Journal of
the Australasian College of Road Safety

Formerly RoadWise — Australia's First Road Safety Journal

In this issue featuring 'Young drivers'

Contributed articles
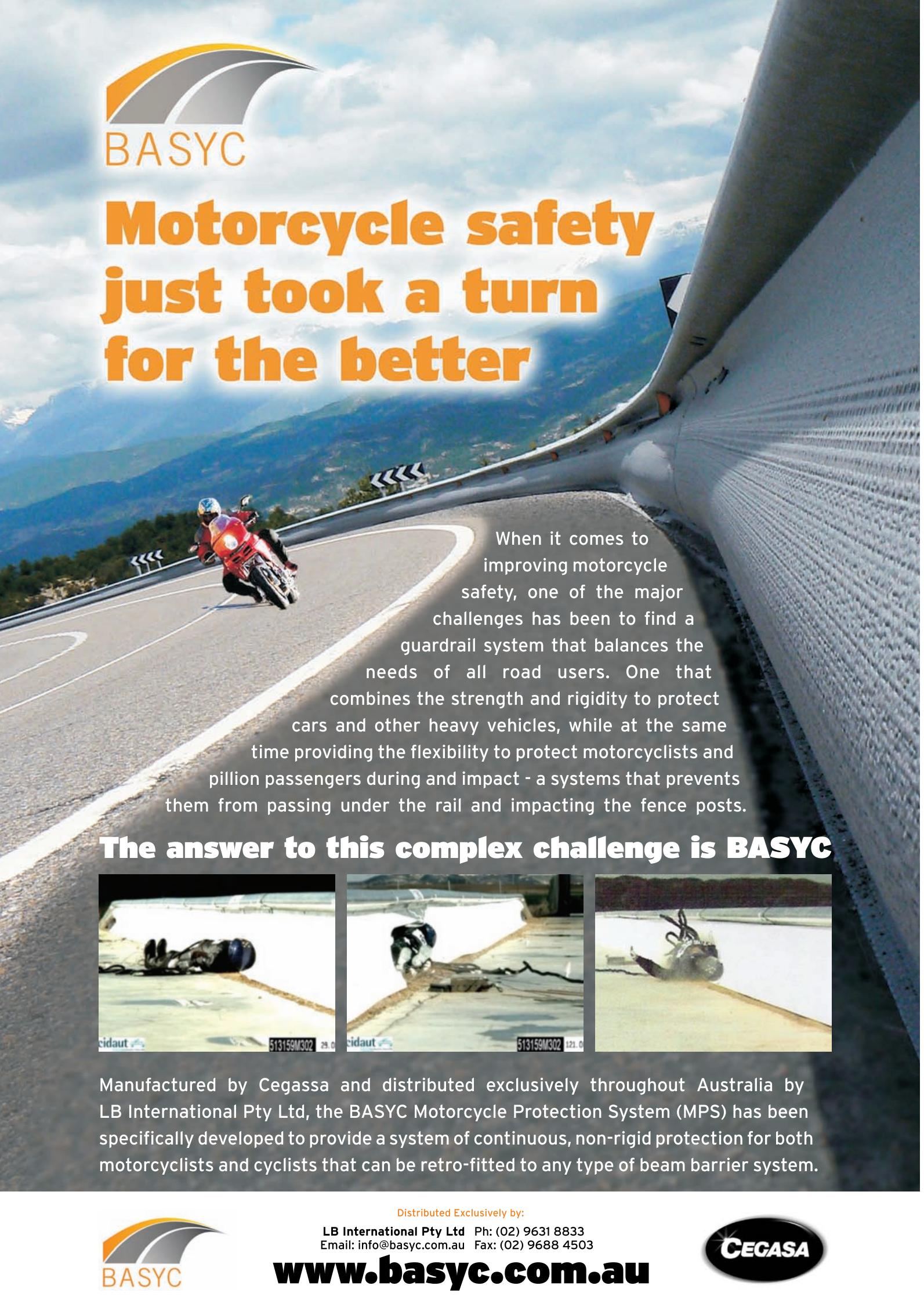
- The Road Safety Decade of Action: Summary of workshop
- Feel safer with Informit
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- ACRS comments on the Draft National Road Safety Strategy
- Road safety on the world stage
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- Stop Territory Aboriginal Road Sadness – NT Police Indigenous Road Safety Project
- Criminal liability of drivers who fall asleep causing motor vehicle crashes: TLRI report

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- Retraction of the Voukelatos and Rissel paper on bicycle helmet legislation and injury
- The role of personality in predicting hooning-related driving behaviour
- Parents and young drivers: The role of learning, behaviour modelling, communication and social marketing

BASYC
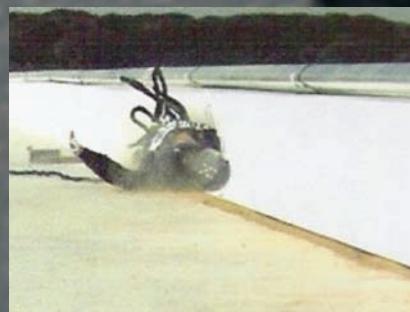
Motorcycle safety just took a turn for the better

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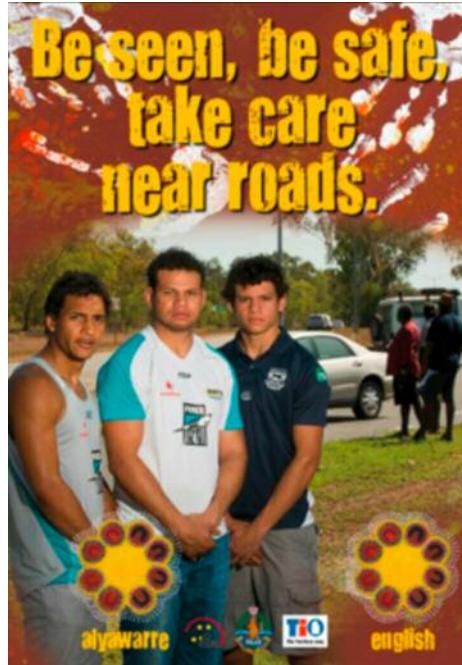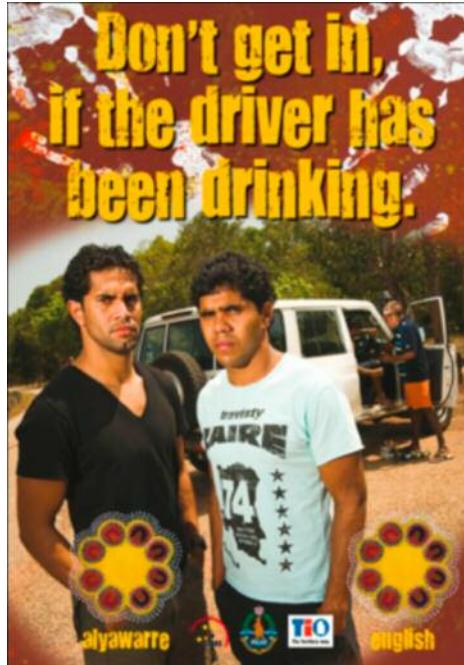
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The three 'talking' posters used in Indigenous communities as part of the Stop Territory Aboriginal Road Sadness (STARS) program in the Northern Territory. See article on page 33.

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Disclaimer

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In this issue

Young drivers are the focus of this issue. Articles look at the development of best practice for road safety education, the keys2drive training program for novice drivers, the STARS program targetting road safety for young Indigenous people, the personality characteristics of 'hoon' drivers, and the role of parents in supervising learner drivers and modelling driving behaviour.

Cover photo

An Aboriginal Community Police Officer (ACPO) on patrol. See page 33 for more information about the Stop Territory Aboriginal Road Sadness (STARS) project in the Northern Territory.

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history, management, and urban and traffic planning. Interdisciplinary
approaches are particularly welcome.

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From the President

Dear ACRS Members,

The College Executive and the secretariat have been busy over the Christmas period preparing a response to the draft National Road Safety Strategy launched in December by the Hon Catherine King MP, Parliamentary Secretary for Infrastructure and Transport and Parliamentary Secretary for Health and Ageing. That response was due in February, but Ministers are unlikely to finalise it until May at the earliest. We have urged Ms King to promote the strategy to the community now to enhance understanding of the Safe System approach.

Australian road deaths were down 9% on the previous year, a credible performance and a tribute to all involved. The new draft strategy has some good suggestions for reducing road trauma, but the consensus of responses from members has been that the strategy does not have a sense of urgency to return Australia to one of the best-performing road safety countries in the next decade. Our submission is summarised on page 20 of this issue of the journal and available in full on the ACRS website at http://www.acrs.org.au/srcfiles/ACRS-submission-to-NRSC-Feb-2011.pdf.

We were pleased to be invited by Rio Tinto to participate in their new online safety exhibition, which will be made available to over 100,000 employees worldwide. We also gratefully acknowledge a grant of $1893 to purchase a new computer, software and conference phone, which was made possible with assistance from the ACT Government under the Community Support and Infrastructure Grants Program.

We have had some positive response to our request from corporate members to lift their level of membership in return for increased numbers of journals and encouragement for conference attendance. See page 7 of the journal. ACRS is looking for every opportunity to boost our resources to improve our services.

We have agreed to participate in a partnership with the Safety Institute of Australia and are looking for ways we can actively renew or establish partnerships with like-minded organisations. We are very pleased to have accepted a proposal from 3M Australia, which will allow us to offer a Road Safety Award to encourage professional development.

This year we will have many issues to address, particularly with the UN launch in May of the Decade of Action for Road Safety. We are working with the ARRB Group Ltd and others to see how we can assist.
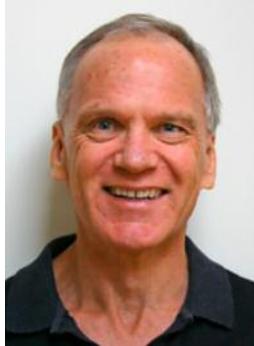
The new Australian National Road Safety Strategy, the new National Road Safety Council and our own conference in Melbourne on 1-2 September this year will provide excellent opportunities for us to encourage a higher level of interest in reducing unnecessary road trauma.

We are pleased that this issue of the journal enables us to look at improving road safety among young people, as road fatalities, particularly among young men, is a pressing problem.

Lauchlan McIntosh AM FACRS
President

RRSP profile – Roger Stuart-Smith, Forensic Traffic Engineer

Following the introduction of this feature in the May 2009 journal, we are continuing to profile in each issue an ACRS member who is on the ACRS Register of Road Safety Professionals. To be on the Register, applicants must satisfy stringent criteria. They must have relevant academic qualifications, have worked for at least five years at a senior level in their particular field of road safety, and be acknowledged as an expert by their peers. For details, visit www.acrs.org.au/professionalregister.

Roger Stuart-Smith obtained his first degree, a Bachelor of Science (Physics), in 1971 from the University of New South Wales. After completing a Master of Engineering Science (Transportation and Traffic) degree in 1977, also at UNSW, Roger commenced his career in road safety. Roger was a member of the New South Wales Traffic Accident Research Unit, the forerunner to today's Road Safety Bureau. Roger's role was as a traffic engineering member of the multi-disciplinary team undertaking in-depth crash studies, from which many research papers were published and many current road safety policies, such as bicycle helmets, had their genesis.

Roger subsequently worked for engineering consulting firms Sinclair Knight and CEANET Pty Ltd, undertaking traffic engineering work and road design tasks, such as the design of parts of the Sydney to Newcastle Freeway (which then only went from the Hawkesbury River to Calga).

Roger was fortunate to be one of the early users of road design software and was able to train the first users of MOSS (highway design software) in the NSW Department of Main Roads (now the Roads and Traffic Authority) and the Queensland Main Roads Department (now the Department of Transport and Main Roads) in the early 1980s.

In 1994 Roger entered private practice as a consulting Forensic Traffic Engineer, providing forensic analyses and expert testimony in relation to all types of motor vehicle road crashes, including passenger vehicle, pedestrian, bicycle, motorcycle and heavy vehicle crashes. Roger also provides expert reports in

relation to road design and construction issues, traffic engineering factors and the application of standards.

Roger is a Fellow of the Australian Institute of Traffic Planning and Management; a member of the Institute of Transportation Engineers, USA (and a member of their Expert Witness Council); a member of the Society of Automotive Engineers (international and Australasia); and a member of the Australasian and South Pacific Association of Collision Investigators.

We asked Roger the following questions:

How long have you been a member of ACRS?

I have been an Associate Fellow of the Australasian College of Road Safety, as an Expert – Road Crash Reconstruction, since 1998. I was fortunate to become an inaugural RRSP when the register opened.

What do you value most about your membership?

The aspect of my membership that I value the most is the *ACRS Journal*. It gives me an opportunity to keep abreast of the latest discussions about the wide range of road safety issues, which provides the broader context for the crash reconstruction science that I use in my work. It also provides a medium through which I can keep track of what other professionals in the field are doing.

What is your particular expertise in road safety?

I provide my expert services to legal firms acting for defendants or plaintiffs in compulsory third party (CTP) claim litigation. Also I provide reports and testimony for road authorities, such as the NSW RTA, local councils and private road operators. I

have assisted the coroner on a number of occasions and have previously acted as a crash reconstruction consultant to the NSW Police and the Director of Public Prosecutions in serious criminal matters.

I have been asked to provide expert evidence in a number of Supreme Court matters over a number of years. Whilst most have involved matters related to injury crashes, I have also had to give evidence in a murder trial (which involved a four-wheel drive crash).

The preparation of an expert report involves a particular attention to detail, since it is almost invariably peer reviewed with an objective of finding any weaknesses or omissions in the analysis. Presenting evidence in court also requires thorough preparation, since an expert must be prepared for a potentially rigorous cross examination. Nonetheless, the objective at the end of the process is for all parties to have a better understanding of the way in which a particular crash occurred and the manner in which the different individuals or organisations may have played a role in the crash.

What is a typical working day for you?

A typical working day can involve working on a crash reconstruction analysis or report in my home office. Alternatively my day might involve doing a site inspection in either a city, suburban or country area, or attending a conference with a solicitor and/or barrister, or attending court to give expert testimony. The most relaxing part of the job occurs when there is a site to be inspected on a quiet road in a pleasant rural valley, requiring a trip through scenic countryside and a picnic lunch after the inspection.

Diary

11 May. Launch of the Decade of Action for Road Safety 2011-2020. http://www.who.int/roadsafety/decade_of_action/en. Use the online form at http://www.who.int/roadsafety/decade_of_action /launch/planned_events/en/index.html to include information about your launch event on the official global website.

15-18 May, Gold Coast. 3rd International Road Surface Friction Conference, 'Safer Road Surfaces – Saving Lives'. http://www.conferenceworks.net.au/friction

30 June, London, UK. Brake 9th Road Safety Forum International Congress, 'Youth, Gender and Road Risk'. http://www.roadsafetyforum.org/events/annualconference.aspx

10-12 August, Melbourne. Australian Institute of Traffic Planning and Management National Conference, 'Linking Communities'. http://www.aitpm.org.au/conference_2011/AITPM%20 Conference%202011.pdf

1-2 September, Melbourne. ACRS National Conference, 'A Safe System: Making It Happen'. http://www.acrs.org.au/activitiesevents/2011conference

5-7 September, Gothenburg, Sweden. 2nd International Conference on Driver Distraction and Inattention. www.chalmers.se/ddi2011

12-16 February 2012, Tampa, Florida. American Traffic Safety Services Association 42nd Annual Convention and Traffic Expo. http://www.atssa.com/cs/roadway-traffic-safety-calendar. For a chance to attend this conference, see the announcement of the 3M-ACRS Diamond Road Safety Award on the front page of this journal.

College News

Welcome to Gold and Silver Corporate members 2011

In 2010 the national executive committee recognised that ACRS should tailor corporate memberships with a view to offering differing benefits to different levels of corporate membership. ACRS is pleased to acknowledge a number of organisations that have paid an additional subscription over and above the Bronze minimum level to become Gold or Silver Corporate members in 2011.

The **National Road Safety Council of Australia** has become an inaugural Gold corporate member. Gold corporate members receive up to 120 copies of the quarterly *ACRS Journal*, distributed in bulk to a nominated representative for distribution; participation for all staff in ACRS local chapter and national activities; a discount of 10% for journal advertising; and a discount of 10% on ACRS conference and seminar registration fees.

Inaugural Silver corporate members include the **NRMA – ACT Road Safety Trust; the Centre for Accident Research and Road Safety, Queensland University of Technology (CARRS-Q); Honda Australia; and the Transport Accident Commission.** Silver corporate members receive up to 40 copies of the *ACRS Journal*; participation for all staff in ACRS local chapter and national activities; and a discount of 5% on ACRS conferences and seminar fees.

ACRS welcomes its inaugural Gold and Silver Corporate members. For more information on levels and benefits of corporate membership, see http://www.acrs.org.au/membership/corporate.html.

Articles reprinted from *ACRS Journal*

Brake is an independent international charity with headquarters in the UK. Funded by donations from individuals, companies and grants, it carries out a number of road safety projects, including the annual Road Safety Week. Brake's Fleet Safety Forum provides an opportunity for companies to receive professional updates and exchange best practice relating to managing occupational road risk. To this end, Brake has reprinted Will Murray and Barry Watson's paper on 'Work-related road safety as a conduit for community road safety' from the May 2010 *ACRS Journal* as a Brake Fleet Safety Forum report.

The German Institute of Urban Affairs (Deutsches Institut für Urbanistik, or Difu) has added the paper by Amy Schramm and Andry Rakotonirainy on 'The effect of traffic lane widths on the safety of cyclists in urban areas', also from the May 2010 *ACRS Journal*, to its literature database on cycling. The database is part of a project set up by the German government called 'Germany's National Cycling Plan' (http://www.nationaler-radverkehrsplan.de/en).

The Australian Trucking Association has asked to use an article published in the August 2009 *ACRS Journal* on the ATA website. Written by the ATA Chief Executive Stuart St Clair and entitled 'Getting Australia's truck drivers home safely,' it is now accessible at http://www.atatruck.net.au/publications.html.

Chapters

Queensland

The Queensland Chapter held a forum for the December quarterly seminar and Chapter meeting on 7 December 2010. The forum was facilitated by Ms Pam Palmer, Senior Manager (Strategic Policy) Road Safety Policy, Road Safety and System Management, Department of Transport and Main Roads, Queensland. The presentation was a 'Presentation of the Draft National Road Safety Strategy 2011-2020'.

Dr Kerry Armstrong, Queensland Chapter Chair and Representative on the ACRS Executive Committee

Victoria

The Victorian Chapter has been focusing on preparing for the national conference on 1-2 September at the Melbourne Convention Centre. I am pleased to report that significant progress is being made, and I am very grateful for the work of Linda and team at the national office, as well as a dedicated band of workers closer to home.

The theme of the conference is 'A Safe System - Making it happen!', and so emphasis lies in showcasing practical programs and investigations that bear directly upon making our traffic networks progressively safer. Our keynote speakers are Dr Tom Dingus from the Virginia Tech Transportation Institute and Dr Bruce Corben of Monash University. Dr Dingus will focus on identifying behavioural risks in our environment, while Dr Corben will discuss innovative developments world-wide to make our roads and roadsides inherently safer.

Sponsorship is always an important aspect of a successful conference, and so it is pleasing to report that the government safety partners in Victoria, together with the RACV, the NRMA ACT Road Safety Trust and CARRS-Q at the QUT, are all providing strong backing for the conference. We also anticipate that we will be able to announce a number of commercial sponsors in the near future.

Abstracts closed on 15 February, so we look forward to moving into the next stage of conference preparation.

With regard to local seminars, one planned for February has been postponed in light of the unavailability of key presenters, with a new date yet to be set. The seminar topic is the importance of role modelling in influencing the behaviours of children and young people.

David Healy, ACRS Co-Vice President and Victorian Chapter Representative on the ACRS Executive Committee

New Zealand

The focus in New Zealand has continued to be on adopting the Safe System approach and implementing the government's road safety strategy for 2010 - 2020, *Safer journeys*. The first of the three-year Action Plans for the ongoing implementation of *Safer journeys* is due to be released by the Ministry of Transport early in 2011, following significant input from the key road safety partners.

Motorcycle safety was progressed with the establishment by the Accident Compensation Commission of a Motorcycle Safety Levy Council to allocate the funds accumulated through an annual $30 safety levy on motorcyclists. The fund will initially be used to fund education and infrastructure improvements in a similar way to the Victorian approach. The new Council will be chaired by Dr Gareth Morgan, a prominent economist and motorcyclist, and will include representatives from key motorcyclist advocacy groups and the motorcycle industry.

Early consultation has commenced on a state highway classification system, and guidelines are being developed to help target road safety engineering improvements on New Zealand's high-risk rural roads.

Improving the education and licensing regime for young drivers continues: this includes raising the minimum driving age and making significant changes to the on-road driving tests used in the graduated driver licensing system to encourage higher levels of driver experience in the learner stage. Work has also started on improvements to the motorcycle training and testing regime. The revamped young driver website, Practice (www.practice.co.nz), which is designed to support higher levels of supervised driving experience for young drivers, received extensive and very positive coverage through TV, radio and print media during November.

Designing the possible interventions and regulatory changes targeted at high-risk drivers outlined in *Safer journeys* also continues. High-risk drivers are defined in New Zealand as unlicensed and disqualified drivers, those with previous speed and alcohol offences, or those who were engaged in high-risk behaviour (e.g., driving with a high blood alcohol content, evading enforcement or illegal street racing) at the time of the crash. A recently completed analysis shows that, over the last five years, high-risk drivers were at fault in one in three crashes that resulted in death or serious injury.

Building public understanding and recognition of the importance of *Safer journeys* and the Safe System is a crucial component for the success of the strategy. Activity to assist in building this public understanding and recognition has been initiated by the National Road Safety Management Group and is being deployed through a range of means by the various road safety partners.

Fabian Marsh, New Zealand Chapter Chair and Chapter Representative on the ACRS Executive Committee

Managing Editor's note: I would like to thank Fabian very much for his informative quarterly Chapter reports about road safety developments in New Zealand. After four years, he is leaving the NZ Transport Agency in Wellington to take up a road safety role with the public works authority in Doha, Qatar. Best wishes to him in his new position.

Western Australia

The WA committee will be meeting in early February to plan the program of events for 2011.

Dr Paul Roberts, Western Australian Chapter Representative on the ACRS Executive Committee

The Road Safety Decade of Action: Summary of workshop outcomes

by L Mooren, B Turner** and RFS Job****

*Senior Research Fellow, NSW Injury Risk Management Research Centre (IRMRC), University of New South Wales
**Principal Research Scientist, ARRB Group
***Director, NSW Centre for Road Safety, Roads and Traffic Authority

Abstract

The global Decade of Action for Road Safety will be launched on 11 May 2011. Instigated by a UN resolution with the support of the Australian government, the aim of this initiative is to address the more than 1.2 million road deaths that occur every year. This paper provides a summary of this global initiative. It discusses some of the key issues and challenges that will need to be addressed to ensure the initiative is successful, as well as highlighting some of the ways in which Australian individuals and organisations can contribute to this.

Keywords

Global road safety, Decade of Action for Road Safety, United Nations

Introduction

Worldwide, it is estimated that around 1.2 million people die in road crashes every year, and a further 50 million are injured [1]. This represents a major burden on health systems, as well as inflicting profound pain and suffering on individuals, families and communities. Around 90% of these deaths and injuries

occur in low- and middle-income countries, many of which are on Australia's doorstep.

The Decade of Action for Road Safety starts this year. This global initiative was instigated by a UN resolution, co-sponsored by more than 90 countries, including Australia. The goal is to halt or reverse the increasing trend in road traffic deaths and injuries around the world.

In preparation, two workshops were held to explore what the Decade of Action is about and how Australians can engage in it. The first workshop was held in Sydney in June 2010, and the second was held in Melbourne in October.

Sydney workshop presentation

The Sydney Chapter of the Australasian College of Road Safety in cooperation with the National Road Safety Council held a workshop in Sydney on 25 June 2010. The workshop was organised by Australia's members of the United Nations Road Safety Collaboration (UNRSC), Lori Mooren and Soames Job. It presented current developments and challenges to road safety at global and national levels, and enabled small group discussions across a broad spectrum of road safety researchers and practitioners.

There were 58 participants, including seven who joined the workshop from remote locations via a web link device. These participants included professionals working in the government and private sectors, spanning disciplines including enforcement, mechanical and civil engineering, behavioural and social science, public health, medicine, education, transport, employers and planning.

Lori Mooren gave a presentation on the global Decade of Action, acknowledging that much of the presentation was originally prepared by David Ward, FIA Foundation. Other UN Road Safety Collaboration members, especially Socheata Sann of Handicap International Belgium, also contributed to the presentation.

The presentation began with introductory remarks about the United Nations resolutions that have progressively committed member nations to an active approach to reduce road trauma. The UN Road Safety Collaboration, chaired by the World Health Organization, meets twice per year to develop a coordinated set of actions to advocate for and address road safety, particularly in low- and middle-income countries. Data were presented to demonstrate that road injury is not just a significant threat to global public health, but indeed an economic development issue.

Mooren advised that:

- Road crashes affect the economically active population, as 67% of all road deaths are of people under 45 years of age
- Road crashes are the number one killer of people aged between 10 and 25
- Typically only 10% of road deaths occur to people who are retired and nearing the end of their natural life span

- Road crashes contribute to the cycle of poverty for families and countries. Low- and middle-income countries account for 90% of global deaths from road crashes, despite having only 48% of the global motor vehicle fleet. See Figure 1 for a view of traffic conditions in Africa.

Figure 1. Child pedestrian in Africa (photo courtesy of the FIA Foundation)

The disparities between rich and poor nations are forecasted to grow. The World Bank has estimated that South Asian countries will see a 144% rise in road deaths between 2000 and 2020, whereas they predict a 28% drop in road fatalities in high-income countries over the same period.

Figure 2. Actress Michelle Yeoh, representing the UN Ambassador of Malaysia, and Global Ambassador of the Make Roads Safe Campaign (photo courtesy of the FIA Foundation)

After a range of efforts by the UN Road Safety Collaboration and others, the UN General Assembly in New York voted unanimously on 2 March 2010 to proclaim the years 2011-2020 the Decade of Action for Road Safety. Figure 2 shows Michelle Yeoh speaking for the resolution in the United Nations General Assembly. The resolution was sponsored by 98 countries and supports the goal to 'stabilize and then reduce the level of road fatalities', which will require a 50% reduction in
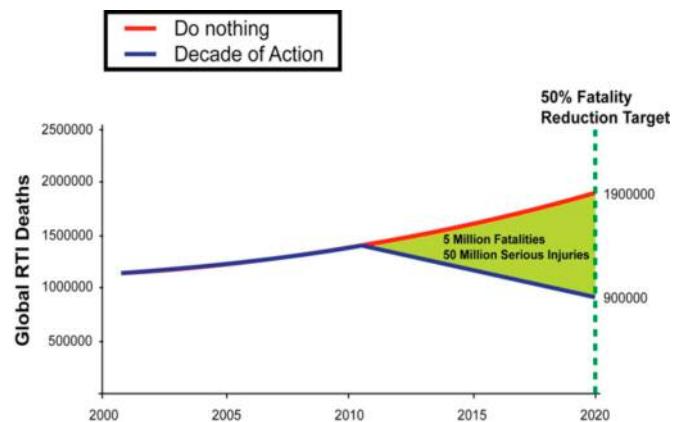

Figure 3. Graph of predicted road traffic injury deaths (courtesy of the FIA Foundation's Commission for Global Road Safety)

the forecast level of fatalities by 2020. This could prevent more than 5 million deaths and 50 million injuries (see Figure 3), saving $3 trillion.

The Resolution called upon the UN Road Safety Collaboration (UNSRC) to develop an action plan for the Decade of Action. At a global level, the plan features an overarching framework for international coordination. The UNRSC will seek to coordinate actions to:

• find ways to increase global funding
• advocate for the Safe System approach
• increase awareness of risk factors
• provide guidance to countries
• assist to improve the quality of road crash and injury data.

The draft Decade of Action plan [2] contains recommended actions and performance indicators for national activities under five 'pillars', as depicted in Figure 4.

Figure 4. Pillars of the Decade of Action [2]

Under Pillar 1, each country will be encouraged to establish a lead agency for coordinating national actions under a national road safety strategy with targets and adequate funding. The draft plan calls for the creation of multi-sectoral partnerships to carry out plans and achieve targets, supported by the data collection and evidential research to assess countermeasure design, and monitor implementation and effectiveness.

Pillar 2 calls for the use of road infrastructure assessment ratings and improved design to raise the inherent safety and protective quality of road networks for the benefit of all road users, especially the most vulnerable. Mooren advised that, consistent with Safe System principles, some of the ideas generated by UNRSC members include the construction and maintenance of 'forgiving' roads, which:

• use low-cost safety architecture
• are self enforcing (less scope for speed)
• separate vulnerable users and vehicles
• avoid vehicle conflicts (roundabouts rather than junctions, median separation)
• use innovative rating and assessment systems (iRAP) to make transparent the safety performance of the road network.

Pillar 3 urges global deployment of improved vehicle safety technologies for both passive and active safety through a combination of harmonisation of relevant global standards, consumer information schemes and incentives to accelerate the uptake of new technologies. The UNRSC wants car buyers to choose the safest models they can afford and encourages a 'market for safety' by promoting:

• consumer crash test information (New Car Assessment Program, or NCAP)
• fiscal incentives for safer cars
• fleet purchasing policies
• new crash avoidance systems such as electronic stability control (ESC)
• global UN fleet safety standards that set minimum requirements for all new cars.

Pillar 4 calls for sustained enforcement of road traffic laws and standards and rules, combined with public awareness and education activities (in both public and the private sectors) that will raise compliance with regulations that reduce the impact of the key risk factors (speeding; drink driving; non-use of motorcycle helmets, seatbelts and child restraints; pedestrian right of way; and commercial vehicle operations). The UNRSC has prepared guidance manuals for road safety practitioners in low- and middle-income countries to address most of these risk factors.

Mooren highlighted two innovative programs that have been implemented – a seatbelt campaign in Costa Rica and a 'helmets for kids' program that began in Vietnam and is now being implemented in other countries as well. The Asia Injury Prevention Foundation [3] provides an opportunity for local and international companies to 'adopt a school' and purchase effective, low-cost motorcycle helmets for every child in a school. (See Figure 5.)

Figure 5. Helmet ceremony in a Vietnamese school (photo courtesy of the Asia Injury Prevention Foundation)

Pillar 5 is seeking an increased responsiveness to emergencies and improvement in the ability of health systems to provide appropriate emergency treatment and longer-term rehabilitation. Mooren provided examples of how some low- and middle-income countries are struggling to address these challenges. For example, the Australian Red Cross assisted the training of Vietnamese motorcycle taxi drivers in first aid and how to stabilise road trauma victims.

She told the participants about an example of how public policies can go wrong. In Nepal, where most people do not have insurance, a law was passed to make vehicle controllers who are at fault in injuring another road user pay to support that person and their family until the person is able to do this for themselves. This resulted in drivers who knocked down pedestrians reversing over the bodies to ensure that they did not survive, because the fine for killing someone with a motor vehicle is generally a lesser amount to pay.

While not in the current draft plan, Mooren suggested that, consistent with the Safe System approach, the UNRSC should consider another pillar to focus activities on safer speeds. Mooren spoke of the global challenge for the road safety community to achieve ambitious targets, including a 50% reduction in predicted fatalities being advocated by the Commission for Global Road Safety 'Make roads safe' campaign.

Mooren said that the next step forward included working up a final draft of the Decade of Action plan for the meeting of the UNRSC in early October 2010. The launch date for the Decade of Action for Road Safety is 11 May 2011.

Working group outcomes

Workshop attendees participated in working groups on one of five topics. Topics and group leaders were as follows:
- Road Safety Management and Post-Crash Care – Harry Camkin, Sydney Chapter executive member, ACRS
- Safer Road Infrastructure – Neil Walker, RTA
- Safer Vehicles – Jack Haley, NRMA
- Safer People – Liz de Rome, The George Institute
- Safer Speeds – Senior Sergeant Mick Timms, NSW Police

Each group discussed the following questions related to their topic:
1. What are the best opportunities to reduce road injury?
2. What are the likely barriers to taking effective actions?
3. What should be done to minimise barriers to success?
4. What are the best indicators of successful actions?
5. What kinds of targets – including interim and output targets – should we set?

Key outcomes of group discussions are summarised below.

Pillar 1: Road Safety Management

This pillar goes well beyond the building of road safety management capacity to the construction of institutional frameworks within governments. It can be seen to be an essential element for establishing a national strategy. The incorporation of activities under the proposed pillars would provide a good structure for a strategic plan. However, transformation into a specific national strategy would initially depend primarily on the level of sophistication in the country's approach to road safety.

There is a view that insufficient attention is given to the importance of road safety administration in managing the extensive mix of countermeasures under the Safe System approach, and managing it for cost effectiveness, equity and vulnerability.

All of the activities outlined in the original draft Decade of Action document are thought to be appropriate for a generic plan. However, establishing an appropriately empowered lead agency and developing a national strategy where they do not exist must be primary objectives.

With regard to capacity building, succession planning should begin in this Decade of Action, to ensure that activities and results are sustained. The possible barriers to effective actions depend on how far down the track a particular nation has already progressed. Common barriers include:

- political and community priorities that give road safety a lower priority for attention compared with education, defence, health care or economic development
- impacts of the Global Financial Crisis
- level of expertise available
- level of funding
- understanding (by politicians, community and decision-makers) of the nature and magnitude of the problem and what can be done about it
- value of human life and human rights issues
- differing cultural values.

Ways to minimise the effect of such barriers include:
- promulgate this UN initiative to national decision-makers and encourage ratification of national government endorsement of it
- take guidance from the work of the UNRS Collaboration
- develop an improved level of road safety expertise
- set up a professional association similar to the Australasian College of Road Safety domestically and through an international network
- carry out public information campaigns about the scale of the problem and as a setting for activities under the pillars
- identify and forge links to other policy agendas such as environment and health
- focus on the returns from highly cost-effective road safety activities
- ensure that relevant agencies are familiar with UN, OECD and WHO reports, particularly, *Towards Zero: ambitious road safety targets and the Safe System approach*
- Share responsibility – community and individual
- Develop national charters for government signature.

Best indicators of successful action are downwards trends in casualty rates per capita, the degree of inter-sectoral cooperation, and proximity of trends to targets.

Process targets should include:
- political endorsement and commitment
- implementation of planned countermeasures
- identification and application of best practice
- establishment of inter-sectoral and partnership coalitions
- benchmarking progress with implementing programs and strategies.

Outcome targets should include:
- fatality and casualty rates (per 100,000 population)
- fatality and casualty rates by socio-economic level and vulnerability
- specific intervention targets, e.g., seatbelt use, reduction in mean speeds
- interim and long-term targets.

There should also be a clear aspirational goal of no deaths nor serious injuries.

Pillar 2: Infrastructure (Roads)

With regard to road design, this discussion group advocated that 'less road safety developed' countries could learn from mistakes, as well as successes, of 'more road safety developed' jurisdictions. For example, in some cases land use and transport planning has not taken road safety considerations into account.

A Safe System approach requires a separation of vulnerable road users from motorised traffic. Constructions including clear zones and roundabouts, for example, need to consider the needs of pedestrians and cyclists.

Opportunities and ideas:
- Consider affordable infrastructure interventions from evidence-based research. Incremental staged development may maximise safety and cost effectiveness
- Place priority on human injury and fatality risk reduction
- Consider whether road infrastructure development is the most affordable transport development solution.

Possible barriers and challenges include:
- lack of political will
- cultural values that place economic needs above human life and safety
- lack of financial resources
- lack of knowledge of low-cost solutions, or lack of acceptance of their efficiency
- lack of availability of technical/governance/standards-setting framework and expertise
- climatic challenges that require different road development standards or materials, for example, monsoon-prone areas.

Pillar 3: Safer Vehicles

This group advised that opportunities could be derived from both new and old vehicle technologies. The newer technologies such as intelligent speed adaptation (ISA) have now been pilot-tested in a number of countries. Other technologies such as in-vehicle monitoring devices, breath alcohol ignition locks and other such advances can assist to reduce risk to human life.

However, protective equipment such as seatbelts, child restraints, and motorcycle and bicycle helmets have been around for many decades, but even when available may not be used. As a primary objective, governments should take action to ensure that for each motor vehicle permitted to use public roads, a seatbelt should be available for use.

Roadworthiness standards should be required and enforced – including, for example, lights, brakes and tyres.
Crashworthiness standards and consumer-driven vehicle safety programs, such as the New Car Assessment Program (NCAP), could be implemented in all countries. Moreover, motorcycle and bicycle helmet standards should be developed and enforced.

Barriers to advancing vehicle safety progress could include:
- macro- and microeconomic costs of improving vehicle safety standards

- accessibility to safer vehicles and technology
- lack of design rules and vehicle registration standards
- lack of enforcement

Target indicators should include:
- age of fleet
- number of vehicles fitted with seatbelts for all occupants
- fleet purchasing safer vehicles
- helmet standards in place and enforced

Pillar 4: Safer People

The opportunities for the Decade of Action include adaptation of road rules in active road safety jurisdictions to those jurisdictions with few or ineffective road rules. However, a lack of or poor licensing systems, lack of enforcement or corruption of enforcement may mean that road rules cannot be effectively enforced.

Administrative apparatus for licensing and record/data keeping is essential for a road user regulatory system to work. This also needs to be supported by traffic law enforcement Barriers and challenges could include:
- corruption in licensing and enforcement
- lack of evidence-based information on behaviour management
- lack of government commitment to regulation
- lack of research on behavioural intervention effectiveness.

Targets could include:
- community support and engagement on regulation and enforcement
- level of harmonisation of road rules
- preparedness to enact traffic laws and regulations
- Preparedness to promote laws and regulations to road users.

A possible additional Pillar: Safer Speeds

Consistent with the Safe System approach, there are opportunities to advance safer speeds. These include the introduction or reduction of legal speed limits. In rural areas unsafe vehicle speeds can be particularly fatal for vehicle occupants. In cities and towns where motorised traffic is likely to be in conflict with vulnerable road users such as pedestrians, the speed limits need to be quite low to ensure injury-free road travel.

Barriers and challenges include:
- lack of police training and equipment
- corruption or cultural issues in some countries
- volume of traffic – population density
- lack of road rules
- lack of compliance
- poor education of the population
- lack of effective media about speeding risk
- lack of funding and government support.

To minimise the adverse effects of these barriers, the group suggested that speed enforcement is critical and resourcing this

can be achieved, either through self-funding systems or by securing overseas aid. In addition, long-term public education campaigns should complement enforcement efforts. International events such as the World Cup or other international sporting events can be utilised to rally support in host countries. Indicators of success could include:

- tracking and reporting speed-related fatalities
- monitoring of people's behaviour, with CCTV monitoring of selected sites over 10 years
- speed infringement data (though this may be a measure of enforcement rather than of compliance)
- proportion of roads that have sign-posted speed limits
- number of trained police
- number of speed detection devices
- free-flow traffic speeds.

Pillar 5: Post-Crash Care

This workshop group advised of opportunities to utilise models such as those devised by the Royal Australasian College of Surgeons for the development of a trauma care system. Barriers include:

- availability of resources for expert treatment and rehabilitation
- capacity to notify of a serious crash
- relative national priorities for infrastructure, education and other government tasks versus trauma care
- cost of insurance cover in developing nations
- misinterpretation of valuation of human life.

The promotion of benefits of primary, secondary and tertiary prevention over long-term treatment may assist to reduce barriers to actions. Indicators of success could include:

- actions within the 'golden hour' (post-crash response)
- reductions in costs of medical treatment of road trauma victims
- pre-hospital and rehabilitation services for road trauma victims
- resources dedicated to emergency rescue and treatment.

Melbourne workshop

As part of the 24th ARRB Conference(in October 2010, a workshop was held in association with the Road Engineering Association of Asia and Australasia (REAAA) to provide background information on the Decade of Action. A further aim of the workshop was to discuss how those based in Australia can usefully contribute to this new initiative, both here in Australia and globally. Over 50 attendees contributed to discussions on Australian involvement.

Several presentations were provided giving background on the Decade of Action and current activities relating to this. These included the following speakers and topics:

- Robert Klein, Road Safety Consultant: background to the Decade of Action document

- Rob McInerney, Chief Executive from the International Road Assessment Program (iRAP): Road Infrastructure Pillar
- Eric Howard, Road Safety Consultant: Road Safety Management Pillar
- Blair Turner, Principal Research Scientist at ARRB Group: recent and current initiatives that Australian safety experts have been involved in internationally
- Alan Coulthart, Principal Infrastructure Advisor for AusAID: recent AusAID initiatives in road safety

Key discussion themes

The presentations were followed by a workshop discussion. Several key themes emerged during these discussions, including the need for coordination of activities, transfer of knowledge and experience, and alignment with the Australian National Road Safety Strategy.

Coordination of activities

Australia is already involved in a significant way in global road safety, but there is no real coordination of our international road safety activities and this should be addressed. Coordination should include facilitation of resources. It was suggested that this be addressed at senior government level (e.g., Council of Australian Governments).

Some type of coordinating body is required to concentrate Australian efforts at the regional and global level. It was also suggested that Australia lacks a road safety champion. Australia's previous international involvement has relied largely on a philanthropic approach, but with the increased global emphasis on road safety, this needs to switch to a more sustainable approach in terms of funding. A long-term commitment is needed.

Australia's federal system of government presents challenges for coordinated national action, with road safety being primarily a state and territory responsibility. There is a need to coordinate and connect relevant resources at local, state and national levels. Austroads may have an important role in this respect. NGOs and corporate organisations have capacity for involvement in the Decade of Action, but again there is a need to coordinate actions.

Transfer of knowledge and experience

Australia has very solid experience in road safety, both within Australia and globally. There is a need to identify areas of safety where we perform well (and particularly those areas with high safety impacts) and concentrate on these in our international efforts. One suggestion was in the area of heavy vehicle safety, although there are many others.

There is a need to prepare new professionals for involvement in these global initiatives. The benefits of this are likely to be twofold: countries where the skills are applied will benefit from trauma reductions, and the individuals participating are likely

to gain in terms of personal and professional development. Opportunity should be sought for younger Australian professionals to gain experience overseas, perhaps initially in some sort of shadowing role. Longer-term projects lend themselves well to these sorts of arrangements.

It was suggested that Australia has a wealth of road safety guidance documents that would be of relevance to those working in other countries. It was recommended that greater dissemination of this guidance be investigated, including the possibility of Austroads providing these documents for free to those in developing countries.

Some type of network involving senior road managers in the region would be of value. There are several organisations already active in the region that could act as a platform for establishing and maintaining such a network (e.g., Road Engineering Association of Asia and Australsasia).

Australia could assist developing countries by conducting further research to address global research needs. For example, little is known about the safety benefit of various road infrastructure measures in developing countries.

The Australian National Road Safety Strategy

It was unclear at the time of the workshop whether the current draft of the new National Road Safety Strategy for Australia [4] contains reference or sufficient linkage to the Decade of Action. Like the Decade of Action, this strategy also spans the period from 2011 to 2020. This linkage needs to be examined with urgency. The Decade of Action provides an international framework for road safety activity, and actions within Australia need to be connected to this. In addition, the national strategy is a very useful means to concentrate thinking about how Australia can be involved at the global level in the Decade of Action.

Early indications are that the crash reduction targets in the new Australian Road Safety Strategy will be less than those set down in the Decade of Action. This needs to be reviewed with urgency, especially given that others in the region look to Australia for guidance on road safety issues. If a lower target is set for Australia, any difference with the international target needs to be carefully explained.

It was also suggested that we take a critical look at the delivery of road safety within Australia and New Zealand, as our performance over the last decade has not improved greatly.

Recommendations from the Melbourne Workshop

The workshop participants made the following recommendations:

- As a priority, the new Australian Road Safety Strategy should be reviewed to ensure it is consistent with the new global Decade of Action road safety strategy. Opportunities should also be sought to include actions to facilitate global involvement in road safety and achievement of the Decade of Action outcomes.

- A coordinating body is required to maximise the impact of current and future efforts in the delivery of global road safety. A high profile road safety champion would be an asset in this aim, and would also assist in the delivery of road safety within Australia.

- The coordinating body (as well as individuals and organisations) should explore ways that we can concentrate our efforts in terms of transfer of knowledge and experience at the regional and global levels.

- Individuals and organisations should consider how they can contribute to the Decade of Action. To facilitate this, greater education and publicity about this initiative is required.

Concluding comments

Both of these workshops were successful in presenting information on the Road Safety Decade of Action, and exploring some of the issues that will need to be addressed to make this a success. However, it is recognised that both workshops had limited scope to address all of the issues relating to global road safety, and that each contributed in a limited way in this task.

It is suggested that further workshop events be held to more thoroughly explore these issues. ACRS and ARRB are proposing a follow-up roundtable session in 2011. It is intended that this roundtable include peak road safety bodies, motoring clubs, road authorities and other key stakeholders, and that it aim to help progress discussions in advance of the launch of the Decade of Action. Key suggestions from the workshops included increased focus on safer roads and roadsides, effective enforcement (with education), and greater focus on management of speed.

Acknowledgements and disclaimer

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Indexers of the *ACRS Journal*

Note from the Managing Editor: This journal is now being indexed by Informit in Australia and SafetyLit internationally. We asked both of these organisations to provide an article about themselves, so that our readers have better knowledge of where and how to seek information through these channels.

Feel safer with Informit

by Amy Han, Marketing Assistant, RMIT Publishing

The *Journal of the Australasian College of Road Safety* is one of the leading sources of regional road safety information and research, but it is by no means the only one. Road safety information is available from a wide range of disparate, sometimes hard-to-find sources, and these, along with *JACRS*, are accessible through RMIT Publishing's Informit database service. For December 2010, the most viewed articles about road safety and the source and collection in which they are located are shown in Table 1.

RMIT Publishing, a business unit of RMIT Training Pty Ltd (a wholly owned subsidiary of RMIT University), partners with some of the most authoritative publishers and associations in Australasia to provide centralised access to current and archived research in engineering, health, business and public affairs. Specialising in online research content from Australia, New Zealand and the Asia Pacific region, RMIT Publishing has more than 500 regional partners and millions of users worldwide – from students, educators, academics and industry professionals to the business, government and health sectors.

RMIT Publishing collates and digitises content provided by partners and organises them into its Informit brand of research databases. Informit includes over 70 subject-based Collections (100% full text), Plus Text (a combination of full text, index and abstract data), Media and Index databases.

Road safety: In-depth perspectives

In December last year, a draft National Road Safety Strategy for 2011-2020 was released for public consultation. Upon release, the chairman of the of the Australian Transport Council, John Anderson, said that despite some decrease in road tolls since 2000, the level of yearly carnage on Australian roads was still far too high. While the new strategy aims to combat this, no one expects the toll to decrease dramatically overnight. The reality is, with Australia's vast landscape and urban sprawl only set to spread, road safety will remain in the Australian headlines for the foreseeable future. Consequently, demand for research that sheds new light on road safety debates is on the rise.

Table 1. Most viewed road safety articles in Informit – December 2010

Article title	Source title and Informit subject collection
Cycling injuries in Australia: Road safety's blind spot?	*Journal of the Australasian College of Road Safety* (Health Collection / Engineering Collection)
Victoria's unique approach to road safety: A history of government regulation	*Australian Journal of Politics and History* (Australian Public Affairs – Full Text)
Alcohol and the teenage brain: Safest to keep them apart	*Journal of the Australasian College of Road Safety* (Health Collection / Engineering Collection)
Road use, road safety and civil law in Australia	*Legaldate* (AGIS Plus Text)
A1 Roadlines: Leading the way in line marking and road safety equipment	*Highway Engineering in Australia* (Engineering Collection)
The influence of occupational driver stress on work-related road safety: An exploratory review	*Journal of Occupational Health and Safety Australia and New Zealand* (Australian Public Affairs – Full Text)
Driving while disqualified or suspended under s 30 of the Road Safety Act 1986 (VIC): Abolition of the mandatory sentencing provision?	*Deakin Law Review* (AGIS Plus Text)
Road safety is no accident	*Health Promotion Journal of Australia: Official Journal of Australian Association of Health Promotion Professionals* (Health Collection)
Victoria's unique approach to road safety: A history of government regulation	*Australian Journal of Politics and History* (Australian Public Affairs – Full Text)

Informit Search Interface

Figure 1. Example of a broad road safety search on the Informit database

Informit contains hundreds of clearly indexed articles and reports relating to road safety available as full-text PDFs. The Informit database is divided into a number of separate subject collections. Most of the road safety research can be found in the Engineering Collection and Health Collection, with some also available via the Business Collection, Humanities & Social Sciences Collection, Australian Public Affairs – Full Text, and AGIS Plus Text (Law). Informit enables searching across databases, titles and subjects, tailored according to need.

With respect to road safety, reports, news articles and research papers in Informit cover a wide range of topics: new developments and initiatives, education, public transport, drink driving, road toll, motorcycle safety, statistics, and injury prevention and rehabilitation, to name a few.

Broad searching

To draw out the most results, searchers can use search term variations – for example, '(road safety) OR (traffic safety) OR (road dangers) OR (pedestrian accidents) OR (road AND safety measures)'. This search returns over 200 results when searching the Engineering Collection alone. By selecting, 'Also Search Full Text of Articles', the results returned increases to nearly 500 articles, as shown in Figure 1.

Narrow searching

There is also the option of searching more narrowly for a specific topic – for example, traffic lane widths in relation to the safety of bicyclists. Here searchers are encouraged to experiment with a variety of terms in order to achieve the best results. As shown in Figure 2, searchers could start with '(safety) AND (cyclists) AND (lane)' across the Informit Health and

Informit Search Interface

Figure 2. Example of a narrow road safety search on the Informit database

Engineering Collections. Subsequent searches could include '(cyclists) AND (road)', and '(bicycle) AND (lane)'.

Users can stay up to date on the latest content relevant to searches by signing up for email alerts. Informit will save searches, and when new results are added, let the user know.

Searching by medium

With road safety a consistent topic in the broadcast media, the Informit TVNews database can be used to locate, browse and download individual news stories, including reports, documentaries and current affairs, from all Australian free-to-air networks since 2007. For example, a search for 2010 results for '(road accident) OR (road safety) OR (road death) OR (road toll) OR (car crash)' returns more than 300 items. Informit

TVNews is available for education purposes where an organisation holds a Screenrights licence.

Do you have access?

Informit is available at universities, state libraries, hospitals, businesses and government departments throughout Australia and around the world. To check whether you have access, ask whether your library subscribes. If the answer is no, Informit offers 14-day free trials to libraries: www.informit.com.au/trial.html.

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SafetyLit: A bibliographic service for injury prevention

by SMF Oliverio and DW Lawrence, SafetyLit, Center for Injury Prevention Policy and Practice, Graduate School of Public Health, College of Health and Human Services, San Diego State University, San Diego, California, USA 92120

Abstract

SafetyLit is a free bibliographic database and current literature update service. Its contents are selected from more than 9000 scholarly journals. Among these are 140 journals that have a focus on ground transportation issues.

Keywords

Bibliographic databases, Journal articles, Safety research

Introduction

SafetyLit® (short for safety literature) is a bibliographic database and weekly online update of recently published scholarly research in the broad field of injury prevention and safety promotion (IPSP). SafetyLit is a free service, presented without advertising by the Center for Injury Prevention Policy and Practice at San Diego State University in cooperation with the World Health Organization.

Since the 3Es (education, enforcement, engineering) concept was proposed almost 100 years ago [1], we have known that effective policy formation, program development and research requires a multidisciplinary approach. The issues relevant to IPSP arise from at least 30 distinct professional disciplines (more if certain medical and engineering specialties are considered separately) [2]. Thus, SafetyLit draws its content from the scholarly publications of many disciplines, but selects articles that are relevant to the issues of injury prevention and safety promotion.

SafetyLit sources

SafetyLit staff and volunteers regularly examine (issue by issue) the contents of more than 3400 current scholarly journals. Another 3000-plus current journals are searched at least once per volume. When IPSP-relevant articles are found, they are added to the SafetyLit database and may be included in the SafetyLit *Weekly Update Bulletin*. In addition to prospectively following new publications, articles are being added from the backfiles of these current journals and an additional 2700 journals that are no longer being published.

SafetyLit tracks more than 140 journals that have more than half of their contents composed of ground transportation issues. SafetyLit currently includes articles from more than 4000 journals that are not included in MEDLINE/PubMed and at least 12 transportation journals (such as this one) that are not included in the US Transportation Research Board's TRID service.

Information about the journals indexed in SafetyLit is found in the SafetyLit Journals Database that lists each journal title and current publisher; title abbreviation; both the print and electronic International Standard Serial Number (pISSN and eISSN); the range of years the journal has been published; the range of years that are included in SafetyLit; the number of articles from each journal issue; the journal's previous or subsequent titles; and a link to the journal's page on the publisher's website.

Each journal listing also includes a link to the Online Computer Library Center's WorldCat to facilitate finding nearby libraries with collections that include the journal. WorldCat is a union catalogue that itemises the collections of 71,000 libraries in 112 countries that participate in the Online Computer Library Center (OCLC) global cooperative [3].

How are articles selected?

SafetyLit content is generally limited to injuries – regardless of intent – that occur over a short period of time, as opposed to the effects of repeated exposures to chemical agents or cumulative damage from repetitive motions. The SafetyLit vision is to include every article relevant to IPSP that is published in any journal that has its text or abstracts in English.

SafetyLit includes citations or summaries of reports about injury occurrence and risk factors. Articles are considered relevant if they concern any of the pre-event or event elements of the Haddon Matrix [4]; the epidemiology of injury; or the financial, personal, or societal costs or consequences of any injury or risk factor. Articles concerning treatment for injuries or complications of medical or surgical care are generally excluded except when the article also contains information on one of the inclusion criteria.

SafetyLit also includes reports on other topics that may help a reader to make decisions about research or prevention strategies and priorities. If an article meets these criteria, the process of selecting it for inclusion is simple – if the answer to any of the following questions is "yes", then the report is likely to be added:

- Do the SafetyLit reviewers find the report interesting?
- Has there been a recent news report about the article?
- Are SafetyLit readers likely to hear of a report from a colleague and want to respond knowledgeably?
- Are SafetyLit readers likely to be questioned about the report from a member of the population they serve?
- Does the report contain findings that are likely to be used to oppose the actions or recommendations of a SafetyLit reader?

SafetyLit strives to include reports from all sides of any issue. Reports summarised in each SafetyLit update are not screened for quality. Even when we believe that there are methodological errors that affect the research findings or when we disagree with the implications, we attempt to provide an objective summary of the report. Material in the 'comments' section of each report's summary is provided by the author(s) of the report – not by SafetyLit.

Using SafetyLit

The SafetyLit *Weekly Update Bulletin*

The *Weekly Update Bulletin* contains citations of 200-300 new journal articles. Clicking on the title of the article will provide more detail such as an abstract or a link to the full text if these are available. Articles are listed under 38 interest categories. The purpose of the categories within SafetyLit is to make it easy for subscribers to the *Weekly Update Bulletin* to limit their content only to the topics that are within the sphere of their interest.

Articles are assigned multiple categories based upon the answer to the question, "Might someone with an interest in (category) find this article useful or interesting?" For example, an article concerning a physiological basis for deep emotional depression could be assigned to the Suicide and Self-Harm category even if suicide is not mentioned in the article text.

The contents of the weekly update are available three ways:

1. A PDF file is posted each Monday before 0100 UTC to the SafetyLit website (www.safetylit.org). The current and past versions of the *Weekly Update Bulletin* may be found via the 'Browse archives' link. The PDF file contains bookmarks that allow a reader to jump directly to any category without needing to scroll through 50-plus pages of citations to get to their category of interest. Those who wish to do so may subscribe to an email notice that will alert them when the bulletin is available at an earlier hour.

2. The new week's citations and abstracts are available in html format at 0100 UTC each Monday by clicking on the 'View current abstracts' link from the SafetyLit home page. (After this time the previous week's material is only available by viewing the appropriate PDF file on the Browse Archives pages.) From here it is possible to scroll through all the week's citations and abstracts or to check selected tick boxes to limit the scope of articles to certain interest categories. A user may avoid the need to tick or un-tick categories by registering and signing up for a personalised custom listing of articles.

3. Each of the SafetyLit categories is available via RSS feed. A feed with an unduplicated listing (without categories) of all articles is also available. This allows readers to receive new articles throughout the week as they are entered into SafetyLit or at any interval (up to once per month) that they desire.

The SafetyLit database

The SafetyLit database contains more than 225,000 articles with more than 1000 items being added each week. The database may be searched by author name or textword using the basic search screen or, if the advanced search screen is used, by author name, textword, hybrid index term, or journal using Boolean operators.

The hybrid index term search uses the SafetyLit thesaurus to allow a user the advantage of 'synonym ring' and hierarchical term searching. The synonym ring function allows a searcher to use a single textword such as 'baby walker' to substitute for doing a series of regular textword searches using the 15 other terms by which the device is known.

Work on the SafetyLit thesaurus is not finished, so the full hierarchical search system is not yet complete. However, some term hierarchies such as geographic area names are available for searching. For example, an index term search using 'Australia' will find articles that contain the words 'Canberra', 'Adelaide', or 'Perth', even if the SafetyLit records do not contain the word 'Australia'.

Until mid-January 2011, a query of the SafetyLit database could take up to a minute to produce results. Now, even a complex search using multiple terms and Boolean operators can produce results in three or four seconds.

Information from the SafetyLit database is available for direct download to bibliographic management software. Formats available include unAPI for the free Zotero system, as well as RIS and BibTeX formats.

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Note from the Managing Editor: In my email correspondence with David Lawrence over the past year, he has made a number of comments. I have excerpted a few below, as I thought they may be of interest to journal readers.

JACRS indexing in SafetyLit

Articles from the most recent issues of *JACRS* have been included in the SafetyLit *Weekly Update Bulletin*. I very much enjoy reading your articles. Each of the peer-reviewed research articles has been quite interesting and I find your news articles useful. I have been particularly impressed with your authors' knowledge of the relevant literature as evidenced by the thorough lists of references. The addition of these recent issues will bring SafetyLit up to date from 2007 forward. Articles from 2005 and 2006 will be included in the SafetyLit archive database.

Coverage of conference proceedings in SafetyLit

SafetyLit has always tried to include abstracts of the complete conference proceedings for international traffic safety-related organisations. Often, this is an important source for information because many important presentations never end up as articles in scholarly journals. Currently, SafetyLit is the only source (free or subscription-based) of the entire AAAM proceedings with author abstracts. By the end of March we should have the complete Stapp and IRCOBI proceedings. Again, although several databases contain some of the proceedings (and those that do contain them have serious errors with the authors and missing page numbers), no other database

has the complete proceedings. By the end of April we should have the complete proceedings of the International Council on Alcohol, Drugs and Traffic Safety.

I found several years of the Australian Road Safety Research, Education and Policing conferences online and will begin adding them. I noticed that the US Transportation Research Board's TRID database has some but not all of these conference abstracts online. We will begin adding full proceedings with author abstracts from these conferences. If you or your readers have suggestions for other conference proceedings that we should add, please contact me at david.lawrence@sdsu.edu and I will try to include them.

ACRS comments on the Draft National Road Safety Strategy

The ACRS has made a formal submission to the Draft National Road Safety Strategy 2011-2020. Although the ACRS welcomes the proposed Safe System approach and the inclusion of serious injuries in its target, the submission also makes a number of criticisms of the draft.

Excerpts from the ACRS submission follow, including introductory remarks, some positives of the Draft, limited attention to linkages and synergies, and the executive summary. The full ACRS submission to the Draft National Strategy is at http://www.acrs.org.au/srcfiles/ACRS-submission-to-NRSC-Feb-2011.pdf

Introduction

The Australasian College of Road Safety (ACRS) is an independent body for those working in or interested in road safety. Members include engineers, epidemiologists, road trauma specialists, researchers, driver trainers, enforcement agencies, psychologists, policy makers, industry representatives, motoring associations, insurance companies and many others who have a stake in road safety.

ACRS offers the following comments on the Draft National Road Safety Strategy 2011-2020 (the Draft).

ACRS has for many years recommended improvements in national road safety. Its *2004 Yearbook*, with expert views on what should be done in the next seven years to achieve the target of reducing the national road toll, included measures discussed in the Draft, e.g., inclusion of injuries as an indicator and the issue of speed. In 2009-2010 in the lead up to the production of the Draft, ACRS ran seminars [1] and focused on the upcoming strategy in its quarterly journal, using the comments of several of the most eminent road safety practitioners and researchers in Australia.

ACRS therefore welcomes the opportunity for formal consultation in relation to the Draft. ACRS was grateful for the lengthy telephone conversation with those responsible for the Draft on 20 January 2011. The comments here are based in part on the information contained in the Draft itself and also on

the conversation that took place.

Some positives of the Draft

ACRS commends the Draft for the inclusion of serious injuries in the overall casualty reduction target (page 12), as the issue was given very little attention in the previous strategy. The definition of the injuries and specific reduction targets, whether to vehicle passengers or other road users, should be specified. ACRS also commends the Safe System as the organising framework for the Draft and the development of the program around its principles (pages 11-12).

As an advocate of evidence-based action, ACRS considers that the 'Research and Modelling' section of the Draft is vital, but inclusion of the material in this section rather than its production on request of limited data for public analysis would have been preferable to enable a more thorough examination than has been possible in the timeframe available to ACRS. Additionally, more information about the selection of the policy scenarios put forward, particularly in relation to others that might have been considered but were discarded, would add credibility.

The Draft's recognition (page 9) that drivers make mistakes and that greater emphasis should be placed on initiatives that improve the inherent safety of the road safety system (that the introduction of seat belts, ESC, traffic lights, roundabouts, etc., do – that is, engineer the driver out of the system) is welcomed. Also welcome is the recognition (page 13) of system managers' roles, i.e., a primary responsibility to provide a safe operating environment. These two statements are not, however, examined to explore possible remediation mechanisms for system managers who fail to provide a safe operating system, just as drivers are often penalised when they fail.

Limited attention to linkages and synergies

The most common expression of dissatisfaction with the Draft by members was in relation to the limited attention given by the Draft to linkages and synergies (p 13). The EU

communication *Towards a European road safety area: Policy orientations on road safety 2011-2020* [2] refers to road safety having close links with policies on energy, environment, employment, education, youth, public health, research, innovation and technology, justice, insurance, trade and foreign affairs – a long list. It also refers to the concept of shared responsibility, which is picked up in the Draft, but the former concept is not expanded on.

To use members' words: "What is disappointing is that the strategy is not contextualised within the broader framework of health, environment and sustainability. While these things are briefly alluded to, the allusion is to 'synergies' rather than critical determining factors. There is no development of the relationship between modal split, health, environment and sustainability – e.g., the idea that public transport can be a road safety countermeasure. In this sense this strategy is a lost opportunity to think outside the box and to be visionary about what road safety is likely to mean in the decades to come. It is disappointing that the really strategic aspects of national policy (as distinct from the more tactical elements) have received scant recognition in the draft. Little more than lip-service is given to the concepts of intersectoral coordination and subsequent synergistic benefits to other agency programs, or of the opportunity cost to other national programs represented by the cost of the road toll."

The College recognizes that the new strategy must be reformist in nature and will require change in many areas. Niccolo Machiavelli captured resistance to change in his famous quote: "There is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things. For the reformer has enemies in all who profit by the old order, and only lukewarm defenders in all who profit by the new order."

While the Draft signals early on (Foreword second paragraph) that bold steps will be needed and that "the time is ripe for a fresh approach" (page 5) to reduce further the number of deaths and serious injuries in Australia, our analysis below suggests that it may have fallen short of its own ambitions. ACRS is a strong advocate for, not an enemy of, the necessary reform.

Executive summary

ACRS welcomes the Draft's Safe System approach and the inclusion of serious injuries in its target. However,

• the Draft lacks an integrated approach to road safety

• the Draft lacks an international context

• the Draft has a target which is not ambitious enough

• the Draft fails to take the opportunity to strengthen data capture and research

• the Draft fails to include cost-effectiveness as a "guiding principle" of the strategy and

• the Draft is not persuasive in relation to implementation and accountability. The case for the interventions chosen in the Draft for priority implementation (sections 7 to 10) is not fully persuasive and the plan for implementation is not robust.

• A combination of the above points in relation to target and international context could lead to the inclusion of an aim or vision for Australia to be at least in the top 10 OECD countries for road safety performance before the end of the decade of the strategy.

• An overarching communication strategy is needed to support all the facets of the National Road Safety Strategy and a clear acknowledgment within the strategy that communication with key stakeholders, such as the media, is vital.

• The Draft lacks urgency and specificity to implement action. It should include performance-based outcomes (i.e., concrete proposals of what is to be achieved) - e.g., no one who is impaired by drink driving will be able to drive a car by 2020; no car less than ANCAP-rated 4 stars will be sold by 2015; no new major road will be less than AusRAP 4 stars by 2015. Technologies which are available now should be utilized immediately rather than leaving them as future steps, e.g., increasing traffic surveillance to improve detection of unregistered vehicles and unlicensed drivers (Draft page 51). Generic targets should be removed as being too easy to achieve. The action steps need to be revisited, and where action is already underway on the first steps, additional steps should be re-prioritized as first steps to assist the rate of improvement. Specific technology should not be mandated, but encouraged through market mechanisms, as it may change during the lifetime of the strategy.

• The Draft lacks any program to improve the skills and competence of all the various professionals and practitioners involved in the many areas on road safety to develop the concept of the Safe System, not only drivers.

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Note from the Managing Editor:

Future issues of the journal will have themes as follows:

   Volume 22 No. 2, 2011 - Road safety in Asia

   Volume 22 No. 3, 2011 - Heavy vehicle safety (a special issue with guest editor Lori Mooren)

   Volume 22 No. 4, 2011 - Media, advertising and road safety messages (a special feature with guest editor Dr Ioni Lewis, CARRS-Q)

Members are invited to contribute articles related to these themes or on road safety more generally. Contact the Managing Editor (journaleditor@acrs.org.au) with respect to deadlines for receipt of articles.

Contributed Articles

Road safety on the world stage

by Geoff Horne (glhorne@optusnet.com.au)

One of the most significant developments of the second half of the last century, in that it impacted the world's population in many ways, was the growth of a global approach to political, social, industrial and commercial initiatives. This was seen most obviously in the formation of the United Nations and its various sub-organisations from 1945 onwards. One of the major sub-organisations was the World Health Organization, formed in 1948, which began running many different health-related projects, particularly to assist developing countries.

It is interesting that the idea of taking a global approach to road safety, and recognising that it is a major health issue in all nations, took much longer to gel, but it is undoubtedly with us now. On 3 March 2010 the United Nations General Assembly agreed that 2011-2020 would be the global Decade of Action for Road Safety. Another manifestation of the growing global approach to road safety was the 'First global ministerial conference on road safety' held in Moscow in November 2009. Our ACRS President Lauchlan McIntosh attended this conference and reported on it in the February 2010 *ACRS Journal* [1]. But these activities were by no means the first stirrings of action at the global level.

The World Health Organization

The World Health Organization (WHO) held its first World Health Day with a road safety focus in 2004, under the theme 'Road safety is no accident' [2]. The WHO website states that 'World Health Day 2004 tried to advocate a "systems approach" to road safety, which takes into consideration the key aspects of the system: the road user, the vehicle and the infrastructure'. That is very significant, as the Safe System approach has now caught on as the way to go in improving road safety.

The International Transport Forum

International activity in road safety was often preceded by international cooperation in general transport issues. An example of this was the formation of the European Conference of Ministers of Transport (ECMT) in 1953. The ECMT decided to broaden its membership in 2006 and to rename itself the International Transport Forum (ITF), with links to the Organisation for Economic Co-operation and Development (OECD). The ITF brings together Ministers of Transport annually from the member countries (currently 51) to discuss general transport issues. In 2008 the ITF published a report, *Towards Zero: Ambitious road safety targets and the Safe System approach*. The report was the culmination of three years' work by international experts [3].

Asia-Pacific Economic Cooperation

Another international organisation that has shown a growing interest in road safety at the global level is the Asia-Pacific Economic Cooperation (APEC) organisation. Founded in Canberra in 1989 with 12 member countries, it now has 21 members.

At the 5th APEC Transportation Ministerial Meeting in March 2007, a joint statement was issued on transport safety, which included a number of sections on road safety [4]. Section 42 summarised the global road safety problem: 'We recognise that an estimated 1.2 million people are killed in road crashes worldwide each year; as many as 50 million are injured, and that 85 per cent of the casualties occur in low and middle income economies; a large proportion of these road traffic fatalities and injuries worldwide occur in APEC economies; and without further action, these figures could increase by 65 per cent over the next twenty years, increasing the social and economic burden across APEC with the costs being estimated to be in the range of 1 to 3 per cent of an economy's annual gross national product.' The joint statement agreed on a number of actions and priorities that would address the road safety problem.

The World Bank

The World Bank has had an important role in road safety developments, particularly in developing countries, by providing financial loans for road improvements to be made and other safety activities to take place. The road safety aspects of projects got under way when the World Bank's Global Road Safety Facility was launched in November 2005 and formal operations started in April 2006 [5].

With total funding of US$15.9 million from fiscal years 2006 to 2010 [6], the new facility was a direct response to various resolutions on road safety adopted by the General Assembly of the UN, so although one might feel justified at times in being sceptical of UN General Assembly resolutions, numbers 58/289 of 14 April 2004 and 60/5 of 26 October 2005 seem to have borne fruit. Apparently the World Bank was also influenced by the World Health Assembly's resolution WHA57.10 of 22 May 2004, which stated, among other things, that the WHA 'considers that the public health sector and other sectors – government and civil society alike – should actively participate in programmes for the prevention of road traffic injury....' [7]

Australia, through AusAID, has been making a contribution to the facility, albeit only 5% of the total funding. One example of this support is in Vietnam. 'As part of our contribution we're funding a pilot in Vietnam to train officials in road safety and to identify affordable engineering projects which will improve the condition of roads,' reported Kerry Groves, AusAID's Counsellor in Vietnam [8].

The UN Road Safety Collaboration

Following the resolution by the WHA, the World Health Organization encouraged formal collaboration between a group of UN and other international road safety organisations, which is now referred to as the UN Road Safety Collaboration (UNRSC). The UNRSC consists of some 40 UN and international agencies working in road safety, with a broad range of skills and experience from the transport, health and safety sectors, and representing governmental and non-governmental organisations, donors, research agencies and the private sector.

UNRSC meets biannually, with meetings alternating between WHO headquarters and the UN Regional Commissions offices. So far, the collective efforts have focused on implementation of the recommendations of the *World report on road traffic injury prevention* [9]. These include:

* publishing and disseminating good practice guides that provide technical guidance on major risk factors, i.e., drink-driving, excessive speed, and helmet and seatbelt use
* global and regional advocacy efforts
* a guide to advocate commemoration of the annual World Day of Remembrance for road traffic victims
* efforts to increase road safety funding.

The FIA Foundation

Discussion of global road safety participants would be incomplete without referring to the important role of the FIA Foundation. The FIA Foundation is an independent UK registered charity founded in 2001 with a donation of US$300 million from the Fédération Internationale de l'Automobile (FIA), the non-profit federation of motoring organisations and the governing body of world motor sport.

The Foundation manages and supports an international program of activities promoting road safety, environmental protection and sustainable mobility, as well as funding specialist motor sport safety research. As a non-government organisation, the Foundation has Roster Consultative Status with the Economic and Social Council of the United Nation, and is a regular participant in the Working Party on Traffic Safety and a leading participant in the UN Global Road Safety Collaboration.

The Foundation works with a range of international agencies, including the WHO, the World Bank and the UN Environment Programme, on road safety and environmental issues [10]. The proposal for a Global Decade of Action for Road Safety was first made by the Make Roads Safe campaign, led by the FIA Foundation, which launched an international advocacy effort to win support from UN members.

Road Safety Week

The first United Nations Global Road Safety Week was held from 23-29 April 2007 and encompassed a variety of activities in many different countries [11]. Part of the activities included the first World Youth Assembly for Road Safety, held in Geneva, Switzerland, and attended by some 400 young people. They agreed to take practical measures to improve road safety and encourage adults to do more as parents and leaders. At the end of the Assembly they issued a 'Youth declaration for road safety' [12].

Road assessment programs

The Safe System approach to road safety has enhanced professional and public awareness of the need for roads that are inherently safe. Ideally, roads should never be the primary cause of crashes and should never increase trauma in the event of crashes due to other causes. In Australia, the Australian Road Assessment Program (AusRAP) has been very beneficial in highlighting sections of road that contain serious hazards for travellers. Similar programs have been running in other developed countries, and more recently, this effort has been extended to some developing countries under the International Road Assessment Program (iRAP) [13].

New car assessment programs

New car assessment programs have existed for a long time – for example, they started in the USA in 1978 through the National Highway Traffic Safety Administration [14] and in Australia in 1992 through the Australasian New Car Assessment Program (NCAP). However, the knowledge obtained from specific test and assessment protocols is not necessarily useful internationally, due to the often local nature of car production and different local safety standards.

Nevertheless, there has been increasing interest in harmonising test standards between the different national or regional programs so that where cars are exported to a number of countries, the NCAP tests are acceptable to all authorities. In this regard, EuroNCAP and Australasian NCAP signed a Memorandum of Understanding in 1999. At a meeting in Japan in October 2010, Australasian NCAP and Japanese NCAP held a meeting of international NCAP organisations, which included a crash test of Mitsubishi's new electric vehicle. Officials were present from Australia, Europe, Japan, Korea, Malaysia and the USA [15]. Current NCAP organisations exist in Australia/New Zealand, China, Europe, Japan, South Korea and the USA. Latin America and India are expected to announce their programs soon [16].

Individual initiatives

In spite of most global road safety activities being launched by international organisations, there remain niche opportunities for individuals or national groups to take useful initiatives at the global level. An example of this is ASIRT – the Association for Safe International Road Travel [17]. ASIRT is a non-profit organisation that was established in 1995 in response to the death of a young American in Turkey. The US Ambassador suggested the creation of a road safety organisation that would promote road travel safety through education and advocacy. It would protect both American citizens abroad and residents of countries around the world. ASIRT publishes road travel reports for over 150 countries to enable travellers to make informed travel choices.

Conclusion

Road safety is now well and truly on the global map! It will be very interesting to see what this means for the future of road safety, particularly for the poorer countries where budgets are very tight and money spent on roads means less for other health and education issues. Hopefully, more of the richer nations will come forward with specific aid programs to address the road safety problems of such nations.

Meanwhile, we have much work to do to make our own road systems safe. We can also share with the rest of the world what we have learned through hard experience and skilful research, and, in fact, have been doing so for some time. A number of our ACRS members, both corporate and individual, have been participants in overseas consultancies and as speakers at overseas conferences and seminars. It would seem that, internationally, Australian expertise in road safety is held in high esteem and that in contributing to the global road safety scene, we are already 'boxing above our weight'. That will only continue to be the case if our federal and state/territory governments and

industry together provide adequate funding for the research and implementation of road safety initiatives in pursuit of further reductions in the road toll.

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Principles of best practice for road safety education

by Professor Donna Cross*, Dr Margaret Hall*, Stacey Waters*, Bruno Faletti**, Deb Zines**, Anne Miller**, Linda Parsons** and Elise Saunders**

*Child Health Promotion Research Centre, Edith Cowan University, Western Australia
**School Drug Education and Road Aware, East Perth, Western Australia

Introduction

Between 2007 and 2009, School Drug Education and Road Aware (SDERA) and the Child Health Promotion Research Centre at Edith Cowan University (CHPRC, ECU) worked together to develop best practice principles for road safety education. One of the benefits and critical success factors of developing a best practice model for road safety education has been the ongoing involvement of key stakeholders at both a state and national level. This national and state collaboration and increased commitment is unparalleled in the area of road safety education.

SDERA in conjunction with Edith Cowan University has widely disseminated the results of this project. It has been a unique initiative involving Western Australian, Australian and New Zealand stakeholders. In 2010, SDERA and ECU were jointly awarded an Injury Control Council of Western Australia Excellence in Community Safety Award in the research category for the research and development work on the *Principles for school road safety education* (SDERA, 2009). The principles that were developed ensure that content and delivery methods of road safety education are consistent with what is currently understood to be best practice in the field.

Best practice road safety education and a Safe System approach

Educating children and young people to be responsible, compliant road users and to become advocates for this behaviour is a critical part of the Safe System approach, which underpins all road safety strategies in Australia including the National Road Safety Strategy. Fostering shared responsibility, building relationships, partnering with the community and ensuring best practice are also pivotal to a Safe System. These are all cornerstones of the best practice project undertaken in 2007 by SDERA in association with the Child Health Promotion Research Centre at Edith Cowan University in WA.

Providing schools and communities with a best practice model for road safety education strengthens and contributes to a Safe System approach by:

- encouraging collaboration and a shared responsibility
- increasing the efficacy of road safety efforts in schools and communities
- educating young people to be compliant road users
- educating young people to be advocates for safer road use
- involving parents and the community in road safety efforts for children and young people.

Rationale

Children and young people use the transport system as pedestrians, passengers, cyclists, drivers and increasingly as moped riders. As a vulnerable and high-risk group, and as frequent users of road and transport systems, children and young people remain a key target group for many jurisdictions and their road safety strategies.

Australian statistics reveal that children and young people up to the age of 18 years are highly represented in transport-related fatalities and hospitalisations. Their injuries and fatalities occur mostly when they are passengers and drivers, with non-use of restraints remaining a significant contributing factor. Males are over-represented in nearly all age groups and road user types,

with pedestrian crashes being another critical issue for children and young people.

The impact of road trauma is devastating for individuals, families and communities. Schools and communities often have limited time and resources to address road safety education. Road safety efforts in school communities are a vital part of the Safe System approach and need to be addressed using best practice methods to ensure meaningful, worthwhile student learning with efficient use of time and resources.

Each year schools and communities contribute to the government's aim of eliminating road crash death and serious injury by:

- increasing parents' exposure to accurate and relevant information about the benefits of children and young people being safer road users and making safer choices
- providing a school environment in which students and staff are encouraged to commit to and engage in safer road safety behaviour
- providing teaching and learning opportunities that engage students in road safety education.

Overview

In 2005 the idea to develop best practice principles was raised by SDERA and supported at a national level by the National Road Safety Education Forum (a nationally representative group of road safety managers) and the then National Road Safety Strategy Panel (the appointed national road safety executive group). It was agreed at a national level that developing evidence-based principles for successful practice in road safety education would benefit all road safety education stakeholders and educators across the country.

With formal support and collaboration from these national reference groups and significant funding from the Insurance Commission of WA, the research to develop *Principles of best practice in road safety education* was commissioned by SDERA in 2006 and completed by the Child Health Promotion Research

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INCLUSION CRITERIA

SCIENTIFIC EVIDENCE:	OR	THEORETICAL EVIDENCE:
The principle has been articulated and the nature of its contribution to effective road safety education specified in *at least three* reputable professional or scientific publications.		The theoretical or conceptual basis of the principle has been described and justified comprehensively in *at least one* reputable professional or scientific publication.

AND

PRACTICAL EVIDENCE:	OR	REAL-WORLD EVIDENCE:
The principle has been identified in the scientific literature as an integral part of *at least two* road safety programs that have demonstrably improved positive road safety attitudes and/or behaviours.		The principle has been *implemented with fidelity* in a real-world setting so that the practicality of the principle has also been assessed.

Figure 1. Inclusion criteria for developing the principles for school road safety education
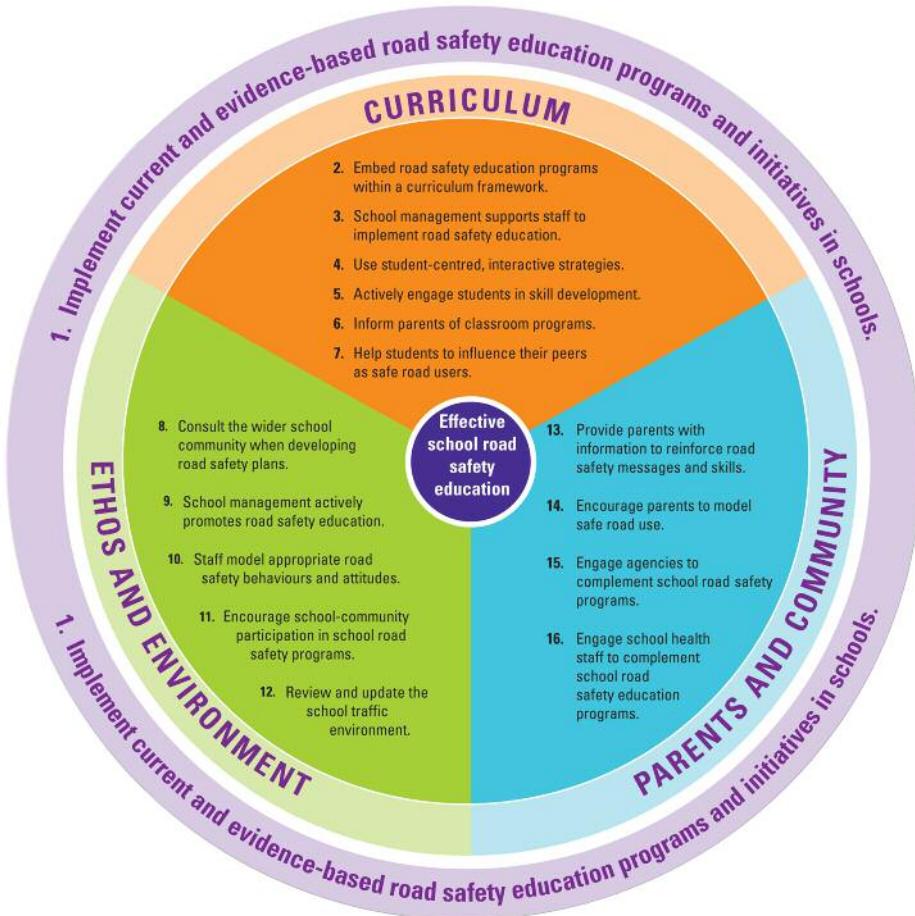
Figure 2. The Effective School Road Safety Education Model. School Drug Education and Road Aware, 2009

Figure 3. Covers of documents recently published by SDERA

Centre at Edith Cowan University in November 2007. VicRoads, along with the Traffic Accident Commission of Victoria (TAC) and the South Australian Government, also contributed financially to this initiative.

The National Road Safety Education Forum (NRSEF) was an important group during all phases of the project. Between 2007 and 2010, the NRSEF was consulted, included in the research and involved in the ongoing dissemination.

The underlying reason for developing principles of best practice for school road safety education included providing clear guidelines for:

- developing resources and training programs
- providing consistency in content and delivery methods with what is currently understood to be best practice in the field
- increasing consistency between road safety education programs across Australia
- helping educators to select the most effective road safety education programs
- increasing national collaborative efforts for initiatives, such as national curriculum, sharing of resources and knowledge.

As a result of the research conducted by the Child Health

Promotion Research Centre at ECU, 16 principles of best practice were formulated for use by schools and communities.

A robust and empirical method was employed by ECU, which included:

- An extensive review of empirical, descriptive and theoretical literature by establishing key search areas, relevant databases, article summaries and a matrix, to search:
  - road safety and road injury for children and youth
  - mediators and outcomes for child and youth road-related injuries
  - origins of road safety education and policies in Australia
  - identified current empirically tested road safety intervention strategies, including barriers
  - identified best practice principles developed in other health areas
- Recruitment of an expert consultation panel consisting of experts/authors, national road safety stakeholders and teachers/educators
- Establishing inclusion criteria for principles and several iterations with a two-round Delphi consultation process
- A validation process with stakeholders, schools and teachers
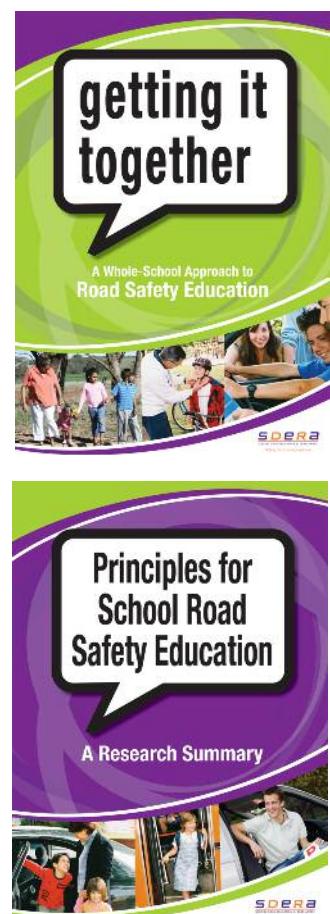
involving school case studies and a national workshop consultation process.

To reach the final list of 16 principles, a draft list of principles was developed after close scrutiny of the literature and against the criteria. This included each principle being robust enough to meet one of the four benchmarks or 'inclusion criteria', as given in Figure 1.

In 2007 and 2008 ECU, in collaboration with SDERA, presented the research findings at two national road safety conferences. During 2008 and 2009, SDERA presented the best practice initiative at three Western Australian forums. In 2009, the *Principle*s were launched at a national meeting of the NRSEF in Adelaide, and SDERA posted a summary document of the *Principles* on the SDERA website in order to provide free access to all road safety stakeholders across Australia.

In 2009, based on ECU's research, SDERA devised the Effective School Road Safety Education Model (see Figure 2), published two documents and distributed the following widely:

• *Principles for school road safety education: A research summary*
• *Getting it together: A whole school approach to road safety education*
• *Principles for school road safety education*.

The covers of the first two documents are shown in Figure 3, and the *Principles* are at Appendix 1. The three documents and model can be used by schools, program developers, educators and agencies to improve road safety education initiatives and efforts in school communities.

In 2010, SDERA and ECU presented the research and *Principles* at the Victorian Traffic Safety Education conference, and SDERA published a report profiling a 2009-10 grants process involving 12 schools that used the *Principles* to develop road safety guidelines and best practice initiatives. SDERA has distributed a copy of *Principles for school road safety education: A research summary* and *Getting it together: A whole-school approach to road safety education* to all national road safety stakeholders represented on the National Road Safety Education forum.

For schools working at a practical level, the *Getting it together* resource simply and clearly demonstrates how staff can:

• address road safety in a whole-school approach (i.e., Health Promoting School Framework, http://www.wacountry.health.wa.gov.au/default.asp?documentid=851)
• plan, implement and review road safety education programs, policies and practices
• increase the value and importance of road safety efforts in the school community
• provide meaningful and developmentally appropriate road safety education programs.

For program developers, educators and agencies the documents describe ways to enrich and complement school programs, and to work collaboratively in a school community. In essence the *Principles* provide a best practice framework of core concepts and values to guide the planning, implementation and review of road safety education programs, policies and practice in school communities. A best practice approach is a fundamental way for schools and educators to contribute to a Safe System by helping them focus on:

• best practice
• a shared responsibility between teachers, parents, community and students
• a collaborative approach to road safety that includes parent and community involvement, sound teaching and learning programs, and an enrichment of the school ethos and environment
• a high level of road user compliance and responsibility
• positive student attitudes towards being an advocate for their own road user behaviour and that of their peers.

In broader terms, SDERA's objectives in developing these documents were:

• to increase the likelihood of schools using a best practice framework for road safety education
• for schools to develop their own road safety guidelines, factoring in all three areas of the Health Promoting School Framework (or whole-school approach)
• ongoing collaboration with agencies, educators and program developers to enrich and complement school programs
• ongoing collaboration with states and territories agreeing to adopt the *Principles* as the foundation or reference for road safety education in their state or territory
• to monitor the links with key stakeholders at a local, state and national level in order to keep road safety as a key agenda item, build relationships, use resources and investigate opportunities.

Key achievements

In 2009 NRSEF endorsed the *Principles for school road safety education* as a best practice framework, based on empirical evidence outlined in the 2008 research report developed by ECU. As a result of the research and SDERA's consultation and dissemination process, the following jurisdictions refer to the *Principles* as the foundation for their road safety education programs:

• **Victoria** – via the organisations represented on the Traffic Safety Education Reference Group, primarily VicRoads, the Department of Education and Early Childhood Development and the Transport Accident Commission
• **Queensland** – Queensland Department for Transport, Energy and Infrastructure
• **Western Australia** – School Drug Education and Road Aware and RoadWise (part of the WA Local Government Association)
• **South Australia** – South Australian Department for Transport, Energy and Infrastructure, and the South Australian Royal Automobile Association
• **Northern Territory** – Department for Lands and Planning

- **ACT** – Department of Education
- **New Zealand** – Department of Land Transport.

In 2010, SDERA and ECU were jointly awarded an Injury Control Council of Western Australia Excellence in Community Safety Award in the research category for the research and development work on the *Principles*. They were also jointly nominated as finalists for the Insurance Commission of Western Australia Road Safety 2010 Awards for the *Principles for school road safety education*.

Monitoring and stakeholder consultation

The collaborative effort of all stakeholders has enabled extensive reach to virtually all jurisdictions in Australia adopting the *Principles*. The project has consequently proved to be a cost-effective model in terms of reach and value for money.

One of the significant initiatives in this project in terms of increasing uptake and reach of the *Principles* was the development of SDERA's three documents based on ECU's research. During the consultation and validation processes of the ECU research, 35 schools from all Australian states and territories provided case studies and samples of exemplary road safety activities being implemented in order to illustrate the practicality of the *Principles*.

The National Road Safety Education Forum (NRSEF) was included throughout the research, development, dissemination and implementation phases of the *Principles*. Twenty-nine members agreed to take part in the consultation phase of the research.

The National Road Safety Executive Group (NRSEG) was updated regularly by SDERA and the NRSEF about the development of the *Principles* and as such, has been supportive of this initiative. Following the establishment of the National Road Safety Council (NRSC) in 2010, SDERA briefed the NRSC secretariat and WA representative on this initiative

In Western Australia during 2009 and 2010, approximately 25 schools attended SDERA professional development workshops based on the *Principles*, and many of these schools developed road safety guidelines and reviewed their programs based on best practice.

In 2010, SDERA published a report profiling 12 schools that received a grant from SDERA in 2009 to develop road safety guidelines and implement best practice road safety education based on the planning tools from *Getting it together*. One example is a school in the Pilbara initiating a 'walk to school' day as a the central theme to involve parents, the community, lessons about road safety and an audit of the school's traffic management processes.

In Victoria, schools are being encouraged to base their road safety programs on a whole-school approach and on the *Principles*. Some examples of this include a holistic bus travel program for a school located in the Snowy Mountains area, and

using student-centred teaching and learning integrating road safety and music.

The *Principles* are reflected in the next Traffic Safety Education: Directions and Action Plan Victoria 2011-2013 (due for release March 2011). Work will be undertaken as part of this plan to develop principles using the SDERA framework for early childhood road safety education appropriate for early childhood settings. This will be in line with the early childhood reforms endorsed by COAG.

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Appendix 1. Principles for school road safety education - Checklist

OVERARCHING PRINCIPLE

1. Implement evidence-based road safety education programs and initiatives in schools and include local research and current legislation where available.

CURRICULUM

2. Embed road safety education programs within a curriculum framework thereby providing timely, developmentally appropriate and ongoing road safety education for all year levels.

3. School management supports teachers to effectively implement road safety education by ensuring access to available resources and professional learning opportunities.

4. Use student-centred, interactive strategies to develop students' utility knowledge, skills, attitudes, motivation and behaviours regarding road safety.

5. Actively engage students in developing skills that focus on identifying and responding safely to risk situations.

6. Provide information to parents/carers that will encourage them to reinforce and practise road safety skills developed in the classroom, in the real road environment.

7. Encourage students to support and influence their peers positively as a way of improving road safety behaviour.

ETHOS AND ENVIRONMENT

8. Consult the wider school community when developing road safety guidelines and policies and then disseminate this information to families and monitor implementation.

9. School management actively promotes road safety education by supporting staff to plan and implement road safety education within the curriculum and other school programs and initiatives.

10. School management actively encourages staff to model appropriate road safety behaviour and attitudes consistent with the school's road safety guidelines.

11. Encourage and promote school-community participation in school road safety programs.

12. Review and update where necessary, in partnership with external authorities, the school road environment to encourage and support parents and carers to practise safer road safety skills.

PARENTS AND COMMUNITY

13. Provide parents and carers with information that will assist them to reinforce appropriate road safety messages and skills (including school guidelines and policies) at home.

14. Provide parents and carers with practical, opportunistic and planned, on-road training for modelling of appropriate behaviours to their children.

15. Establish and maintain links and involve community agencies and local government in the delivery of road safety messages that complement and support existing school road safety programs.

16. Engage, train and resource school health service staff to complement and support road safety education programs and other initiatives in schools.

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keys2drive: An evolution or revolution in the way Australian learner drivers are taught?

by B Haythorpe, Australian Automobile Association National Project Manager, keys2drive, and C Pepper, Senior Communications Consultant, RAA

Introduction

keys2drive is a joint initiative of the AAA (Australian Automobile Association) and the Australian Government. It is perhaps the most extensive and far reaching novice driver training and road safety education initiative in Australia's history. The program has been developed by the AAA and its members (NRMA, RACV, RACQ, RAC(WA), RAA(SA), RACT and AANT) with strong support from the driver training industry and funding from the Australian Government.

keys2drive consists of three major components:

- a free lesson delivered by a keys2drive-accredited professional driving instructor to learner drivers, accompanied by their supervising driver
- a sophisticated website for learner and novice drivers, supervising drivers and professional driving instructors, rich with information and ongoing leaning experiences
- a voluntary accreditation scheme for professional driving instructors who wish to participate, involving initial training, professional development and commitment to the keys2drive code of conduct.

With an aim of 'six months on P-plates with zero harm', the program is designed to contribute to a reduction in the number and severity of crashes involving young drivers. Central to this aim is a change in how novice drivers are taught by both the professional driver training industry and by their supervising driver.

keys2drive has introduced a coaching method called 'Find your own way'. This method encourages the learning-to-drive process to be student focussed and encourages learner drivers to take an active role in their learning.

This paper highlights the results of an independent review of the program completed in November 2010 by Ken Ogden and Associates Pty Ltd, as well as audit results and research conducted by the AAA in 2010 involving learner drivers, their supervisors and the driver training industry.

Background

In 2009, 1507 people were killed on Australian roads – on average, over four deaths every day. Young people aged 17 to 25 years accounted for 361 fatalities, or nearly one-quarter of these deaths, despite representing less than 15% of the population [1].

Research from around the world shows that one of the best things that can be done for novice drivers is to help them gain more real-world, on-road supervised driving experience before they go solo [2]. In May 2008, the Federal government committed $17 million over five years for the AAA to develop keys2drive and deliver free lessons to learners accompanied by their supervising driver. The program was trialled in Tasmania in mid-2009, introduced to the mainland in Victoria in November 2010 and has been progressively rolled out around the country since.

Driving instructors - changing the way young people are taught to drive

'The AAA has put considerable effort into developing a best practice learning design, which would form the basis of the free keys2drive lessons and ideally be used by driving instructors as a basis for all their lessons. The learning design is pedagogically sound and evidence-based, being based on coaching (as distinct from "training" or "instructing" it is referred to as "find your own way") and arguably represents a significant advance in learner driver education.' [3]

The keys2drive approach and program relies on the skill of the driving instructor to move from a traditional teacher-focussed method of teaching to one that is student-focussed and directed. This new approach, called 'Find your own way' (FYOW), encourages the learner driver to ask questions, better recognise risky situations, and find and fix mistakes. FYOW encourages learners to practice for longer, have lots of variations when driving, and actively learn by self-assessing and self-reflecting.

To become keys2drive accredited, driving instructors have to complete:

- an eight-hour classroom-based workshop, facilitated by one of 12 specially trained and experienced coaches (also licensed driving instructors), followed by
- five online, written self-reflection tasks that require the instructor to practice what they have been taught during the training day.

Coupled with this, there are the requirements of:

- a minimum four-star ANCAP (Australasian New Car Assessment Program) safety rating for instructors' vehicles by December 2011
- a minimum of Certificate IV in Driving Instructing (also by December 2011)
- abiding by a keys2drive Code of Practice (developed by the AAA in consultation with the driving training industry) that ensures professional practices.

To date (5 January 2011), more than 98 workshops have been held across the country in every state and territory. A significant number of driving instructors who attended a one-day training course chose not to complete the self-reflection tasks and forfeited the opportunity to gain full accreditation. The reasons for non-completion have been many and varied – for some the requirements proved too difficult and/or time consuming to achieve, while others disagreed with the new approach or requirements.

There are no official or accurate statistics recording the total number of driving instructors in Australia. However, AAA's estimate of the numbers in each jurisdiction, along with the number of keys2drive driving instructor registrations and accreditations as at 5 January 2011, are shown in Table 1.

Table 1. Estimated number of driving instructors and keys2drive accreditations as of 5 January 2011

Jurisdiction	Estimated DIs	DIs who registered an interest in keys2drive	keys2drive accredited
NSW	2000	529	153
VIC	1500	724	308
QLD	1200	354	88
TAS	50	50	24
SA	500	140	34
WA	500	142	31
ACT	50	41	8
NT	30	10	4
Total	5830	1995	650

Based on current figures, less than one-third of driving instructors who expressed interest in the program became accredited. The AAA believes that this has ensured that only those driving instructors who are committed to the program have gone on to gain full accreditation.

The AAA was aware from the beginning that this program would not be taken up by all driving instructors, so the focus became an evolution in the way that learner drivers are taught rather than a revolution. Pleasingly, keys2drive has a strong network of driving instructors that stretches from Bunbury to Cairns and Darwin to Hobart, with more than one-third based in regional Australia.

Ogden & Associates' independent review of keys2drive revealed strong acceptance of the accreditation scheme from driving instructors:

- 'The driving instructors who have embraced the program can become passionate and committed, they liked being networked, believe in the FYOW philosophy, see the difference it makes in learners, and see their business improving as a result.
- I became involved because I value the training, enhanced my professional development, and it made me a better driving instructor.
- keys2drive has played a vital role in the resurgence of my business over the past 12 months.' [3]

The program has 16 'champion' driving instructors who have delivered more than 100 keys2drive lessons and are now reporting that the program has helped to grow their business by repeats and referrals. Positive word of mouth referrals from driving instructors have assisted greatly in promoting the program to potential students and other driving instructors.

The Ogden & Associates' review concludes that while there is probably no objective measure of best practice, the following can be stated about the keys2drive program as it currently stands:

- 'It has been developed with significant (but not total) industry participation.
- It has been well received by those driving instructors who have participated.

The traditional approach to teaching a young person to drive:

Supervised   Unsupervised

'Do as I say'   *'Now find your own way'*

The keys2drive Find Your Own Way (FYOW) approach to learner driving:

Supervised   Unsupervised

'Find your own way and I'll help you in whatever ways I can for as long as you want.'

Figure 1. A comparison of traditional and keys2drive approaches to learning to drive

- It has requirements and a code of practices which, prima facie, seem reasonable and accepted by much of the industry.
- It has a sound pedagogical basis in learning design which forms the basis of keys2drive lessons, reflected in the 'Find your own way' philosophy with an emphasis on coaching as distinct from "training" or "instructing".' [3]

In 2011, the focus of driving instructor training will move from recruiting new instructors to up-skilling those driving instructors already fully accredited. This is seen as an important refresh as well as an audit mechanism to ensure that driving instructors remain true to the keys2drive philosophy. This will be done on a one-on-one basis using the existing network of keys2drive coaches.

Added to this are the 'maintaining accreditation' requirements – short on-line tasks provided to driving instructors every six months, which are designed to professionally develop and continuously improve the keys2drive pool of driving instructors.

Supporting learner drivers and supervisors

As well as the free lesson, the program offers support for learner drivers and supervisors via a comprehensive website, www.keys2drive.com.au. The website has recently been refreshed to allow content that was previously available only to registered users to be available to anyone visiting the site. This is designed to assist learners and supervisors alike throughout the learning process from the time before they get their L-plates to when they receive their P-plates.

The website reinforces the key messages of the FYOW approach and explains the importance of 'long, wide and deep' learning experiences. In a keys2drive context, 'long' refers to having lots of practice, 'wide' refers to having a variety of driving experiences, and 'deep' refers to the active learning or thinking and reflecting associated with each lesson.

keys2drive encourages learner drivers to begin to have P-plate driving experiences while they are on their L-plates to better prepare them for the realities of driving unassisted on P-plates. The program also encourages learners to realise that, even though they may have their P-plates, they are still a beginning driver and should continue to actively learn the skills and attitudes needed to be a safe driver. Figure 1 illustrates the traditional approach to learning to drive compared to the keys2drive approach.

Evaluation – supervisors and learner drivers

The AAA completed two participant surveys in April 2010 and October 2010 among learners and supervisors, which provided a useful measure of the program's effectiveness. In each case, 200 supervisors or learners were telephoned and asked seven questions about their keys2drive free lesson experience.

One of the most significant questions asked was, "Does the supervisor consider that what the beginning driver learned in the keys2drive lesson helped them to be a safer driver?" In April 2010, 93% of respondents answered "yes" and a further 5.5% answered "possibly". In October 2010, a similar question, "Will the keys2drive lesson help the learner be a safer driver?" yielded similar results with 92% of respondents answering "yes" and a further 6% answering "possibly". Overall satisfaction ratings with the program were also extremely encouraging, with 30.5% of respondents rating overall satisfaction levels at 10 out of 10 in April 2010 and 39.5% giving 10 out of 10 in October 2010.

Another positive outcome from the program is that more than 15% of supervisors and learner drivers are returning to the keys2drive website after a lesson to post comments on their experience, such as:
- "My son was very reluctant to attend this service but afterwards realised the importance of the keys2drive program, thanks for opening our eyes
- The Driving Instructor I had was excellent, so excellent in fact I will be using him for all my driving lessons
- I thought it was done really well, I got a lot out of it and I told all my friends who have their L-plates
- My instructor was great, he was really patient and encouraging. Plus my mum learnt a few new things too."

The AAA believes that the many positive comments made about keys2drive can be attributed to the fact that lessons are given in a style that is consistent with how young people are now taught in schools. In essence, this is a shift from one of control to one of empowerment:

'While the approach may be seen as a radical departure from traditional learn-to-drive approaches – and is seen by many driving instructors as such – it actually reflects contemporary

teaching methods for the learner driver age group. In fact, several driving instructors interviewed claimed to be using a similar method; these were the ones who enthusiastically embraced the FYOW approach and keys2drive in general.' [3]

Raising public awareness

To generate more lesson bookings and attendance, and to increase general public awareness for the substantial benefits to be derived from receiving a lesson from a keys2drive accredited professional instructor, a national marketing and communications campaign was launched in December 2010. Preliminary market testing involved piloting a range of key messages to determine the strongest approach and best performing channels. In addition, a number of individuals who the keys2drive team has identified as appropriate and relevant social 'influencers' will be approached with a view to engaging them to assist in increasing awareness for the program.

From November 2010, intensive media monitoring of national newspapers provided further opportunities to respond to stories featuring learner drivers with the keys2drive message. These searches included any stories with references to L-platers, P-platers, and learner drivers generally. Most articles referred to general issues and debate concerning learning to drive, and the keys2drive response consisted of a letter to the editor.

A Facebook page was also set up in response to the dramatic growth in social networking to encourage learner drivers to share their driving experiences and promote the program with their friends. Facebook has more than 500 million active users per month worldwide, and it has become widely accepted as an important communication tool for young people in Australia [4].

The 'wall' element of the keys2drive Facebook page includes tips by driving instructors and is designed to generate general discussion and feedback about the program, as shown in Figure 2.

The AAA has also leveraged its connections with the motoring clubs within each state to assist with marketing and promotion. With a combined membership of more than six million members, an extensive network of retail outlets and access to

some of the most widely distributed magazines in the country, this is a uniquely powerful network for reaching novice drivers and their families.

keys2drive has also received strong support from a number of state-based licensing authorities. Recent agreements in Queensland and South Australia will see all learner drivers who receive their learners permit being given a keys2drive 'postcard' with information on how to access a free lesson.

Conclusion

With a refreshed keys2drive website and hundreds of keys2drive-accredited driving instructors in place around Australia, the program is poised to respond to a significant ramping up in the delivery of free lessons. The success of keys2drive will be judged on its ability to lift instructional standards, as well as its influence in changing the current culture of learner and P-plate drivers.

Passing a test does not guarantee that you are a safe driver. keys2drive offers the ability to empower young people by encouraging them to have 'long, wide and deep' learner driver experiences that ensure they are better prepared for the realities of P-plate driving. Significantly, the vast majority of people who have completed a keys2drive lesson believe the experience will help the learner be a safer driver (93% in April 2010 and 92% in October 2010). These experiences assist learner drivers in the way that they think and behave and, coupled with a change in learner driving culture, will help to ensure a safer driving future for the next generation of young Australians.

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Figure 2. The keys2drive Facebook page

Stop Territory Aboriginal Road Sadness – NT Police Indigenous Road Safety Project

by Superintendent Tony Fuller, Northern Territory Police, Fire and Emergency Services

Introduction

The Northern Territory Police, Fire and Emergency Services are committed to Stopping Territory Aboriginal Road Sadness. Every year we attend too many road crashes where Indigenous people are killed or seriously injured. An example of this carnage occurred on 31 December 2010 with the deaths of two boys aged 5 and 14 years, who were killed as passengers in a motor vehicle being driven on a remote road by a 13-year-old unlicensed driver. There were no adults in the car and the boys were not wearing seatbelts.

This tragic crash was unusual as the driver was not intoxicated; more than half of the Indigenous road deaths are alcohol-related and nearly all are preventable. In the past five years (2006-2010), 130 Indigenous people were killed on Territory roads out of a total 257 road deaths. On average over that period, 26 Indigenous people and 25 non-Indigenous people are killed each year. Putting it into perspective, just over 50% of people killed are Indigenous, yet they account for approximately 30% of the total population. Whilst those figures are tragic in themselves, for every Indigenous person killed, five more are seriously injured in vehicle crashes.

Every day Northern Territory Police apprehend traffic offenders, including drink drivers, in an effort to reduce the road toll, as shown in Figure 1. However, enforcement is only one tool. Education is another important tool to lower the number of road users killed, in particular Indigenous road users, so that they do not become the next Territory road statistic.

Figure 1. Police apprehending traffic offenders in the Northern Territory

Whilst not our core business, in late 2008 the Indigenous Policing Development Division (IPDD) of the Northern Territory Police was tasked by the then Commissioner of Police, Mr Paul White APM, with developing an education project to highlight and address this issue. Thus the STARS project commenced.

The Situation

The number of road fatalities in the Northern Territory for 2010 was 50 (21.3 per 100,000 population) as shown in Table 1. This was 19 more than that recorded over the same period the previous year. Twenty-four of the 50 people killed were Indigenous, which is slightly down on the average, but eight more than the previous year. This still demonstrates an over-representation of Indigenous people in the Northern Territory road statistics.

Table 1. Northern Territory road fatalities 2006-2010

	2006	2007	2008	2009	2010	Total	Average
Indigenous	24	31	35	16	24	130	26
Non-Indigenous	20	26	40	15	26	127	25
Total	44	57	75	31	50	257	51

Source: NT Road Safety

Table 2 provides a breakdown of the figures for 2010, which gives an indication where the target areas are for this project. Obviously from these statistics Indigenous drivers, passengers and particularly pedestrians are over-represented significantly compared to non-Indigenous road users. Not seen in last year's figures, but represented in previous figures, were the number of Indigenous passengers who were killed as opposed to drivers. In past years it was more likely that Indigenous passengers would be killed than drivers. Some of the reasons for this were crashes when there were multiple deaths, crashes when the driver was wearing their seatbelt and the passengers were not, and overloading of vehicles. The project aims to address some of these issues.

Project aim and theme

The aim of the Stop Territory Aboriginal Road Sadness (STARS) project (see logo in Figure 2) is to reduce the number of Indigenous road fatalities and serious injuries in the Northern Territory by raising public awareness in relation to road safety, specifically amongst the Indigenous community.

The theme of this project is using the symbol of stars. This symbology is threefold. Firstly, it is the acronym for 'Stop Territory Aboriginal Road Sadness'. Secondly, the stars represent the positive Indigenous role models who will be presenting their messages, coupled with the message of being bright at night in an effort to combat our pedestrian deaths. Lastly one star is faded, representing the Indigenous People who have died on our roads.

Figure 2. STARS project logo

The primary messages of the project are aimed at:

- drink and drug driving
- pedestrian deaths
- seatbelts.

Project activities to date

ACPO workshop

In August 2009 Aboriginal Community Police Officers (ACPOs) from across the Northern Territory (see photo on the cover of this issue of the journal) attended a workshop addressing issues relating to Indigenous road safety. As part of the workshop they discussed what they, as Indigenous people, thought were some of the issues and how NT Police may be able to address them. They received training from a number of guest lecturers, including road safety lectures from Road Safety – NT Government.

The ACPOs then developed their own training package and submitted what training aids they would need to present the training package to differing Indigenous audiences across the Northern Territory. Funding submissions were tendered and the Division has been gradually acquiring the training aids and distributing them to the regions.

Barunga Road Safety Song Competition

Senior Aboriginal Community Police Officer Bernie Devine teamed up with Indigenous Police Officer Allen Gebadi and

Bernie's brother Chris Devine and wrote and performed a road safety song for the Barunga Road Safety Song Competition held in 2009. This competition is an annual competition run by the Department of Lands and Planning and held at the remote Indigenous community of Barunga, where Indigenous bands are encouraged to write and perform their own road safety songs. Although they did not win the competition, their song has been since used by IPDD in other road safety messages.

In 2010 Senior ACPO Devine again entered a band in the Barunga Road Safety Competition and this time his band came in as runner-up, winning a trophy and $1500.

Talking posters

Through their contacts with Indigenous community members and local knowledge, IPDD sought out the services of a number of AFL footballers to front a series of 'talking posters', as shown on page 2 of this issue of the journal. The players who kindly donated their time and services to pass on their road safety messages were as follows:

- Mr Alwyn Davey (Essendon Football Club), his brother Mr Aaron Davey (Melbourne Football Club) and Mr Russel Davey (Palmerston Magpies Football Club) speak about the loss of their father in a car crash.
- Mr Marlon Motlop and Mr Daniel Motlop (Port Adelaide Football Club) and Mr Steven Motlop (Geelong Football Club) speak about the loss of their grandfather, who was killed as a pedestrian.
- Mr Matthew Campbell (North Melbourne Football Club) speaks about the need to wear seatbelts.

These posters are equipped with audio players that allow messages to be played, giving a stronger message to the target audience. Coupled with this, the messages have been interpreted into 26 different Indigenous languages with the assistance of the Northern Territory Aboriginal Interpreter Service. These posters will be displayed in 52 Indigenous communities throughout the Northern Territory.

They are online at http://www.nt.gov.au/pfes/index.cfm?fuseaction=page&pID=515

Table 2. Northern Territory road fatalities 2010 by road user

	Total	Male	Female	Under 25	Over 25	Indig.	Non Indig.	Urban[a]	Rural
Driver	25	21	4	7	18	12	13	1	24
Passenger	13	7	6	7	6	6	7	1	12
Motorcyclist	5	5	0	2	3	0	5	3	2
M'cycle pillion	0	0	0	0	0	0	0	0	0
Bicyclist	0	0	0	0	0	0	0	0	0
Pedestrian	7	5	2	1	6	6	1	6	1
Total	50	38	12	17	33	24	26	11	39

[a]Urban fatalities relate only to urban areas in Darwin, Palmerston and Alice Springs. All fatalities in other regional areas (Katherine, etc.) are recorded as rural.

Source: NT Government Internet, http://www.nt.gov.au/transport/safety/road/stats/index.shtml

NT Police, specifically IPDD, acknowledge the generous support of the Territory Insurance Office (TIO), which supported this part of the project by funding the purchase of posters. We also acknowledge the support of the players, their families and their football clubs for their assistance in getting these road safety messages to the Indigenous communities of the Northern Territory.

Education sessions

ACPOs, Indigenous police and members from IPDD have been travelling to various school and public events specifically targeting Indigenous audiences to pass on road safety messages utilising the training package developed in the ACPO workshop. Primarily these sessions are aimed at Indigenous events, such as community festivals or schools with Indigenous students.

Other project activities

IPDD are in constant consultation with Road Safety, Department of Lands and Planning, to devise additional joint projects to complement the work already achieved as part of STARS. Some of the projects that IPDD are progressing at the moment include:

Road safety merchandise

NT Road Safety, Department of Lands and Planning, with IPDD have purchased a variety of educational merchandise that will complement the messages already developed and that can be used in the promotion of Indigenous road safety and the STARS project. This merchandise has been purchased to target the Indigenous population. Specifically we have looked at items that are robust, likely to be retained, worn or used, and that could assist with visual identification of pedestrians at night. These items carry the various road safety messages and where possible appear on bright-coloured items.

We have also looked at items dependent on climate. Thongs and bright coloured singlets are used for the top end, whereas we have purchased bright-coloured beanies for the southern regions. We have looked at our audience and use the colouring-in cards for school children and the slapsticks that are very popular with teenagers. We recently received lanyards to give to people in their teens and older, to attach to their mobile phones or keys. We also purchased stickers with clear backing that can be affixed at the top of windscreens with the various road safety messages.

Rather than simply handing out the merchandise we deliberately engage the audience by asking them road safety specific questions and reward them with the gift on the appropriate answers. Several of the merchandise items are shown in Figure 3.

Figure 3. Merchandise products used to market various road safety slogans

Community Road Safety Days and "Muttacar Sorry Business"

In 2009 NT Road Safety, Department of Lands and Planning, sponsored the play "Muttacar Sorry Business", which travelled to a number of Indigenous communities in the Northern Territory promoting road safety messages. NT Police were loosely associated with the play in providing police support where possible in communities where the play was performed.

In 2010 the road safety theme was expanded to Community Road Safety Days, with NT Police giving a stronger commitment by providing Indigenous members who travelled with the show over six weeks. The members performed in the show and presented their road safety messages to the community after each show. Additionally a representative from TIO toured with the group to provide information on motor vehicle compensation. Feedback from the communities was very positive.

Media coverage

Fortunately for NT Police, there has been some very good free media coverage of the project in print, radio and television. Initially members of Radio Larrakia, the local Darwin Indigenous Radio Service, attended the ACPO workshop and assisted the ACPOs in developing their own radio messages in English and several Indigenous languages. These messages were kindly produced by Radio Larrakia and have since been played regularly on Radio Larrakia and other Indigenous radio stations both locally and nationally. NT Police acknowledge the support of Radio Larrakia and the other Indigenous radios stations that have promoted these messages.

Additionally, on at least two occasions we have received national coverage through the television media. Firstly the SBS program "Living Black" came to the territory and filmed a story on Indigenous road safety, specifically on the project and current AFL player Aaron Davey. Secondly Senior ACPO Lorraine Jones, who has been conducting many of the training sessions, featured in an ABC program that covered the Community Road Safety Days.

Locally we have also been fortunate to have had local print coverage with articles about Indigenous road safety. Specifically we have had the Motlop cousins covered in a *NT News* story when they took time out from their football commitments to attend a road safety session at a local high school with a number of Indigenous boarders.

Project evaluation

At this stage a project evaluation has not been completed, as it is simply too early to do so. Additionally this is just one educational project that complements and works alongside others being conducted by NT Road Safety and other service providers targeting Indigenous road users. We are also mindful that the statistics in the Northern Territory, whilst very high per 100,000 population compared to other jurisdictions, are small in number and one crash with multiple deaths can significantly alter the ratio.

On a positive note and at the risk of ruining a good run, at the time of preparing this, the crash killing the two Indigenous boys is the last recorded fatal crash in the Northern Territory. The Northern Territory experienced their first fatality-free January in 2011. This is the first time since data were first collected in 1981 where the NT has not experienced a fatal crash during the month of January. In 2009 February was a fatality-free month, and an exceptional year where only 31 fatalities were recorded as opposed to the average 51.4. Here's hoping this year we will experience a lower level again.

Criminal liability of drivers who fall asleep causing motor vehicle crashes: TLRI report

by R Bradfield, Senior researcher, Tasmania Law Reform Institute, and E Newitt, Executive officer, Tasmania Law Reform Institute

Introduction

In October 2010 the Tasmania Law Reform Institute (TLRI) released its Final Report on drivers who fall asleep at the wheel and cause motor vehicle crashes. The Report looked at the criminal liability of drivers who fall asleep causing motor vehicle crashes that result in death or serious injury. It considered the current laws in Tasmania that relate to these types of crashes and reforms that have been introduced in other jurisdictions. It also considered police practices and procedures, in particular the collection of evidence and the interviewing of drivers and witnesses, in suspected fall-asleep driving cases in Tasmania. The TLRI made a total of 10 recommendations in its Report, of which at least one has been expressly adopted to date.

Background and current law

Courts in Australia have had cause to consider the criminal responsibility of drivers who fall asleep and cause motor vehicle crashes resulting in death or other serious injury on a number of occasions. Most notably, the High Court considered the issue in *Jiminez v The Queen* ((1992) 173 CLR 572). This case is the leading authority in Australia. In *Jiminez*, the court found that for a person to be found guilty of causing death or injury by driving, it is necessary for the prosecution to establish that the accused's act of driving was voluntary.

The court also found that in fall-asleep cases, the period of driving while asleep does not constitute that voluntary act. This means that the focus of the prosecution case must be on the driving that

immediately precedes the driver falling asleep. It is for this prior period of driving that the prosecution must establish criminal fault. A finding that the driver fell asleep may allow the inference of criminal fault to be drawn. That is, if the court finds that the driver fell asleep at the wheel of their motor vehicle, the court may infer that the driver would have known that they were affected by tiredness to the extent that in the circumstances their driving was objectively dangerous and therefore, by continuing to drive, they were criminally at fault.

However, the High Court also found that the liability in such cases is strict rather than absolute, meaning that the accused may rely on the defence of honest and reasonable mistake. This means that the accused can argue that they honestly and reasonably, but mistakenly, believed that it was safe for them to drive.

Between 2001 and June 2010 there were 14 cases in Tasmania where a driver was charged with dangerous driving causing death. The topic for the TLRI's project was suggested by the Attorney-General of Tasmania in 2003 following considerable public comment about two fatal motor vehicle crashes where the drivers had fallen asleep.

An Issues Paper, which considered the application of the principles articulated in *Jiminez* and proposed possible reform options, was released in 2007. The TLRI received 13 responses to this paper. Some responses were from government departments, including the Department of Police and Emergency Management, the Department of Infrastructure, Energy and Resources and the Office of Director of Public Prosecutions, while others were from scientific bodies and agencies associated with sleep research and

transport safety. The TLRI also received a number of submissions from individuals who had been directly affected by fatal motor vehicle crashes caused by a driver who had fallen asleep.

In preparing the Final Report and developing its recommendations, the TLRI gave detailed consideration to all responses received on this matter. The TLRI also attempted to reconcile two competing views about the liability of drivers who fall asleep. On the one hand, there is a reluctance to apportion criminal liability, or blame, to acts over which a person has no conscious control. It would be contrary to a recognised rule of law for an accused to be held liable for an act, such as driving while asleep, which was unconscious and therefore involuntary.

On the other hand, the community is becoming increasingly aware of the dangers posed by drivers affected by tiredness or some other medical condition that may result in diminution of concentration or a loss of consciousness. The community has an interest in seeing that drivers are deterred from driving in circumstances where they pose a danger to themselves and other road users. Some of the submissions received by the TLRI demonstrated or acknowledged the general community's difficulty in understanding and accepting the High Court's finding in *Jiminez* and the principles of voluntary and intentional actions.

Sleepiness/drowsiness and driving

The Report examined research that looked at the cause of sleepiness/drowsiness, the impact of sleepiness/drowsiness on driving, and a driver's awareness of their level of sleepiness/drowsiness. It cited a number of clinical trials and studies[1] that examined awareness of sleepiness and individuals' capacities to predict their driving ability after extended periods of wakefulness.

The Report noted that a driver's awareness of their level of drowsiness is relevant both to the question of the dangerousness/negligence of the driving and also to the defence of honest and reasonable mistake in fall-asleep crash cases. This is because a driver who recognised their level of drowsiness before a crash would be less able to argue that they honestly and reasonably believed that it was safe for them to continue to drive.

The Report did find, however, that the limitations of these studies and the application of their findings to criminal trials ought to be recognised. One limitation identified is whether the results obtained in laboratory-based simulators can be extended to real driving experiences. In particular, most studies involve single periods of sleep deprivation and not an accumulation of insufficient sleep periods or opportunities as usually happens in real-life situations.

Another potential limitation is that the subjects of these trials may have been more aware of their drowsiness because they were being questioned about it. As the submission from the Australian Sleep Association (ASA) highlighted, individuals not in test conditions become less able to judge their performance when sleepy and therefore may not recognise that their driving ability or competence is likely to be impaired. The ASA's submission also

noted that with some medical disorders, such as narcolepsy, falling asleep is not necessarily preceded by a period of drowsiness. The ASA wrote that they did not agree at present that a person who falls asleep can be presumed to have prior awareness that they were at risk of this occurring.

An important distinction that became apparent during the consultation period from a number of the submissions in response to the Issues Paper was that between sleepiness/drowsiness and fatigue. As one respondent noted, fatigue (a subjective state of weariness, often with muscle aches or discomfort, emotional irritability and a disinclination to continue activities) is relieved by rest, whereas drowsiness (the intermediate state between alert wakefulness and sleep and often resulting in 'microsleeps') is relieved by sleep.

The TLRI recommended that greater community education programs and material be developed to inform the public about the risks of driving while drowsy and that the only effective remedy for drowsiness is sleep. This educational material should also address the typical misconceptions drivers have that winding down the window, turning on the radio or turning off the heater will help them be more alert.

Reform options and recommendations

Although the TLRI considered various legislative reform options, including introducing a rebuttable presumption that a driver who fell asleep at the wheel did in fact have prior awareness that they were at risk of falling asleep and amending the current legislation to exclude falling asleep at the wheel as a defence to dangerous or negligent driving charges, it was ultimately decided that no changes ought to be made to the substantive law.

The first reform option explored by the Report was to introduce a provision that specifies that if there is an appreciable risk of falling asleep, driving when sleepy may constitute negligence or dangerousness. A similar provision has been introduced in Victoria into the Crimes Act 1958 (Vic). As noted in the Report, introducing this kind of provision may help to clarify what must be proved to establish negligence and/or dangerousness, and it would provide a framework for prosecuting authorities to properly particularise any charges laid. This option, however, was not supported by most respondents as it was seen to add an extra level of complexity to the current legislation.

The TLRI also received little support for the second reform option to introduce deeming provisions to establish a rebuttable presumption that a person who fell asleep at the wheel did in fact have prior awareness that they were at risk of falling asleep. This presumption would result in a reversal of onus of proof and would require an accused to prove that, despite falling asleep at the wheel, they had no prior indication or awareness that this would occur.

Normally the prosecution is required to prove the elements of an offence and rebut any defences. That is, if the defence of honest and reasonable mistake is raised by the accused, the prosecution must prove beyond reasonable doubt that the defendant did not have an honest and reasonable belief that it was safe to drive

because they were aware of their level of sleepiness/drowsiness.

This option was rejected by respondents on two grounds. Firstly, it was seen to encroach on the fundamental legal presumption of innocence and principle that the prosecution must prove the defendant's guilt. The Australian Lawyers Alliance wrote that requiring a person to prove that they had no warning that they were falling asleep would be unfair and unjust and should not be implemented.

It was also rejected on scientific grounds. As mentioned above, the ASA pointed out in its submission that a person cannot be presumed to have prior awareness that they were at risk of falling asleep based on their feelings of sleepiness. Several other submissions from both the medical and legal communities also noted the limitation of research in this area.

The TLRI received no support for the reform option of amending the current legislation to exclude falling asleep at the wheel being relied upon as a defence. This approach was seen as extreme and would result in falling asleep at the wheel being treated differently from any other form of driver behaviour. For example, driving in excess of the speed limit or after drinking or taking drugs does not automatically result in a finding of negligence or dangerousness.

This reform option does not take account of circumstances where a person may have no warning that they were going to fall asleep, such as an undiagnosed sleep disorder. It also offends against the fundamental principles of criminal responsibility that an accused's conduct must be voluntary and intentional. It would also create an undesirable situation where a judge would have to direct a jury to pretend that the defendant was awake at the time of the crash, even though the jury may have irrefutable evidence that the defendant was in fact asleep. Ultimately it was decided that this reform option would be unnecessary, radical and irrational.

The final option, and the one recommended by the TLRI, was for no changes to be made to the substantive law. That is, the current law as set out in *Jiminez* should continue to apply. This means that prosecution are required to prove that the accused's act of driving that caused death or serious injury was voluntary and intentional. In fall-asleep cases, the prosecution need to ensure it shifts the focus of the legal inquiry from the time the driver fell asleep to the immediately preceding time when the person was awake.

The TLRI also gave consideration to procedural matters in relation to the prosecution of cases involving motor vehicle crashes. All serious and fatal motor vehicle crashes are investigated by the Accident Investigation Squad. The police in these squads have specific skills and training in accident investigation. Where an investigating officer believes that a crime or a summary offence has been committed, he or she prepares a file that is forwarded to the Director of Public Prosecutions, or Deputy Director, who review the file and recommend what charges ought to be laid. Officers in the prosecution section then draft and file a complaint in the Magistrates Court. This complaint contains the particulars of the charge.

After considering the submissions received, and reviewing a number of Tasmanian cases from the last 10 years, the TLRI

formed the view that the current procedure appears to be working sufficiently in relation to the formation of the charge. However, the TLRI found that there appears to be some continued problems in relation to the drafting of the particulars of negligence in fall-asleep cases. In a number of cases, several of the particulars (that is, the details of the crash relevant to the charge) referred to the period of driving after the accused had fallen asleep (and so could not be considered criminally responsible). These particulars did not comply with the requirements of *Jiminez*.

In order to avoid these situations in the future, the TLRI recommended that police prosecutors, with guidance from the Office of the Director of Public Prosecutions, prepare a precedent for the particularisation of negligence where it is alleged that the driver has fallen asleep. In December 2010, the TLRI received a letter from the Director of Public Prosecutions stating that he had drafted some particulars in accordance with this recommendation for the Prosecution Service to use.

During the consultations and research conducted by the TLRI, it became evident that the initial investigation of crashes by police, including the interviewing of both the driver and other witnesses, is vital to the success or otherwise of a case. Fall-asleep driving cases have been successfully prosecuted in Tasmania where the crash was investigated by a member of the Accident Investigation Services and the interview conducted by a police officer with experience in driving cases and an understanding of the issues surrounding *Jiminez*.

For these reasons, the TLRI recommended that police policy and procedures reflect the need for all crashes to be investigated by police officers with training in the legal principles set out in *Jiminez* and all interviews in suspected fall-asleep cases be conducted by police with similar training and understanding. To date the TLRI has not received any indication from the Department of Police and Emergency Management (Tasmania) to indicate if these recommendations have been adopted.

Both the Issues Paper and Final Report are available from the TLRI's website: www.law.utas.edu.au/reform

Notes

[1]These included the following: Reyner L, Horne J. Falling asleep whilst driving; Are drivers aware of prior sleepiness? International Journal of Legal Medicine 1998; 111(3): 120-123; Crummy F et al. Prevalence of sleepiness in surviving drivers of motor vehicle collisions. Internal Medicine Journal 2008; 38(10): 769-775; Lisper H et al. Relation between time of falling asleep behind the wheel on a closed track and changes in subsidiary reaction time during prolong driving on a motorway. Ergonomics 1986; 29(3): 445-453; Horne J, Baulk S. Awareness of sleepiness when driving. Psychophysiology 2004; 41(1): 161-165; Atzram M et al. Can sleep attacks occur without feeling sleepy? Sleep 2001; 24: 428; Jones C et al. Self-awareness of impairment and the decision to drive after an extended period of wakefulness. Chronobiology International 2006; 23(6): 1253-1263.

Peer-Reviewed Papers

Retraction of the Voukelatos and Rissel paper on bicycle helmet legislation and injury

Note from the Peer-Reviewed Papers Editor

As indicated in the November 2010 issue of the journal, the response from Dr Alex Voukelatos and A/Prof. Chris Rissel (V & R Response) to Tim Churches' letter concerning data errors in the original Voukelatos and Rissel paper published in August 2010, was not published in full. It was indicated to readers that there was insufficient time to further relay the reviewers' concerns regarding the V & R Response back to the authors. In particular, it appeared that the V & R Response presented new information from other researchers' literature to support their original conclusions that "mandatory bicycle helmet legislation appears not to be the main factor for the observed reduction in head injuries among pedal cyclists at a population level over time", rather than focussing entirely on addressing the data errors in the original paper. Moreover, the editors were concerned that all of the issues concerning correction of the errors highlighted by the reviewers were not adequately addressed.

Since November 2010, there have been two rounds of reviews of Dr. Voukelatos and A/Prof. Rissel's reply letter and response from the authors. Dr. Voukelatos and A/Prof. Rissel provided yet another reply. After much deliberation, the journal editors have decided to formally retract the publication by A Voukelatos and C Rissel, 'The effects of bicycle helmet legislation on cycling-related injury: The ratio of head to arm injuries over time', published in the August 2010 issue of the journal. This decision was made in compliance with the guidelines provided by the Committee on Publication Ethics (COPE) as ratified by the ACRS Executive Committee on 18 November 2010 (http://www.acrs.org.au/publications/journalauthorguidelines.html)

Retraction of the paper is made for the following reasons:

a) The authors had been given the opportunity to provide a response to the Tim Churches letter, and had done so.

b) The authors' response was sent out for peer review to five independent reviewers: three Australians, one American and one international reviewer from Germany. The reviewers' qualifications range across the professions of psychology, engineering, medicine and science, while their extensive expertise ranges across the areas of epidemiology, biostatistics, cycling safety, transport engineering, hospital and crash databases, and crash investigations. As a result of the review the authors were asked to further revise their response.

c) This revised response was again sent to the peer reviewers, but was found to still contain serious errors: it contained data errors (incorrect ICD-9-CM codes used); it excluded the first year of data from the original paper without good reason; it still had graphing errors (RTA survey data still shown in wrong place on graph); it failed to implement simple but essential adjustments (sample weighting and exclusion of hospital transfers), which are routinely done for analysis of such data; and it introduced new data (on cycling fatalities), which was not in the original paper and which was inappropriate to include in such a correction.

In retracting this paper, the journal is not trying to stifle scientific debate; however, in the absence of a response from the authors that addresses reviewers' concerns - in effect, that is free of data errors and that has no basic methodological flaws - the journal has no choice but to retract the paper and apologises for any inconvenience this has caused.

The authors have been offered the opportunity to submit a new paper on this topic for consideration for publication by the journal.

Prof. Raphael Grzebieta
Peer-Reviewed Papers Editor

The role of personality in predicting hooning-related driving behaviour

By CL Thake, KA Armstrong and NL Leal, Centre for Accident Research and Road Safety – Queensland (CARRS-Q), Queensland University of Technology

Abstract

'Hooning' constitutes a set of illegal and high-risk vehicle-related activities typically performed by males aged 17-25, a group that is over-represented in road trauma statistics. This study used an online survey of 422 participants to test the efficacy of the Five Factor Model of Personality in predicting 'loss of traction' (LOT) hooning behaviour. Drivers who engaged in LOT behaviour scored significantly lower on the factor of Agreeableness than those who did not. Regression analyses indicated that the Five Factor Model of Personality was a significant predictor of LOT behaviour over and above sex and age, although Agreeableness was the only significant personality factor in the model. The findings may be used to better understand those drivers likely to engage in LOT behaviours. Road safety advertising and educational campaigns can target less socially agreeable drivers, and aim to encourage more agreeable attitudes to driving, particularly for younger male drivers.

Keywords

Hooning, Driving, Personality, Five Factor Model of Personality, Agreeableness

Introduction

Hooning behaviour has received increasing attention as a road safety issue [1] and considerable media coverage across Australia in recent years [2, 3]. During the past decade, Australian state governments have progressively introduced legislation specifically aimed at reducing hooning activity, with the intent of minimising road fatalities and trauma. Proactive road safety countermeasures including driver education [1] and preventative campaigns aimed at influencing driver attitudes toward hooning behaviours [4] have also been regarded as important to curbing the behaviour. The current paper sought to expand the limited evidence base available to better understand those drivers likely to engage in a subset of hooning-related driving behaviours defined by 'loss of traction' (LOT) events, and to inform road safety advertising and education campaigns aimed at reducing LOT behaviours.

Defining a 'loss of traction' subset of hooning-related behaviour

The term 'hooning' generally refers to a diverse cluster of illegal and risky driving-related behaviours described in Table 1. Though often considered collectively, two different subsets of vehicle-centred hooning activities are evident [5]. One is mainly characterised by speed and racing activities, and the other by noise and 'loss of traction' events [6]. Hooning behaviour involving speed and racing constituted 19%, and 'loss of traction' events 67% of offences committed during a 15-month period by drivers whose vehicles had been impounded at least once under the Queensland Police Powers and Responsibility Act [7]. These statistics highlight the greater frequency of 'loss of traction' events.

Additionally, there are inherent difficulties in measuring the broad range of activities that typically constitute hooning, and precise definitions of hooning behaviour are needed [8]. Therefore, this study sought to enhance internal reliability by investigating a homogenous set of behaviours characterised by 'loss of traction' events, which are defined as doing 'burn outs', 'donuts', 'skids', 'fishtailing' or any other driving manoeuvre that intentionally causes the wheels of the vehicle to lose traction with the driving surface.

Who is involved in hooning driving behaviour?

Previous studies have confirmed that the majority of drivers involved in broadly defined hooning activities are males aged 17-25. For example, it was found that a sample of drivers whose vehicles had been impounded at least once under Queensland Police Powers and Responsibility Act [7] during a 15-month period ending in October 2006 were predominantly male (97.3%) and aged 17-24 years (75%) [6]. Similarly, it was found that males aged 16-25 years were more willing to engage in hooning-related behaviour than drivers of all other sex and age cohorts [8]. It is this same group of young male drivers that is over-represented in Australian road crash statistics [9].

Potential for harm

Males and females aged 17-25 years each account for approximately 7% of the Australian population [10]. However, males in this age group accounted for 19.5% of total road deaths in Australia during the 12 months ending April 2008, compared with 5% for females in the same age group [9]. The prevalence of hooning-related behaviour and road crash deaths for males aged 17-25 years highlights the importance of continued research in the area.

Previous studies have produced useful data regarding incidence, demographics and safety implications of hooning [1], perceptions and experiences of those engaged in the hooning 'culture' [5], profiles of typical and atypical drivers who engage in hooning behaviour [6], and strong external and social influences on the prediction of hooning behaviour [8]. No previous research has captured the possibility of purely internal influences on hooning-related behaviour, for example, personality.

Table 1. Activities typically considered as hooning behaviours in Queensland

Activity	Description
Burn outs	Purposely causing the rear tyres of a vehicle to lose traction with the driving surface and spin, producing smoke from burning rubber or substances such as oil placed under tyres
Donuts	Fully locking steering on front wheels while doing a burn out, causing the rear of the car to rotate, leaving a circular pattern of tyre rubber on the road surface
Skids	Locking the wheels whilst in motion, causing the vehicle to be dragged along by its own momentum
Fishtailing	In rear-wheel vehicles, purposely causing the rear end of the vehicle to skid to one side, then turning the steering wheel in the same direction as the skid until the rear end of the vehicle skids in the opposite direction. Fishtailing is usually performed on low-friction road surfaces such as unsealed roads or in wet conditions
Lapping	Repeatedly driving vehicles slowly around a pre-determined combination of streets
Street racing	Simultaneous rapid acceleration of two or more vehicles that are beside each other on the road, in a test of comparative acceleration capacity of the vehicles
Road blockades	To enable cars travelling ahead on multi-lane roads to street race from a rolling start, vehicles travelling behind, and side by side, travel very slowly to block regular traffic from behind
Speed trial	A trial of any description that is designed to test the speed capacity of a vehicle and/or driver
Drifting	Accelerating a vehicle while cornering in such a way as to cause the rear end of the vehicle to slide on the road
Parking up	A large gathering of people who study each other's vehicles, network and plan illegal driving activities

Sources: Folkman (2005) [1]; Leal et al. (2007) [6].

Personality theory

Personality is a theoretical concept that considers the many internal mental processes that integrate to characterise what an individual is like, and how he or she behaves across different situations [11]. The Five Factor Model of Personality is a trait approach, which posits that characteristics of personality can be captured by five dimensions. Extensive factor analyses of a range of personality tests and scales, and of numerous adjectives used to describe personality, produce clusters of related characteristics, each cumulatively representing one of the five personality factors [12]. Broadly, these five factors can be described as:

1. *Neuroticism* - the degree to which a person is anxious and insecure as opposed to calm and self-confident
2. *Extroversion* - the degree to which a person is sociable, leader-like and assertive as opposed to withdrawn, quiet and reserved
3. *Openness to experience* - the degree to which a person is imaginative and curious as opposed to concrete-minded and narrow in thinking
4. *Agreeableness* - the degree to which a person is warm and cooperative as opposed to unpleasant and disagreeable
5. *Conscientiousness* - the degree to which a person is persevering, responsible and organised as opposed to lazy, irresponsible and impulsive.

The Five Factor approach has evolved to the model presently measured by the NEO Personality Inventory (NEO-PI) [13]. Scales measuring individuals' scores are interpreted on continuums according to whether each individual scores higher or lower on a particular factor [13].

Previous studies have applied the Five Factor Model of Personality to road safety issues. For example, a study that examined the mediated relationship between personality and crash risk indicated that all five factors had indirect effects on crash risk as measured by crash involvement and traffic offences [14], while a different study revealed that traffic offenders scored higher on extroversion than non-offenders [15]. Another study found a negative relationship between altruism (which is a facet of Agreeableness) and speeding behaviour for young drivers [16]. These findings support the proposal that personality may also play a role in explaining hooning-related behaviour.

Aims and hypotheses

The aim of this study was to investigate the influence of personality (as measured by the Five Factor Model) on LOT behaviour, first by testing for group differences in personality between those who do and those who do not engage in the behaviour, and second by testing the efficacy of the Five Factor Model in explaining LOT behaviour. Therefore, it was hypothesised that on average, drivers who engaged in LOT behaviour would differ from those who did not in terms of personality as measured by the Five Factor Model.

Consistent with typical characterisations of hooning behaviour [see 1, 17, 18] and the nature of each of the personality factors, it was predicted that drivers who scored higher on the continuum of Neuroticism (and thus were more insecure) and Extroversion (and thus were more assertive) would be more likely to engage in LOT behaviour. Conversely, it was predicted

that drivers who scored lower on the continuum of Openness (and thus were less imaginative), Agreeableness (and thus were less cooperative) and Conscientiousness (and thus were more impulsive) would be more likely to engage in LOT behaviour.

Effects of age and sex on generally defined hooning behaviour have been identified [e.g., 6, 8], as have differences in trait personality according to age [19] and sex [20]. As such, in order to avoid possible confounding effects of age and sex, these factors were used as controls.

Method

Participants

In total, 422 participants who had driven a car on the road in Queensland during the previous month were recruited from Queensland University of Technology (QUT) students and staff, from Technical and Further Education (TAFE) colleges in south-east and northern Queensland areas, and via social networking internet sites. The sample comprised 274 (65%) females and 145 (34%) males (three people did not indicate their gender), with ages ranging from 17 to 73 years (median = 27, standard deviation = 12.45).

Design and measures

Demographics: All participants were required to indicate relevant demographic information including age, sex, car licence type, study institution, work status and occupation.

Hooning-related behaviour: For the dependent variable, hooning-related behaviour, participants were asked to recount the number of times during the previous month that they had engaged in the subset of hooning activities described as LOT events and defined by doing burn outs, donuts, skids, fishtailing, or any other driving manoeuvre that intentionally caused the driving wheel or wheels of the vehicle to lose traction on a public road or footpath, or in a public park or car park. This information was transformed into a dichotomous variable labelled 0 ("no") or 1 ("yes").

Personality: The independent variable was measured by a scale of 50 items sourced from the International Personality Item Pool (IPIP) Collaboratory [21], which is freely available online. The IPIP measure used was designed to correlate highly with the five domains of Costa and McCrae's [22] Revised NEO Personality Inventory (NEO-PI-R) [23]. The internal consistency of the IPIP measure is comparable to the NEO-PIR-R, with Cronbach's alpha coefficients from an adult community sample of .86 for the Neuroticism subscale, .86 for the Extroversion subscale, .82 for the Openness subscale, .77 for the Agreeableness subscale and .81 for the Conscientiousness subscale [23]. With correction for measurement error, correlation between the IPIP scales and the corresponding NEO-PI-R scales range from .85 to .92. [21]. Each domain is measured by five positively keyed and five negatively keyed items scored on a five-point Likert scale rated from 1 ("very inaccurate") to 5 ("very accurate").

Procedure

Participants were recruited by self-selection in response to a direct email invitation. An electronic checkbox was provided to indicate informed consent, and directly linked respondents to the online questionnaire. Participants from the QUT first-year participant pool could claim course credit, while other participants could enter into a draw to win one of a number of double movie passes. Questionnaire responses were automatically recorded on a Microsoft Excel spreadsheet.

Results

Data analysis

The Statistical Package for the Social Sciences version 16.0 (SPSS) was used to analyse data. Several cases contained more than 15% missing data and were retained and used only for analyses for which data was adequate. Where analytic procedure allowed, remaining cases with a random pattern of missing values representing 5% to 15% of data were excluded analysis by analysis. To avoid depletion of sample size, for items with missing values, all mean scale scores were calculated to allow for one missing value. An alpha level of $p < .05$ was used for all analyses. Table 2 displays demographic characteristics of the participants.

Table 3 displays sample and LOT behaviour group means for the five factors of personality. For the personality factor of Neuroticism, the sample mean was central on the five-point Likert scale, indicating that on average, participants were neither high nor low on this trait. For the four other personality factors, sample means ranged from 3.43 to 3.75 indicating that, on average, participants scored moderately high on these traits. Sample mean scores for all factors of personality did not show a great range of variability. Consistent with predictions, it is noted that, drivers who did engage in LOT behaviour during the previous month had marginally higher mean scores for the factors of Neuroticism and Extroversion, and marginally lower mean scores for the factors of Openness and Conscientiousness than drivers who did not engage in the behaviour.

Independent groups t-tests (one-tailed) revealed that observed differences for the factors of Neuroticism, Extroversion, Openness and Conscientiousness were not statistically significant. However, for the trait of Agreeableness, scores were significantly lower $t(368) = 5.38, p < .001$, for drivers who engaged in LOT behaviour (*Mean* = 3.39, *Standard Error* = .07), than for those who did not (*M* = 3.81, *SE* = .03). The mean between-groups difference was .42 (*SE* = .08), with a 95% confidence interval of .26 to .57, with large effect (*d* = .83).

As sex and age were related to personality factors and LOT behaviour, a sequential logistic regression analysis was performed to determine whether personality theory was a significant predictor of LOT hooning behaviour over and above sex and age. That is, sex and age were entered as controls into

block one, and were significant predictors, such that the addition of the five personality variables at block two revealed a good model fit, with personality theory significantly improving the overall model. While the overall model $\chi^2(7, 348) = 65.81$, $p < .001$ predicted LOT behaviour, a Nagelkerke R square value of .31 suggested that, after controlling for the effects of sex and age, personality theory explained an additional 5% of variance in LOT behaviour.

Table 2. Participant Demographics (N =371)

Characteristic	n	%
Age range		
17-25	156	42.0
26 and over	198	53.4
Missing	17	4.6
Car licence type		
P1[a]	43	11.6
P2[b]	14	3.8
Provisional[c]	33	8.9
Restricted	1	0.3
Open	272	73.3
International	8	2.2
Work status		
Employed	321	86.5
Not Employed	50	13.5
Occupation[d]		
Manager	27	7.3
Professional	131	35.3
Trade or technical	24	6.5
Community and personal services	15	4.0
Clerical or administrative	55	14.8
Sales	54	14.6
Machinery operator or driver	1	0.3
Labourer	9	2.4
Self employed	5	1.3
Missing	50	13.5

Notes:

[a]Provisional Licence held for less than one year.

[b]Provisional Licence held for more than one and less than three years.

[c]Provisional Licence held for up to three years. At the time of the study, some drivers still held this superseded licence type, and had done so for more than two and less than three years.

[d]Occupations labelled according to the Australian Standard Classification of Occupations [24].

As shown in Table 4, the personality factor of Agreeableness was a significant individual predictor of 'loss of traction' driving behaviour during the previous month ($p < .05$), with those who scored lower on this trait more likely to engage in the behaviour.

Table 3. Personality factor means

Personality factor	LOT Group	n	M	SD
Neuroticism		370	2.46	.74
	No	316	2.44	.75
	Yes	54	2.55	.69
Extroversion		368	3.43	.67
	No	315	3.42	.68
	Yes	53	3.50	.57
Openness		369	3.55	.58
	No	315	3.56	.59
	Yes	54	3.50	.51
Agreeableness[a]		370	3.75	.54
	No	316	3.81	.53
	Yes	54	3.39	.48
Conscientiousness		369	3.70	.64
	No	317	3.71	.63
	Yes	54	3.63	.67

[a]Difference between LOT = No and LOT = Yes was significant at $p<.01$

Discussion

The aim of the current study was to test the application of personality theory to LOT hooning behaviour, by testing the efficacy of the Five Factor Model of Personality in predicting the behaviour. It was found that personality differed between those drivers who did and those who did not engage in recent LOT events. The difference was limited to the trait of Agreeableness, revealing that those who did engage in the behaviour were less agreeable in personality compared to those who did not.

It is important to note, however, that on average all participants reported a moderately agreeable disposition, indicating that as a group, those drivers who engage in LOT behaviour are not characteristically low on the continuum measure of Agreeableness but rather somewhat less agreeable in disposition than those who do not engage in the behaviour. Although not significant, the directions of trends in group differences were consistent with predictions in accordance with characteristics of hooning-related behaviour and personality traits.

The utility of personality theory in explaining LOT behaviour further revealed that the Five Factor Model of Personality predicted additional variance in the behaviour, after controlling for the influence of sex and age. Consistent with the previous analyses, Agreeableness was found to be individually significant in predicting LOT behaviour, suggesting that in general, drivers who are less agreeable (and therefore are characterised as less warm and cooperative) are more likely to engage in LOT hooning behaviour.

Implications and recommendations for road safety

While it is not possible to legislate based on personality, studies such as this improve our understanding of the factors associated

Table 4. Sequential logistic regression: Contribution of personality factors to prediction of LOT behaviour (N=348)

Variables	B	SE	Wald	Odds ratio statistic	95% Confidence interval for odds ratio	
					Lower	Upper
Block 1: Sex and Age						
Sex	1.91	.40	22.96[a]	6.78	3.10	14.80
Age	1.57	.41	14.66[a]	4.82	2.16	10.81
Block 2: Personality						
Neuroticism	.27	.33	.68	1.31	.69	2.50
Extroversion	.38	.31	1.52	1.46	.80	2.68
Openness	.10	.34	.10	1.11	.57	2.15
Agreeableness	.89	.40	5.07[b]	.41	.19	.89
Conscientiousness	36	.33	1.19	1.43	.75	2.74

[a]$p < .001$, [b]$p < .05$

with LOT behaviour prevention. The significant finding for the personality factor of Agreeableness has potential to inform advertising campaigns that promote responsible driving behaviour whilst appealing to less socially agreeable drivers. For example, an advertisement could feature a role model expressing no concern for breaking the law, but distress at the thought of injuring innocent people. Educational strategies and advertising campaigns could also encourage more caring and cooperative attitudes for drivers.

Strengths and limitations

Further, it is important to note that the current study has a number of strengths and limitations. For instance, the study is original in testing the association of personality with hooning-related behaviour. Second, the internal validity of results is enhanced by use of a clearly defined construct of hooning, limited to LOT events, which avoids possible confounds associated with other overlapping illegal driving behaviours, for example, speeding. Third, sample size was adequate to produce robust findings for the regression model, which tested the influence of personality on LOT behaviour. Control for the effects of sex and age in regression analysis further improves the validity of findings with regard to personality, as these factors are associated with both the independent and the dependent variable and could have posed rival explanations for the results.

A low base rate of hooning activity in the overall driving population may explain the proportionately small group of drivers who self-reported engaging in LOT behaviour. However, it is suspected that response bias has contributed to under-representation of the true proportion of drivers who engage in LOT behaviours. Fear of legal apprehension may have discouraged participation by some invitees, while personality may have also contributed to depletion of size for the target sample – that is, altruism, cooperation and social mindedness are attributes of those who score high on Agreeableness [12].

In the overall sample, the mean score for Agreeableness was higher than for the other four personality factors. It is possible that those lower on the trait of Agreeableness who stated they had engaged in LOT behaviour may have been inclined to contribute to response sets, and to submit incomplete surveys, all of which resulted in exclusion from the final sample.

Invitees who were less agreeable may also have been unwilling to participate at all. Therefore it is likely that drivers who are low on Agreeableness and thus more inclined to engage in LOT behaviour are under-represented in the current study. From this argument it is suggested that the association between Agreeableness and LOT behaviour may be stronger than revealed by current results and that personality may actually be a barrier to accessing a population sample that represents the true incidence of LOT hooning-related behaviour within the driver population.

Further, sample demographics for this study do not represent the general population of drivers [10, 24]. In particular, those who typically engage in hooning-related behaviour are under-represented in terms of age, sex, and occupation [6]. Hence, caution is recommended in generalising findings to other driver populations.

Definition of a homogenous subset of LOT hooning-related activities strengthened the internal validity of results in the current study. Future research could define and investigate a homogenous subset of hooning activities associated with speed and racing, to produce literature that encompasses the diversity of behaviours typical to hooning.

Additionally, future research may aim to improve external validity of results by accessing a more random sample of participants. Improved accessibility to participants from trade and technical institutions could be achieved by prior arrangement with management to ensure administration of request emails to a pre-determined number of potential

participants, or by employing a method that does not rely on institutions for accessing participants.

Conclusion

Overall, this study has added a unique dimension to road safety literature by demonstrating that there is a significant association between personality and hooning-related behaviour. Specifically, it was found that those who engage in the behaviour will be, on average, less agreeable in character than those who do not. No significant differences between drivers who do and do not engage in the behaviour were found for Neuroticism, Extroversion, Openness or Conscientiousness.

Further, results of this study confirm the role of personality, and in particular, the factor of Agreeableness, in explaining LOT hooning-related behaviour over and above the influences of sex and age. These findings can be utilised to better understand those drivers likely to engage in LOT behaviours, and to inform proactive interventions such as advertising and educational programs.

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Parents and young drivers: The role of learning, behaviour modelling, communication and social marketing

by M Franks Papakosmas and G Noble, Centre for Research in Socially Responsible Marketing, University of Wollongong, Northfields Ave, Wollongong, NSW, 2522, email: maryp@uow.edu.au

Abstract

The rates of death and injury amongst young novice drivers remain disproportionately higher than for any other group of licensed drivers despite a range of measures such as the Graduated Licensing System (GLS) and mass media-based safety education campaigns. To date, there has been little

research examining the role of a critical reference group – parents – in influencing novice driver learning and behaviour, with studies predominantly concentrating on the role of parental supervision and the effectiveness of the GLS.

In this qualitative study, learner and novice drivers and their parents were recruited take part in a series of focus groups in order to gain insight into how parents teach their children to drive and the perceived experiences of both groups. Research findings suggest the negative behaviour parents modelled conflicted with the safe driving habits they attempted to teach. The research also found parents struggled with confidence, competence and communication while acting as driving instructors. These findings are discussed from both an upstream and downstream social marketing perspective. The development of downstream interventions that focus on parents' role in shaping young drivers' attitudes could positively influence novice driver safety.

Keywords

Young drivers, Parents, Social marketing, Communication, Behaviour modelling

Introduction

Around the world the rate of death and injury among young drivers (17-25 year olds) is disproportionately higher than for other licensed drivers, and is particularly high in the months immediately after licensure [1, 2]. For example, in New South Wales (NSW), young drivers aged 17-25 represented 14% of all licensed drivers, yet in 2006-07 they were involved in 24% of all fatal crashes [3]. Similarly in Victoria in 2008, 27% of fatalities involved 18-25 year old drivers although they accounted for only 13% of all Victorian licence holders [4]. In the USA 15-20 year old drivers accounted for only 6.4% of the nation's licensed drivers, but were involved in 13% of all fatal crashes in 2007 [5].

Driving skill, knowledge and experience of newly licensed drivers have been suggested as factors in their rate of death and injury [6-8], with crash figures particularly high for the first six months of licensure [2]. Major safety education campaigns, changes to legislation and the introduction of the Graduated Licensing System (GLS) represent the mainstay of government strategies to curb these rates of death and injury.

In 2000 the NSW government launched its version of a GLS that restructured training and licensing requirements to complement other initiatives, including ongoing road safety advertising campaigns targeted at young drivers. Further initiatives introduced in 2007 included limits on peer passengers at night, automatic suspension for speeding drivers, and the requirement for learners to complete 120 hours of supervised driving.

While research reveals a decline in young driver crashes in NSW from 1997-2007, 17-year-old drivers are at higher risk despite these regulatory interventions [9]. Crash statistics remain relatively constant in other parts of the world, with the exception of the UK where figures have increased steadily since 2000 [10]. As a result, legislators, researchers and the community remain focussed on improving what is commonly referred to as an 'unacceptably high' fatality rate amongst young novice drivers.

The GLS aims to develop skill and knowledge levels while providing an opportunity to gradually increase on-road experience and exposure to higher risk conditions. Versions have been employed in Australia, the United States, Canada, the United Kingdom and Sweden. There is, however, a significant body of literature suggesting skills- and knowledge-based programs such as GLS alone are not effective in lowering the crash rate amongst young drivers [11-13].

In summary, what can be concluded from a review of this body of research is that the connection between knowledge, skills and behaviour is generally poor, and that crashes and injuries result from what road users choose to do, more than what they are able (or unable) to do. Further, from the literature, it would appear that a driver's choice of action at any given moment is determined by a combination of internal motivations and external influences, some of which have been shaped by parents in the years leading up to licensure.

Subsequently, social marketing-based interventions that are aimed at changing an individual's beliefs, values, attitudes and – in turn – behaviours, have the potential to improve young driver crash rates. In general terms, social marketing can be described as the application of commercial marketing principles and practices to change behaviour and achieve socially desirable goals [14]. Social marketing strategies involve the development of 'downstream' strategies that provide the individual with tools for a safe and healthy lifestyle, and/or 'upstream' strategies that address the social and physical determinants of a behaviour.

Campaigns designed to change behaviour within a social context are underpinned by understanding the effect of knowledge, attitude and social norms [15] and the eight key determinants of behaviour: intention, environmental constraints, skills, anticipated outcomes (attitude), social norms, self-standards, emotion and self-efficacy [16]. Social marketing, which promotes welfare, safety and risk minimisation by exchanging information and products or tangible incentives for the target audience's behaviour change [17], has been utilised in public health, road safety, child abuse and, increasingly of late, the environment. Social marketing or its 'variations' [18], namely social advertising and social communication, have underpinned adolescent behaviour-change strategies in areas such as the TRUTH campaign to reduce teen smoking [19] and a range of campaigns to reduce alcohol consumption amongst university students [20]. These applications support the use of social marketing in relation to the issue of young driver safety, as suggested in this study.

Effective social marketing-based intervention requires a sound understanding of the underlying beliefs, values and attitudes

associated with a particular behaviour, which in the case of this study is the on-road behaviour of newly licensed novice drivers. Parents form one group – along with peer, personal and other social influences [21] – that shapes young drivers' attitudes and behaviour.

Parents are most often the primary supervising drivers as a novice learns to drive, and they provide a significant model of driver behaviour in the years before and during learning. As such, they are a significant reference group for novice drivers. Reference groups can act as both a comparison for self-appraisal and a source for the establishment of personal norms, beliefs, values and attitude structures [22]. As an important reference group, parents can influence a young driver's skill development through their supervisory role in the learning process and, crucially, influence their driving attitude and behaviour.

Despite parents' potential influence on novice driver behaviour, there has been little research into their role as an important reference group in the formation of young drivers' attitudes to driving. Instead, research has largely focussed on the effectiveness of the Graduated Licensing System and the role of parental supervision [23-26] or the relationship between parenting and teen driving [27]. However, that relationship takes the form of post-licence limitations and monitoring.

Further, most studies of the effectiveness of GLS focus on parent support for and involvement with novice driver restrictions [27-29]. Bianchi and Summala [30] expand the investigation of parental influence; they examine whether parental driving style predicts that of their children and find a significant relationship between the two, principally in terms of dangerous driving behaviours. Similarly, the research of Ferguson, Williams, Chapline and Reinfurt [31] links parents' driving records to those of their children.

A review of extant research on parental role and influence indicates a lack of understanding in two areas: parents' role in the learning process before novices are licensed; and how parents' driving behaviours influence their children's learning and driving behaviours. Researchers have called for a more detailed understanding of parental impact on novice driver safety [27, 32]. Williams [33] describes parents as one influence that is 'largely beyond the reach of driver education instructors'. This paper aims to examine parental influence and communication practices with learner and novice drivers in order to contribute to improving young driver safety through social marketing-based interventions.

Methodology

The lack of prior study and understanding of parental influence on novice drivers justified an exploratory investigation using a qualitative research design. This research approach supported the development of in-depth understanding of what, how and, crucially, why people think and feel as they do [34, 35]. Data was collected through focus group interviews, as this allowed participant interaction that enhanced the detailed exploration of the topic [36]. Focus groups have been used successfully in other road safety studies, including those with young drivers, which added to the case for a qualitative methodology [37].

During 2006 and 2007 participants were recruited from two local government areas on the south coast of NSW, approximately 90 kilometres south of the state capital, Sydney. Advertisements were placed in local papers and expressions of interest distributed during a local council's learner driver training initiative.

The study attempted to explore the topic from the perspective of parents and young drivers; consequently, matched dyadic pairs of parent/s and young drivers were recruited. Participants agreed to their anonymous contribution to the project, signing a consent form approved by the University of Wollongong's Ethics Committee. To ensure participants were able to freely express their opinions, the matched pairs were placed into separate young driver and parent focus groups. As the results indicated, this method revealed the difference in perceptions between the two cohorts on key issues.

Focus group size ranged from three to 12 participants, with Table 1 showing a breakdown of representative characteristics. Data was collected in several stages following the principles of 'theoretical sampling' [38, p. 35], with group composition and focus group cues evolving as new themes emerged during the data analysis. After nine focus groups involving 53 participants, the project reached theoretical saturation [36], in which the same pattern of focus group responses became evident, and data collection ceased.

Although data collection and analysis proceeded in an ongoing and concurrent fashion through the constant comparative method [38], the entire body of data was further analysed once collection ceased. Following recommended principles for the analysis of qualitative data [39, 40], the data was coded using identifying titles that were closely linked to and described the concept, and defined so terms were applied consistently during analysis. This process assigned meaning to the descriptive or inferential information compiled. The manual analysis identified

Table 1. Focus group participants

Round	Young driver total	Learner driver	Novice driver	Male	Female	Supervising driver total	Male	Female
1	7	4	3	4	3	6	3	3
2	18	15	3	8	10	15	7	8
3	4	3	1	1	3	3	0	3

and confirmed overall patterns and themes, clarified relationships between themes and allowed further theme explanation [35].

Results

From data analysis four major themes emerged, each of which could inform effective parental driving supervision and the establishment of successful intra-family safety communication about novice driver road safety. These themes were:

1. Parental driver modelling in the pre-learner and learner phases
2. Parents' skills as driving instructors
3. The communication gap between what young people say they need (parental involvement) and what they demand of their parents (driving freedom)
4. The milestone represented by a driver's licence when young people are seeking independence from their family.

Each of these themes is described and discussed in detail in the following sections.

Parental modelling

The data suggested that young drivers did most, if not all, their learner driving with their parents as the primary supervising driver. Parents' comments revealed that the significance of this responsibility was not lost on them, with one mother stating: "This is a very critical thing. The most important thing we are going to teach them is how to get behind this weapon and not die."

Parental influence can be divided into three phases: pre-learner (the childhood and early teenage years); learner (when a young person is learning to drive); and post-licence (which begins when a young person qualifies for a provisional licence). In NSW, even before a learner driver takes the wheel under parental supervision, they have generally spent more than 16 years watching how their parents drive. They develop an opinion about what they observe and are influenced subliminally and directly by this, even before they formally begin learning themselves. The strength of this influence is captured in the following quote from a learner driver: "[Parents] don't realise that it is more of an influence than directly saying something."

Parental awareness of the impact of their children's observation increased once they assumed the role of driving instructor, largely because the task called upon them to consider what they otherwise did automatically or subconsciously. Typically, young learners increasingly criticised parental driving as their road knowledge/skill developed. The contradiction in how parents drove and what they said to young people as driving instructors diluted the effectiveness of any safety message being communicated.

Young people spoke of exposure to positive driving behaviour; however, data revealed the profound impact of observing negative behaviour. Even parents who are seen as 'good' drivers

had concerning habits: a father who was described as "a good driver" was also termed a "casual, street-wise driver" who was "not attentive"; a mother was described as "good with speed limits, except if she is in a hurry."

This brings into question the common understanding of what is good or safe driving behaviour, and what benchmarks young people used to make their judgements. Good or safe driving extends beyond simply observing road rules. Young drivers' responses in this study clearly identified the role of attitude in the development of safe driving behaviour and the role of parents in developing that attitude long before a young driver took control of a vehicle.

Parents as driving teachers

Teaching was the second area in which parents' influence and behaviour modelling significantly affected young drivers. Young people appreciated patience, knowledge and compliance with road rules. However, they were challenged by their parents' approaches to teaching: parental behaviour and knowledge might oppose the current road rule book; parents might be ignorant of these contradictions; or, if aware, parents might concentrate on developing positive behaviour in the learner driver while continuing their own contradictory behaviour.

Young drivers admitted this often resulted in conflict. Many parents in this study took little notice of comments about their driving and were unwilling to engage in discussion. Those aware of the gap between their modelling and their instructions might have attempted some communication, but there was no commitment to changing the underlying problem – their driving behaviour.

It must be said that many young drivers participating in the focus groups commended their parents as positive driving role models and good teachers. For their part, parents' awareness of the importance of their role was often accompanied by low confidence in their effectiveness as teachers, as is revealed by the following exchange between two mothers:

Parent 1: "It's hard on parents… what training do parents have to be able to teach the child? We all just fumble through it because it has to be done, but whether you're nervous or a yeller or whatever, the child has to put up with whomever they have to take them. It's the only way that they will get through the hours to get [their licence]."

Parent 2: "And if you're a crummy driver, you've got X hours of crummy driving to get through."

Many parents admitted to teaching subjectively, strongly influenced by how they drove or how they were taught decades ago under different regulations and road conditions. They recognised information currency as a particular issue and felt unsupported in their role. Despite this, few parents had accessed NSW Roads and Traffic Authority (RTA) resources designed to update parental knowledge and improve their teaching techniques; many were unaware that the resources were available, and of those who were aware, only a small proportion had viewed the material

The communication gap

Young drivers appeared fearful, at least initially, about being behind the wheel without the reassurance of a supervising driver. Learners described the prospect of solo driving as "weird" while provisional licensees confessed to feeling nervous. Others admitted their inability or unwillingness to accept advice: "I don't want [my mother's] advice, but I still need it." This comment exemplified the communication dissonance, the discrepancy or gap between what young drivers said to their parents and what they elsewhere admitted to really needing in terms of parental communication. Dissonance increased parents' difficulty when trying to determine the level and type of involvement in their son's or daughter's driving.

Parental communication about safety appeared to take one of two forms: indirect or general communication, such as frequent reminders to "drive safely"; and direct communication, often in the form of counselling about risk behaviour or a conversation about an accident seen in the media. Regardless of the nature of their communication, parents were frustrated that their message was ineffective or young drivers were not receptive, particularly once young drivers became licensed. Some did not begin discussions because of the reception their comments received, while others were challenged by the difficulty of reprimanding their children's poor driving when they were legally young adults and often owned their own car.

Young people revealed that neither a direct nor indirect communication approach appeared to profoundly affect their driving decisions, attitudes and behaviour. The common link throughout the focus groups was that largely they did not listen nor pay attention to parental reminders about safety, although the following comment from a female learner driver shows that delivery, as well as message content, perhaps contributes to this: "If mum just sat me down and said it calmly instead of screaming at me, I would probably take it in more."

The driver's licence as a teenage milestone

During data analysis, distinct differences emerged regarding the significance parents and young drivers attached to obtaining a licence and the act of driving. Parents referred to driving as a "necessity" that served a purpose and allowed other important activities to occur; young people perceived it as less about function, and more about social and enjoyment factors.

To young people a driver's licence represented entrée into a new world of independence, which from their descriptions was somewhat transformational: "At first I just wanted to drive, to keep driving. I had to drive two minutes home from work – that was the first time I drove – but I didn't want to stop because I was in the car by myself and I just felt so free and different." Novice drivers commented how they focussed on reaching this goal, which represented a milestone of independence, rather than developing driving skills.

Once licensed, many young drivers described themselves as confident, even over-confident, which their parents identified as a major risk factor. Young drivers' comments showed that confidence was not matched by competence or, often, the necessary driving attitudes, as shown by this observation from a male novice driver: "We would always notice my friends who had just got their licence. We would go in the car with them but we'd be scared because they wouldn't be a safe driver. You can tell new drivers – they drive a bit fast, they don't pay attention." A contributing factor to low competence could be the focus of young drivers, parents and, according to young people, driving instructors on successfully passing a driving test and obtaining a licence, rather than including the importance of driving safely once licensed.

Discussion

The themes identified from the data in this study highlight shortcomings in current practices to prepare young people to be safe drivers. The data revealed several issues that arise when parents combine the roles of driving instructor, role model and road safety communicator. Participants' responses indicated they perceived a failure in driver training approaches, which emphasise development of skill over attitude. These findings suggest a gap in current approaches to driver training for learners and their parents, a 'gap' that, as we discuss in the following sections, the development of social marketing-based road safety interventions targeting young novice drivers and their parents could help to address.

The findings of this study provide insights into why some existing interventions may have only limited success in curbing the rate of death and injury among young novice drivers and, in particular, why upstream social marketing interventions - that is, legislative and regulatory changes - have not been more successful. For example, the impact of such upstream interventions as the lowering of novice driver speed limits and increasing training hours through GLS models may be limited due to their focus on road skills/vehicle management techniques as opposed to driver attitude formation.

As stated previously, the literature suggests that crashes result from what people choose to do, rather than from what they are or are not able to do in terms of vehicle management skills and knowledge [11-13]. In other words, the attitude of the road user appears to be a critical factor in many road crashes. The link between attitude and behaviour is well documented in various psychological theories of persuasion and behaviour development such as the Theory of Planned Behaviour and Reasoned Action [41]. The Theory of Reasoned Action [15] demonstrates how behavioural intention, and ultimately behaviour, is shaped by knowledge, attitude to the behaviour and perceptions of social norms.

Experience gained from social marketing interventions in the area of adolescent safe sex behaviour and AIDS prevention demonstrate the potential of campaigns that focus on attitude change [42]. For example, Marchard and Filatrault [43], in a Canadian study examining AIDS prevention, identified the

importance of positive attitude formation as a moderating factor in determining safe sex practice and condom use among young adults. The experience gained from these campaigns suggests that developing social marketing interventions that emphasise the importance and role of attitude, specifically attitudes to safe driving, through a focus on parental modelling and teaching may be a direction road safety campaigners could consider.

In terms of downstream social marketing, or individually focussed behaviour-change interventions, the study's findings suggest that social advertising-based TV ads attempting to change attitude and behaviour often overlook the reality that parents are frequently the source of that behaviour. In other words, the results of this study highlight the significance of one key reference group – parents – and how their behaviour influences the attitudes, values and belief structures of young novice drivers.

In this study, four elements emerged as significant in understanding and informing effective parental supervision of young learner and novice drivers: the driving behaviour that parents model, their skill as driving instructors, the young driver communication gap and the milestone that a driver's licence represents. These results could help in devising more effective downstream social marketing interventions targeted at individual behaviour, a distinguishing characteristic of such interventions [44].

A focus on individual behaviour change could help address parental attitudes to their negative driving behaviour both in the years before teaching and during the teaching phase. Young drivers consistently commented on the perceived double standard of watching parents driving to their own set of rules and then teaching another. Parents were disinclined to discuss or permanently improve their behaviour or, if aware, made positive change largely only when the novice was in the car with them.

Interventions aimed at changing parental driving behaviour would need to focus on long-range behaviour change. It may be too late to affect the behaviour of parents when teaching novice drivers, as these same novices have been exposed to more than 16 years of observing parental driving. Perhaps a more effective strategy would be to target parents of much younger children, aiming to educate and raise awareness that their children are watching their driving behaviour from a very young age.

Interventions addressing parental driving behaviour would focus on the behaviour variables of self-standards and social norms. Using Fishbein, Triandis, Kanfer, Becker, Middlestadt and Eichleet's [45] classification of determinants of behaviour, a parent may modify their behaviour and model safe driving if they perceive strong social pressure to drive 'well', or safely, for the sake of their children and if this safe behaviour is consistent with their self image and status as a role model for their children.

Similarly, theories of learning such as Social Cognitive Theory [46] support such an approach. These theories suggest a young driver's knowledge, attitude and behaviour can be directly traced to their observation of significant others (e.g., parents) within the context of their social interactions and experiences. Creating social marketing interventions that highlight to parents of young children how the observation of their driving over 16 years can influence the future driving behaviour of their children may be of value in structuring the driving behaviour of young novice drivers.

Related to the preceding discussion, this study also found that young drivers often lacked confidence in their parents as supervising drivers and, more profoundly, that parents lacked confidence and skill in this role. While most parents recognised their responsibilities, there were a number of challenges: negative behaviour modelling, outdated knowledge, and poor driving and communication skills.

Parents involved in this study required more support to effectively teach young people to drive safely. As they are responsible for the overwhelming majority of that teaching, largely for reasons of cost and practicality, it would appear to be an effective placement of governmental resources. In NSW, for example, the RTA currently offers measures, including workshops and information, for supervising drivers (http://www.rta.nsw.gov.au/licensing). This research reveals, however, that parents were not accessing these resources and/or the resources did not satisfy their needs.

A downstream social marketing intervention to support the teaching role could enhance parents' skills and self-efficacy – their perception of capability to perform the behaviour – as positive and effective driving supervisors. Justification for such an approach can be found in the driver education literature, which suggests that programs aimed at only improving young drivers' knowledge and skills in handling a vehicle do not necessarily result in a safer driver [11 - 13]. These results suggest social marketing interventions aimed at improving parental ability to act as effective role models and teachers of driving skills, knowledge – and attitudes – may also improve the driving effectiveness of young novice drivers.

Communication is another area in which a social marketing intervention could lead to positive behaviour change. Young drivers in this study did not heed parental safety messages. For their part, parents did not feel confident when communicating with the young drivers in their family about these issues, nor were these messages delivered particularly effectively.

Social marketing interventions to develop parental teaching capabilities could support parents in their role as their family's road safety communicator and could also address the behavioural variables of skill and self-efficacy. Social marketing-based campaigns that focus on adolescent behaviours have already been employed effectively in the areas of smoking and alcohol consumption and could be a 'viable companion to control and education approaches to behaviour change to promote teen driving safety' [47, p. 38].

As indicated by the results of this study, a further social

marketing intervention could focus on the driver's licence as a major social milestone for young people. Participants indicated that gaining their licence had a strong impact on their behaviour: the desire to assert independence and experience driving freedom was often coupled with risky behaviour such as speeding. Re-shaping the meaning of this milestone, while maintaining its importance, could result in safer, and therefore life saving, behaviour.

To achieve this, a downstream social marketing campaign could shift the focus from freedom, independence and maturity, as expressed by risky driving choices, to one where independence and maturity are signified by responsible attitudes and behaviours. A campaign of this nature hinges on the development of 'self' in relation to community and could impact on a range of behavioural variables (e.g., self-standards and perceptions of social norms, anticipated outcomes (or attitude), self-standards and emotion) in order to positively influence a young driver's behavioural intentions, that is, to drive safely.

There is a significant body of literature in the field of psychology that examines the concept of 'self' and underpins such a social marketing approach. This body of literature highlights how life milestones such as gaining a driver's licence can be significant in shaping a young person's concept of who they are and, more importantly, how they act in different circumstances including while on the road as drivers [48].

Conclusion

The aim of this study was to increase understanding of parental influence and communication in order to develop social marketing-based interventions to improve young driver safety. Although not attempting to generalise from this study, the consistency of participant responses indicates that parental driving behaviour coupled with their level of skill as supervising drivers could be a contributing factor to effective – or ineffective – teaching and safety communication at a time when young people wanted to increase their independence.

These findings and the social marketing strategies suggested present opportunities for further, long-term study. Further research is also suggested to investigate the meaning of driving and the significance of the social milestone that is represented by obtaining a driver's licence.

This study was not without its limitations, principally in terms of focus group composition and location. The research design attempted to ensure data collection from a cross-section of the population. However, more participation from young people and, in particular, parents from different social and driving backgrounds would have been useful. This would have allowed the comparison of findings across community groups to determine any differences in how young people were taught and what parental driving behaviours were observed prior to gaining a learner's permit. This process would also have

identified if different groups had specific requirements that could be addressed through alternative social marketing interventions. In addition, focus groups were conducted in one regional area in Australia, limiting the study geographically.

In conclusion, this study provides a step toward addressing the gap in understanding the role and influence of parents in developing safe driving practices amongst young novice drivers. The study's findings revealed shortcomings in the manner in which young people were prepared for the task of being a safe driver. Social marketing has proved to be an effective intervention method in changing individual behaviour in a number of fields, including health and the environment [49], and in particular in adolescent behaviour change [19, 20, 43]. This justifies consideration of the application of social marketing-based campaigns and interventions to the issues raised in this study.

The study highlighted issues around parents' roles and provides direction for possible downstream social marketing-based interventions to address this. To lower the rate of death and injury amongst young novice drivers around the globe, governments and road safety administrators are encouraged to consider the findings of this study in the context of existing upstream and downstream social marketing practices.

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Literature Review

Minimising in-vehicle distraction

reviewed by Road Safety Literature Editor Andrew Scarce, Road Class, 6 Oasis Gardens, Bendigo, Victoria 3550

'Nomadic' devices comprise all portable electronic devices for information, entertainment or communication that can be brought into the vehicle by the driver and used while driving. The risks associated with using nomadic devices while driving for work are the focus of a report titled *Minimising in-vehicle distraction* and released in December 2010.

The report is one of a series to be released by Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE). PRAISE is an initiative co-funded by the European Commission and implemented by the European Transport Safety Council (ETSC) to advance work-related road safety management and provide the know-how to employers who have to take on that challenge. According to PRAISE, work-related road safety is an area of policy that clearly needs renewed political commitment, .

The report paid particular attention to mobile phones, smart phones and portable navigation devices. PRAISE said these could distract drivers in several ways – physical distraction (manipulating the device), visual distraction (blocked view, eyes off the road, looking at the road but failing to see), auditory distraction and cognitive distraction. The report encouraged employers to 'adopt balanced policies based on clear scientific evidence and provide clear and easy-to-apply guidelines for their employers on acceptable use'.

Portable navigation devices (PND) provide many safety benefits, but they should not be interfered with while driving. 'It is therefore not the devices in themselves that are safe or dangerous, but it is the way users use them and this is something that employers should manage,' PRAISE said. Proper use also included frequently updating navigation systems, as out-of-date or incorrect information could lead to wrong decisions. The report endorsed the Intelligent Transport Systems (ITS) technology for PNDs being phased in by 2013, which will provide real-time traffic information systems and systems to reserve available parking lots.

Detailed recommendations and research on the use of mobile phones while driving for work are provided in the report, including recommendations for training, monitoring and incentives. 'If a company is providing mobile phones, at the very least employers should be required to sign and acknowledge that they have received, understood and will comply with the company policy,' PRAISE said.

PRAISE said employers and employer policy had a huge part to play in regard to restricting the use of mobile phones while driving. 'Senior managers should be expected to lead by example. They must never make or receive a call on a mobile phone while driving for work or expect their colleagues to do so. It is the role of the top managers to make sure that systems of work do not pressure staff to use a mobile phone while driving for work.'

(*Source:* http://www.etsc.eu/documents/PRAISE_Thematic _Report_Moving%20In%20Vehicle%20Distraction_21_Decem ber%202010.pdf)

Recent CASR reports

reviewed by Jaime Royals, Information Manager, Centre for Automotive Safety Research, University of Adelaide, South Australia

To access the entire report series or subscribe to an RSS feed from the CASR website, see http://casr.adelaide.edu.au/ publications/researchreports/. For hard copies of these reports, contact Jaime Royals at jaime@casr.adelaide.edu.au.

Implications of easing head impact criteria in pedestrian crash standards. Report CASR083 by DJ Searson and RWG Anderson, http://casr.adelaide.edu.au/publications /list/?id=1197

Pedestrian headform testing is used to measure the relative safety of structures that may cause head injury to a pedestrian in the event of a collision. Examples of this testing include the Australasian New Car Assessment Program (ANCAP), the new Global Technical Regulation (GTR) on pedestrian safety, and AS 4876.1 on bull bars. In these tests, the Head Injury Criterion (HIC) is used to measure the risk of head injury in a given impact. For each of these test protocols, choices were made regarding the conditions of the test, and the HIC required in order to pass the test. These choices have implications, in that they may be expected to guide the development of structures designed to meet that test criterion.

This report examines the differences in test outcomes that can be expected for test protocols that specify more relaxed criteria than others. A speed distribution obtained from in-depth crash investigation was used to derive the distribution of HIC values across real crash speeds, for structures that meet different test criteria. The results indicate that what may seem like relatively small changes in test conditions and acceptable HIC levels may result in significant changes in HIC, and the proportion of real crash speeds that a given structure could be considered safe for.

Casualty crash reductions from reducing various levels of speeding. Report CASR076 by SD Doecke, CN Kloeden and AJ McLean. http://casr.adelaide.edu.au/publications /list/?id=1206

Casualty crash reductions from reducing various levels of speeding are estimated by applying the relative risk of involvement in a casualty crash to the proportion of vehicles travelling at a given speed. The greatest overall effect on casualty crashes involving vehicles travelling at speeds from 1 to 20 km/h above the speed limit will come from reducing speeds just above that limit in almost all cases. Analysis of where injury and fatal crashes occur indicates that while speed reductions of any type would be expected to reduce injuries and fatalities, the greatest potential gains for reducing injuries appear to be in targeting low level speeding on Adelaide low speed roads. For fatalities this would be extended to include low level speeding on high speed rural roads.

Australasian College of Road Safety Executive Committee 2010-11

President

Lauchlan McIntosh AM
McIntosh Management Services
PO Box 486, Bungendore, NSW 2621
H: (02) 6238 0472   Fax: (02) 6238 0475
Email: lauchlan.mcintosh@bigpond.com

Immediate Past President/NSW (Sydney) Chapter Representative

Professor Raphael Grzebieta
Chair of Road Safety
NSW Injury Risk Management Research Centre, Bldg G2, Western Campus
University of New South Wales, NSW 2052
W: (02) 9385 4479   Fax: (02) 9385 6040
Email: r.grzebieta@unsw.edu.au

Co-Vice President

Professor Barry Watson
Director, Centre for Accident Research and Road Safety (CARRS-Q)
Queensland University of Technology
Kelvin Grove Campus, Level 4, K Block
130 Victoria Park Road, QLD 4059
W: (07) 3138 4955   Fax: (07) 3138 4907
Email: b.watson@qut.edu.au

Co-Vice President
Victoria Chapter Representative

Mr David Healy
Melbourne, Victoria
W: (03) 9890 4188
Email: david.healy2@gmail.com

Secretary
ACT Chapter Representative

Dr Stephen Jiggins
96 Krantzcke Cct, Nicholls, ACT 2913
Ph: (02) 6241 4188
Email: stephenjiggins@gmail.com

Treasurer

Mr Jeff McDougall
Managing Director, Trent Driving School
21 Kennedy Pl, Bayview Heights, NSW 2104
W: (02) 8748 4500 Fax: (02) 9979 4322
Email: jeffmcdougall@bigpond.com

Queensland Chapter Representative

Dr Kerry Armstrong
Postdoctoral Research Fellow
Centre for Accident Research and Road Safety - Qld (CARRS-Q)
Queensland University of Technology
K-Block, Kelvin Grove,
130 Victoria Park Road, Brisbane, QLD 4059
W: (07) 3138 8418 Fax: (07) 3138 4734
Email: ka.armstrong@qut.edu.au

South Australia Chapter Representative

Dr Jeremy Woolley
Senior Research Fellow
Centre for Automotive Safety Research
University of Adelaide, Adelaide, SA 5005
W: (08) 8303 3633
Email: Jeremy@casr.adelaide.edu.au

WA Chapter Representative

Mr Paul Roberts
Senior Scientist, Safe Systems
ARRB Group Ltd
191 Carr Place, Leederville, WA 6007
W: (08) 9227 3012   Fax: (08) 9227 3030
Email: paul.roberts@arrb.com.au

NSW (New England) Chapter Representative

Ms Sonia Percival
240 Dumaresq St, Armidale, NSW 2350
M: 0402 851 954
Email: sonia.percival@hnehealth.nsw.gov.au

New Zealand Chapter Representative

Position now vacant

(formerly held by Mr Fabian Marsh
New Zealand Transport Agency)

Committee Members

Dr Soames Job
Director, NSW Centre for Road Safety
Level 18, 101 Miller St, Nth Sydney, NSW 2059
W: (02) 8588 5801 Fax: (02) 8588 4180
Email: soames_job@rta.nsw.gov.au

Liz de Rome
LdeR Consulting
PO Box 177, Erskineville, NSW 2043
W: (02) 9550 2292   Fax: (02) 9516 2780
Email: liz@lderconsulting.com.au

Professor Mark Stevenson
Accident Research Centre and the School of Public Health and Preventive Medicine, Monash University
Email: Mark.Stevenson@monash.edu

Dr Julie Hatfield
NSW Injury Risk Management Research Ctr
Building 92, University of NSW
UNSW, NSW 2052
W: (02) 9385 7949 Fax: (02) 9385 6046
Email: j.hatfield@unsw.edu.au

National Secretariat

Executive Officer – *Linda Cooke*
eo@acrs.org.au
Executive Assistant – *Jacki Percival*
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PO Box 198
Mawson ACT 2607
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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

Visit the College website at www.acrs.org.au