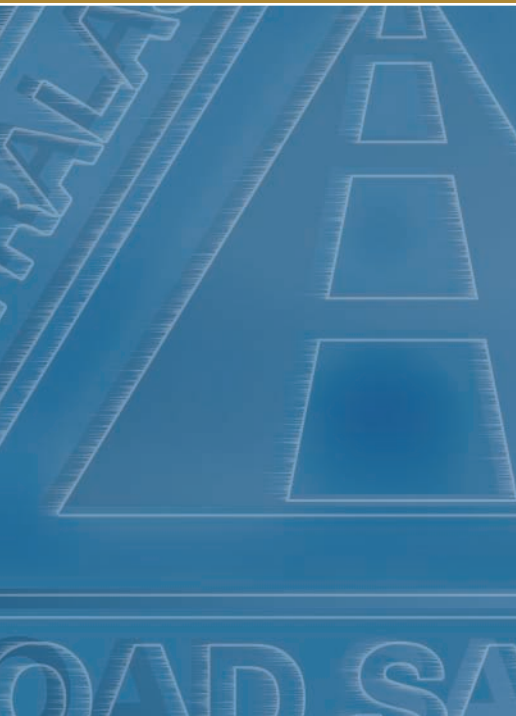




Journal of the Australasian College of Road Safety

Formerly RoadWise — Australia's First Road Safety Journal



In this edition —

Contributed articles:

- Motoring Matters – for every Australian
- Road Safety Song Competition- See it on DVD
- Rolling on Road to Disaster
- Car Restraints for the Child Over 12 Months
- Helicopter Rescue's Key Role in Reducing the Road Toll
- Occupational Road Safety case study
- Policies of the Australasian College of Road Safety

Peer-reviewed papers:

- Child restraint misuse: Incorrect and inappropriate use of restraints by children reduces their effectiveness in crashes
- Speed Behaviour of Long and Short Haul Heavy Vehicle Drivers



ACRS is a Member of the SaferRoads Partnership

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The policy of the publisher is to provide a medium for expression of views and for debate, within the traffic safety community, on a wide range of issues. The journal provides authors of papers with the opportunity to have their work submitted to the Editorial Board for peer review.

Encouragement also is given to interested persons and organisations to submit articles, photographs or letters for publication. The publisher reserves the right to reject submissions or, with approval of the author, edit articles. No payment is offered for articles submitted.

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Cover photo: RACQ CareFlight landed on site to assist a woman involved in a motor vehicle accident at the Bremer River Bridge, Ipswich. (Photo courtesy of the Queensland Times)

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From the President



Dear ACRS Members,

This is my first report as the re-elected President of the College – my fourth term. I feel humbled by your trust and desire to have me to step back into this position for one more year. Hopefully I will be able to fulfil the demands and College Members' expectations that this position requires. Nevertheless, I must

also say that I took on this role with some apprehension, as I have felt that it was time for others to lead and direct the College. However, most individuals approached cited professional demands were outweighing their desire to take on the role. Also circumstances in regards to personal matters for some Executive Committee members have led to their having to likewise withdraw, although their strong societal desire is to continue to contribute as best they can. Whilst their efforts will be greatly missed, and their service to the College has been invaluable, it has also provided an opportunity for other keen road safety stake holders and advocates to move onto the Executive Committee. I would strongly encourage any College member who has such a desire to serve on the Executive to indicate this desire to the committee. We really do need to reinvigorate our efforts and introduce new innovative ideas to further reduce road trauma. One of my focal points this year will be to strongly support any keen College Member wanting to join and work with the Executive Committee.

After 12 years of service on the College Executive Committee, Ken Smith decided to step down. Ken's tireless contributions to the College over the past decades, despite some very serious health problems that he has thankfully overcome, have been nothing short of extraordinary. Ken has served as Treasurer, Vice-president and ACT Chapter Representative. He has helped shape the College into what it is today. Whenever there was a critical issue to deal with, Ken would be the first person on the email or phone to Executive Members or to the Executive Officer sorting the matter out for the College. Any requests from any inquiry, Ken would be responding on behalf of the College. I would hate to think how many voluntary hours Ken committed from his very busy schedule to the College and to road safety. It will also be a lot more work running the College without his much valued help.

One of Ken's main focal points was the College policies. Together with other ACRS members he helped craft and ensured they reflected the members position statements and world's best practise in regards to Road Safety issues. These policies are the foundation on which the College and

Executive Members respond to media and public questions, and to requests from government committees and politicians concerning any particular road safety issue. Some issues have been controversial. Yet Ken has skilfully and calmly led and helped the various Road Safety experts and stake holders come to a common ground that benefits all road users and is focussed on road trauma reduction. I am sure many people's lives have been saved and injuries reduced as a result of Ken's outstanding efforts. Even though he is no longer a member of the Executive Committee, Ken continues via his professional work, to contribute to road safety, helping his fellow road users reach their destination safely. We all take our hats off to you Ken. We are grateful that you helped make travelling and walking on Australian roads one of the safest in the world. On behalf of the College Membership we thank you from our hearts and wish you all the best.

Replacing Ken will be Robin Anderson who has just recently been elected new ACT Chapter Representative. Robin has a long heritage of strong activity in Road Safety in the ACT local government. He received the 2005 Winston Churchill Fellowship for Road Safety - a Fellowship sponsored by the NRMA - ACT Road Safety Trust. He studied community-based safety programs for older road users in Europe and the USA and a copy of his report entitled "New Moves for Older Road Users" is available for viewing/downloading from the NRMA - ACT Road Safety Trust web site. We welcome you Robin and look forward to working with you.

The College also ran its yearly conference which always focuses on a particular road safety theme. This year the topic was 'Infants, Children and Young People and Road Safety'. Opening presentations were provided by the Hon. Jim Lloyd MHR – Commonwealth Minister for Roads and Territories and the Hon. Eric Roozendaal MLC - NSW Minister for Roads. Minister Lloyd presented the national perspective whereas Minister Roozendaal the NSW perspective. Both speeches demonstrated not only the importance of Road Safety in both Liberal and Labour party policy doctrines but also their bi-partisan commitment to Road Safety. When people's lives are at stake it's very pleasing to see that regardless of political persuasion the focus is on improving the safety of all Australians on our roads. Keynote addresses were also presented by Gillian Calvert, Commissioner of the NSW Commission for Children and Young People, and by Associate Professor Lyn Fragar, Director of the Centre for Farm Safety. All presentations were very well received and the conference was deemed a success by all accounts. Proceedings of this conference, along with proceedings of previous national conferences run by the College, are available on request. Special thanks go to the organisers of the conference, namely Ian Faulks, Geoff Horne, NSW Sydney ACRS Chapter members, to the sponsors NRMA, ATSB, Britax Safe n Sound child restraints and seats, the NRMA-ACT Road Safety Trust, the MAA, and to all the speakers who contributed papers, without whom the conference would not have happened.

Their generous efforts are very kindly appreciated.

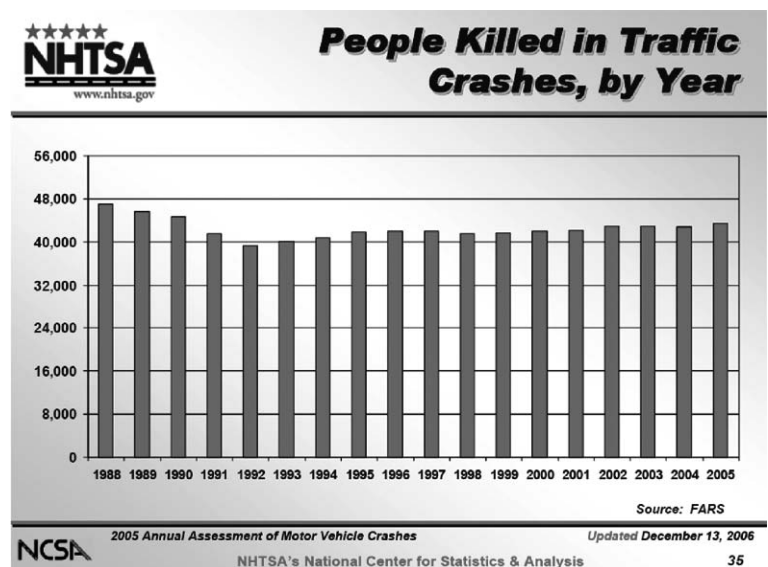
Reflecting on the bi-partisan commitments made by the respective Federal and State Ministers Lloyd and Roozendaal, and the strong support by our sponsors, conference speaker's and delegate's to 'Infants, Children and Young People and Road Safety', and the subsequent media coverage the conference attracted, has prompted me on another matter that I would like to raise here about our culture and commitment in relation to Road Safety. Having just recently returned from the USA from a month long stay there, where I presented talks at two conferences - one on road side barrier systems in Rapid City and another on rollover crashworthiness in Washington D.C. - I was somewhat stunned by the apathy the US government, Senators from both the Democratic and Republican parties, and the media, seem to project in regard to their now horrific road safety problem. I am thankful that we, as a nation, seem to be developing a more concerned attitude and approach towards road trauma. Let me elaborate.

At both the Rapid City and Washington conferences I presented some sobering data to my audience that was made up predominantly of US (with a smattering of European and Aussie) delegates. I reminded them that around 42,000 people were dying annually on US roads from a population of around 300 million. That is, 115 people dying on the roads every day or one person every 12.5 minutes. I noted that since 1966 around 1.8 million people had died on US roads, compared with 1.3 million that had died from all the wars that they had engaged in (including their Civil War in the 1860's) and a lesser figure of 72,000 people that had died from all natural and man-made disasters (including Hurricane Katrina). The cost of road trauma in the USA is around \$230 billion whereas their human resources budget is \$748 Billion (which includes health, social services and education), and their defence budget is \$727 billion. I also presented the graphs shown in **Figure 1** from their NHTSA web site and compared it to our graph of fatalities produced by the ATSB. I suggested that it was a matter of concern that their fatalities were rising whereas ours in Australia were dropping. I further showed that their fatality rate per 100,000 population as indicated in **Figure 2**, was the second worst of the OECD nations with Poland as the only other nation worse than the US and that their rate was almost double ours. However, having just visited Poland prior to my US visit, I was also aware that Poland's road fatality rate was rapidly dropping because of their recent joining the European Community and hence coming under ECE road safety directives.

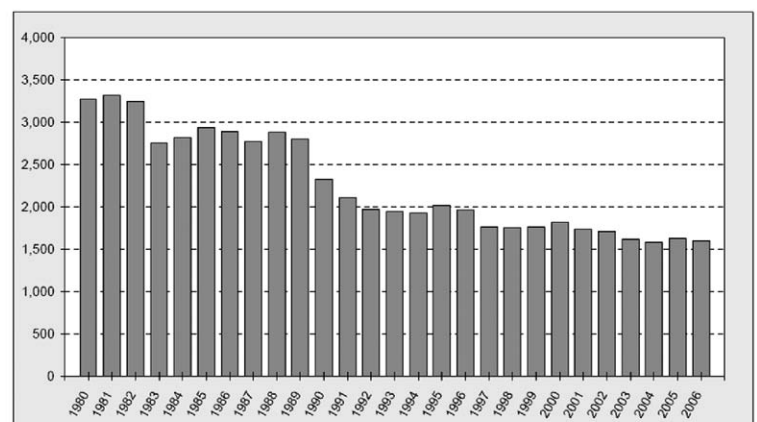
It does appear that the US is rapidly heading towards being the worst OECD nation in the world with regard to road safety, despite the good work done by NHTSA and FHWA for vehicle and road safety. I noticed my audience were, to say the least, a little stunned and concerned by the facts that I presented. At the Washington two day conference devoted to rollover crashworthiness, where around 10,000 deaths are attributed to rollover crashes in the US each year, a number of

US Senators from both sides of the political spectrum and general media were invited. Yet no Senators were present nor were any media interested. Some small news items appeared in a couple of esoteric news media. I was similarly stunned by the apparent apathy of their politicians and media with respect to the carnage occurring on their roads. At that point, I was very grateful that Australia (we) as a nation are so tuned into what is a threat to our every day safety and well being, and that we are strongly supported by our government of the day to further enhance that safety.

Those of you who know Professor Claes Tingvall's perspective on road safety will appreciate his words "*Having a road transport system that is killing and injuring such a huge part of the population is just not a way to live in a civilised society*". I am so grateful, that our Federal and State Ministers and their



Australian annual road deaths 1980 to 2006



Source: http://www.atsb.gov.au/publications/2007/pdf/mrf_2006.pdf

Figure 1

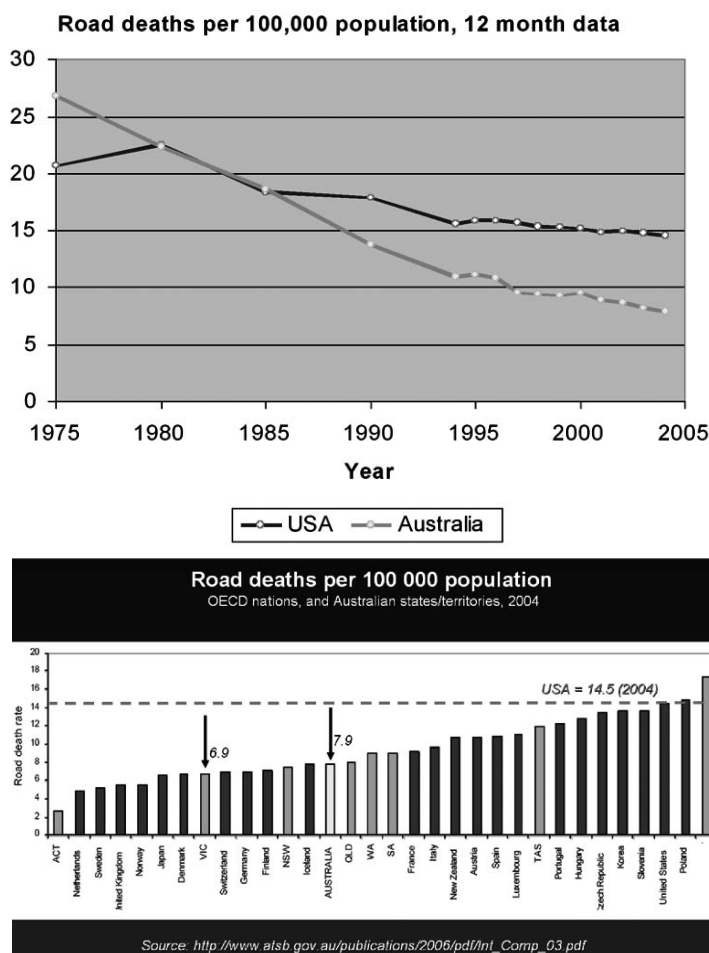


Figure 2

Departments have recognised that we cannot tolerate a transport system that kills so many people each year, and are not only doing something about it but are achieving positive results. When the graphs shown in Figures 1 & 2 are viewed in the perspective shown, they highlight the tremendous work the ATSB and the Australian Transport Council (ATC) have achieved, and continue to do so, for what no doubt would be the vastly lesser sums of money and possibly available technology in contrast to that available in the US. When one considers the size of Australia, its small population, and hence reduced financial resources, it is impressive that the ATSB, Federal and State Governments from both political spectrums, and Local Council and Shires, have truly excelled and have achieved nothing short of a miracle. No wonder there are so many international delegates visiting Australia finding out how we have achieved these results with limited financial resources.

However, my immediate concern when looking at the ATC's National Road Safety Strategy, is that it is obvious that the 2010 target of no more than 5.6 fatalities per 100,000 population is going to be difficult to meet. Hence, it is critical that the ATSB's financial resources are substantially increased. In particular, sufficient funds must be made available to the National Road Safety Strategy Panel that reports to the ATC, so that new strategies can be well formulated, sensibly executed in the same way they currently are and that new strategies are credibly researched. Without further substantially elevated injections of funds into a system that we can see is working well, and is having a positive effect on trauma reduction, it will be difficult to make any further substantial progress. In the previous President's editorial report I made mention that "road safety activities at the Commonwealth level are now competing for attention in an agency which is also concerned with air and rail safety. Given the relative fatality and injury rates of road, air and rail, road safety issues should attract substantially more attention, staffing and funding." The intention of this statement was that it is time attention, staffing and funding for Road Safety should be substantially increased without any financial or staffing reductions to air or rail safety. In other words, extra funds on top of current funding levels need to be injected into ATSB for Road Safety if we are to achieve lower trauma rates. I would hence appeal to all ACRS members to consider writing a letter to your local Federal Member of Parliament, pointing out the tragedy that occurs on our roads every day, and appeal to them to make road safety funding an election issue, and that the ATSB's Road Safety Department's financial resources be substantially increased on top of current funds.

Travel safely.

Raphael Grzebieta

Letter received from the Victorian Minister for Public Transport

Our President has received the following letter from the Victorian Minister for Public Transport:

Dear Mr Grzebieta

Railway Level Crossings - Safety

Thank you for your email of 7 June 2007 to the Premier of Victoria, regarding railway level crossings. Your email has been referred to me as Minister for Public Transport.

Hundreds of people have written to me with comments and ideas to improve safety at level crossings. This is a tangible way that people can assist and I am very appreciative of your efforts.

The Government has been very active in the area of level crossing safety. The following gives you an overview of some of the recent activities that we have undertaken.

Level Crossing Upgrade Program

During the last two financial years, 153 level crossings have been upgraded to active protection (this is more than at any other time in Victoria's history). Other crossings, such as those at Box Hill and Portland have recently been grade separated.

On 25 June 2007 the Government announced the investment of an additional \$33.2 million to improve safety at level crossings. This Level Crossing Safety Package will include:

- Installation of rumble strips at 200 level crossings in regional Victoria at a cost of \$11.7 million. These rumble strips will be laid approximately 250 metres before the crossing. The raised strips will physically alert motorists to upcoming level crossing signage; and
- 53 automated advanced warning signs to be installed at 26 level crossings on highways and a further 27 high road traffic volume sites across the state at a cost of \$11.1 million. The flashing signs will be constructed on the side of the road approximately 250 metres prior to the level crossing and will activate automatically when a train is approaching to warn motorists well in advance of them reaching the crossing.

Public Education Program

The Government has also recognised that the public needs to be educated about the risks around level crossings.

Accordingly, in November 2005 we launched a \$1 million Railway Crossing Public Education Safety Awareness campaign to encourage Victorians to take responsibility for safe behaviour around level crossings. The campaign's key message is to remind Victorians to obey railway crossing signals at all times via the tag line 'Don't Risk It'.

The 'Don't Risk It' campaign will soon be updated to incorporate new measures and laws, and will be distributed via print, radio, television and school programs.

Enforcement boost

As part of the Level Crossing Safety Package mentioned above, the Government has announced that penalties for level crossing infringements are to be toughened.

The new penalties for drivers who disobey railway level crossing signals will rise from a \$177 fine and three demerit points to \$430 and four demerit points. In addition, new offences will be introduced for speeding to beat a train, crossing tracks when lights and bells are operating, or weaving in between boom gates that are already down. These offences will carry a fine of \$3,304, four demerit points and an automatic three months licence suspension.

Victorian Railway Crossing Technical Group

The Government established a Railway Crossing Technical Group in 2005. This technical group meets on a monthly basis and includes representatives from across the rail industry. The group considers a range of technical matters including new technology proposals to ensure that the Government examines all possible strategies to improve safety.

Your suggested improvements to level crossing safety will be submitted to the Committee for its consideration. Again, thank you for your comments and your interest in level crossing safety. Should you wish to discuss this matter further, please contact Terry Spicer of the Department of Infrastructure on (03) 9655 6422.

Yours sincerely

Lynne Kosky, MP

MINISTER

16 / 08 /2007

Diary

14-17 October 2007: 51st Conference of the Association for the Advancement of Automotive Medicine (AAAM), Sofitel Hotel, Melbourne. For more information visit: <http://www.aaam1.org/annual/annual.php>

17 – 19 October 2007: Australasian Road Safety Research, Policing & Education Conference 2007 - 'The Way Ahead', Crown Promenade Melbourne. For more information and to register your interest visit www.roadsafetyconference2007.com.au

31 Oct – 2 Nov 2007: Australian Institute of Traffic Planning and Management National Conference at the

National Convention Centre, Canberra. Enquiries: Kim Thomas, tel: 08 8372 7878 or aitpm@aitpm.com

2 November 2007 – One-day ACRS-ATSB Seminar on 'Lessons in Investigating Road Crashes' and 'Intelligent Transport Systems Developments', Canberra. The main speaker will be Mr Mark V Rosenker, head of the US National Transport Safety Board.

29-30 November 2007, 3rd International Road Safety Conference, Perth. For further information contact: <http://www.roadsafetyperth2007.com>

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Outstanding careers at The University of Adelaide

Director, Centre for Automotive Safety Research

Centre for Automotive Safety Research
Job Reference Number: 3354

The University is seeking to appoint an outstanding individual as Director of the Centre for Automotive Safety Research (CASR). The successful applicant will be appointed as a Professorial Research Fellow in Road Safety and will provide professional, academic and administrative leadership to CASR.

CASR evolved from the Road Accident Research Unit, which was established at the University of Adelaide over 30 years ago, and comprises a multi-disciplinary team of researchers and key support staff who conduct research in road safety and injury control aimed at reducing the human and economic costs of road crashes. It is supported by contract research and sustaining funds from the Government of South Australia through the Department for Transport, Energy and Infrastructure and the Motor Accident Commission.

You should have:

- a PhD, or equivalent standing, in a field relevant to road safety research
- an international reputation for outstanding research in one or more areas relevant to road safety and a record of attracting research funding
- demonstrated experience in leading and managing a group of research staff and building collaborative research partnerships

Salary: (Level E) \$123,035 per annum, plus an employer superannuation contribution of 17% applies.

This fixed-term position is available immediately for a period of five years. Further information, including the selection criteria, may be obtained from Ms Leonie Witter, telephone: (08) 8303 5997 or email: leonie.witter@adelaide.edu.au. Information about CASR may be obtained from www.casr.adelaide.edu.au

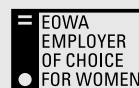
Deadline: 7 September 2007

Your application must:

- include your resume/Curriculum Vitae
- address the selection criteria
- quote the relevant reference number
- include residency status
- include the names, addresses and/or email details of three referees

Email applications to christine.vascosabat@adelaide.edu.au or forward in duplicate to:

Ms Christine Vasco
Human Resources
The University of Adelaide
South Australia 5005



Applicants must address the selection criteria for the position. They are available, with the duty statement from www.adelaide.edu.au/jobs

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Quarterly News

ACRS Executive Committee

Some members have inquired about the procedure for electing officers of the College. This is the responsibility of the Executive Committee. In accordance with the Constitution, the new Executive Committee must meet within two weeks of the Annual General Meeting and elect the officers of the College for the next twelve months. The Executive Committee thus met on 5 June 2007 and elected the following officers: President: Raphael Grzebieta; Co-Vice Presidents: Lauchlan McIntosh and Lori Mooren; Honorary Secretary: Paul Simons; and Honorary Treasurer: Jeff McDougall. The Executive Committee is made up of 6 elected members and one representative from each State or Regional Chapter. In addition the Executive Committee has the power to co-op additional members or to appoint sub-committees. The current elected members of the Executive Committee are: for 2006-2008: Raphael Grzebieta, Soames Job and Lori Mooren; and for 2007-2009: Barry Watson, Jeff McDougall and Anne Harris. Chapter representatives are elected by the Chapter Committees. Current representatives are ACT and Region: Robin Anderson; NSW (New England): Tom Fisher; NSW (Sydney): Liz de Rome; New Zealand: Michael Cummins; Queensland: Peter Kolesnik; Victoria: David Healy; South Australia: Paul Simons and Western Australia: Alexandra McManus. There is currently one co-opted member of the Executive Committee, Lauchlan McIntosh serving 2007-2009.

Chapter News

Australian Capital Territory and Region

The Chapter met on 19 July and discussed future activities. The Chapter has been invited by the College Executive to host a national seminar in Canberra on 2 November 2007 for the visit to Australia of the Chairman of the US National Transport Safety Board, Mr Mark V Rosenker,. Sponsored by the Australian Transport Safety Bureau, two topics will be covered in the seminar – Road Crash Investigations and Intelligent Transport Systems. Other seminars planned by the Chapter include ‘Unlicensed and Recidivist Drivers’ and ‘Driver Distraction’, to be held later in 2007 and early 2008. The Chapter nominated Mr Robin Anderson as its representative on the College Executive.

New South Wales (Sydney)

The Chapter hosted the International Conference in Sydney 2-3 August on ‘Infants, Children, Young People and Road Safety’. About 100 delegates attended the Conference and some 30 papers were presented. Keynote speakers were the Hon. Jim Lloyd, Federal Minister for Local Government, Territories and Roads, the Hon. Eric Roozendaal MLC, NSW Minister for Roads, Commissioner Gillian Calvert, NSW Commissioner for Children and Young People, and Associate Professor Lyn Fragar, founder of the Australian Centre for Agricultural Health and Safety.



A Founder Member and Fellow of the College, Harry Camkin, with College Honorary Treasurer Jeff McDougall at the Sydney Conference.

Queensland

The Chapter held a well-attended seminar on 5 June when the speaker was Mike Stapleton from Queensland Transport. He described how the initiatives proposed at the Queensland Road Safety Summit were being put into practice.

Victoria

A date has not yet been fixed, but plans are in hand for a seminar on Youth Road Safety. This seminar will provide an opportunity to hear reports from the Victorian representatives to the World Youth Road Safety Conference earlier in the year in Geneva, Switzerland. There will also be a presentation on the Victorian graduated licensing program.

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Western Australia

The Chapter Annual General Meeting was held on 24 May. The Committee continues to meet monthly and has plans in hand to August 2008. The Chapter held two successful Older Road User seminars on 26 July 2007. The first was in the morning, at Technology Park, Bentley, Mr Robin Anderson, NRMA-ACT Road Safety Trust Churchill Fellow, Mr Jim Langford of MUARC, and Dr Alexandra McManus, WA Chapter Chairman, spoke on a range of older road user issues. A presentation was also given by the WA Office of Road Safety on the new State Road Safety Strategy. About 30 people from a range of academic, government, community and industry groups attended the seminar.

This was followed by an afternoon seminar hosted by the Royal Automobile Club of WA, at the Perth Town Hall. Over 200 RAC 'Gold members' attended, giving Robin Anderson, Jim Langford and the RAC President, Freda Crucitti, an enthusiastic reception and many questions.

The two seminars provided valuable exposure for the WA Chapter to both the road safety community and the general public. Special thanks to Tiiu Stojanovic of the WA Chapter and David Moir of RAC, for organising the seminars. The next meeting is planned for 20 September on 'Road Safety Research – Drink Driving'.

Australian News

New South Wales Steps Up School Penalties

In a campaign to enhance the safety of school children, the NSW Government increased some key penalties for traffic and parking offences committed in school zones during posted school hours from 21 May 2007. The new fines and demerit point increases include: Speeding – minimum fines of \$128 and 4 demerit points; approach children's crossing too quickly to stop safely – \$384 fine and 4 demerit points; double parking – \$231 fine and 2 demerit points; and stopping on or near a children's crossing – \$308 and 2 demerit points.

NSW Establishes a Centre for Road Safety

The NSW Government announced in May that it planned to set up a Centre for Road Safety from 1 July 2007 as part of the restructure of the Roads and Traffic Authority's (RTA's) Road Safety Group. One of its first tasks is to address the problem of speeding. The Centre will also be looking at new technologies and how these might be used to influence road safety. There will be four main aspects of the Centre's work: Behaviour, Vehicles, Technology and Road Environment. In

particular, the Centre has been tasked with developing:

- An anti-speeding campaign aimed at young male drivers
- Tests of new safety technology for both vehicles and the road environment
- Industry awards for innovation in safety technology
- Safety classifications for vehicles; and
- Best practice design models for road building and maintenance.

Draft new laws for child seat and seatbelt restraints

The National Transport Commission (NTC) released a draft proposal in May for new standards for child seat restraints. The proposed changes would require that children up to 6 months old must be restrained in a rearward facing infant capsule; then a forward facing child seat until the age of 4; and a booster seat from 4 to 7 years old. The proposed laws include a provision to ensure a child is not required to use a restraint unsuitable for their size and weight (for example a child who is too tall or heavy for the restraint).

Current laws require children to use a suitable approved child restraint or adult seatbelt that is properly fastened and adjusted. Compliance generally relies on the interpretation of educational guides.

Dr Jeff Potter, the NTC's Senior Manager– Safety, said, “While many parents and carers strive to do the right thing, the research shows children are moving to bigger seats too early. The new laws will provide better guidance informed by the latest available technology, research and world's best practice.” The opportunity for public comment on the draft proposal closed on 29 June, 2007. *(Source: NTC Media release 16 May 2007)*

Changes to rules for learner drivers in Victoria and Queensland

In Queensland, new laws from July 1 will prevent provisional licence holders under 25 and provisional probationary and restricted licence holders from carrying more than one passenger under 21 years in a car between 11pm and 5am.

In Victoria, from July new learners under the age of 21 years, applying for a probationary licence, must hold their learner permit for at least 12 months. Importantly, they must have also logged a minimum of 120 hours of supervised driving, including 10 hours at night. These changes are part of Victoria's new graduated licensing system, which is being introduced to help make young drivers safer drivers.

Other new learner driver laws to become effective in Victoria from 1 July 2007 include:

- * Learners, whilst driving, must not use a mobile phone at all,

including hand held, hands free, or messaging of any kind.

- * Learners must carry their permit with them whenever they drive.
- * For learners aged 21 and over, but under 25, the same rules apply except they only have to stay on their learner permit for at least six months.
- * Learners 25 and over will only have to hold their learner permit for three months.
- * Learners over 21 are not required to complete 120 hours of supervised driving or an official logbook.

(Source: Australian Road Forum Email Newsletter June 07)

Passengers and Driver Distraction

The George Institute has recently conducted a research study into the distractions to driver concentration caused by passengers. The research has shown that drivers with two or more passengers are twice as likely to crash as unaccompanied drivers. However, the study revealed that driver distraction caused by passengers is not as serious a problem as driver distraction caused by using a mobile phone.

(Source: Newsletter of The George Institute for International Health, Issue 6 June 2007)

2007 Anti-Drink Driving Campaign in Queensland

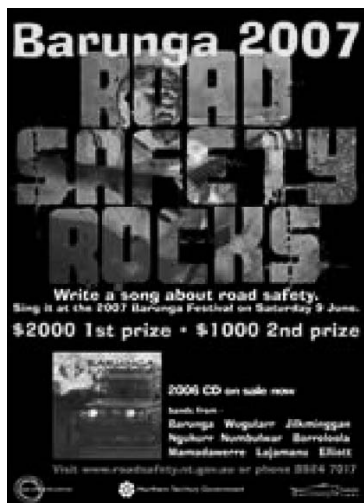
There are some 70 fatalities and 590 hospitalisations each year in Queensland due to drink driving. The 2007 public education campaign against drink driving carries the slogan ‘Drink drive. You lose.’ The campaign consists of television, radio and outdoor advertising and is designed to complement police random breath tests, particularly during holiday periods and long weekends, when statistics show a higher proportion of crashes. *(Source: Queensland Dept of Transport)*

TAC Launches Driver Distraction Campaign

The Transport Accident Commission of Victoria recently launched a new public education campaign to discourage motorists from taking actions that distract their attention while driving. Using a mobile phone while driving has specifically been targeted as one of the most common and dangerous distracting activities a driver can engage in. The campaign was launched through a number of mainstream media including; television, radio and outdoor. The TV component of the ‘Distractions’ campaign features two 30 second commercials, each depicting everyday scenarios that can lead to driver inattention on the road. These scenarios are talking on a hand held mobile phone, changing a CD, distraction from other passengers and text messaging on a mobile phone.

(Source: TAC media release)

Road Safety Song Competition Rocks NT



Once again the NT Government has sponsored a song competition for aboriginal bands to encourage people to think about road safety. The competition was conducted at the Barunga Festival on Saturday 9th June. There were four prizes of \$2,000, \$1,000 and two at \$500. The songs entered in the competition could be any style of music, but the words had to include

messages about wearing seatbelts, never to drink and drive, pedestrians to watch out for cars, not to put too many people in a car and not to ride in the back of utes. The picture shows the poster used to advertise the event. A report on the competition is given in ‘Contributed Articles’.

Tasmania Targets Motorcycle Safety

The Tasmanian Government has introduced two further key initiatives to the Tasmanian Motorcycle Safety Strategy (2006-2006) effective from 1 July 2007. The new initiatives are:

- A Learner Approved Motorcycle Scheme (LAMS). This power to weight scheme will replace the current 250cc maximum engine capacity restriction for all learner riders and all riders in their first year after progressing from a motorcycle learner licence; and
- Increasing the minimum age for getting a motorcycle learner licence from 16 years to 16 years and 6 months.

The scheme allows learner riders and all riders in their first year after progressing from their motorcycle learner licence to ride moderately powered motorcycles with a maximum power to weight ratio of 150 kilowatts per tonne combined with a maximum engine capacity of 660cc. The power to weight ratio is a measure of the motorcycle's performance and is a better indicator of performance than engine capacity alone. The power to weight ratio is the power output (kilowatts) divided by the tare weight of the motorcycle + 90kg (for rider and fuel). The result is then multiplied by 1000 (to convert to kW per tonne). The manufacturer determines the engine power and tare weight of the motorcycle. The figure of 90kg in the calculation is the figure used for testing braking in Australian Design Rule ADR33 “Brake Systems for Motorcycles and Mopeds”.

Tasmania is not the first State to introduce the LAMS scheme. New South Wales and South Australia have the scheme and the Australian Capital Territory (ACT) has a slightly different power to weight system in place.

(Source: Tasmanian Department of Transport)

WA Road Safety Council Welcomes Bi-partisan Approach

Road Safety Council independent chair Grant Dorrington has welcomed Road Safety Minister John Kobelke's establishment of a bi-partisan Parliamentary Reference Group on road safety. “If we, as a community, are going to continue to make real gains in improving safety on the roads, it is vital that our leaders take a bi-partisan approach to an issue that has such a wide-ranging impact on society,” he said. “Already it has been terrific to see such a positive response to the Minister's invitation for MPs to host a community road safety forum with more than 20 MPs responding. “This Group will play an essential role in the development of the road safety strategy to take us from 2008 to 2020.” Mr Dorrington applauded the choice of international road safety expert Eric Howard, former general manager of road safety for VicRoads, as independent chair. “We are talking about the development of a strategy that will prevent people dying and receiving horrendous injuries from road crashes,” he said. “The achievement of these goals relies on the collective will and action of Government, political, community, business and industry leaders, and the public. It is an issue that extends beyond party politics—it is an issue where we all have a shared responsibility.”

(Source: WA Office of Road Safety media release 4 July 07)

MUARC booklet for parents of P-plate drivers

The Monash University Accident Research Centre (MUARC) announced a new publication on 27 June 2007 designed to reduce P-plate driver crashes. P-plate drivers are 33 times more likely to have a crash than learner drivers. The risk of P-plate drivers having a crash decreases dramatically over the first 6-12 months. MUARC claims that this is the first time in Australia that P-plate driver safety information has been targeted specifically at parents. ‘Going Solo’ was devised by MUARC Senior Research Fellow, Dr Jennie Oxley and her research team, funded by ExxonMobil. It informs parents about P-plate driver crash risks and strategies they can use to promote safe driving.

The booklet highlights nine key risk factors and encourages parents to get their son or daughter to sign a Vehicle Access Agreement. In the first three months of gaining a probationary licence, the driver would agree to only drive between 6am and 10pm and not carry any passengers aged 16 to 23. After seven months experience they would be allowed to drive from 6am to Midnight and carry a maximum of one young passenger.

Dr Oxley said, “ Parents who continue to discuss safe driving with their P-plater could help prevent crashes and potentially even save lives. Driving with a car full of friends increases the fatal crash risk by four times, compared with driving alone. P-plate drivers have over thirty per cent of their crashes at night even though only nine per cent of their driving occurs during that time,” she said.

‘ Going Solo’ is available free for a limited time at all Mobil Service Stations in Australia except WA and Tasmania, or can be downloaded from

www.monash.edu.au/muarc/goingsolo.html

(Source: MUARC media release)

New Zealand News

‘Regular irregularity’ key to breath testing

Concern about the increasing number of drink drivers on New Zealand roads was the catalyst for Operation Remove All Impaired Drivers (RAID) recently. Police staff from one end of the country to the other helped stop and breath test 43,000 drivers on Friday 25 May. 304 of those drivers were to be prosecuted for drink drive offences. Because of the effectiveness of this operation, another Operation RAID is planned for the near future.

(Source: Ten-One Community Edition: 298 July 2007)

Road Safety Promoted in 3-D Slingshot



Photo courtesy Land Transport NZ

Passers-by in Manukau are having their attention grabbed by this three-dimensional hoarding promoting seat belt use for rear-seat passengers. 11 per cent of New Zealand adults still don't buckle up in the back seat, compared with just 5 per cent of drivers and front seat passengers. In Manukau city the non-wearing rate for back seat passengers is 21 per cent. If everyone wore their seat belts, Land Transport estimates that 25 road crash fatalities could be saved each year.

(Source: Land Transport News May 2007)

Work-related Road Safety Awareness

A report on work-related road safety published in May by the Department of Labour seeks to make employers aware of their responsibility to ensure, as far as is possible, the safety of their employees who drive a vehicle as part of their daily work.

The report examines the extent and far-reaching costs of work-related vehicle crashes in New Zealand, and makes a number of recommendations. Recent amendments to the Health and Safety in Employment Act place a duty on employers to train employees to be safe in a work-related environment. Work-related road safety is relevant to anyone driving for work irrespective of vehicle ownership. “ The report also highlights some areas where we can improve our research capabilities” , said Geraint Emrys, Chief Advisor for Occupational Health at the Department of Labour.

The report follows a series of workshops in October 2005 for transport operators and government transport sector managers, conducted by Dr Will Murray, a UK expert on reducing work-related vehicle crashes. Dr Murray is a member of the Australasian College of Road Safety. 'The workshops provided participants with information on work-related on and off road vehicle safety. Data from the UK and Australia suggests that up to a third of all road fatalities may be work-related.

(Source: Interactive Driving Systems, 8 May 2007)

European News

European Parliament rejects road safety infrastructure proposal

The Transport Committee of the European Parliament has rejected the European Commission's proposal on road infrastructure safety management. Citing, among other reasons, their wish to avoid additional bureaucratic constraints for the Member States, a large majority of Committee members voted against the legislation, which aimed to enhance and extend safety standards throughout the EU.

Requiring Member States to adopt guidelines for infrastructure safety management, the Commission estimated that the proposed legislation had the potential to save more than 600 lives and avoid 7,000 injuries every year in the EU. Driven by this goal, the Commission made a legislative proposal in October 2006 on the four most important infrastructure safety instruments, leaving the details of their implementation to Member States.

The European Transport Safety Council (ETSC) believes that the decision of the European Parliament has given many Member States freedom to continue to disregard their obligation towards their citizens in keeping road infrastructure safe during many years to come. “ The European Parliament

has deliberately chosen not to demonstrate leadership on this issue of extreme importance which affects virtually every EU citizen,” said Jörg Beckmann, ETSC Executive Director. “If the EU is serious about halving yearly road deaths by 2010, it must exploit all policy instruments available. The EU’s Common Transport Policy has suffered a heavy blow today due to the lack of political wisdom, resolve and responsibility on the part of the European Parliament.”

(Source: ETSC Media Release 5 June 2007, Brussels)

Annual Road Safety Day Planned for EU

The first European Road Safety Day, held on 27 April, will from now on be held every year, giving the European Commission an opportunity to evaluate the success in reaching the goal set in the 2001 White Paper on transportation. This aims at reducing road fatalities between 2001 and 2010 from nearly 50,000 to 25,000. According to the Transport Commissioner Jacques Barrot, in 2006 nearly 12,000 lives were saved in the EU as compared to 2001. This amounted to a reduction in road fatalities of 22% (8% for 2006) for the period. The Road Safety Day this year was devoted to young drivers. The 18-25 year old category represents 10% of the EU population, but 21% of all road fatalities, with 33 deaths every day.

(Source: ETSC Safety Monitor No. 69)

France Leads Europe on Road Toll Reduction

France, Luxembourg and Belgium have achieved the largest reductions in yearly road fatalities between 2001 and 2005, according to the first Road Safety PIN Report* on “Raising Compliance with Road Safety Law”. The report compared 27 European countries on speed, alcohol and seat belt wearing. The highest levels of seat belt wearing were recorded in France, Germany and Malta, while the Czech Republic, Belgium and Germany achieved greatest improvements in the area of drink driving over the last decade. Speed reduction has seen little progress in Europe, with the exception of France, Belgium and Switzerland. It is also in these countries that some of the largest reductions in road fatalities have been achieved. France’s achievement in reducing road deaths has become the greatest contributor to the European target of halving the number of road deaths by 2010.

(Source: ETSC Safety Monitor No. 69)

** The ETSC's Road Safety Performance Index is a policy instrument launched in June 2006 to help 27 EU Member State participants to improve road safety. It facilitates comparisons between Member States' performance, identifies and promotes Best Practice and encourages the political leadership needed to create a road transport system that offers maximum safety.*

North American News

USA's Top Safety Official Urges Caution

Nicole R. Nason, Administrator of the National Highway Traffic Safety Administration, issued a public statement prior to the 4th July Independence Day celebrations, historically the deadliest day on America’s roads. Nason urged drivers to help save lives by buckling up, driving sober and obeying speed limits during this major annual holiday. “We want people to enjoy the fireworks and cook outs but more importantly we want people to be alive to enjoy the next celebration,” she said.

The statistics show over 25 years just how hazardous travel is during the July 4 holiday. 51 percent of all deadly traffic crashes are related to the use of alcohol, compared to the annual average of about 40 percent. In addition, Nason said nearly half of those killed in crashes were not using seat belts. “With so many more people on the road for their holiday celebrations, it becomes critical for drivers to buckle up, drive sober and obey the speed limit.”

(Source: NHTSA media release July 07)

World News

First Global Road Safety Week makes its mark

The first United Nations Global Road Safety Week (GRSW) was held from 23 - 29 April 2007 to draw attention to the global road safety crisis, with a particular focus on young road users. Organised by the Global Road Safety Partnership (GRSP)* the GRSW project resulted in special road safety events in many countries. The following are examples of what was achieved.

GRSW in South Africa was launched during an event hosted by the Road Traffic Management Corporation at the Freedom Square in Kliptown, Johannesburg. The event started with a procession by members of the SA Police Services, the Johannesburg Metro Emergency Services and school children representing the youth of South Africa. See http://www.grsproadsafety.org/?pageid=331#South_Africa. Other events were held in Namibia and Ghana.

In China an event was organised that brought together for the first time all Ministries involved in road safety in China. GRSP CEO David Silcock spoke on behalf of non-governmental organisations and announced the publication of the Drinking and Driving good practice manual, and its translation into Chinese.

GRSW was well supported in South East Asia. In Laos the GRSW was opened by the Deputy Prime Minister and Chairman of the National RS Committee. The ceremony was attended by high-ranking members of the key ministries, donor agencies, diplomatic missions and the NGO community as well as 150 students representing the country's young road users. (See <http://www.grsproadsafety.org/?pageid=331#Laos>). In

Advertisement

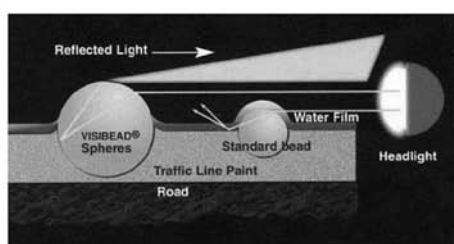
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[Photographs taken at Potters demonstration site at Jerrabomberra Road, Canberra. Rain simulation by water-cart]

Thailand, road safety activities organised during the Songkran festival or Thai New year on 11-17 April 2007, flowed into events for GRSW, including a campaign organised by Thailand's Road Safety Committee. GRSW activities also took place in numerous provinces of Indonesia.

The GRSP Hungary Association designed a road safety information leaflet that was disseminated during the 6th European Road Conference in Budapest. The Association also developed a banner to call the attention of young drivers and travellers to the importance of being safe and responsible road users. (See <http://www.grsproadsafety.org/?pageid=331#Hungary>)

In Poland numerous GRSW events took place during the week. (See <http://www.grsproadsafety.org/?pageid=331#Poland>). GRSP Romania gave impetus to the organisation of a high level inter-ministerial meeting on road safety that took place at the start of the GRSW. The Ministers of Transport, Interior, Education and Health were personally present and other ministries were represented. Decisions taken at the meeting include the development and launch of two road safety improvement programmes within the framework of the National Strategy for Road Safety. The programmes, Stop to accidents! Life has priority! and Building Safe Roads for Life, were officially opened in a high-profile event on Friday, 27 April, on the occasion of the European Day for Road Safety.

GRSP Brazil supported GRSW by implementing numerous events in many of its network towns. (See <http://www.grsproadsafety.org/?pageid=331#Brazil>)

(Source: GRSP "e-News" May 2007 - No. 5)

**The Global Road Safety Partnership (GRSP) is one of four Business Partners for Development (BPD) programs initiated by the World Bank in February 1999. The GRSP links business, civil society and governmental organisations around the world to collaborate in improving road safety. It is governed by a Steering Committee and assisted by a Secretariat based in Geneva, Switzerland. Over 200 organisations have taken an active role in establishing the GRSP and it is now active in over 10 countries. The GRSP is not a funding agency and does not finance road safety interventions of the type normally financed by governments, bilateral and multi-lateral donors.*

Contributed Articles

Motoring Matters - For Every Australian

The Australian Automobile Association and Australia's motoring clubs represent some 6.5 million members in a range of different forums at regional, state, national and international levels. With the Federal election imminent, AAA has developed a campaign strategy to advocate on a number of major issues to motorists and all road users - **Motoring Matters for All Australians**.

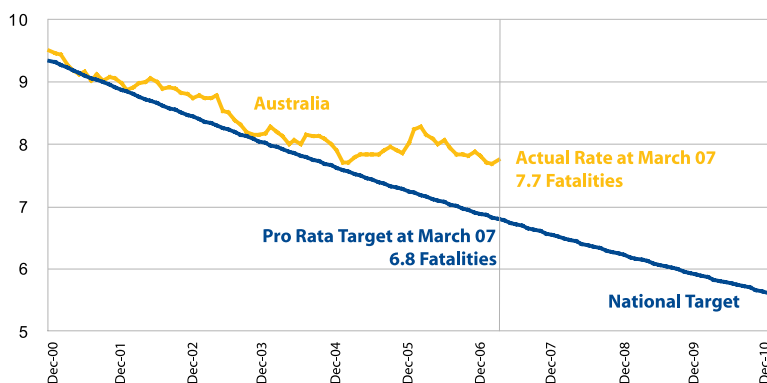
Following is the Motoring Matters strategy.

This article was supplied by the Safer Roads Program.



Motorists are a strong lobby. There is a car in almost every Australian household - roads permeate all aspects of our society and represent the major arteries of modern society, playing a crucial role in local, regional and national economies. Five people die every day on Australian roads - which is a national tragedy in economic and human terms.

Road Fatality Rate vs National Target
(fatalities per 100,000 population)



The Australian Automobile Association and Constituent motoring clubs represent the interests of more than 6.5 million members, their families and, further, the motoring public. We act as the principal consumer advocate on Australian road safety matters at the local, State, national and international level.

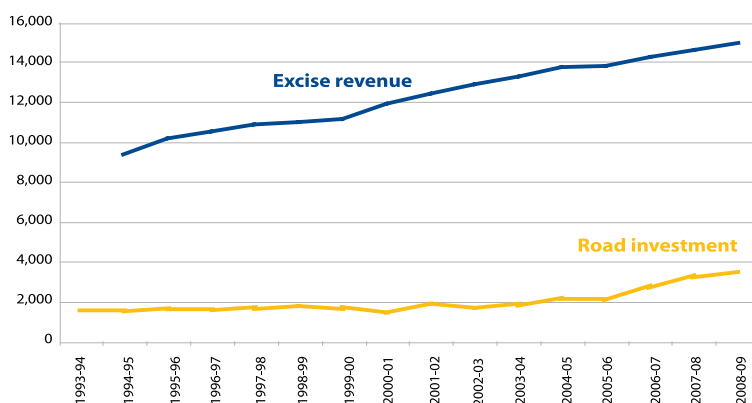
In the lead up to and during the election, AAA will be promoting its election dossier – **Motoring Matters** – and seeking to enlist broad support from the electorate and political parties.

AAA believes in a systems based approach to road safety – safer drivers in safer cars on safer roads. This philosophy adopts the holistic approach incorporating the various elements to preventing road trauma and underpins AAA's strategic aims and activities.

The economic and social importance of a safe, well constructed and maintained road system in Australia cannot be questioned. Investment in roads can reduce vehicle operating costs and travel times; leading to greater productivity benefits and incomes for the nation. There are many strategic road investments on the drawing board which will benefit Australia. For every \$1 invested, the economy reaps a return of up to \$5 (CEDA Infrastructure Report 2005).

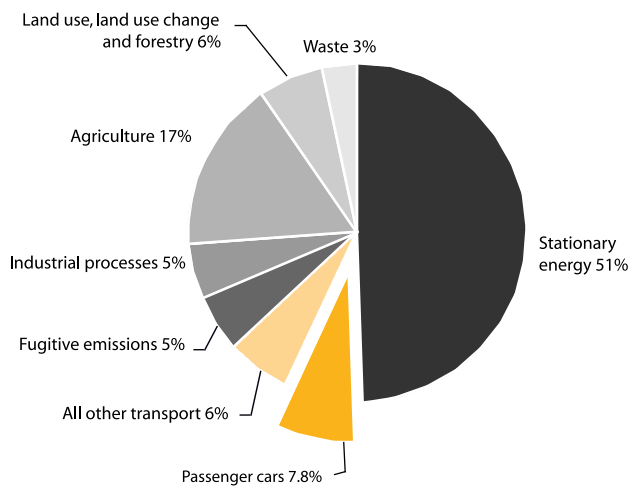
The 2007 Federal Budget outlined a major funding boost for road infrastructure through AusLink 2 of \$22.3 billion for road and rail infrastructure without allocating for specific projects. While well received, AAA and the motoring Clubs believe this allocation will fall short of the \$25 billion a year it has long advocated – equivalent to 12cpl out of the 38cpl taken in fuel excise.

Commonwealth Fuel Excise Revenue vs Road Investment (\$ million)



Source: Commonwealth Budget Papers

Australia's Greenhouse Gas Emissions By Sector, 2005



Source: Australian Greenhouse Office, National Greenhouse Gas Inventory, 2005

Investment in roads also improves road safety outcomes, with associated benefits in terms of improved quality of life, lower health and welfare costs and lower insurance premiums. The cost of road crashes and trauma to the Australian economy is currently estimated at \$17 billion a year (Aust Centre for Economic Research on Health, UQ).

The importance of ensuring adequate real-world driver training and tuition – particularly for our young drivers – is also a major AAA issue and one which will be pursued with major political parties. AAA believes there is a strong role to be played by parents and carers in this training process and this needs to be recognised nationally. Climate change and greenhouse gas emissions will be prominent themes in the election campaign. Passenger car emissions contribute only 7.8% of total greenhouse gases (National Greenhouse Gas Inventory 2005). The Bureau of Transport and Regional Economics estimates the avoidable costs of congestion for Australian capital cities totaled approximately \$9.4 billion in 2005 (BTRE Working Paper 71, 2007). Reducing this congestion will deliver economic benefits and reduce greenhouse gas emissions.

A commitment to **Motoring Matters** will reduce costs to motorists.

AAA is seeking commitment to a range of appropriately funded national programs which will deliver better road infrastructure benefits – these in turn will deliver better regional and national economies, a better environment (reduced congestion, less fuel and fewer emissions), consequent lower costs for motorists and, most importantly, lower road fatalities and trauma in line with the National Road Safety Strategy targets.

Motoring Matters builds on the relationships established in Canberra to advocate for further Federal Government investment in roads and related issues through policies and program funding that produce safer drivers in safer cars on safer roads.

Motoring Clubs: 'Important' Roles

	Total Important
Improving the safety and condition of roads	92%
More petrol tax spent on roads	91%
Testing the safety of cars	91%
Driver training and education	90%
Putting motorists' views to government	90%
Monitoring petrol prices	88%
Reduce tax on petrol	86%
Reduce environmental impact of cars	84%

Source: AAA National Survey of Motorists' Attitudes, ANOP 2007

Continued on page 16

What Motorists Say

AAA undertakes regular polling to determine motorists' views and attitudes to a range of motoring issues. In 2007, AAA's fifth detailed survey of these attitudes in eight years included motorist's views on the motoring clubs' "important" advocacy role on a range of issues.

What We Want

- AAA and Constituent Clubs are seeking the following commitments from political parties contesting the next Federal election:
- That the Federal Government increase road investment in AusLink 2 (2009/10 to 2013/14) to at least \$25 billion. This is equivalent to 12cpl raised from the 38cpl fuel excise;
- Strong project management that delivers projects on time and on budget;
- Increased funding for the Commonwealth's Black Spots program to \$100 million a year, through to the end of AusLink 2 in 2014;
- Introduction of family oriented programs to help learner drivers receive adequate real world driving experience;
- Ensure that every new car sold in Australia has at least the same level of safety as equivalent models overseas;
- Government to partner with motoring clubs on specific programs to address climate change, and to reduce greenhouse gas emissions from cars;
- Reform of fuel taxation which will result in fuel being cheaper for motorists and their families. By acknowledging and investing in the programs Australian motorists want, all Australians benefit in the following ways:

Why We Want it

- AAA and Constituent Clubs believe there are good reasons for political parties to support Motoring Matters:
- Road transport plays a significant role in economic growth;
- Road upgrades can lead to lower vehicle operating costs, improved travel times, improved safety and reduced environmental costs;
- There is currently a significant backlog of road projects;
- The Black Spot Program is highly effective with a return of \$14 for every \$1 invested;
- ANOP research consistently shows 9 out of 10 motorists believe the amount of petrol tax spent on roads is inadequate;

- AAA's road rating program, the Australian Road Assessment Program (AusRAP), has star rated the AusLink network and 51% is rated 3 stars out of 5, which is unacceptable;
- The build up of urban congestion in some Australian cities increases the level of greenhouse gas emissions and raises the costs of motoring for drivers;
- Increasing fuel prices impact upon family budgets;
- Australia is lagging well behind the target set under the National Road Safety Strategy (NRSS).

How We All Benefit

By acknowledging and investing in the programs Australian motorists want, all Australians benefit in the following ways:

• Economy

Reduced vehicle operating costs

Reduced travel time

More efficient road infrastructure

Higher productivity and incomes

• Environment

Reduced congestion, leading to lower fuel use

Reduced impact on climate change from vehicles

Reduced air pollution

• Road Safety

Reduction in road fatalities, injuries and trauma

Lower human and social cost

Reduced impact on Australia's health system

Contributes to achieving NRSS targets

• Motoring Costs

Lower vehicle running costs

Improved mobility

Equity between truck and car road user charges

Road Safety Song Competition- See it on DVD

by Aaron Watson

The power of music is being harnessed in the Northern Territory to spread important messages about road safety in remote Indigenous communities. In its second year running, the Road Safety Song Competition took place at the Barunga Cultural and Sports Festival on the June Queen's Birthday long weekend. Indigenous bands from across the Territory made the trip to Barunga, 80km south east of Katherine, to showcase their music and to take part in the competition and Festival activities.



The competition is a fantastic way of encouraging safe road use practices at the Barunga Festival and is proving a success in promoting road safety messages at the grass roots level. Eleven songs were entered in the 2007 Road Safety Song competition, each featuring a unique blend of messages and musical appeal.

The Sandridge Band from Borroloola took out first prize of \$2000 with their song, *Take care when driving along*, which is packed full of road safety messages including reminders to never drink and drive and think about the lives of your passengers.

Warren H Williams from Hermannsburg near Alice Springs was runner-up, winning \$1000, with

Hey you mob which asks people to put their seatbelts on and look out for cars near the road.

Barunga School won the school category, winning \$500 for performing a fantastic song they wrote with well known Indigenous musician Shellie Morris. Kriol, or pidgin English, is used in one of the school's songs and will have wide appeal across the region.

The strong field of entries in the competition builds on the successful roll-out of the winning songs from the 2006 competition on radio and as backing tunes to television and radio commercials. The 2006 competition winner, Reggae Dave, features on road safety television commercials aimed at heightening road safety awareness amongst Indigenous people.

The Barunga Live 2006: Safe Tracks Home CD, featuring last year's road safety songs and other music from the Festival, has been well received in Indigenous communities across the Territory and proceeds from the sale of the CD go towards future Barunga Festivals.

A high quality DVD production of the 2007 competition will be launched in late August. The DVD features all the road safety songs performed, road safety scenarios and interviews with band members. The DVD will be sold widely through community stores, music shops and online at NT Indigenous music publishers Skinnyfish Music. Visit www.skinnyfishmusic.com.au for more details. The DVD will be given to Indigenous TV stations and distributed to bush schools in the NT. It is shaping up to be a great tool to spread strong messages about very important road safety issues including drink driving, pedestrian safety, seatbelt use, the importance of having a licence and general road safety issues. The winning road safety songs will continue to be aired on Aboriginal radio stations throughout the NT and beyond.

For more information about the Road Safety Song Competition, the CD or DVD visit www.roadsafety.nt.gov.au or phone (08) 8924 7017.

Rolling on Road to Disaster

By Raphael Grzebieta

[Ed: This article was published originally in the Herald Sun Newspaper of 14 June 2007 and is reproduced by permission. It is a good example of how the media can provide opportunities for College members to promote the cause of road safety.]

I CARRY out crash tests for a living. I know how much energy a barrelling big rig possesses. I keep well clear of them if I can.

Big trucks and cars do not mix well. Big questions are being asked. The State Coroner is searching for the answer after horrific crashes in the Burnley tunnel and at a Kerang rail crossing. Both disasters involved trucks. What went wrong?

When trucks travel at 80-100km/h they take a lot of stopping in an emergency. It is obvious that if we want a truck travelling at 100km/h to safely stop at a railway crossing, it takes time. Any warning sign of an approaching train must be clearly visible when the driver is at least 300m away. Slowing the truck to 60km/h well ahead of the crossing is an obvious alternative.

Another thing we know about trucks is that they can scare people in cars in front and alongside them. Stories abound of car drivers being tailgated and bullied by speeding truck drivers. On my return from a two-week visit to the US West Coast, I suddenly noticed how many trucks travel on our roads. I seemed to be surrounded by them. The amount of energy contained in a fully laden B-double, with a mass of about 62 tonnes, travelling at 100km/h, is 39 times more than that of a car travelling at the same speed. But consider this: The difference in energy between a car travelling at the same speed, although much slower, is only around 15 times that of a cyclist, although the cyclist would be much slower.

In a crash between a truck and a car, the bottom of the truck's bumper bar is usually at the height of a car driver's shoulder. The truck's bumper often overrides the main structural crush components of the car. The truck bumper hits the car driver or passenger directly in the head before scrunching up the car. If a car hits the rear of the truck, the tray is again at around head height. Decapitation of the passenger is sometimes the result. It's no wonder cars come out second best when involved in truck crashes. An Australian Design Rule has now been introduced requiring trucks to be fitted with front override barriers. But rear and side underrun barriers are not required, in spite of calls for their introduction more than 30 years ago.

A truck moving at 100km/h will travel about 70m before the driver begins to apply his brakes. The driver will then require another 100m of hard braking to stop the truck. A car with ABS brakes will also travel about 70m before the driver reacts and applies the brakes. But the car can stop in 50m and a car braking hard in front of a truck braking hard will either get pushed forward or overridden and crushed by the truck. So, why do we allow trucks and cars to travel freely in the same lanes? A truck crashing into the rear of another truck is surely much better from an energy-management and occupant-survivability point of view than a truck riding over the top of a car.

One of the fundamental energy-management rules used by crash experts is to separate big moving objects from little moving objects. Trucks should be kept separate from cars, as cars should be kept separate from pedestrians and cyclists.

In the UK, trucks must keep to the left lane and can only move to the adjacent lane to overtake another truck. They must also travel about 15km/h slower than cars. The rules also apply on the west coast of the United States. Why are we tolerating an unnecessary and increasing risk on our roads by allowing trucks to use all lanes?

(Copyright: Herald Sun Newspaper)

Car Restraints for the Child Over 12 Months

By Dr Sam Tormey, Medical Doctor and Research Fellow at OzProspect, a non-partisan policy think tank based in Melbourne.

This article was published originally under the title 'Restraining Reorder' in the June 2007 edition of 'Canberra's Child', a free monthly magazine published in the ACT for parents. See www.canberraschild.com.au.

Big changes are underway to the regulations concerning children's safety in cars. There have been mutterings for some years now about how we restrain children in our vehicles, but a tragic accident near Wollongong last year has prompted more urgency to the reform process.

Danielle and Noel Broadhead, like many of us, assumed that Australia would have some of the toughest safety laws in the world in this field. After all, we are well-recognised internationally for having extremely strict and effective air and road safety regulations. Our road safety campaigns have been used as a model example by many countries in how best to reduce accidents and road deaths. The Broadheads had followed the current law that states that all children under 12 months must travel in a dedicated infant capsule. As their children grew older, they purchased Australian Standards-approved booster seats. It was into one such seat that they strapped their 3 year-old daughter Isabelle for a short trip

down the mountain the day before Good Friday last year. Driving cautiously down the steep and winding road, Isabelle's mother was confronted by an oncoming truck which had veered into her lane. Despite her best efforts, her people-mover hit a tree at about 40km/hr, stopping the car from falling into a gully. Apart from the initial shock of the crash, Danielle and her two daughters (who were both in booster seats in the rear seat of the car) appeared to be uninjured. Tragically, Isabelle soon lost consciousness and died shortly afterwards.

It was the findings of the coroner that spurred the Broadheads into action. The coroner held that Isabelle died from massive internal injuries sustained from the adult seatbelt which restrained her within the booster seat. With the dreadful clarity of hindsight, it became apparent that Isabelle was not in an appropriate seat for her height and weight. Since then, her parents have embarked on a tireless campaign to prevent similar deaths.

Thanks in large part to their efforts, new regulations have now been drafted which set out a pathway of restraints from birth to seven years old. A draft proposal from the National Transport Commission (available at www.ntc.gov.au) states that children up to six months old must be restrained in a rearward-facing restraint with an inbuilt harness; then in a rearward or forward-facing restraint with an inbuilt harness until the age of four; and a forward-facing restraint with an inbuilt harness or booster seat from four to seven years old. As well, the Commission notes that "while the proposed laws cater for the majority of

children, a provision has been drafted to ensure a child is not required to use a restraint unsuitable for their size and weight (for example, a child who is too tall or heavy for the restraint)”.



Photo courtesy Kidsafe

Strapping the kids into the family car is one of the most risky experiences to which we ever subject them. About 3000 children under the age of 10 are injured in car crashes each year – about 500 of those kids are seriously injured or killed. Scientific research strongly suggests that we can reduce these figures by using more specific restraints tailored to the height and weight of our children. [Ed. See the peer-reviewed section of this Journal for the Brown and Bilston paper on this subject]. We have had good regulations as regards infant restraints (rear-facing capsule until age 6 months, thereafter forward-facing) although some countries take a far tougher line (in Sweden, for example, children must be in rear-facing restraints until aged 4 years). Toddlers and school-age children, however, are often in inadequate restraints and are graduating to adult seat-belts far too soon. Adult seatbelts are designed to safely restrain passengers who are at least 143cms tall, roughly equivalent to a 9 or 10 year old child. Research conducted by Monash University suggests that we discard booster seats at an average age of 5.6 years, which is 3 to 4 years too early for most children.

A quick look on the internet will reveal a bewildering array of safety devices. There are no less than five different types of restraint designed from birth up to 9 years old. Choosing the right restraint is quite complex, but there are many resources available to help – see links listed below. Until very recently, many of the best seats were not available in Australia, however the range is now improving.

To ensure safe travel for your child, aim to keep your baby in a rearward-facing infant restraint for the first year, rather than the recommended six months. After twelve months, choose a forward-facing child seat that has a six-point internal harness. Most of these chairs will serve your child until he or she is approximately five years old. The chair itself is anchored to the car seat by the adult belt and must be attached to an anchor

point on the frame of the car, either on the roof or behind the passenger seats. The six points of the harness comprise two shoulder straps, two hip straps and two crotch straps. The crotch straps in particular are crucial as they prevent “submarining” or slipping forward under the belts during an impact, a common cause of injury in poorly fitted restraints.

After five years of age (or about 18kg weight) inbuilt harnesses must not be used, and the child should be restrained by the adult seatbelt (hence the use of a booster seat to raise the child to the height at which the adult belt can be used as the restraint). A growing body of evidence suggests that it is safer to add a separate harness to booster seats. These are known as “H” harnesses and should be used in booster seats that already have a crotch clip. Booster seats must be securely fastened to the car and should have some side “wing” protection. The most common reason for changing from a booster seat to an adult belt alone is that the child has outgrown the seat. It is strongly suggested that parents consider a larger booster seat to take their child right up to age of nine years.

Do's and don'ts of child car restraints:



Photo courtesy Kidsafe

- Never use the front passenger seat to transport children. The back seat is safer.
- Keep children in rear-facing restraints for as long as practicable.
- Don't scrimp and save. Choose the best quality seat available, and be very cautious about second-hand seats if they are more than 10 years old, visibly damaged or have ever been involved in an accident.
- Never fit a booster seat to a lap-only adult belt (ie avoid the central rear seat in cars that have lap-only belts in this position)
- Ensure that there is a sash-guide adjacent to the shoulder to ensure the sash does not slip. The sash should go over the child's shoulder and must not be in contact with the neck.
- Straps attached to an anchor point on the frame of the car, either on the roof or behind the passenger seats, must be really tight. Lean into the seat to ensure there is no slack in the strap.
- Children in booster seats must be educated to never touch the seatbelt or fiddle with the buckle.
- Totally avoid booster “cushions” which have no back or side sections.
- Never fit a booster seat to a rear-facing car seat.

- If you are not confident that the seat is fitted correctly, ask an approved fitter for assistance. Most motoring organisations can provide a list of approved restraint fitters.
- Children grow quickly, so you need to regularly review whether your child is in the right seat.
- Always use the restraint, every single time, no matter how much a child protests.

Useful Links

www.belletoni.org.au this is the website for the advocacy organization set up by the parents of Isabelle Broadhead and Toni Perrin. Both children died in car accidents on the NSW South Coast. The website contains an excellent section on choosing restraints, including pictures.

www.isabelle-broadhead.memory-of.com is Isabelle's memorial website, containing her mother's moving story of the campaign for law reform and better resources for parents.

<http://www.vicroads.vic.gov.au/Home/RoadSafety/SeatbeltsChildRestraints/ChildRestraints/> there are similar websites from other state government transport departments offering useful advice.

http://www.mynrma.com.au/cps/rde/xchg/SID-3F5768EC-EB1A9ECA/mynrma/hs.xsl/child_and_infant_restraints.htm
This excellent piece includes some specific crash test data for certain brands of restraints.

<http://www.monash.edu.au/muarc/reports/muarc250.html> for those who wish to look at some leading Australian research in detail.

www.atsb.gov.au/pdfs/child_restraints.pdf is a simple guide to child restraints from the Australian Transport Safety Bureau.

Helicopter Rescue's Key Role in Reducing the Road Toll

by Geoff Horne

It has long been understood that providing medical care for road trauma victims within one hour of the crash can be critical in saving lives and highly beneficial in reducing the long term effects of injuries. This key period is sometimes referred to as "The Golden Hour". Considering the victims of major trauma who die, experience indicates that 2/3 will have suffered major head or other central nervous system injuries about which little could have been done to prevent the outcome. However, 2/3 of the remaining fatalities would be preventable if the casualty were to receive appropriate medical management in this "Golden Hour" (1). In recent years

improvements in response times by emergency medical personnel have been greatly assisted by the use of helicopters. As an example, for an ambulance to drive from Dunedin to Christchurch in New Zealand takes about 5 hours, whereas a helicopter, travelling at 120 nautical miles per hour can complete the journey in 1 hour 20 minutes. The typical modern rescue helicopter can be regarded as a fully equipped intensive care unit in the sky. It has everything you would find in the back of a well-equipped road ambulance, and more.

The aim of this article is to give an overview of the considerable extent of helicopter emergency medical and rescue services in

Australia and New Zealand. Some examples are given of the historical background, the current level of activities and the costs involved in this vital road safety service, in order to give the reader a feel for this comparatively new way of responding to road trauma and the beneficial impact it is having.



A Bell 412 Helicopter in service with
Emergency Management Queensland

Australia

The first Australian helicopter emergency medical and rescue service (HEMS) was started in Sydney in 1973 (2). Today helicopter rescue within the Golden Hour is available for most of the densely populated regions of Australia. Even where rescue response is necessarily longer due to Australia's vast distances between population centres, helicopters are playing a vital role in providing much faster medical attention than was previously possible by surface vehicles.

Unlike road ambulance services, no charge is levied from most recipients of the services provided by rescue helicopters.

Helicopter emergency services vary in their funding sources, which may be from government, corporate sponsorship, individual donations and community fundraising activities, but often a

combination of all these. Unlike road ambulance services, no charge is levied from most recipients of the services provided by rescue helicopters. There are a few instances of 'user pays', such as international tourists covered by travel insurance. Typical costs of providing a rescue helicopter are in the region of \$2,500 - \$4,000 per flying hour, so it is quite remarkable that the service is mainly free, and a tribute to the community-minded people whose campaigning for sponsors and fundraising efforts make this possible.

There are two categories of helicopter for HEMS operations. Category 1 helicopters are twin engine, have one pilot and are capable of night operations. Their minimum cruise speed is 120 knots and they can accommodate any type of patient and have the capacity to transport two stretcher patients with medical equipment, two medical attendants, a pilot and flight crew. Category 2 helicopters are smaller and generally operate in daylight hours only. They can carry one patient at a time plus a pilot, flight and medical crews. (3)

Gathering information on HEMS in order to obtain an overall picture of activities in Australia is difficult because there is no centralised compulsory reporting system for HEMS flying hours and the number of patients carried (2). In looking at helicopter rescue as a road safety issue, it should be noted that these services are not applied only to road trauma rescue, but to any kind of rescue or medical emergency. Although many of the HEMS activities were initiated for surf and remote bush area rescue, road trauma rescue is becoming an increasingly important part of their activities.

New South Wales

There are six helicopter services contracted by NSW Health to perform emergency services in the New South Wales community. In total there are 9 helicopters currently operating across the State, 6 Category 1 helicopters and 3 Category 2 helicopters (3)

Sydney - Orange

For many years HEMS work in and around Sydney was done by the NRMA Careflight team and the Westpac Surf Life Saver. Following a NSW Government decision in 2006 to upgrade the level of HEMS in the State, a contract was awarded by the NSW Government to CHC Australia, effectively taking over the roles of NRMA Careflight and Westpac Surf Life Saver in 2007. The contract called for AW139 and EC145 helicopters to be based in Sydney, Orange and Wollongong. Announcing the change (4), Health Minister John Hatzistergos said that the contract would mean a new direction for state-of-the-art medical helicopter retrieval services in NSW. Essential requirements of the new contract were that CHC would provide helicopters capable of carrying two patients or a patient heavier than 120kgs, improved poor weather performance, improved safety features and greater range at 30% faster flying speeds. In addition, a back-up helicopter would be available at all times. All helicopters provided by CHC under the new contract are twin-engine, with controlled flight ability in the event of one engine failure.

NRMA Careflight will continue to sponsor and support the HEMS service out of Sydney and Orange by providing doctors for the rescue and retrieval aircraft. (Under the previous arrangements doctors were part of the HEMS team, but this was not provided for under the CHC contract). (4)

NRMA CareFlight Media Release 10th May 2007

An NRMA CareFlight trauma team flew to Spit Junction, on the lower north shore, to treat a pedestrian who was hit by a car on Spit Road early this afternoon. Police blocked busy Spit Road to allow the NRMA CareFlight helicopter to land at the scene. The NRMA CareFlight doctor said the semi-conscious 61-year-old Mosman man suffered head injuries. After stabilisation by the doctor and ambulance paramedics the man was taken by Road to Royal North Shore Hospital.

Having doctors on board rescue helicopters will ensure the continuation of the Head Injury Retrieval Trial (HIRT). This medical trial is investigating the benefits of 'pre-hospital' trauma care at the scene of a crash in improving recovery outcomes for people with head injuries.

Australian Capital Territory and the Southeast Region of New South Wales

Snowy Hydro SouthCare helicopter rescue service operates throughout this region, providing retrieval and rescue services that are coordinated by the NSW Ambulance Service (5)

Media Release example by SnowyHydro SouthCare ACT & South-East NSW Aeromedical Service, 1 October 2004

Snowy Hydro SouthCare flew to Nerriga North of Braidwood today to airlift a thirteen year old male teenager injured in a motor vehicle accident. At 9am this morning Snowy Hydro

SouthCare was tasked to fly to Nerriga to airlift patients involved in a single vehicle motor vehicle accident. Due to severe weather conditions the helicopter had to fly along the power lines and arrived at the scene at 0945am. A 43 year old male driver, two thirteen year old male teenagers and a ten year old female had been in the vehicle when it hit a tree and rolled. One of the male teenagers managed to get out and raise the alarm for help. The other male teenager was trapped in the vehicle for over an hour. All four patients were treated by NSW Ambulance officers and stabilised. Snowy Hydro SouthCare airlifted one of the male teenagers who was suffering from abdominal injuries and compound leg fractures and was in a serious but stable condition upon arrival at the Canberra hospital, arriving at 11.35am. The other three patients suffering minor injuries were road transported by the NSW Ambulance Service to Braidwood Hospital.

Newcastle – Tamworth

Westpac Rescue Helicopter Service is a community owned and operated aeromedical search and rescue service, serving the Hunter, Mid North Coast, New England and North West regions. The Service's Bell 412 aircraft is based at Broadmeadow in Newcastle and is on call 24 hours per day with a Bell 407 as a backup aircraft during daylight hours for the Hunter & Mid North Coast areas of the State. For New England & the North West another Bell 407 operates 12 hours a day from Tamworth Airport. Over one million people are covered by this service (6).

Northern New South Wales

This region is serviced by a Westpac helicopter based in Lismore (7). Its operational area extends from the Queensland border in the north at Tweed Heads, south to Nambucca Heads and west to Glen Innes and Tenterfield in the ranges. The geography of this flight area consists of large and rugged mountains, long areas of coastline, inland waterways, rain and timber forests, farmlands and the infrastructure of roads, highways and rail links. The Rescue Helicopter Service commenced at Ballina in 1982, motivated by the need for surf rescue work. This was the fifth Surf Life Saving Australia (SLSA) service established in Australia. A twin-engine Aerospatiale Dauphin helicopter was brought into service in 1991, which greatly improved the quality of the service provided.

A second identical helicopter was purchased in 1996, facilitating the provision of a 24-hour aero medical service, every day of the year. More than half of the annual \$3 million budget comes from community fund raising and donations, while the remainder is provided by the NSW Government and 10 commercial sponsorships, with Westpac as the principal sponsor.

The Westpac Life Saver Rescue Helicopter was tasked to airlift a 19-year-old Ocean Shores male from Lismore to Gold Coast Hospital. The patient had a depressed skull fracture sustained in a motor vehicle accident on Rifle Range Road. (Source: *Westpac Lifesaver Rescue Helicopter Northern Region media release, 20th April 2007*)

Wollongong

Plans are in hand to open a new 24 hour HEMS based in Wollongong (4). The new helicopters provided by CHC are expected to extend the reach of HEMS to Kempsey, Tamworth, Condobolin, Cooma and Wagga Wagga. This will ease the pressure on existing HEMS operations out of Newcastle, Tamworth, Lismore and Canberra.

Northern Territory

The Northern Territory does not have a dedicated HEMS service. However, the police and emergency services often charter helicopters from local companies in Darwin and Alice Springs for rescue work., though there appear to be few reports of road trauma HEMS rescue. The RAAF Tindal Airbase also sometimes provides a helicopter for emergency rescue operations.

Article from News.com

Driver arrest after Ghan train crash

December 13, 2006

The truck driver involved in the derailment of the Ghan passenger train south of Darwin yesterday has been arrested. The truck driver, 57, who suffered suspected spinal injuries, was also taken to hospital by ambulance. A 50-year-old British woman remains in critical but stable condition in Darwin hospital today after she was removed unconscious from the wreckage by rescue workers. She suffered head injuries and had to be stabilised at the scene before being flown to Darwin in a RAAF search and rescue helicopter.

Queensland

Queensland has a number of separate organisations providing HEMS, but they are all coordinated by Queensland Clinical Coordination, a government department that also coordinates road ambulances across the State (8). The HEMS network includes:

- Emergency Management Queensland (EMQ) – a fully government funded service operating out of Brisbane, Townsville and Cairns.
- RACQ CareFlight – a charity based at the Gold Coast and covering north to Gympie, west to Goondiwindi/Roma and south to Lismore for road rescue.

- Energex Community Rescue – a charity based at Maroochydore covering the Sunshine Coast and Bundaberg.
- Central Queensland Rescue – a charity based at Mackay.
- Capricornia Rescue – a charity based at Rockhampton.

EMQ uses Bell 412 helicopters operated by a crew made up of the pilot, winch operator and down-the-wire rescue officer. In the case of medical missions, a doctor and paramedic are included. The following table shows how HEMS road trauma missions are on the increase in the area covered by EMQ.

Air Base	2003/2004		2004/2005		2005/2006	
	Tasks	Flying hours	Tasks	Flying hours	Tasks	Flying hours
Brisbane	13	13.26	40	32.33	51	50.92
Townsville	19	32.96	17	21.48	19	30.7
Cairns	10	14.5	9	16.1	29	40.77
Total	42	60.72	66	69.8	99	122.39

RACQ CareFlight performed around 40 Scene/Primary missions for road trauma in the 2005/06 year. In such situations the helicopter flies directly to the scene of the accident with a four-man crew made up of the pilot, crewman, doctor and paramedic, so that immediate treatment can be given, even if the injured are trapped in their vehicle. This greatly increases the chance of the patient's survival.



Palen Creek motor vehicle accident – the RACQ Careflight landed on site to assist a man injured when his car hit a tree. Photo courtesy RACQ Careflight.

This is a 24 hours, 7 days per week service. RACQ CareFlight has two helicopters: a twin-engine Bell 412 with a flying range of 3.5 hours, capable of carrying four crew and two critically ill patients; and a Squirrel that has a flying range of 3 hours and can carry four crew and one critically ill patient. Average mission costs are estimated at \$7,000. These costs are met from a number of sources: 20% from major commercial sponsors, 20% from the local and state government and the remaining 60% from fund-raising and donations from the local community.

South Australia

The Adelaide Bank has been sponsoring a State HEMS operation from Adelaide for the last four years, coordinated by the South Australia Ambulance Service (9). The SA HEMS operations were relaunched in December 2005, to provide twice the capacity to perform winch rescues, more capacity for medical retrievals, quieter helicopters for Police patrols and increased capacity to firebomb during bushfires. The new Adelaide Bank Rescue Helicopter Service contract is project

managed by the Department of Justice (10). It provides a helicopter platform for four vital services to South Australians - Hospitals, Police, Country Fire Service and Ambulance. Under the contract with Australian Helicopters, four helicopters are guaranteed to be available when needed. The Westpac Life Saver Rescue Helicopter in South Australia patrols beaches on weekends, public holidays and busy weekdays over summer from November through to March each year and may be called on for road trauma rescue.

Tasmania

The Tasmania Rescue Helicopter Service was established in September 2000 (11). Funding for the Air Rescue helicopter is provided by the State Government through the Department of Police and Emergency Management's recurrent budget. This arrangement is on the understanding that complementary funding sources through community ownership are sought to maintain the continual improvement to specialist equipment and training required by Police and Ambulance personnel and the pilots' night flying training. To this end, the Tasmanian Air Rescue Service was established as a sponsorship and fund-raising organisation to support the air rescue service. The helicopter is available for a wide and varied range of missions, including motor vehicle accidents. Known as the Westpac Rescue Helicopter under its current major sponsor, the aircraft is a twin-engine Kawasaki BK117 which operates 24-hours a day, seven days a week and is equipped with medical and emergency equipment enabling it to fly into almost any area in any conditions, day or night.

The helicopter has a three-person winch stretching 70m in length and contains a stretcher. The helicopter is capable of two-patient transport when required. It also contains intensive care medical equipment and a range of rescue equipment. It has a 30 million candle power 'Nitesun' searchlight for night

operations. The helicopter can carry ten people, including the pilot, and has a full payload range of 540 km and a flying time of 2 hours 50 minutes.

Tasmanian Air Rescue Trust - Newsletter Winter Edition

Late April and a woman died and six were left injured after a horrific pile-up on the Midlands Highway. The call-out came just after 2pm when seven people were injured in two cars including one towing a caravan. A woman was trapped and died at the scene while three others were transported by Westpac Rescue Helicopter to Royal Hobart Hospital and three others taken by ambulance. The highway was closed for several hours with traffic being diverted through paddocks.

Victoria

The helicopter emergency rescue service in Victoria is operated by Air Ambulance Victoria (AAV) under the organisation of the Metropolitan Ambulance Service (12). The AAV has both helicopters and fixed wing aircraft. There are three helicopters operating out of Essendon, Bendigo and the Latrobe Valley. Their primary focus is in responding to emergency calls, providing early Mobile Intensive Care Ambulance (MICA) care at the scene of an accident and rapid transport of critical patients to major hospitals. A Dauphine twin-engine helicopter with two-stretcher capability operates out of Essendon, with an operational range of 175km. It is crewed by a police pilot, observer and MICA flight paramedic. This helicopter is used for both ambulance and police duties. Both the Bendigo and Latrobe Valley helicopters are Bell 412 aircraft, which are used for ambulance and fire fighting duties.

The following table shows the number of responses made by the AAV to road traffic accident (RTA) calls between 2003 and 2006. RTA primaries are direct visits to attend to road trauma victims at the crash site. RTA secondaries are transfers of road trauma victims between hospitals.

Year	RTA primaries	RTA secondaries
2005-6	460	55
2004-5	409	57
2003-4	439	59

Supporting the work of AAV in Victoria is the LifeFlight organisation. This has two fully operational medical/rescue/fire fighting helicopters, which can be used for Air Ambulance, Rescue and Fire Fighting purposes.

The LifeFlight Helicopter Emergency Medical and Rescue Service (HEMS) is offered to medical retrieval teams and Air Ambulance Victoria as a backup, when the Air Ambulance helicopters are unable to meet the demand. It is available throughout Victoria. LifeFlight operates two BK117 B2 model twin-engine helicopters. Each of the helicopters in LifeFlight is fitted with multiple stretcher systems, medical oxygen, suction,



AAV helicopters (Photo: AAV)

medical quality lighting, backup power, as well as specialist coronary and neonatal medical equipment, rescue stretchers and rescue diver immersion equipment. LifeFlight is a Non Government Organisation that receives approximately 50% of its funding from government, relying upon sponsorship and donations from the community and philanthropic groups to make up the remainder.

Western Australia

There has only been a dedicated HEMS in Western Australia for the past 3 years, but it has already made a considerable impact on road trauma rescue operations. In 2004-05 the service undertook some 120 missions in response to motor vehicle and motorcycle accidents. Busiest times were on

Busiest times were on Saturday and Sunday, and the quietest, Wednesday and Thursday. WA HEMS, known as RAC Rescue 1 due to sponsorship support by the State motoring organisation, is the State's only dedicated emergency helicopter service (13). The

helicopter, pilot and rescue crewman for this service are supplied under contract by CHC Helicopters Australia, while the St John Ambulance organisation provides a critical care paramedic. The radius of operation is 200km from Jandakot Airport, Perth, thus providing HEMS coverage for approximately 90% of WA's population. The rescue helicopter operates 24 hours a day 7 days a week.

The Call Response time, that is, the time taken from the initial receipt of the emergency call to the time RAC Rescue 1 is airborne varied during 2005-06 between under 10 and 30 minutes, as shown in the table below.

Call Response Time	<10 min	10-20 min	21-30 min	>30 min
Flight numbers	103	68	21	22

Funding for the service is provided by the State Government and the Royal Automobile Club of WA and amounts to some \$4.5M p.a., most of which is incurred irrespective of the flying hours. The flying hours component is about \$450,000 p.a., giving an approximate cost per mission (not just road trauma cases) of \$2,250. The service is managed by the Fire and Emergency Service Authority (FESA) (13).

New Zealand

Helicopter rescue services in New Zealand can trace their origins back to 1970-71, when a helicopter operator offered his spare flying time to the Auckland Surf Lifesaving Association (ASLA). Operating a small Hiller 12B helicopter, pilot George

Sobiecki made 11 rescues in the first year (14). By January 1985 the service had achieved 1000 rescues. Thus the motivation for establishing HEMS in New Zealand, as in Australia, was not a response to the needs of road trauma cases, but to surf life saving and other difficult rescue situations. However, road trauma now forms an important part of the HEMS work in New Zealand.

New Zealand now has some 15 rescue helicopter services spread throughout the country and supported mainly by commercial sponsors and community fund-raising efforts. As in Australia, the Westpac Bank has had a long association with HEMS and leads a number of other commercial businesses in sponsoring rescue helicopters in Auckland, Christchurch, Hamilton and Wellington.

North Island

Whangarei

HEMS in the Whangarei region is run by the Northland Emergency Services Trust, which was formed in 1988 (15). The trust uses a Sikorsky S76A helicopter that has an operating radius of 270kms from the base in Whangarei and is capable of operating in all weather conditions. Its maximum speed is 287 km/h and its long range capability allows the helicopter to provide coverage to all of Northland and most off shore rescue work. The Sikorsky S76A is designed to carry 2 pilots, 4 medical attendants and 2 stretcher patients comfortably. Usually only 2 medical attendants are required, therefore on most occasions, there is room for a relative/friend to travel with the patient. The Trust's base is at the St John Ambulance headquarters in Whangarei, which provides efficient liaison with the paramedics.

Two Cut From Car, Northern Advocate, 13th January 2005

Two people were trapped after a serious car crash in the Far North yesterday. Mangonui firefighter John McLaren said a car allegedly crossed the centerline of State Highway 10, outside

the Whangaroa Golf Club, before crashing into a culvert about 11.50am. The woman driver and male front seat passenger had to be cut from their car, Mr McLaren said. They were both wearing seatbelts. A St John spokesman said one of the pair received serious injuries while the other received moderate injuries. The man and woman were flown by a NEST rescue helicopter to Whangarei Hospital.

Auckland

In 1990 the ASLA handed over control of the rescue helicopter to the newly-formed Auckland Rescue Helicopter Trust (16) A Squirrel AS350B model became the main flying machine, replaced by a BK 117 model in 1993. In the year 2000 forward looking infrared (FLIR) systems were fitted to the Auckland-service BK117 for night flying and tracking victims using body heat. In 2002 this service was awarded ISO 9002 (an international system for establishing the quality level of service provided by a company or organisation). This was the first such award to an air rescue operation in Australasia. The Auckland Rescue Helicopter Trust relies on commercial sponsors, with Westpac as the helicopter naming sponsor, and community support. It does not receive direct government funding.

Auckland Westpac Rescue Helicopter Missions for May 2007

7 May 2007: The helicopter was tasked to Maramarua to a motor vehicle accident. Stood down enroute (2 deceased).

13 May 2007: After a motor vehicle accident at Tomorata a woman was transported to North Shore Hospital.

20 May 2007: After a car v car at Whitianga a woman was transported to Waikato Hospital.

26 May 2007: After a motor vehicle accident at Thames a male was transported to Waikato Hospital.



The Auckland Rescue Helicopter Trust Westpac HEMS in action.
Photo: Geoff Mackley (June 2005).

Hamilton, Tauranga, Rotorua, Taupo and Palmerston North

The Philips Search and Rescue Trust, a non-profit charitable trust, operates and manages the air ambulance and rescue helicopter bases at these centres (17). The Trust was established in 1985 with a grant from Philips NZ Limited as a legacy to mark the loss of its Managing Director in a light plane crash. The rescue helicopter service is crewed by St John Ambulance paramedics, hospital doctors and flight nurses. The Hamilton-based helicopter, a Bell 222B, provides rapid response medical care to the Waikato, King Country and Bay of Plenty communities. The current principal Waikato sponsor is Westpac, hence the name Westpac Waikato Air Ambulance. A flight from Hamilton to Auckland takes about 35 minutes, and to Rotorua 25 minutes.

The Philips Search and Rescue Trust has had a rescue helicopter based in Tauranga since June 2000. The TrustPower TECT Rescue Helicopter, named after its major sponsors, covers an area from Waihi to Te Kaha and inland to Matamata. The base averages about three jobs a week. The majority of calls to the Tauranga base are for accidents involving motor vehicles, as well as incidents on farms and those related to recreational pursuits.

The Trust has operated the Rotorua Rescue Helicopter since 1994. The BayTrust Rescue Helicopter is a 24/7 rescue service (weather conditions permitting), situated in the grounds of Rotorua Hospital. The service provides medical and rescue services to the wider Bay of Plenty region.

The Taupo Rescue Helicopter began operations in February 1985. The current principal Funding Partner is the Lion Foundation. The Palmerston North region has had a HEMS since October 1991. The Square Trust Rescue Helicopter is situated on the Palmerston North Hospital grounds, resulting in only a short stretcher journey between the helipad and hospital. The hangar and office facility was built in 1992. A large number of local businesses contributed to the construction and building of the hangar. The Rescue Helicopter operates to all points throughout the Manawatu, Wanganui and Horowhenua regions.

Wellington

Helicopter rescue services from Wellington were launched in 1975 when a commercial helicopter company, Capital Helicopters made itself available for emergency rescues. In 1981 this developed into a dedicated rescue service using Capital Helicopter's Bell 206B. The Life Flight Trust (18) now uses a BK117-B2, a popular Emergency Medical Service helicopter around the world that has become the standard type of rescue helicopter for a number of centres in New Zealand. It has two engines for increased safety. Westpac is the principal sponsor of this service. The Trust provides air rescue services to the greater Wellington region including Wellington, Porirua, Kapiti, Lower Hutt, Upper Hutt, Wairarapa and the Marlborough region of the South Island.

Media Release: Two Motorcyclists Seriously Injured Near Paraparaumu, 29 July 2006

The Wellington based Westpac Rescue Helicopter has just flown two seriously injured patients from an accident in Kapiti. The two patients, we believe to be a husband and wife, from Hastings, were rider and pillion passenger on a motorcycle heading southbound on State Highway 1 when a car turned in front of them. The vehicles collided and the pair on the motorcycle are both suffering serious lower leg injuries, as well as other trauma. Police, fire and Wellington Free Ambulance personnel were all on the scene when the Westpac Rescue Helicopter arrived. St Hwy 1 was shut down so that the helicopter could land on the road, just outside of Lindale.

The two patients, treated by two WFA paramedics, were then flown to Wellington Hospital Emergency Department where they are currently being treated and assessed.

We understand that the driver of the other vehicle was transported by road ambulance, also to Wellington Hospital.

South Island

Christchurch

A Christchurch helicopter rescue service was established in 1986 as the Canterbury and West Coast Air Rescue Trust (19) assisted by a local company, Garden City Helicopters, which had previously provided limited rescue services. The Trusts helicopters include the Westpac Rescue Helicopter (based in Christchurch), the Solid Energy Rescue Helicopter (based in Greymouth) and the NZ Community Trust Nelson / Marlborough Rescue Helicopters. To give some idea of the investment involved in helicopter rescue, the Westpac Rescue Helicopter has a replacement cost of about \$6 million, plus a further \$1 million to cover the cost of the rescue, medical and avionics equipment it carries (20).

April missions flown by the Westpac Rescue Helicopter BK117-ZK-HJC based at Christchurch

10 April 2007: Mt Cook motor vehicle accident. Two patients were flown to Christchurch Hospital, one a 69 year old woman with a spinal injury and a 71 year old man also with a spinal injury.

17 April 2007: Marble Point, Hanmer, motor vehicle accident. Two patients were transferred to Christchurch Hospital, one a 23 year old woman with an arm injury and the other, a 47 year old woman with leg and rib injuries.

21 April 2007: Bus accident between Franz Josef and Fox Glacier. A 26 year old woman with a neck injury was flown to Christchurch Hospital.

24 April 2007: Rangiora motor vehicle accident involving a 21 year old male who had sustained multiple injuries. He was flown to Christchurch Hospital.

30 April 2007: Waiiau 4WD/motorbike accident where a 56 year old male with shoulder injuries was flown to Christchurch Hospital.

Conclusions

It is clear that rapid progress has been made in the last 20 years or so in developing helicopter road rescue services. The general community, together with commercial interests, have provided substantial support for these services. Without such support, it is unlikely that this progress would have been made, as in most instances government funding alone would be insufficient to provide an adequate service.

What of the future? Perhaps the immediate need is to make sure that there are no gaps in the availability of HEMS to all the major population areas. HEMS availability should be for 24 hours per day, seven days per week, using helicopters capable of operating in difficult terrain and weather conditions and with adequate carrying capability. The remote areas of Australia and perhaps also New Zealand are likely to remain a long term problem for HEMS operations, due to the sparseness of the population in these areas and therefore the lack of adequate funding and community support to justify the costs involved.

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Occupational Road Safety case study:

Roche Australia cuts risks, collisions and costs

by Jann White, Fleet Manager, Roche Australia and Dr Will Murray, Research Director, Interactive Driving Systems/ CARRS-Q Visiting Research Fellow *

(* Contact for correspondence via
www.virtualriskmanager.net)



Introduction

Roche Products Pty Limited of Australia (Roche) is a pharmaceutical manufacturer and distributor, part of the wider global Roche Company based in Switzerland. Employee safety on the road is of great importance to the company all over the world. In Australia, we are dedicated to creating a safe driving culture for our 650 staff. Our aim is to promote heightened awareness and responsible driving behaviours for all employees, to prevent vehicle collisions, reduce personal injury and minimise property loss claims.

This case study describes four key initiatives Roche has undertaken with support from its insurer Zurich Australia and Interactive Driving Systems.

1. Implemented Virtual Risk Manager (VRM) for all existing staff and new employees.
2. Policy development.
3. Communications program.
4. VRM enhancements.

Since starting the program in January 2005, Roche has successfully **implemented VRM Driver Profile, RoadRISK, One More Second and RoadSKILLS** modules and the MIS that supports these tools. This approach enabled Roche to carry out risk assessments, and to monitor and improve the safety of its employees. Roche also took the opportunity to roll out its **Vehicle Safety Policy** and **Driver Licence Checks** as part of VRM, allowing a seamless process for driver risk assessment, monitoring and improvement – achieving almost 100% compliance on each of the four modules for existing staff. New recruits undertake the program soon after joining the organisation as part of their extended induction.

The program was effective immediately - generating discussion in corridors, over morning teas and at question times. Roche analysed and targeted high, medium and low risk areas, for the company as a whole and at an individual employee level. The outcomes provided both short term and long term objectives,

which were addressed by working closely with Interactive Driving Systems and internal teams such as HR and OSH.

For example, one of the RoadRISK questions is ‘Have you had an eyesight test within the last 12 months?’ Over 25% of employees answered ‘NO’. This was drawn to the attention of the HR department, who subsequently offered free eyesight tests to all employees – whether entitled to a company vehicle or not. In total, 138 employees took the opportunity to have their eyes tested, 64 required further examination and 28 required glasses. This is now an annual assessment process for all employees.

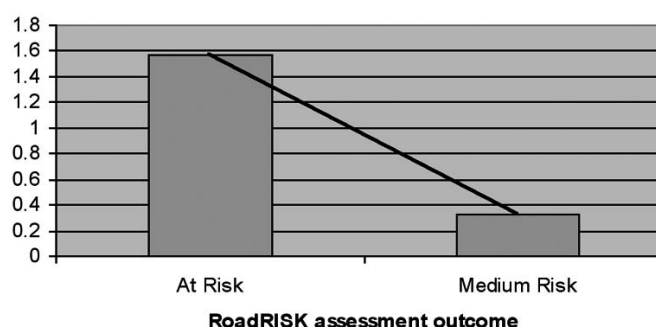
As part of the program, Roche has also developed, implemented, monitored and **improved its policies, procedures, processes, driver manual and on-going communications** including initiatives on collision reporting and investigation, anti-lock brakes, speed, seatbelts, alcohol, fatigue, holiday driving, back pain, journey management to minimise employee kilometres, vehicle checks and driving whilst pregnant.

Outcomes

The program has improved safety based on both proactive and reactive indicators.

One of the key reasons for adopting VRM was the availability of extensive university and industry-based **proactive evaluation data**. Based on the first 422 Roche drivers to complete RoadRISK a clear correlation between the assessment outcomes and driver crash history was identified (see graph).

RoadRISK evaluation data



The ultimate **reactive** measure of the success of a program is in relation to ROAD SAFETY OUTCOMES. Based on data provided by Zurich insurance underwriters, Roche has reduced all its major collision types (table below), improved its loss ratio from 69% to 48% and cut its costs.

Description	Difference between 2004 & 2006
Failed to Yield	10% increase, between 2004 & 2005 30% decrease
Hit Stationery Object	13% reduction
Hit in rear by Third Party	30% reduction
Hit Third Party in Rear	30% reduction
Reversing	30% reduction

The program has also received external recognition recently by being the first Australian organisation to be recognised by the prestigious Fleet Safety Forum Awards, hosted by the UK-based road safety charity Brake. Roche was Highly Commended in both the Road Risk Manager of the Year and Company Driver Safety awards.

Summary and future steps

As well as showing a major commitment to road safety, the program is also innovative in many ways:

- Application of sophisticated internet-based technology to fleet safety in Australia.
- Research-led approach based on independent evaluations and Roche's own internal data.
- Extensive MIS allowing data visibility, with results easily centralised, analysed and actioned.
- MIS developed to include own policies, licence checks and methodology to effectively risk manage starters and leavers.
- Highly cost effective - by targeting most risky areas in a

standardised way, allowing employees to receive a large element of their recruitment, induction, risk assessment and corrective training before they and their trainers are exposed to the risks of the road.

- Not tied to expensive and poorly targeted in-vehicle driver skills based interventions.


Despite the successes to date, Roche is not standing still and is working on steps to:

- Sustain and maximise the use of VRM for all existing employees and new starters.
- Develop new initiatives to reinforce Corporate Policy, including its newly revised mobile phone policy.
- Design and implement new VRM modules, including the Safe Driving Pledge, Risk Foundation policy assessment, version 2 of the RoadRISK Profile, RiskCOACH, bespoke KPIs and CrashCOUNT.
- Engage in external programs such as benchmarking and road safety outreach through best practice case studies to help other organisations learn from its initiatives.


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Policies of the Australasian College of Road Safety

by Ken Smith RRSP, ACRS Fellow

Alcohol

ACRS Policy Position

Drink driving has always been a major contributor to road trauma in Australia. There has been great improvement over the last three decades, but further reductions in alcohol associated road trauma are possible. To this end ACRS supports

- present national permissible blood alcohol limits of 0.05 BAC for most drivers and 0 for novice drivers (0.02 in WA), drivers of heavy vehicles, dangerous goods vehicles, emergency vehicles, public service vehicles, and driving instructors and supervisors of learner drivers
- continued enforcement, education and publicity on the risks and dangers of drinking and driving
- efforts to reinforce the social desirability of separating alcohol and road use
- maintaining a high level of high profile random breath testing, to at least one test for each licensed driver each year
- regular review of penalties for drink driving so that a range of measures including monetary, driver's licence, denial of vehicle use and custodial penalties remain a real deterrent against drinking and driving
- continuing development of measures to deal with 'problem' alcohol users and recidivist drink drivers, including social measures such as rehabilitation
- greater availability of safe and reasonably convenient public transport alternatives.

In the longer term, ACRS sees merit in investigating whether there is a case for further reduction in permissible blood alcohol concentration to Zero BAC for all motor vehicle operators.

ACRS presses for the development and universal fitting of passive breath test devices or driver impairment sensors that detect the presence of alcohol or impaired performance, and provide warnings or prevent the vehicle being driven.

Objective

Objectives of this position are to:

- continue to reduce the influence of alcohol on road trauma
- reinforce the social desirability of separating alcohol and road use.

Discussion

Drink driving has been one of the largest single contributors to road trauma. In 1980 when 3272 persons were killed in road crashes, 44% of drivers and motorcycle riders killed had more than the legal concentration of alcohol. In 1995 when 2017 persons were killed that proportion was 30%. The most recent national figure, for 1997, is 28%.

The improvement has come about through a combination of reducing the permissible blood alcohol limit to 0.05 g/100ml of blood (0.05%), introducing and maintaining a high level of random breath testing, and heavy penalties reinforced with publicity and information measures (eg the distribution of millions of 'standard drink' cards, media advertising, etc) aimed at making drink driving socially unacceptable.

However, any single problem that still accounts for more than one quarter of driver road deaths should be capable of improvement, and a major target for countermeasures. Further improvement can be gained by increasing the level of random breath testing to at least one test per licensed driver per year (a component of the National Road Safety Strategy 2000-2010 announced by Australian Transport Council in November 2000), strategically targeted to achieve the greatest effect.

Alcohol ignition interlocks have been proposed, usually as a way to allow convicted drink drivers to continue to drive where court rulings allow. Technology is now being developed to fit 'passive' devices that can sense the presence of alcohol and prevent the vehicle from being started until a test is passed. Such devices would not inconvenience a sober driver. Any such device should be reliable, accurate and difficult to bypass, and fitted to all vehicles in manufacture.

The College also notes that devices have been developed for the road transport industry to assess impairment from fatigue, and that there is potential for systems to automatically assess variation from a driver's own baseline driving performance characteristics, and issue progressively more intrusive warnings and eventually shut down vehicle systems if the driver does not respond. ACRS should press for the further development and eventual equipment of all vehicles with such devices.

There remain some problem areas such as recidivist drink drivers. Recidivist drink driving is the effect of a problem, not the problem itself. As well as enforcement measures to deter offending and alcohol interlocks, recidivist drink drivers need other treatment and support measures such as rehabilitation programs. As well, there may be a case for applying penalties administratively instead of going through the courts, for repeat offenders. Measures such as impoundment of the vehicles of repeat offenders should be investigated, trialled and implemented if found to be effective.

In the longer term, society should consider moving to more stringent permissible blood alcohol limits (ie 0 BAC) for all motor vehicle drivers.

Reference

Australian Transport Council, The National Road Safety Strategy 2001-2010, ATSB Canberra 2001

Comment

Unfortunately there is little significant change in the position regarding road trauma resulting from drink driving. The numbers have remained relatively stable for the last several years (as has road trauma generally). Of itself this suggests that there is more to be done, with one of the major emphases in recent times being the problem of recidivist drink drivers. It is possible that more research should be done to develop 'smarter' practices in random breath testing.

In this policy statement ACRS called for more stringent permissible blood alcohol limits to be considered. This should still remain as a medium to long term policy objective, but we note that one of the largest problem areas remains in high range alcohol offences, as well as recidivists. It is possible that the most significant alcohol problem continues to be those with an alcohol use problem.

Fatigue

ACRS Policy Position

ACRS supports measures to increase public awareness of the contributors to and dangers of driver fatigue, to promote awareness of countermeasures, and further research on these factors and the nature of fatigue and its effect on performance.

Objective

To improve safety by improving knowledge of the causes, contributing factors and effect of fatigue on performance.

Discussion

Fatigue is believed to make a primary contribution to between 4 and 30% of crashes (Moore & Brooks 2000, NRTC 2001). There is however no agreed definition of fatigue and no reliable and exhaustive means of determining whether or the extent to which fatigue contributed to a particular crash (Neville Inquiry, 2000). It is possible that crashes attributed to fatigue are actually the result of the driver falling asleep, and that those crashes represent the lower bound of a much larger number. Some crashes attributed to other causes such as inattention or failure to anticipate could well have fatigue as a factor behind the identified cause.

Whatever the true figure, fatigue is a serious safety problem. Better knowledge of fatigue and factors contributing to it may help the driving public to adopt practices that minimise fatigue and prevent fatigue related crashes from occurring. There has been a considerable amount of research on fatigue in the last decade or so and although much of that has been carried out with respect to the road transport industry, the fundamental physiological factors apply to all.

Australian research on fatigue has tended to characterise fatigue operationally, focussing on mental and physiological effects.

The symptoms or effects of fatigue include impaired performance (loss of attentiveness, slower reaction times, impaired judgement, poorer performance on skilled control tasks and increasing probability of falling asleep) and subjective feelings of drowsiness or tiredness. Contributory factors include long periods awake, inadequate amount or quality of sleep, sustained mental or physical effort, disruption of circadian rhythms (the daily cycle of waking and sleeping), inadequate rest breaks and environmental stresses (heat, noise and vibration).

Adequacy of sleep and length of time awake are probably more important than duration of actual work. Two pieces of Australian research (Dawson & Reid 1997 and Williamson et al 2000) have found that being awake for 17-19 hours (eg, from (say) 6am to around 11pm-1am) brought a deterioration in performance on some tests equivalent to having a blood alcohol concentration (BAC) of around 0.05%, the legal limit. After 24-27 hours, impairment was equivalent to a BAC of 0.1%.

Circadian rhythms have an important effect. The body is governed by inbuilt biological rhythms that are attuned closely to the cycles of day and night. There are two 'low' points in the circadian rhythm when there is a strong propensity to sleep: from about midnight to 6am and a lesser one in the early to mid afternoon. Work is best performed during the day when the bodily system is (other things being equal) awake and alert; the best sleep is obtained at night. Sleep at other times of the day is less 'efficient'; work performed at the low points of the cycle may be more prone to error.

Sleep is a biologically determined drive, and fatigue can only be relieved by sleep. If restorative sleep is not obtained, then impairment and progressive deterioration in performance occur, and sleep will follow. If sleep deprived to a significant extent, a person may fall asleep without warning, either into deep sleep or 'microsleeps' of a few seconds' duration.

One reviewer (Swann, 2000) has noted that at lesser levels of sleepiness drivers may have significant withdrawal of attention from road and traffic demands which can affect collision avoidance ability (selective) or collision avoidance and vehicle control (general). At these impaired levels of information processing drivers may not detect critical events such as stop signs and red lights and may fail to appreciate high crash risk situations.

Simple measures are available to avoid the dangers of fatigue. The most important are:

- Get a good night's sleep before travelling: repay any sleep debt
- Many people leave for holidays after work on Friday. This should really be avoided if possible. The effect of a full day's wakefulness and a day's work will affect alertness, judgement and anticipation
- Plan the trip to allow for rest breaks
- Take frequent breaks. There is no research evidence on a 'good' rest interval, but the usual suggestion of a break every two hours is good advice.

- Know what signs to look for. Passengers can look for some of these too and alert the driver.
- Wandering in the lane or over lane lines
- Changes in speed, especially slowing down without reason
- Yawning
- Nodding
- Lapses in concentration.

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Comment

Fatigue is emerging as one of the most urgent and serious problems in road safety. For a long time it has been considered to be a problem most especially of the long distance road transport industry, but it is now becoming clear as some of the available (but nevertheless very poor) evidence is showing, that it is very much a problem of the whole community. Two serious problems are that it is not really possible to get a good estimate of the extent of the problem because it is so difficult to reliably identify crashes in which fatigue was a prominent contributory factor, and that by and large the public is ignorant of the extent of the problem. The President's report for the October 2006 issue of the ACRS Journal (17:4, October 2006) deals with the problem of fatigue. The ACRS National Executive has identified fatigue as one of the priority safety issues for action over the next twelve months.

The ACRS policy statement was further elaborated on in an article in the ACRS Journal (17:1, February 2006).

This is an issue on which all members could usefully inform themselves and spread the word. By making known the facts on fatigued driving ACRS members can perform a real service to the community.

Heavy Vehicle Fatigue

ACRS Policy Position

Fatigue is recognised as a significant problem in the road transport industry, in terms of the health and lifestyle of drivers as well as in the potential for crashes.

ACRS supports measures by governments and the road transport industry in partnership to manage and mitigate fatigue in road transport. ACRS considers all heavy vehicle drivers should have regular health checks, including assessment for sleep disorders such as sleep apnoea.

ACRS supports the development and implementation of measures to effectively manage fatigue in the road transport industry, having regard to circadian rhythm and cumulative fatigue, and the roles of manufacturers, consumers and other parts of the distribution chain.

Objective

To enhance heavy vehicle driver health and safety, and the safety of other road users, and minimise the impact of fatigue arising from freight transport practices.

Discussion

Fatigue is a significant problem in road transport, especially in view of long distances and the structure of commercial/industrial operations, and the geographical spread of industry and commerce in Australia. Fatigue is believed to contribute directly to between 4 and 30% of road crashes, and there are probably many more in which fatigue may have played a part but was not identified, or the crash was attributed to other causes such as inattention. Fatigue of heavy vehicle drivers is believed to contribute to about 4% of heavy vehicle crashes (NRTC 2001).

Traditionally Australian governments have sought to minimise the safety and health consequences of fatigue by limiting daily and weekly hours of driving for long distance operations. It is now considered that this is not sufficient, and that account must be taken of the causes and precursors of fatigue (see separate policy statement). Further, road transport is just one part of a distribution chain, and often the root problem of fatigue in the road transport industry is the demand of industry, commerce and the consuming public for movement of goods to particular schedules.

ACRS supports measures by governments, the road transport industry and other parts of industry and commerce to manage fatigue directly and to address the conditions that give rise to the fatigue problem.

Reference

National Road Transport Commission and Smithworks Consulting (2001) *Heavy Vehicle Driver Fatigue: Review of Regulatory Approach Discussion Paper* NRTC

Comment

There has been a good deal of movement on this issue over the last few years, with the National Transport Commission continuing to develop policies and guidelines, and the concomitant regulations, for transport drivers. It remains an area that is very difficult to grapple with because the root causes of the problem are the demand for timely delivery of consumer goods, coupled with the extremely competitive nature of the industry. The effect of this last is that to keep costs down, even under regulations drivers are permitted to work hours that would be regarded as unacceptable in any other industry. Surely the community could accept a small increase in the freight component of the goods they buy (a few cents, say on top of the cost of a packet of breakfast cereal) to allow more drivers to be employed and allow all to work more reasonable hours.

One development since this policy statement was written is the advent through the National Transport Commission of Chain of Responsibility policies and legislation that requires non transport parts of the distribution chain to accept responsibility for practices that contribute to or increase driver fatigue. This includes setting schedules that cannot be met without breaching driving hours or speed limits; long waiting times for loading and unloading during which drivers are nevertheless on duty and cannot take rest; goods receiving schedules that require extended night duty by the truck driver and so on.

The ACRS President's report for the Journal (17:4, October 2006) outlines some recent findings and developments. If members wish to inform themselves further on this difficult issue, the National Transport Commission web site www.ntc.gov.au has a wealth of information.

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Peer Reviewed Papers

Child restraint misuse: Incorrect and inappropriate use of restraints by children reduces their effectiveness in crashes

by Julie Brown and Lynne Bilston, Prince of Wales Medical Research Institute, UNSW

This paper was originally presented under the title ‘ Misuse of Child Restraints and Injury Outcome in Crashes’ at the Australasian Road Safety Research, Policing and Education Conference held at Surfers Paradise, Queensland, 25-27 October 2006.

Abstract

It is well known that restraining children in cars reduces their risk of injury in a crash. However, sub-optimal restraint use reduces restraint effectiveness. While the most common form of sub-optimal use is inappropriate use, incorrect use of a restraint has potential for more severe outcomes. This paper draws on field data and studies injury mechanisms through laboratory simulations. Field data is drawn from a dataset of children aged 2-8 in crashes. Laboratory simulations of a number of these crashes were used to study injury mechanisms. Only a small proportion of children in the field sample (5%) were incorrectly using a restraint system, however most of these children (5 out of 7) sustained moderate to severe injuries. This was significantly different to what occurred in the children correctly using restraints. Most incorrect use was seen in children under 5. Most cases involved misuse of the internal harness system of forward facing restraints or the adult belt (with or without a booster). The laboratory study showed an increased injury potential resulting from excessive head and torso excursion in incorrectly used restraint systems. This paper discusses these findings with respect to current restraint system design and calls for an increase in the amount of attention paid to this issue.

Introduction

There is no doubt that a restrained child is offered more protection than an unrestrained child in a crash. However, recent research has demonstrated that the highest levels of protection are provided when the child uses the optimal form of restraint available.(1-8)

Optimal restraint requires two things. It requires that the restraint being used is of a type that is the most appropriate for the child's size, and that the restraint being used is being used correctly. Sub-optimal restraint therefore encompasses inappropriate restraint use and incorrect restraint use. Inappropriate restraint use is the most widespread form of sub-

optimal restraint use and has received substantial attention in recent years. (2-4, 8-10, 24). This has resulted in the implementation of educational and legislative strategies in numerous jurisdictions to increase the use of appropriate restraint systems by child occupants.

Incorrect use has received far less attention, however most studies of children in crashes cite incorrect use of restraints as a major source of injury (7, 11-20). Exactly how widespread incorrect use is in the general population is difficult to determine. All population based restraint observation studies conducted to date have involved roadside observation of restraint use. This type of methodology involves observation of occupants in their vehicles as they travel in traffic, and therefore does not allow adequate detail related to correctness of restraint use to be observed. In North America, convenience sample based observational surveys have shown that about 80% of child restraints were not being used as intended (21).

There are primarily two distinct categories of incorrect use: - incorrect installation of the restraint in a vehicle, and incorrect placement of a child within a restraint. An Australian study of child restraint installations conducted in a convenience sample (17) observed that there were problems with how the restraint system was fitted in the vehicle in 39% of cases. Data related to how children were using their restraints was collected from only a small sample, but suggested that about 30% of forward facing restraints may be being used with too much slack in the harness.

Different types of incorrect use can have different effects on restraint performance in crashes. Laboratory studies have demonstrated that some forms of incorrect use may have little impact on the performance of a restraint system while others appear to be extremely deleterious to restraint performance (15, 22, 23).

This paper describes the types of incorrect restraint use seen in a field study of children in crashes conducted in NSW, Australia, and compares the outcomes of children incorrectly restrained with the outcomes of children using other forms of sub-optimal restraint. Potential injury mechanisms in children incorrectly using restraints has also been studied in the laboratory by our group and results relevant to the primary forms of incorrect use seen in the field are presented here as well.

Methodology

A sample of 152 children involved in crashes was collected through a previous retrospective review of all child occupants aged 2-8 years who presented to a paediatric emergency department following crash involvement from July 2003 until January 2005. Analysis of this total sample, that includes 47 cases collected through in-depth investigation and 105 collected through case review has been reported elsewhere (2-3). For this current analysis all restrained children for whom quality of restraint use could be determined in that original

charts (27) to estimate weight. While the use of booster seats by children between 14 and 18 kg may be in accordance with the design range set by the Australian Standard for Child Restraints, optimal restraint practice involves delaying transitions for as long as possible (26), therefore the lower limit of 18kg was used in the assessment of appropriate booster seat use. The upper limits for booster seat appropriateness were based on the findings of Klinich et al (28), that good adult belt fit is rarely achieved before a height of 145cm. As a 95th percentile 8 year old male is 138cm tall (27), it was concluded

Quality of Use	Description	Definition
Optimal	Appropriate & Correct	Using most suitable* restraint for size and using restraint correctly
Sub-optimal	Appropriate & Incorrect	Using most suitable restraint for size but using restraint incorrectly
Sub-optimal	Inappropriate & Correct	Not using most suitable restraint for size and using restraint correctly
Sub-optimal	Inappropriate & Incorrect	Not using most suitable restraint for size but using restraint incorrectly

Table 1: Quality of Use Definitions (*Most suitable restraint defined as follow: Up to 18kg: forward facing child restraint (CRS); Height <145cm, Weight > 18kg: Booster)

sample were extracted. This includes 47 in-depth cases and 95 from case review. Information recorded included injury descriptions, crash details, restraint status and type. Restraint type was determined from driver interviews and written data in the medical record. Impact severity and impact direction were rated at the scene by ambulance officers, based on the vehicle damage and witness accounts. Seating position was also noted by the ambulance officers at the scene. For a subset of cases (30% of the entire original sample) full in-depth crash investigation was conducted.

Ethical approval for this work was obtained from the Human Ethics Committee of the Children's Hospital at Westmead and the Human Ethics Committee of the University of NSW.

that eight year olds would not be tall enough to achieve good adult belt fit, unless known height was greater than 145cm. Correct/incorrect use was determined through vehicle and restraint inspections (in the in-depth sample); and misuse descriptions recorded by ambulance officers (in the case review). Quality of use assessments were not made blind to injury outcome as the criteria and methods used to rate quality of use were independent of injury outcome. Comparisons were made between inappropriately and appropriately restrained children with all cases of incorrect use removed; correctly and incorrectly restrained children regardless of appropriateness; and, inappropriately and incorrectly restrained children. In the latter, the appropriately restrained group consisted of only those children correctly and appropriately restrained. The

Test	Dummy	Restraint Configuration	Impact Direction	Velocity Change (km/h)	Peak Deceleration (g)
1	Hybrid III 6	Incorrect use of adult lap sash belt	Full frontal	30.3	15.0
2	Hybrid III 6	Correct use of adult lap sash belt	Full frontal	31.2	14.7
3	Hybrid III 3	Incorrect use of lap sash belt with booster	Full frontal	34.5	18.9
4	Hybrid III 3	Correct use of lap sash belt with booster	Full frontal	34.4	18.9
5	Hybrid III 3	Incorrect use of harness in forward facing CRS	Full frontal	34.0	17.0
6	Hybrid III 3	Correct use of harness in forward facing CRS	Full frontal	33.8	16.9

Table 2: Laboratory Test matrix

Quality of restraint use for each child was assessed as appropriate and correct; appropriate and incorrect; inappropriate and correct; and, inappropriate and incorrect as defined in Table 1. Appropriate/inappropriate use was determined using the heights and weights of the child occupants as reported in parental interviews or recorded within the medical record. Where no height was available, weight alone was used. Where no height or weight data was available, age in months was used in combination with paediatric growth

incorrectly restrained group consisted of both inappropriate and appropriately restrained children.

All tests were conducted on a rebound crash sled. Test 1 and 2 used the Hybrid III 6 year old dummy and adult lap sash seat belt. Tests 3-6 were conducted using the Hybrid III 3 year old dummy. In test 3 and 4 the dummy was restrained with a high back booster and in tests 5 and 6 the dummy was restrained in a forward facing child restraint system (CRS). For each type of

restraint, one test was conducted with the restraint being used correctly and one test was conducted with a form of incorrect use seen in the field study.

Head accelerations, neck loads and moments were recorded. High speed video (at 1000 frames per second) was used to observe dummy kinematics and measure head excursion. Data acquisition was performed by an Applied Measurement signal conditioner at 10 kHz in accordance with SAE J211/1 standards. Each data channel was filtered using the Channel Frequency Class (CFC) filter class specified in SAE J211/1. Comparisons between the incorrect and correct mode of restraint were made on dummy motion and head displacement. Analysis of these and other reconstructions has indicated head acceleration and neck load data are limited in their usefulness (25).

Quality	Restraint	MAIS <2	MAIS ≥4	Total
Appropriate	Booster	7	0	7
	FFCRS	15	0	15
	S/Harness	3	0	3
Inappropriate & Correct	Lap Sash	68	23	91
	Lap	3	4	7
	Booster	9	2	11
	S/Harness	0	1	1
Appropriate & Incorrect	Booster	0	1	1
	FFCR	1	2	3
Inappropriate & Incorrect	Lap Sash	1	1	2
	Booster	0	1	1
	Totals	107	35	142

Quality	Restraint	ISS <4	ISS ≥4	Total
Appropriate	Booster	7	0	7
	FFCRS	14	1	15
	S/Harness	3	0	3
Inappropriate & Correct	Lap Sash	68	23	91
	Lap	3	4	7
	Booster	9	2	11
	S/Harness	0	1	1
Appropriate & Incorrect	Booster	0	1	1
	FFCR	2	1	3
Inappropriate & Incorrect	Lap Sash	1	1	2
	Booster	0	1	1
	Totals	107	35	142

Results

There were a total of 142 restrained children for whom quality of restraint use could be determined. The age range of these children was 2 years to 8 years. There were slightly more males (60%) than females (40%). Most children (82%) were sub-optimally restrained. This included 78% who were using an inappropriate restraint for their size, and 5% who were using their restraint incorrectly. Two percent were using an inappropriate restraint incorrectly.

One quarter of the children sustained moderate to severe (AIS 2+) injuries. In terms of ISS, 25% scored over 4 (ISS>4); 15% scored over 9 (ISS>9); and 10% scored over 15 (ISS>15).

Quality	Restraint	ISS <9	ISS ≥9	Total
Appropriate	Booster	7	0	7
	FFCRS	15	0	15
	S/Harness	3	0	3
Inappropriate & Correct	Lap Sash	78	13	91
	Lap	5	2	7
	Booster	9	2	11
	S/Harness	1	0	1
Appropriate & Incorrect	Booster	0	1	1
	FFCR	2	1	3
Inappropriate & Incorrect	Lap Sash	1	1	2
	Booster	0	1	1
	Totals	121	21	142

Quality	Restraint	ISS <15	ISS ≥15	Total
Appropriate	Booster	7	0	7
	FFCRS	15	0	15
	S/Harness	3	0	3
Inappropriate & Correct	Lap Sash	85	6	91
	Lap	6	1	7
	Booster	9	2	11
	S/Harness	1	0	1
Appropriate & Incorrect	Booster	0	1	1
	FFCR	2	1	3
Inappropriate & Incorrect	Lap Sash	2	0	2
	Booster	0	1	1
	Totals	130	12	142

Table 3: Quality & Type of Restraint Use By Injury Outcome

Comparing the injury outcome for children using inappropriate and appropriate restraints (with all cases of incorrect use removed from the analysis), no child appropriately restrained sustained an AIS 2+ injury, while injuries of this severity were sustained by 28% of those inappropriately restrained. This difference was statistically significant ($p<0.05$). However, the lack of AIS 2+ injuries in the appropriately restrained children prevents the estimation of ORs. The OR for sustaining an injury greater than ISS 4 ($ISS>4$) could be estimated and this

appropriateness). This revealed no significant difference in injury outcome, with similar proportions of children sustaining moderate to severe injuries (AIS 2+) in adult belts (27%) and child restraints (20%). Similar results were observed using ISS as a measure of injury outcome.

For children correctly and incorrectly using their restraints, there were proportionally more children moderately to seriously injured when using their restraints incorrectly (57%) than when using their restraints correctly (22%) ($p<0.05$,

	AIS2+				ISS>4			
	unadjusted		adjusted		unadjusted		adjusted	
	OR	CI	OR	CI	OR	CI	OR	CI
Incorrect v correct p value	8.8	1.6-47.8	6.9	1.7-41.4	4.3	0.92-20.4	3.5	0.63-19.6
	0.010		0.066		0.067		0.145	
Incorrect v inappropriate p value	6.7	1.2-36.2	5.4	0.92-31.8	3.6	0.75-16.8	2.8	0.5-16.1
	0.025		0.151		0.191		0.163	
Inappropriate v appropriate* p value					9.0	1.2-69.5	7.3	0.99-54.3
	0.001		0.082		0.015		0.074	
	ISS>9				ISS>15			
	unadjusted		adjusted		unadjusted		adjusted	
	OR	CI	OR	CI	OR	CI	OR	CI
Incorrect v correct p value	4.6	0.96-22.3	3.5	0.63-19.0	8.5	1.7-43.0	6.9	1.2-39.1
	0.074		0.114		0.021		0.031	
Incorrect v inappropriate p value	4.1	0.84-20.0	3.0	0.53-17.1	8.4	1.6-43.6	6.7	1.1-39.6
	0.096		0.157		0.023		0.044	
Inappropriate v appropriate* p value	-	-	-	-	-	-	-	-
	0.312		0.061		0.688		1.000	

*Odds ratio could not be estimated due to no AIS2+ among appropriately restrained children

Table 4: Association between different forms of sub-optimal restraint and injury with and without adjustment for impact severity

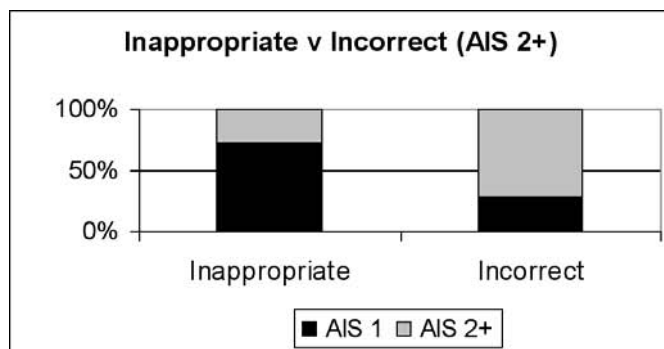
revealed children inappropriately restrained were more likely to sustain at least a minor injury compared to those appropriately restrained. However this difference did not quite reach significance when crash severity was controlled for (unadjusted OR 9.0, 95% CI 1.2– 69.5; adjusted OR 7.3, 95% CI 0.99– 58.3). In the more severe injury categories ($ISS>9$ and $ISS>15$), there was no significant difference between children inappropriately and appropriately restrained. See Table 4

To ensure the difference in injury outcome observed was related to restraint quality rather than restraint type, the injury outcome between children restrained in dedicated child restraints and children restrained in adult seat belts was examined regardless of the child's size (i.e restraint

unadjusted OR 8.8 95% CI 1.6– 47.8, adjusted OR 6.9, 95% CI 1.7-41.4). There were also significantly more incorrectly restrained children with an $ISS>15$ (43%) than correctly restrained (7%) ($p<0.05$). Adjusting for crash severity, incorrectly restrained children were 7 times more like to sustain life threatening injuries ($ISS>15$) than those using their restraints correctly (95% CI 1.1-39.6). See Table 4. However the absolute number of children identified incorrectly restrained in this sample was small ($n=7$).

Of the different forms of sub-optimal restraint, children using their restraints incorrectly sustained a greater proportion of serious injuries (AIS 2+) than the children using inappropriate restraints ($p<0.05$), but this difference did not quite reach

significance when crash severity was controlled for (unadjusted OR 6.7, 95% CI 1.2– 36.2; adjusted OR 5.4, 95% CI 0.92– 31.8). However, the incorrectly restrained children were more than 6 times more likely to sustain life threatening injuries (ISS>15) (unadjusted OR 8.5, 95% CI 1.7– 43.6; adjusted OR 6.7, 95% CI 1.1-39.6). See Table 4 and Figure 1.



A detailed summary of the crash and restraint details for each child incorrectly using a restraint is provided in Table 6. From this table the potentially life threatening nature of the injuries sustained by children incorrectly using restraints is clear. In all but one case there is evidence of head contact. In two children this has resulted in severe brain injury. High spinal injuries were sustained by three of the children aged under 5 years. In one 7 year old child for whom incorrect use was identified, there

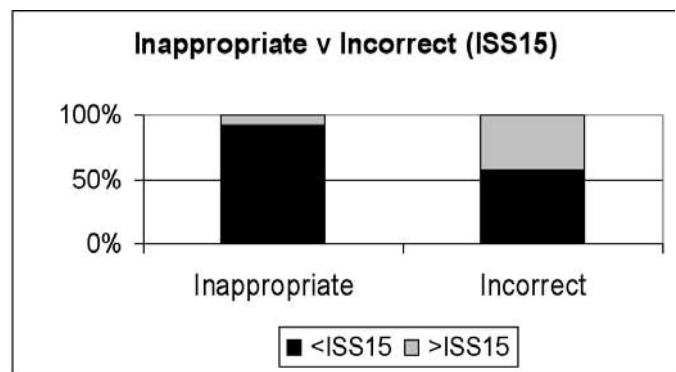


Figure 1: Injury severity in inappropriately and incorrectly restrained children

Unadjusted	Head Injury	Spinal Injury	Chest Injury	Abdominal Injury	Extremity Injury
OR	10.5	6.8	0.49	2.1	0.98
CI	1.2-90.3	1.4-33.1	0.06-4.2	0.39-10.7	0.11-8.7
P value	0.014	0.023	0.445	0.332	0.731

Adjusted	Head Injury	Spinal Injury	Chest Injury	Abdominal Injury	Extremity Injury
OR	11.0	6.3	0.49	1.8	0.59
CI	0.92-130.8	1.2-32.2	0.05-4.4	0.34-9.5	0.06-5.7
P value	0.059	0.013	0.657	0.529	0.609

Table 5: Pattern of injury in incorrectly restrained children and inappropriately restrained children

There was also a difference in the pattern of injury observed between those children injured while inappropriately restrained and those children incorrectly restrained ($p < 0.05$). In particular, there was a greater proportion of head and spinal injuries among those incorrectly restrained (unadjusted OR for head injury in incorrectly restrained 10.5, 95% CI 1.2– 90.3, adjusted 11.0 5% CI 0.92– 130.8; unadjusted OR for spinal injury 6.8, 95% CI 1.4– 33.1, adjusted OR 6.3, 95% CI 1.2– 32.2). See Table 5.

were significant lumbar spine fractures and associated abdominal injury, as well as evidence of head contact. Intrusion was not a factor in any of these crashes. All involved frontal impacts and children seated in the rear.

Six laboratory tests were conducted to simulate outcomes in correctly and incorrectly used restraints. Head displacements measured in each test are shown in Figure 3. Still frames from the point of maximum excursion are shown in Figure 2.

Child No	Child Details (sex)	Restraint Type	Misuse	Crash Details (severity)	Seat Position	Injury Description	MAIS
1	4yrs 5mths 20kg (M)	Booster with lap sash seat belt	Sash part of belt not being used correctly	Two vehicle frontal impact (H)	Left rear	Brain haemorrhage (SAH). Atlanto-occipital dislocation with cord odema. Fractures C6-7 T1-4, T7. Bilateral lung contusions.	4
2	2yrs Wgt unk (F)	Forward Facing CRS	Left arm and shoulder not in harness	Two vehicle frontal impact (H)	Left rear	Abrasion left jaw. Atlanto-occipital dislocation with spinal cord transection at C4. Contusion left flank	6
3	2yrs Wgt unk (F) 2yrs 5mths 12kg (M)	Forward Facing CRS	Restraint not correctly attached to vehicle	Two vehicle frontal impact (H)	Third row rear	Hematoma right forehead. Lacerated tongue	1
4	3yrs 8mths 17kg (M)	Forward Facing CRS	Very loose shoulder harness	Two vehicle frontal impact (M)	Right rear	Extensive laceration right cheek extending to forehead. Contusion left forehead.	2
5	4yrs 5mths Wgt unk (M)	Adult lap sash seat belt	Arm out of sash	Two vehicle frontal impact (L)	Right rear	Diagonal seat belt abrasions upper abdomen	1
6	7yrs 7 mths Wgt unk (F)	Adult lap sash seat belt	Arm out of sash	Two vehicle frontal impact (H)	Right rear	Swollen lips, loose tooth. Grazing left upper abdomen; bruises right lower abdomen; internal abdominal injury; lumbar spine fracture with rupture of spinal ligaments and spinal nerve root damage	2
7	2 Yrs Wgt unk (M)	Booster with lap sash seat belt	Arm out of sash	Two vehicle frontal impact (H)	Right rear	Right facial laceration, brain injury, cervical spinal ligament damage; bowel injury	4

Table 6: Summary of cases involving children incorrectly using their restraints

** Intrusion refers to intrusion into the child's occupant space Abbreviations: Wgt = Weight; Unk = Unknown; Yrs = Years; Mths = Months F = Female; M = Male; L = Low severity; M=Medium severity; H=High severity



Incorrectly worn adult lap sash belt



Incorrect belt use with booster seat



Incorrect harness use with forward facing CRS



Correctly worn adult lap sash belt



Correct belt use with booster seat



Correct harness use with forward facing CRS

Figure 2: Dummy motion in correctly and incorrectly used restraints

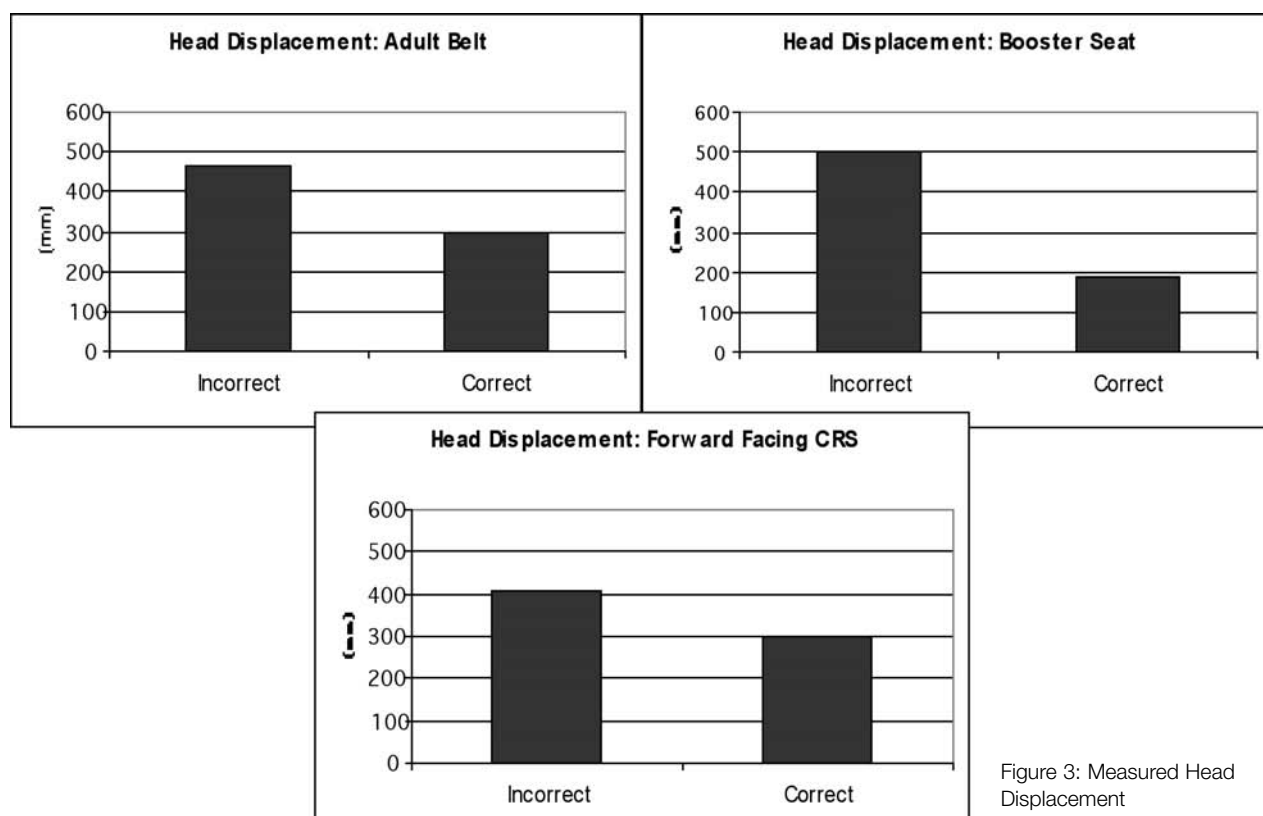


Figure 3: Measured Head Displacement

Tests 1 and 2 compare the motion of a Hybrid III 6 year old dummy in an incorrectly and correctly worn adult lap sash belt. From Figure 2 it is clear that there is substantially more upper body flexion when the lap sash belt is worn incorrectly. The lack of effective upper torso restraint acts to concentrate the seat belt loads across the abdomen like a lap only belt and explains the type of injuries seen in the 7 year old seen in the field study (Case 6, Table 6). Measured head displacements and photographs in Figure 2 and Figure 3 demonstrate the extra head motion that also occurs when the belt is worn incorrectly.

Excessive upper torso and head motion also occur with incorrect belt use in a booster seat. (Tests 2 and 3, Figure 2 and Figure 3). Contact with the seat in front prevents the extreme upper body flexion around the lap portion of the belt, but the head contact while the neck is in tension explains the potential for life threatening upper spinal injuries as seen in the field with this form of misuse (Case 1, Table 6). Similarly, non use of one shoulder harness of a forward facing child restraint also results in the head being allowed to travel a greater distance. See Figure 2 and Figure 3. Head contact occurs when the head and neck are in tension, and explains the catastrophic high spinal injuries observed in the field with this form of misuse. (Case 1, Table 6).

Discussion & Conclusions

Inappropriate use of restraint, particularly premature graduation to adult seat belts and booster seats is the most

widespread form of sub-optimal use seen in the field (2-4, 6-8, 19, 24-25). From a population based sample, Durbin et al (3) demonstrated that for children aged 4 to 7, the odds of injury when using booster seats is 59% lower than when using adult belts.

For children aged between 1 and 4 years, Arbogast et al (1) in a similar sample demonstrated a reduction of 78% in the odds of injury in children using forward facing child restraints compared to adult seat belts. This together with previous Australian work (2-3, 19) supports educational and legislative moves to encourage children to use the most appropriate form of restraint for their size.

Incorrect use of restraints by children may be a less common form of sub-optimal, however, results presented here, suggest the outcome for children using their restraint incorrectly is potentially more serious. While the limitations inherent in the data collection and analysis of the field data presented here (and discussed in more detail below) are such that the increase in the odds ratio of moderate to severe injury must be viewed with some caution, our findings in the laboratory support an increased injury potential in incorrectly used restraints. This injury risk is due to excessive head and upper torso motion that is allowed when restraints are used incorrectly. This emphasises the need for child safety advocates to keep strategies aimed at minimizing and preventing the incorrect use of restraints by children at a high priority. This is particularly important given that if countermeasures to the

inappropriate restraint problem are effective more children will move into dedicated child restraint systems. There may be a need for simultaneous development and implementation of countermeasures targeting incorrect use with strategies aimed at reducing inappropriate use.

Incorrect use of restraints is not a new phenomenon. In 1985, the Traffic Authority of NSW initiated a Child Restraint Fitting Station Network as a specific countermeasure to incorrect use. This network has now spread to most states within Australia. While fitting stations provide many services, their primary role is providing assistance with the correct fitment of restraints into vehicles and they can do little, besides some basic education, to ensure the correct securing of a child within a restraint system. There is a need to develop new countermeasures against misuse, particularly against misuse associated with the incorrect securing of children within restraints.

Simplifying methods of restraint installation and the way a child needs to be secured within a restraint is a long-standing strategy aimed at reducing incorrect use. This is a strategy that has been employed by Standards Australia in the development of the Australian Child Restraint Standard. Assessing the usability of child restraints has also been part of the Australian Child Restraint Evaluation Program (CREP) since its inception in 1992. More recently, following a review of the assessment procedures used in CREP, an enhanced method for evaluating ease of use, and the propensity for misuse, has been introduced into CREP. This method, based heavily on a North American method, aims to encourage manufacturers to provide restraint systems that are difficult to use incorrectly.

For CREP to be effective, consumers must be well informed of the purpose of the program and the results of the evaluations. Widespread promotion of CREP results is a strategy that could be adopted by practitioners as a countermeasure to incorrect use. This would also work to educate consumers of the importance of the correct use of restraints. In the longer term, preventing incorrect use is likely to be most effectively achieved through changes to restraint design. There is a need for the investigation and development of restraint designs that not only minimise the propensity of incorrect use but actually prevent incorrect use. Alternatively, requirements for such features could be introduced through amendments to Australian Standards and possibly Australian Design Rules related to vehicles.

Finally it is important to discuss a number of issues concerning the methods used in this analysis. Most booster seats in Australia have a lower weight range that overlaps with the upper weight range of forward facing seats. e.g. the upper weight limit for forward facing seats is 18kg, while the lower weight limit for most booster seats is 14kg. The use of booster seats by children between 14 and 18 kg may therefore be within the design range but have been judged sub-optimal based on current best practice guidelines (27). While there were a number of children assigned to the inappropriately

restrained group who fell within this weight range overlap, only 3 of these children were using booster seats. The remainder were using adult seat belts. Using the Standards defined weight range for classifying inappropriate use of boosters would therefore have made little difference to the overall results.

Inappropriate and appropriate restraint judgements were made in the same way for all children in this sample (regardless of whether they were collected through in-depth investigation or case review). Incorrect restraint use judgements required more information and were made only when these details were available. The number of children reported to be incorrectly using restraints is therefore likely to be a conservative estimate. This has also resulted in only a small number of incorrect cases being used in this analysis and a high possibility that some cases of incorrect use may have been missed. This may have some affect on the results presented and is reflected in the fairly wide confidence intervals presented with estimations of the odds ratios for serious injury. However there is no systematic difference in how incorrect use was determined depending on injury outcome.

The data represents a convenience sample of children in crashes collected after attendance at hospital emergency departments. This sample does not represent all children in crashes as children from extremely minor impacts may not attend hospital. Conversely child occupants that die on the scene will not always be admitted to a hospital. Therefore the findings from the field cannot be generalized to all crashes involving children. Furthermore, the accuracy of data collected through case review alone is less than that collected through in-depth investigation. The accuracy of the case review data was evaluated by comparing the data collected through case review alone with data collected from in-depth investigation in a subset of cases. There was no specific selection criteria for inclusion in the in-depth study, however inclusion required contact with parents and vehicle owners before vehicle repairs had taken place. This may have biased the in-depth sample towards more severe crashes, and also towards families that were easier to contact. However comparison of crash severities and injury outcomes between these two groups demonstrates that there was little inter group differences in these variables with the exception of slightly more seriously injured children (>ISS 9) in the in-depth sample. The validation study showed that data collected through case review was 100% accurate for crash direction, 85% accurate for seating position and restraint type and 64% accurate for crash severity.

Lastly, the association between restraint quality and injury outcome in terms of MAIS and ISS was adjusted for crash severity. In theory other factors such as seating position and crash orientation may have some influence on injury outcome, however in this sample these factors were not found to be potential confounders. There was no association between seating position and impact direction and injury outcome, and no significant differences in the distributions of appropriately and inappropriately restrained children by seating position or

crash orientation. There were however some differences between inappropriately and incorrectly restrained children, with all children incorrectly using restraints being seated in the rear and involved in frontal impacts. Theoretically, these seating positions in frontal impacts would confer a protective effect. The lack of control for these confounders, if an issue at all, would lead to conservative estimates of any increased risk of injury due to incorrect restraint.

Acknowledgements

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Research Study into the Speed Behaviour of Long and Short Haul Heavy Vehicle Drivers

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This paper was originally presented at the November 2005 Road Safety Research, Policing and Education Conference held in Wellington, New Zealand.

Abstract

In 2005, the Roads and Traffic Authority (RTA) commissioned AMR Interactive to conduct a speed knowledge, attitudes and self reported behaviour research study to identify the reasons why long and short haul heavy vehicle drivers' speed, evaluate the role of enforcement and the types of measures that would influence the drivers to keep within the speed limits.

The qualitative stage included 10 face to face interviews and the quantitative stage included a telephone survey of 376 heavy vehicle drivers.

The highest risk groups identified were younger short haul, younger long haul and older long haul heavy vehicle drivers. About one in ten drivers reported having been booked for speeding in the last 12 months and similar proportions reported that they would be willing to drive more than 10 km/h over the limit while 15% stated they failed to stay within the speed limit in built up areas.

About a quarter of drivers reported experiencing some pressure to speed to meet deadlines. Drivers reported that on-road police enforcement would have the greatest impact on their attitudes and behaviour.

Possible countermeasure strategies include development of an education strategy addressing attitudes to speeding, situational triggers, planning trips and rest breaks, encouraging companies to develop and implement anti-speeding policies and increasing visible, unavoidable police enforcement.

Introduction

Speeding continues to be a major road safety issue. In 2005 there were 70 fatal crashes involving a heavy truck, and of these 13 (19%) involved a speeding heavy truck. There were a total of 290 recorded crashes involving a speeding heavy truck - 13

were fatal crashes, 132 were injury crashes and 145 were tow away crashes. There were 171 casualties from the 290 speeding heavy truck crashes - 15 were killed and 156 were injured [1].

These figures are likely to be an underestimation of heavy vehicle speed involvement, given the high rate of speeding by heavy vehicles (see below) and the higher probability that the heavy vehicle driver will survive to tell his/her side of the story, compared with other road users.

Highway speed surveys conducted by the RTA shows that 52% of heavy vehicles were exceeding the speed limit. The survey found that a high proportion of articulated trucks (34%) and b-doubles (35%) were travelling between 1-5km/h over the limit and 13% of articulated trucks and b-doubles were travelling between 6-10km/h over the limit. Approximately 1% of articulated trucks and b-doubles were travelling 21km/h over the speed limit [2].

Method

The research study was conducted during May 2005 and consisted of a qualitative and quantitative stage. The qualitative stage included in-depth face-to-face interviews with 10 truck drivers (5 long & 5 short haul) to explore motivations/situations that lead to speeding as well as those that lead to staying within the speed limit for the development of the questionnaire for the quantitative stage.

The quantitative stage consisted of a telephone survey of 256 truck drivers and 120 face-to-face interviews with long haul drivers at a truck stop and a trucking terminal. The face-to-face interview component was included to ensure that long haul drivers were well represented in the survey. The quantitative stage examined components that influence behaviour: situational factors such as trip type, schedule, on

road hours, time of day and weather conditions, type of road, factors that motivate them to speed such as attitudes to speeding, perception of safety, responsibility and the consequences of speeding such as crashing, getting caught, as well as the incentives and disincentives.

Group comparisons

The drivers were grouped into a number of categories as shown in **Table 1**.

Table 1. Categories of drivers, number and proportion of drivers in each category.

Grouping	Categories	Number	% of Sample
Total		376	100%
Trips more than 100km from driver base	Short Haul (0-10%)	163	43%
	Long Haul (11-100%)	213	57%
Employment of driver*	Owner driver not working for a company	72	19%
	Owner driver working for a company	68	18%
	Company driver	233	62%
Size of usual vehicle	4.5 to 12 tonnes	61	16%
	Over 12 to under 42 tonnes	146	39%
	42 tonnes and over	169	45%
Age of Driver	Up to 39 years	134	36%
	40-49 years	132	35%
	50 years and over	110	29%

*Three drivers gave some other category of employment

General profile of drivers

The incidence of long haul trips increased substantially with the size of the vehicle driven, with drivers of vehicles up to 12 tonnes gross vehicle mass (gvm) the least likely to report at least 90% of their trips as long haul (7%), and drivers of vehicles of at least 42 tonnes gvm the most likely (56%). Drivers aged 40-49 years reported a higher proportion of their trips as long haul. The incidence of long haul trips increased with hours worked each week. The number of hours worked was higher for long haul drivers, company drivers, drivers of larger vehicles and younger drivers.

About 37% of drivers were ‘owner drivers’ with half of them working directly for a company. Overall 80% of drivers in the study worked for a company.

Input into schedules

Approximately 66% of drivers surveyed had input into their trip schedules and delivery times. Long haul drivers (43%) were more likely than short haul drivers (38%) to have input into the trip schedules on all of their trips. Owner drivers (71%) not working for a company were by far the most likely to have input into trip schedules on all of their trips, compared with either the owner driver working for the company (37%) or company drivers (32%).

Incidence of trips in which there is pressure to meet deadlines

About a quarter of drivers said that they felt pressure to drive over the speed limit because they had to meet a deadline. Drivers up to 39 years (29%) and 40-49 years (29%) were more likely to feel pressure to drive over the limit than drivers aged 50 years and over (14%). Short haul drivers (27%) were more likely than long haul drivers (21%) to feel pressure to drive over the speed limit.

General comments on speeding

The most common reason given by truck drivers for why they go over the speed limit was ‘pressure to make deadlines’ or ‘pressure from boss’. Approximately 76% of drivers nominated a reason associated with work, such as, the pressure to make deadlines/pressure from boss (65%), earn more money (6%) and get home/get the job over (5%) as the reasons for speeding. Work issues were more likely to be nominated by short haul drivers (86%) than long haul drivers (68%).

Agreement with statements about speeding

A very high percentage (83%) of drivers stated they don’t go over the speed limit in built up, urban areas. However, 31% of drivers agreed that it was acceptable to drive ‘up to 10 km/h over the speed limit’ on the open road if you are an experienced truck driver, while 26% agreed that they risk losing money if goods are not delivered on time.

Examination of group differences found drivers aged 50 years and over were less likely than younger drivers to agree that they ‘risk losing money if goods are not delivered on time’ (18% v an average of 29% in the younger age groups).

Consequences and situations influencing decisions about speeding

When drivers were presented with the consequences and situations that influence them to stay within the speed limit, the vast majority of drivers nominated loss of licence/points (87%) and the possibility of crashing (81%) as being very important. Other reasons given were the possibility of getting a fine (74%), having realistic deadlines (70%) and having a company policy against speeding (61%).

Owner drivers working for a company rated having a company policy against speeding as a very important influence not to speed compared to those drivers driving company vehicles (72% v 58%).

Influence of countermeasures to speeding

The strongest motivator to stay within the speed limit was on-road police enforcement (71%) nominated by drivers as definitely likely to discourage them from speeding, followed closely by realistic delivery times nominated by 66% of drivers.

RTA initiatives such as 3 Strikes Scheme (60%), fixed speed cameras (57%), point to point speed cameras (55%) and Safe T Cam (52%) were nominated by drivers as definitely likely to discourage them from driving over the speed limit. Similarly company policy (59%) and basing payment on hours worked (57%) was also nominated as definitely likely to discourage them from driving over the speed limit.

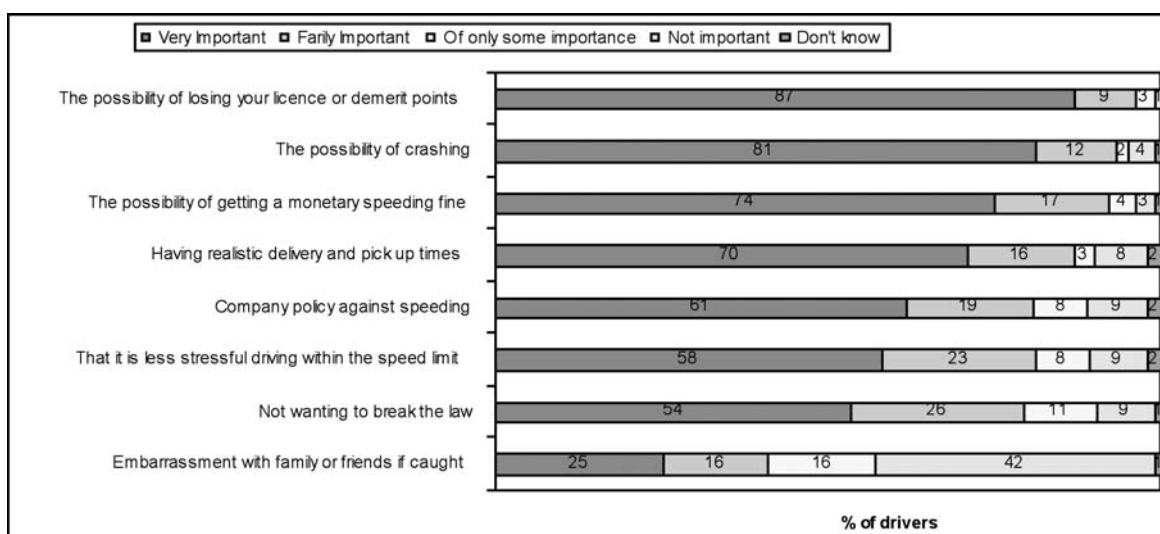


Figure 1. Level of importance of consequences and situations in influencing drivers to stay within the limit

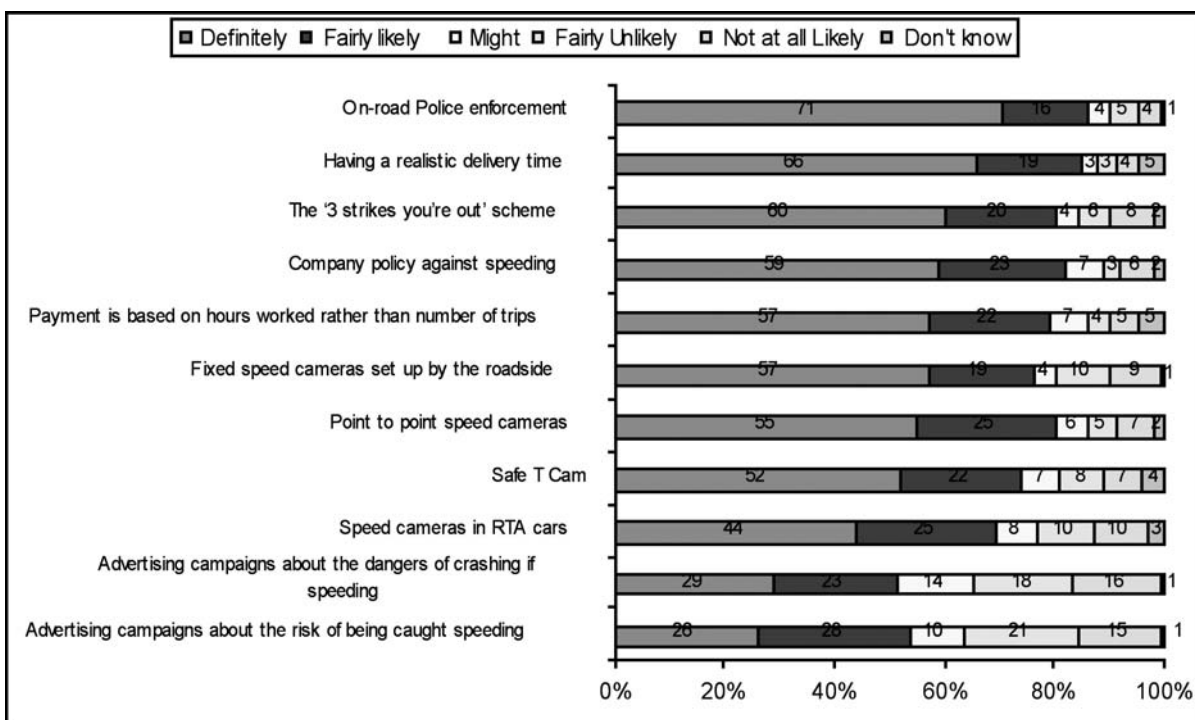


Figure 2. Likelihood of different types of countermeasures and situations discouraging from driving over the speed limit

On-road police enforcement had marginally more impact on drivers of trucks up to 12 tonnes gvm and among drivers aged 40-49 years; while fixed speed cameras and Safe T Cam had marginally more impact on drivers aged 50 years and over.

Drivers who said that they were unlikely to be discouraged by the particular countermeasure/situation were asked why they would not be discouraged. The reasons often related to a belief they could avoid the enforcement, with drivers indicating that they knew the locations of fixed speed cameras and warned each other about the locations (58%) and they speed between fixed speed cameras and slowed down at camera sites (33%).

Approximately 44% of drivers stated that their company did not apply pressure/have unrealistic deadlines and as such did not need to speed.

Experience of enforcement

About 64% of drivers reported seeing police enforcement on their last trip. Seventy-five percent of long haul drivers reported seeing enforcement compared to 49% of short haul drivers. This was also reflected in differences by vehicle type, with 73% of drivers of vehicles of at least 42 tonnes gvm more likely to report seeing enforcement compared to 52-58% of drivers of lighter vehicles

Likelihood of getting caught

About 55% of drivers considered it very likely or fairly likely to get caught when travelling up to 10km/h over the limit. This increased to 74% when travelling more than 10 km/h over the speed limit. The perception of 'very likely' to be caught increased with age in both situations. This perception was also marginally higher among owner drivers working for a company than for other drivers.

Company policy

Approximately fifty-three percent of drivers working for a company reported that their company promoted to drivers 'you must not speed'. Forty-two percent of drivers also said that their company promoted 'being on time for deliveries', and only 31% told drivers not to tamper with the speed limiter.

Short haul drivers were more likely than long haul drivers to be told not to speed and not to tamper with the speed limiter. Drivers of vehicles of at least 42 tonnes gvm were the most likely to be frequently told not to tamper with the speed limiter.

When asked what their companies would do if they were caught speeding, 19% said that they would lose their job and a further 10% said they would lose their job after repeat offences if they were caught speeding. Thirty percent said they would receive a formal warning with no penalties, while 15 % would have been fined or their pay deducted for speeding. Other drivers said that they could not speed as their trucks were speed limited (3%) and others stated (4%) that it was their responsibility to ensure that they did not speed. A further 10%

reported that nothing would happen and 7 % said that they did not know what would happen.

In relation to late deliveries, 26% of drivers said their company would not take any action while 35% would be asked reasons for the delay. A fifth (21%) said they would receive some type of formal warning and only relatively few (8%) would receive a formal penalty.

In terms of tampering with the speed limiter, 69% said they would lose their jobs instantly. About 7% said there would be some sort of warning/penalty/meeting, including some cases in which repeat offending would lead to dismissal.

Management systems

Forty-five percent of drivers working for a company reported that their company checks the vehicle management system of trucks. This was higher among long haul drivers (51%) compared with short haul drivers (36%), non owner drivers (50%) and those driving vehicles of at least 42 tonnes gvm (61%).

About half of drivers whose vehicle management system is checked reported that detection of speeding would be most likely to lead to only a warning or meeting. A more formal penalty would occur for a third of drivers (37%), including loss of job (20%), loss of job after several offences (9%) and financial penalty (8%).

Speeding fines

Four percent of drivers working for a company reported their company paid for fixed speed cameras fines, although a further 5% did not know. This incidence was higher amongst smaller companies: an average of 7% for companies employing 1-9 drivers compared with an average of 2% for companies employing 10 or more drivers. Where it was reported that the company paid the speeding fines, most drivers would still incur the demerit points.

Speeding behaviour

When drivers were asked to nominate the fastest they would consider driving in a 60 km/h speed zone with little traffic that has occasional intersections or traffic light, 79% said they would keep within the limit, 21% indicated they would exceed the limit, including 12% who nominated to driving more than 5 km/h over the limit.

When asked the fastest they would drive in a 100 km/hr speed zone, 45% said they would keep within the limit, 55% stated they would exceed the limit, including 34% who would speed by more than 5 km/h. About 9% stated they would exceed the speed limit by more than 10km/h.

When group differences were examined, drivers aged 50 years and over were the least likely to exceed the limit by 5 km/h or more (20%, compared with 36% of drivers aged up to 39 years and 42% of those aged 40-49 years). Furthermore, drivers of vehicles up to 12 tonnes were less likely than drivers of heavier

trucks to exceed the speed limit (56%, compared with 41% of drivers of vehicles of 12-41 tonnes and 45% of drivers of vehicles of at least 42 tonnes). In this case, the difference was made up by a higher propensity of drivers of heavier trucks to travel 1-5 km/h over the limit.

Booked for speeding

About 11% of drivers reported that they had been booked for speeding in the last 12 months. Strong differences were noted between the driver groups in the incidence of having been booked for speeding. There was a strong difference between short and long haul drivers with 4% of short haul drivers reporting having been caught, compared with 17% of long haul drivers. This was even greater for drivers who were more exclusively long haul, that is at least 90% of their trips more than 100 km from their base. Twenty-three percent of this group had been booked for speeding in the last 12 months.

The incidence of having been booked for speeding was also:

- higher among drivers working for a company (13%) compared with independent owner drivers (4%);
- higher among drivers who drove a vehicle of at least 42 tonnes gvm (18%, compared with 6% of drivers of lighter vehicles); and
- highest among drivers aged up to 39 years (16%) decreasing with age, to be only 5% among drivers aged 50 years and over.

Drivers who had been booked speeding in the last 12 months were more likely than other drivers to consider driving more than 10km/h over the limit on 60km/h and 100km/h roads.

Speed limiters

Twenty-seven percent of drivers said that they had driven a non-speed limited truck that should have been speed limited. One in ten (10%) of these drivers reported they had driven such a truck on at least 50% or more of trips.

When group differences were analysed, those who had driven a truck that was not speed limited, but was required to, was greater among:

- long haul drivers (30%) than short haul drivers (21%);
- company drivers (30%) than either owner drivers working for a company (22%) or owner drivers not working for a company (17%); and
- drivers aged up to 39 years (30%) and aged 30-49 years (32%) compared with those age 50 years and over (16%).

Willingness to speed in specific situations

When asked about their willingness to speed 'up to 10km/h' over the limit under certain circumstances, 51% said they would definitely, fairly likely or might consider speeding to keep up

with the general flow of traffic. Forty percent stated they would speed when driving down hill, followed by 33% who would speed where the speed limit is inappropriate, and 30% who would speed in light traffic conditions.

In the scenario of driving 'more than 10km/h' over the limit, about 16% stated they would consider doing this to keep up with the general flow of traffic. The study found that younger drivers were more likely to consider driving more than 10km/h over the limit when running late to meet a deadline, to finish a trip early, or to catch up after stopping to rest, and company drivers were marginally more likely than owner drivers to speed to finish a trip early.

Other comments

When given the opportunity to make any comment about this issue, twenty-five percent of drivers nominated external pressures as a reason to speed including unrealistic deadlines (13%) and unrealistic pay rates (7%). About a fifth of drivers were critical of truck drivers and stated there should be more enforcement (7%) and education (4%).

Conclusions

The two risk taking dimensions identified in the research were a general willingness to speed, associated with speeding on particular roads, to 'keep up with the traffic flow' and 'in light traffic conditions', and speeding resulting from work issues associated with the trips, particularly around meeting deadlines and fitting in more trips or deliveries.

There was a degree of reported risk taking, reflected in responses of willingness to drive over the limit and having been booked for speeding. About one in ten drivers reported to have been booked for speeding in the last 12 months and similar proportions reported that they would be willing to drive more than 10 km/h over the limit in a number of situations while 15% disagreed that they stayed within the speed limit in built up areas.

About a quarter of drivers reported that they experienced pressure to drive over the speed limit to meet deadlines on at least some trips particularly by long haul drivers, and drivers aged under 50 years of age.

The motivators associated with the two risk taking dimensions were an overall attitude that 'speeding is OK' and pressure to speed to meet deadlines. A further motivator associated with willingness to speed was a general 'likelihood of being detected speeding' and the impact of heavy vehicle enforcement countermeasures.

There was a higher risk of speeding in companies without policies for checking vehicle management systems and who don't promote that drivers don't speed and do promote that goods be delivered on time. There is therefore a clear role for companies to play in discouraging speeding by their drivers.

The group analysis identified the younger short haul drivers (the large majority aged under 40 years) as the highest risk

group, scoring higher on both risk dimensions. This group was also the most likely to report feeling pressure to speed to meet deadlines (36%); tended to be less likely to have input into trip schedules (39%); and was the least likely to have seen enforcement on their last trip (49%).

The younger long haul drivers scored higher on the general willingness to speed dimension, and were the most likely to have driven a truck without a speed limiter that should have been limited (33%), while older long haul drivers had a higher risk profile on work pressure to speed on trips. This group was the most likely to have been booked for speeding in the last 12 months (26%), and to have seen police enforcement on the last trip (81%).

While most drivers in the survey expressed strong compliance with the speed limits, a proportion of drivers expressed substantial pressure to speed to meet deadlines, and a proportion of drivers also considered that speeding is acceptable for 'experienced drivers'.

Only half of drivers considered that 'not wanting to break the law' was a very important influence in decisions to keep to the speed limit, so there is still some way to go before drivers are 'self-motivating' to stay within the law.

Demerit points leading to loss of licence was the consequence of most concern to drivers in the survey, implicating the potential role for enforcement in this context. Detailed knowledge of penalties, however, was low.

On-road Police enforcement was reported to have the greatest impact on attitudes and behaviour. The greater impact of Police enforcement activity may in part be related to the general application of the enforcement. Safe T Cam was also effective but was more restricted in application and hence deterrent threat because it is targeted at specific routes therefore targeting certain types of drivers and trips.

A trial of speed cameras in RTA cars had lower reported impact than the other forms of enforcement. When the trial was conducted no penalties were applied, and there would have been little exposure yet to this type of enforcement. The focus of comments was on the fact that the RTA does not currently enforce speeds, rather than specifically on a lack of deterrent value.

Many drivers not discouraged by enforcement considered they could avoid being caught. They commented that they could adapt their behaviour to the locations of speed cameras, Safe T Cam or point to point speed cameras while still speeding for other parts of the trip. This belief may reflect a lack of understanding about how the technology works or simply be an expression of resistance to countermeasures. While it may be possible to speed in between camera sites, or for part of a trip monitored by Safe T Cam or point to point speed cameras, the potential value to the driver of speeding is diminished because they can not speed for the entire length of the monitored section because these types of enforcement technology monitors speed over a distance.

Awareness of police enforcement on their most recent trip was relatively high, averaging 64% of drivers, although this was even greater among long haul drivers. This indication of greater exposure to enforcement by long haul drivers was reflected in a much higher incidence of being booked for speeding in the last 12 months in this group (17% v 4% of short haul drivers). This high level of enforcement, however, has not eliminated speeding as indicated by RTA speed surveys. While the research supports continued high levels of Police enforcement, it also highlights the need to explore and promote other forms of enforcement such as point to point speed cameras.

In considering the role of enforcement in deterring speeding, it is important to also consider the role of companies in monitoring behaviour and promoting safe behaviour. Workplace rules, policies and penalties were also found to be associated with risk taking.

Companies are implicated in pressure to speed to meet deadlines, including promoting to drivers that they should be on time for deliveries. They are also in a position to pass on penalties that drivers incur for speeding, which almost all appear to do, as well as impose their own penalties for unsafe behaviour such as loss of job.

Based on the findings of the research, a number of recommendations for an education strategy could be developed. The three target groups identified in the research include short haul drivers who have been identified as the highest risk group, younger long haul drivers who have a higher willingness to speed and the older long haul driver who speed because of work pressures. Employers are another target group.

The development of a communication strategy would have to address the general attitudes about the acceptability of speeding, specific situational triggers that lead to speeding such as in light traffic, appropriateness of speed limits and promote planning of trips and rest breaks. The strategy would also need to promote the risk of getting caught especially to younger drivers, increase awareness and knowledge about new anti speed technology, loss of points and licences as well as show a visible police presence on the roads.

Workplace communication strategies would include encouraging companies to implement anti-speeding policies and penalties for violations, encouraging companies (and clients) not to punish drivers for missing deadlines and encouraging companies to adopt payment systems that do not encourage speeding.

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