexity would have risked delivery of the expanded alcohol interlock program. Consequently, only changes required to deliver on the government commitment were made. A project to address the complexities in the Act is in discussion at present.

The third significant challenge was that the VicRoads Driver Licensing System (DLS) is a legacy system, which is complex and expensive to change. While some revisions were inevitable given new legislation, limiting the scope of the initial changes was important for delivering on the initiative in a timely manner. The limitations of the DLS, in combination with other factors, also drove a new IT solution that became integral to the design of the expanded alcohol interlock program.

Identification of these challenges resulted in a recommendation to the previous Government to adopt a two-staged implementation approach, with most changes occurring in 2014 and the remainder to follow prior to the end of 2017. This approach was accepted.

Through the combined efforts of Victoria's road safety partners and the establishment of a dedicated project team, Stage 1 of the expanded alcohol interlock program came into force on 1 October 2014. From this date alcohol interlocks are required for all:

- Probationary and learner drink-drivers;
- First time drink-drivers with a BAC over 0.07; under 0.07 if their driver licences or learner permits are cancelled;
- All repeat drink-drivers;
- All drivers committing offences such as refusing to provide a breath or blood sample, or culpable driving under the influence of alcohol.

This means there are only two groups of drink-drivers in Victoria not subject to an alcohol interlock. The first group is full licence holders committing a first offence with a BAC reading between 0.05 and 0.07. The second group is commercial drivers with a first offence below 0.07 who are issued with a Traffic Infringement Notice but who have the matter heard by a court and successfully mount an argument for licence retention.

All drink-drivers subject to an alcohol interlock condition have their driver licences or learner permits cancelled. The shortest minimum cancellation period is three months (for learner permit and probationary licence holders) and the minimum alcohol interlock condition period six months.

Repeat offenders will continue to have 12 month (second offence) or four year (third and subsequent offence) minimum alcohol interlock condition periods.

2. Court burden

The Victorian court system, like most, experiences heavy demand. VicRoads was asked to ensure that no additional burden be placed on courts as a result of expanding the alcohol interlock program. As all offenders were being managed by courts at the time and a doubling of offender numbers was expected, this meant that an alternative management system was required.

Examination of alcohol interlock management systems across jurisdictions suggested either a fully administrative system or a hybrid administrative and court system would meet the requirement set for the Victorian Alcohol Interlock program. By partially or wholly moving offender management outside the court system, court burden could be managed.

Consideration of the options indicated that a hybrid court plus administrative system was likely to meet Victoria's needs. VicRoads would manage less complex cases: first-time drink-drivers whose driver licence or learner permit was cancelled and who recorded a BAC reading of less than 0.10. Courts would manage all other drink-drivers. This could include offenders otherwise eligible for the administrative system if they faced multiple charges.

VicRoads modelling indicated this division would result in a net reduction in court burden. It would also allow courts to focus on more serious offending where judicial management was likely to be most needed.

Drink-drivers could enter the alcohol interlock management system either through a Traffic Infringement Notice or through a court appearance. Provided that the offence met the criteria for the administrative system the offender would be managed from relicensing through to alcohol interlock condition removal by VicRoads.

As VicRoads had not previously managed alcohol interlock program participants, this decision necessitated the instigation of a major change management process within the Corporation's Registration and Licensing business. A new system was required that could manage estimated starting volumes of 5,000 new offenders per annum as well as a growing number of offenders over time who would be slower to achieve alcohol interlock condition removal or who might become in scope for VicRoads management.

3. Managing alcohol interlock performance

To address the scale and timeframe of the implementation, VicRoads created a dedicated Alcohol Interlock Project Team and multiple concurrent policy development and implementation groups. The decision to establish an administrative process applicable to an estimated 5,000 convicted drink-drivers per annum created challenges for VicRoads in the management of offender volumes and monitoring of alcohol interlock performance. Examination

of the resource implications of manually processing this volume of drink-drivers suggested an IT solution should be investigated. While a small alcohol interlock management team would still be required even if a suitable IT solution could be procured, it was not considered sustainable to establish a large staff contingent to manually manage the volumes involved.

VicRoads therefore went to market to source an IT solution that would automate many of the tasks involved in managing drink-drivers with an alcohol interlock condition. Of the vendors shortlisted, it became apparent on demonstration that only one product presented to VicRoads could perform the functions required. This vendor was therefore selected to develop the new VicRoads Alcohol Interlock Management System (AIMS).

AIMS is built on web-based appointment management software, heavily modified to provide appropriate workflows for alcohol interlock condition management. AIMS is highly configurable, providing opportunities for VicRoads to make running changes and facilitating more major revisions by the vendor as required. It automatically imports offence data stored in VicRoads Driver Licensing System and creates a profile for each offender. AIMS also receives nightly data exports from alcohol interlock suppliers, establishing that an offender has an alcohol interlock installed in a vehicle, along with vehicle details, install date and other data.

At monthly servicing events, data downloaded from alcohol interlocks by service agents is transmitted to AIMS, and populates each offender's record. Decision rules built into AIMS calculate offender performance against criteria established by VicRoads, for example vehicle use and violation counts, to determine potential readiness for alcohol interlock condition removal.

Despite the very tight timeframes involved, AIMS was ready for rollout as the first offenders under the new legislation finished their driver licence cancellation periods (end January 2015). AIMS functionality has been progressively implemented to agreed milestones, as each new system capability set has been required. This staged rollout has accommodated the accelerated implementation timetable for the alcohol interlock program while ensuring that functionality is in place when needed.

The AIMS system has a user portal that allows offenders to log in, view their status, raise queries and apply for alcohol interlock condition removal.

The monitoring and management of offender performance by a government body rather than courts challenged VicRoads and its road safety partners to develop a model that was fair and equitable to offenders but did not involve VicRoads acting as a tribunal. The working group considering offender performance reviewed the literature and consulted subject matter experts to derive decision making principles. The available data and best practice examples together indicated a robust program would include the use of driver identification technology; compliance-based removal; support for low income

offenders; and advertisement of the alcohol interlock program as a general deterrence measure.

Alcohol interlock removal criteria should be based on objective measures using alcohol interlock data and include: evidence of driver identity and vehicle usage; no attempts to start the vehicle with alcohol present for a set number of months; and no attempts to tamper with the alcohol interlock device. These principles were used to establish a set of behavioural requirements that, if met, would qualify the offender for alcohol interlock removal. These included that the offender must demonstrate:

- Personal usage of the vehicle in any month for which data is to count toward removal
- A minimum five months violation free interlock breath sample data immediately prior to alcohol interlock removal
- No attempts to tamper with the alcohol interlock

Offenders would be:

- Allowed to use the first month of alcohol interlock fitment as a 'learning month', where violations of the zero BAC requirement would not have negative consequences
- Permitted to have periods of non-use of the vehicle provided these did not exceed five consecutive months
- Required to restart the data collection period if consecutive non-use was six months or longer
- Allowed roll starts due to mechanical incidents, as long as a breath sample was provided on starting the vehicle
- Required to collect additional alcohol interlock data if they violated the zero BAC requirement or tampered with the device. The five months violation free data resets from the month following any violation
- Treated as having a mouth alcohol sample (rather than a violation) if able to record a second, 'clean' breath sample within an hour of a violation sample
- Allowed to request a review if an offender believed violations were caused by someone else.

These criteria were built into the programming of the AIMS system, allowing it to automatically process and publish offender performance data.

In order for the vehicle usage requirement to be verifiable, Victoria introduced mandatory camera interlocks for offences committed after commencement of the new legislation. Photos for each month in which a vehicle is driven during the alcohol interlock condition period are visually checked by VicRoads staff to verify that the offender has driven it, and are also used to check identity if an offender claims a violation was caused by another person.

Tampering is verified by a combination of alcohol interlock event data, physical inspection by service agents and submission of a report to VicRoads.

Stakeholder agreement was reached to adopt these criteria for both VicRoads and Court managed offenders, to ensure equitable treatment and offer Courts a concrete performance standard. Courts would continue to also take other matters into account in reaching a decision about alcohol interlock condition removal. Victoria increased support for low income offenders by extending concessions on alcohol interlock installation and maintenance to broader groups of concession card holders.

A high level TAC communications campaign across all main channels was used to advertise the changed laws and serve as a general deterrence measure. This campaign will be repeated at intervals along with other drink-driving campaigns to reinforce the messaging.

Future developments

Given that alcohol interlocks are most effective while fitted and recidivism gradually returns to pre-interlock levels (Goodwin et al, 2013), addressing the behaviour that underlies the offending will assist in maximising the long term impact of alcohol interlock programs.

1. Alcohol Interlock Data

One area already receiving attention is the more strategic use of alcohol interlock data. Rather than being used only at the end of an alcohol interlock condition to determine suitability for removal, alcohol interlock data is increasingly employed to provide ongoing behavioural feedback to users and as a trigger for further interventions with regard to alcohol use.

Violations of the zero BAC requirement during alcohol interlock fitment are commonly used as a criterion to extend the time for which the device must be used. This practice recognises that violations indicate the offender is not yet able to separate drinking from driving. The Victorian Alcohol Interlock Program intervenes in this way.

Violations, low level readings that do not trigger violations (under 0.02), mouth alcohol readings, tampering events etc. can also be used to provide behavioural messaging to offenders. These interventions can:

- support the separation of drinking from driving by warning offenders about the potential consequences of continued triggering events (such as extended device fitment periods);
- provide immediate feedback that extension or other consequences have occurred as a result of violations;
- offer tips, strategies, referral options and so on to assist in addressing alcohol consumption.

Positive reinforcement and supportive messaging can also be delivered for periods of compliance with alcohol interlock condition requirements.

The Victorian AIMS system can be configured to automatically deliver this form of intervention to program participants. VicRoads will consider how AIMS can be used to serve effective behavioural messaging that increases program compliance and potentially addresses participants' alcohol use.

2. Alcohol consumption

Addressing drink-drivers' attitudes and behaviour toward alcohol is an important measure to prevent recidivism. Education programs are a staple intervention for drink-driving, and Victoria is no different in requiring certain drink-driving cohorts to complete an alcohol education program.

Victoria also has a requirement for court-managed drink-drivers with alcohol interlock conditions to undergo an alcohol use assessment prior to removal of the interlock licence condition. The assessment occurs in the month preceding the hearing, and provides courts with information about the offender's alcohol use and therefore risk of re-offending once the alcohol interlock condition is removed.

VicRoads is interested in investigating evidence-based interventions for alcohol consumption, to establish their potential to extend the capacity of the Victorian drink-driving scheme to reduce recidivism.

Conclusion

Alcohol interlocks will remain an intervention of choice for drink-driving and their use is likely to increase across jurisdictions and cohorts of drink-drivers. Maximising the impact of alcohol interlock programs through intelligent application of interlock data and supplemental interventions that address alcohol consumption will assist in improving immediate recidivism rates and have the potential to address the longer term degradation in recidivism observed to date.

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Tracking serious injury to improve road safety: Why we can't do it now and what we should do about it

by Ann Williamson and Raphael Grzebieta
Transport and Road Safety (TARS) Research
University of New South Wales, UNSW Sydney, Australia, 2052

Road safety remains a serious problem for the community. Road traffic crashes rob us of too many of our young and productive members of our society, and constitute one of the major causes of premature death and injury. Most concerning is that these deaths and injuries are almost always preventable.

Tracking of changes in road fatalities over the years shows that road safety has improved markedly over the last century and especially since the early 1970's. Initiatives like compulsory seat belts and random breath testing have reduced fatality rates from over 25 per 100,000 population to currently just over five per 100,000. The gains have slowed significantly over the last two decades and our road safety countermeasures have not had the same impact as previously. The wins are getting harder to achieve.

In addition, questions are being raised about the effects of road traffic crashes on injury; especially serious injury. And questions should be asked. First because we really don't have good data on injuries due to road crashes since the focus has always been on road deaths. Second, it is likely that at least some of our efforts to reduce fatalities may actually increase serious injury. Some of our countermeasures act less on preventing crashes and more on limiting damage to the person. This, we fear may be resulting in greater numbers of people with serious longer term injury due to road traffic crashes. We need to know: a) whether this is so, and b) the nature of crashes that results in serious injury so we can prevent them.

Understanding serious road traffic injury

Road safety authorities around Australia and the world have focussed on trends in fatalities. This is because they are undoubtedly unequivocal outcomes, newsworthy and almost always tragic. Increasingly however there have been calls for better data on serious injury. In fact, the primary measure of success for our current National Road Safety Strategy 2012-2021 (Australian Transport Council, 2011) is the number of serious casualties on the roads.

The problem is: What information do we use? Hospital data is available across Australia and the External cause codes (E-codes) differentiate road traffic injury and what type of road user is involved. It is possible to track changes in hospitalisation rates for road traffic injury (Henley and Harrison 2012).

To attempt to make a difference in preventing road traffic injury, however, we need more than this. We need information on the nature of the crash and how it occurred. In all states and jurisdictions in Australia, police collect data on road crashes and pass it on to road authorities for analysis and use in policy development. Police normally attend and investigate crashes where someone is injured or there is significant property damage requiring a vehicle to be towed away. Road regulations require crashes to be reported as soon as possible, especially where someone is injured or requires treatment for injury at a later time.

The problem of data linkage for counting road traffic injury

The problem is that not all crashes involving injury are reported to police; even for serious injury. We know this from multiple studies where hospital admissions data is linked to crash databases. These results show much higher numbers of injured due to traffic accidents being admitted to hospital than are in the road safety crash databases. For example, studies linking road traffic hospital and crash records in WA found only 64% of hospitalised cases linked to cases in the crash database (Rosman and Knuiman 1994), in NSW, only 56.3% linked (Boufous, Finch, Haven and Williamson 2008), in New Zealand linkage was only 63% (Alsop and Langley), in the UK, only 61% linked (Cryer et al 2001) and in Hong Kong only around 58% linked (Loo and Tsui 2007). Clearly, looking only at injury or serious injury data that is captured in the conventional road crash databases will underestimate significantly the number of crashes and people injured. Even more concerning, particular types of crashes, have even lower representation in the crash databases. For example, the research shows that crashes involving particular road users, such as motorcyclists, pedestrians and young children are significantly under-represented in police-reported crash databases. The crash databases relying on police reports therefore only represent part of the problem.

Currently there is a great deal of interest in the use of probabilistic data linkage of hospital admissions and crash databases as a solution to identifying serious road traffic injury from minor injury. These studies show that probabilistic data linkage is not a solution to the problem of tracking serious road traffic injury and understanding why they occur. Counting serious road traffic injury only from cases in crash databases that link with hospital data will result in gross underestimation of the problem. Australia needs a new, alternative approach for monitoring road safety.

A proposed new approach to developing road safety databases

The key to identifying serious road traffic injury is the hospital admission. The objective of a new approach to monitoring road traffic injury would be to systematically report all hospital admissions for road injuries to police. This would allow police to match existing reports of crashes that they had attended or had reported to them. It would also allow them to identify any serious crashes where no report had been made and to follow them up.

This new approach would have some major advantages. First it would produce a database of serious road traffic injury that accurately reflects the size of the problem and will allow tracking of change over time. Second, it would, for the first time, allow direct linking of crash information from the police report with hospitalisation information about the injury outcome of crashes. This would make possible analysis to understand how serious crashes occur, the types of injuries that result from them and allow evaluation of the effectiveness of countermeasures on different types of crashes and different types of injuries. Better information about what works and what works best will improve road safety action and outcomes. Third, the approach will direct police efforts into investigating and reporting on the road traffic crashes of most concern. Currently in many jurisdictions of Australia, police spend arguably too much time reporting on minor crashes and injury. In fact, in NSW, since October this year, police will no longer attend minor collisions or crashes where cars need to be towed, unless someone is injured, drunk, or fails to exchange details.

The proposed approach would not be difficult to achieve. Mandatory reporting of health conditions is already a standard procedure in hospitals for a wide range of diseases of public health importance. Road traffic injury reporting should be included and be triggered when someone is admitted to hospital for a road traffic injury. Computer-based reporting will facilitate linking of police-generated reports and hospital-generated reports. A large percentage of reports will need no further action once existing reports are linked. Where hospital-generated reports do not link

with a complementary police-report, the injured person or their representative would be required to report the crash and provide details of how it occurred just as they currently do. Police can then strategically follow-up crashes as they see fit.

Road safety is unlikely to significantly improve while we still only focus on preventing road deaths. For too long, serious road traffic injury has been largely ignored in spite of its greater financial burden on our health system and the community. Expanding our focus, however, needs accurate data which currently does not exist in Australia. We think some simple, strategic changes to how we manage the collection of information about serious road traffic injury will set us on a better path to improving road safety in Australia.

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By writing for the journal, you have the opportunity to contribute to the important exchange of views and information on road safety. Articles on any aspect of road safety are welcome and may be submitted as papers for the peer-reviewed section of the journal or as contributed articles. Articles are now invited for issues in 2016.

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Please contact the Managing Editor for further information, and for publication dates and deadlines.

Letters to the Editor and items for the News section will also be considered for publication; feedback or suggestions about journal content are also welcome.

The next issues of the Journal will feature articles on heavy vehicles and global road safety. Articles are invited on these themes or other road safety issues to be published in 2016.

Mobile in Moreton

Broughton, J., (Queensland Police Service); Doherty, K., (Moreton Bay Regional Council); Scifleet, H., (Department Transport and Main Roads)

Raising the profile of mobility scooter and motorised wheelchair use through community education and awareness.

Why does it matter?

- Increasing popularity in purchasing and using mobility scooters and motorised wheelchairs
- Issue raised through community feedback sessions
- Lack of understanding in the community of road rules, obligations and how to travel safely using mobility scooters and motorised wheelchairs



Resulted in delivering...

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- Region wide distribution to multiple organisations and agencies
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- Easily transferrable to other areas, regions

The collaborative journey...

- An integral inclusion of the project was community consultation – what information was important, the look and feel of the document
- A common goal of educating the community resulted in strengthening partnerships between Moreton Bay Regional Council, Queensland Police Service and the Department of Transport and Main Roads
- Included reviewing existing material including an old interstate booklet and available state related material



A better connected and informed community

- Increased community awareness on the safe way to use mobility scooters and motorised wheelchairs
- Creating opportunity for community members to move around independently
- Ongoing community engagement and informing sessions
- Providing vital safety messages, road rules and safe travel



2015

Did you know?

In 2011 across the Moreton Bay Region more than 2730 motorised wheelchairs were registered. By 2015 this number increased to more than 3,770.

2011

2730

3770

Motorised wheelchairs

Did you know?

In February 2015 more than 25,250 motorised wheelchairs were registered across the state of Queensland.

Did you know?

Mobility scooters and motorised wheelchair users are classed as pedestrians under current Queensland road rules legislation.

Mobility scooters and motorised wheelchairs must travel on the footpath, shared paths, bicycle paths or nature strips whenever possible.

Did you know?

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ACRS, PO Box 198, Mawson ACT 2607 Australia

Tel 02 6290 2509

Fax 02 6290 0914

Email eo@acrs.org.au

Head Office

Pearce Centre, Collett Place, Pearce ACT Australia

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