ATC

**AUSTRALIAN
TRANSPORT COUNCIL**

National Road Safety Strategy
2011–2020

Foreword

On average four people die and 90 people are seriously injured on Australian roads every day. Most Australians have been personally affected by the trauma of a road crash and the cost to the community in terms of economic loss and personal suffering is enormous.
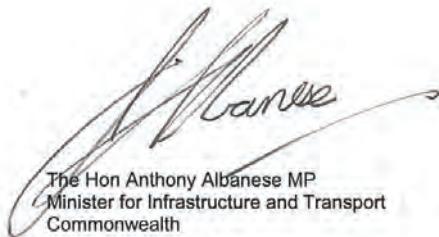
While there has been a measureable decrease in death on Australian roads over the past decade, there has been slower national progress in reducing the number of serious injuries. Any level of serious road trauma is unacceptable and we must do more.

The National Road Safety Strategy 2011–2020 aims to set out a path for national action on reducing fatal and serious injury crashes on Australian roads. It coincides with the International Decade of Action for Road Safety.

This strategy is founded on the internationally recognised 'Safe System' approach formally endorsed by the OECD. This approach accepts that people using the road network will make mistakes and therefore the whole system needs to be more forgiving of those errors. This means there must be a focus on roads, speeds, vehicles and road user behaviour as well as a range of associated activities, including performance monitoring and reporting.

Through the national consultation process for the development of this strategy, feedback from stakeholders and members of the public was gathered, collated, analysed and used to inform the way forward for the strategy and associated initiatives. With so many competing priorities for us all personally, professionally and socially in Australia's current environment, we acknowledge the significant time and energy invested across all consultation sessions and feedback submissions. The volume of responses received, and the level of interest and passion within them is an indicator of the ongoing commitment in our community to strive to improve road safety for all road users. A list of groups who contributed feedback either via consultation sessions or lodging a submission can be found as Appendix 1 at the back of this document.
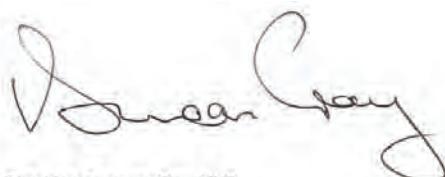
With this strategy, our governments make commitments and take responsibility for critical issues in the system. However, government can only do so much and we need the support of organisations, industry, businesses, community groups and individuals. With your help we can move towards eliminating death and serious injury on our roads.

The Hon Anthony Albanese MP
Minister for Infrastructure and Transport
Commonwealth

The Hon Catherine King MP
Parliamentary Secretary for Infrastructure and Transport
Commonwealth

The Hon Duncan Gay MLC
Minister for Roads and Ports
New South Wales

The Hon Terry Mulder MP
Minister for Roads, Minister for Public Transport
Victoria
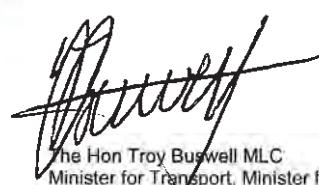
The Hon Annastacia Palaszczuk MP
Minister for Transport, Minister for Multicultural Affairs
Queensland

The Hon Craig Wallace MP
Minister for Main Roads
Queensland
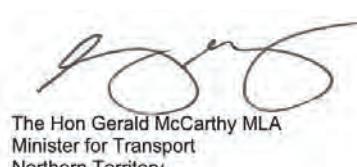
The Hon Tom Kenyon MP
Minister for Road Safety
South Australia

The Hon Troy Buswell MLC
Minister for Transport, Minister for Housing
Western Australia

The Hon David O'Byrne MP
Minister for Infrastructure, Minister for Economic
Development, Minister for Workplace Relations
Tasmania

The Hon Gerald McCarthy MLA
Minister for Transport
Northern Territory

Simon Corbell MLA
Attorney General
Australian Capital Territory

Australian Transport Council
20 May 2011

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Definitions

Alcohol interlock: device that prevents a vehicle starting if the operator has been drinking.

Australian Transport Council (ATC): a national body comprising Commonwealth, state, territory and New Zealand Ministers with transport responsibilities.

Austroads: company of Australian and New Zealand road transport and traffic authorities.

Casualty crash: a road crash in which someone is injured (to any level of severity).

Chain of responsibility: legislation that extends the general liability for on-road transport offences to all parties in the supply chain.

Electronic work diaries: used to record a heavy vehicle driver's work/rest history.

Fatality (or death): death resulting from, and occurring within 30 days of, any apparently unpremeditated event reported to police, or other relevant authority, attributable to the movement of a road vehicle on a public road.

Graduated licensing system: a series of conditions and/or restrictions in the early years of licensing that allows novice motorists to gain experience in low-risk settings.

National Road Safety Council (NRSC): an advisory body that reports to the Australian Transport Council on road safety implementation issues.

Point-to-point speed enforcement: continuous automated speed enforcement system that measures the average speed of vehicles over an extended length of road.

Safe System principles: a road safety approach which holds that people will continue to make mistakes and that roads, vehicles and speeds should be designed to reduce the risk of crashes and to protect people in the event of a crash.

Seatbelt reminder or interlock: device that detects the failure of a vehicle occupant to wear a seatbelt and: provides a conspicuous visual and/or audible alert (reminder system); or prevents the vehicle from starting or accelerating (interlock).

Serious injury: injury from a road crash with enough severity to require hospitalisation.

Serious casualties: people killed or seriously injured in road crashes.

Social cost: total cost of road crashes to society, including estimates of foregone future production, pain and suffering of victims, and services rendered.

Speed camera enforcement tolerance: the margin between the legal speed limit and the minimum detected speed that will incur an infringement.

Tactile line treatments (rumble strips): Road lines that give an audible and tactile sensation to drivers of vehicles passing over them.

Telematics: integrated computing and communication technologies in vehicles that enable electronic monitoring, management and regulation.

Willingness-to-pay: an economic method of valuing human life to inform investment decisions — see further explanation in box on page 50.

Abbreviations

ABS	Anti-lock Braking Systems
ADRs	Australian Design Rules
ANCAP	Australasian New Car Assessment Program
ATSB	Australian Transport Safety Bureau
BAC	Blood Alcohol Concentration
ESC	Electronic Stability Control
GTRs	Global Technical Regulations
ISO	International Standards Organisation
ISA	Intelligent Speed Adaptation
ITS	Intelligent Transport Systems
MUARC	Monash University Accident Research Centre
OECD	Organisation for Economic Co-operation and Development
RBT	Random Breath Testing
RIS	Regulation Impact Statement
SPI	Safety Performance Indicator
UNECE	United Nations Economic Commission for Europe
USCR	Used Car Safety Ratings
VKT	Vehicle-kilometres travelled

1. Introduction

1. Introduction

Australia's first National Road Safety Strategy was established by federal, state and territory transport Ministers in 1992. It provided a framework for national collaboration on road safety improvement that has evolved over the last two decades. Our last national strategy, for the period 2001 to 2010, aimed to achieve a 40 per cent reduction in the per capita rate of road deaths. We fell some way short of the target — recording an actual reduction of 34 per cent — but we strengthened our commitment to national action on road safety issues and made significant gains in many areas.

Under the 2001–2010 strategy, Australia was one of the first countries to formally adopt the Safe System approach to road safety improvement. The Safe System approach takes a holistic view of the road transport system and the interactions of its various elements. It aspires to create a road transport system in which human mistakes do not result in death or serious injury.

This *National Road Safety Strategy 2011–2020* aims to elevate Australia's road safety ambitions through the coming decade and beyond. It is firmly based on Safe System principles and is framed by the guiding vision that no person should be killed or seriously injured on Australia's roads. As a step towards this long-term vision, the strategy presents a 10-year plan to reduce the annual numbers of both deaths and serious injuries on Australian roads by at least 30 per cent. These targets will be challenging: they compare, for example, with a 23 per cent reduction in road deaths achieved over the last decade[1].

The casualty reduction targets for 2020 are ambitious, but achievable. These targets and the supporting initiatives set out in the strategy were partly informed by independent analysis and data modelling carried out by the Monash University Accident Research Centre (MUARC). The modelling was designed to estimate the potential reductions in deaths and serious injuries that could be expected from a range of road safety interventions.

However, the level of trauma reduction that can actually be achieved by 2020 will depend on the costs and policy changes that the community is prepared to accept in return for a safer road transport system.

The new strategy sets out a range of high-level directions and priority actions to drive national road safety performance to the end of 2020. It also lays the groundwork for longer-term goals and aspirations.

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1   Based on a comparison of the actual number of road deaths during calendar year 2010 with the average annual number of deaths during the period 1998–2000.

Many severe road crashes are preventable and history provides evidence that the right interventions can make a significant positive impact. Since 1970, Australia has continuously achieved large and lasting road safety gains from road improvements, safer vehicles, lower speed limits, graduated licensing and a range of successful behavioural programs targeting drink driving, seatbelt usage and speeding. Independent studies and other objective evidence have demonstrated the success of each of these initiatives in reducing road trauma. Despite these achievements, road crashes still cause some 1,400 deaths and 32,500 serious injuries each year. The social impacts are devastating — and the annual cost to the Australian economy is estimated to be $27 billion [1][2].

The strategy sets out our 10-year directions for a safer road transport system, with governments committing to a number of first steps, and identifying a range of additional steps for further consideration. It focuses on the main areas where there is evidence that sustained, coordinated effort can lead to large gains. It also focuses on measures which may not see results for some time but which will lead to long-term improvement.

In 2014 there will be the first of two reviews of the strategy, including assessment of the progress we are making in delivering the strategy's initiatives.

This National Road Safety Strategy represents the commitment of federal, state and territory governments to an agreed set of national road safety goals, objectives and action priorities. It will be supported by a comprehensive performance monitoring and reporting regime.

However, the strategy is not an implementation plan. The detailed planning required to give effect to the strategy, including funding, legislative and administrative arrangements, will require ongoing work by all governments and their respective transport agencies. Furthermore, the mix of measures adopted in individual jurisdictions, and the details of specific measures, may vary to reflect local circumstances and priorities.

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2   The estimate of $27 billion is based on an economic method of valuing human life known as 'willingness-to-pay'. An alternative method based largely on the 'human capital approach' has produced a more conservative estimate of $18 billion. See further explanation of these methods in the box on page 50.

2. The Australian Road Safety Journey
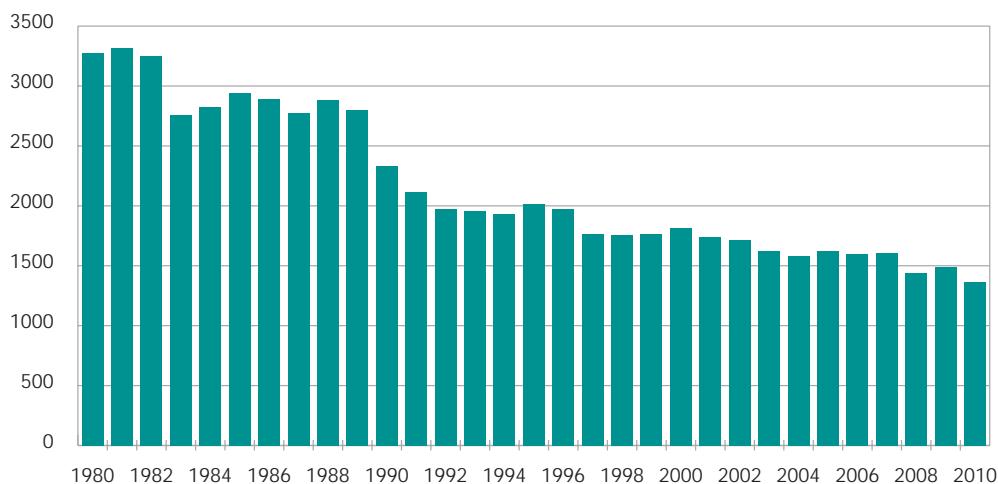
2.   The Australian Road Safety Journey

General progress

Australia has achieved substantial reductions in road crash fatalities over the last 30 years, despite a 50 per cent growth in population and a two-fold increase in registered motor vehicles. Between 1980 and 2010, the nation's annual road fatality rate declined from 22.3 to 6.1 deaths per 100,000 people.

The chart below shows the progressive reduction in fatality numbers over that period.

Figure 1: Annual number of Australian road deaths

Note: Refers to deaths resulting from, and occurring within 30 days of, any apparently unpremeditated event reported to police, or other relevant authority, attributable to the movement of a road vehicle on a public road.
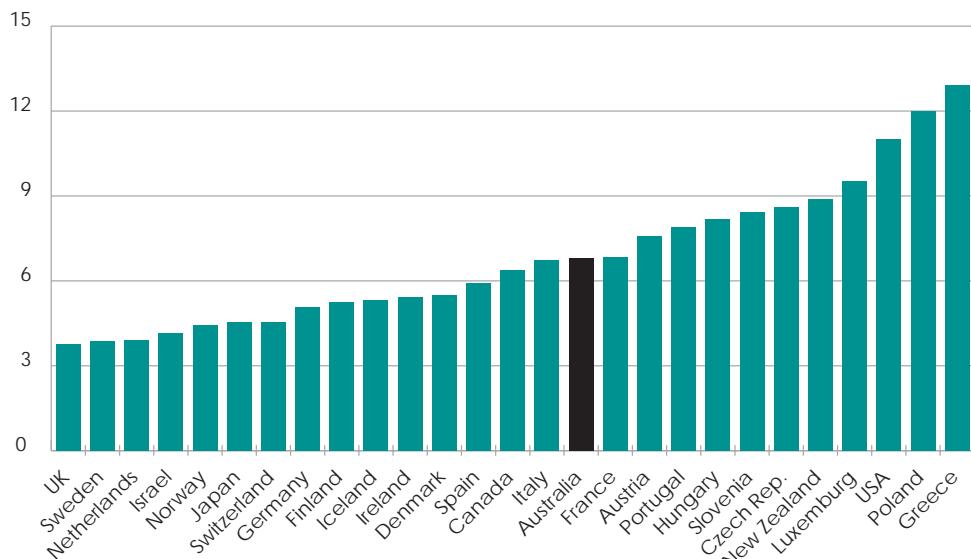
Trends in Australian road trauma have been characterised by short periods of rapid decrease — large downward steps — followed by longer periods of consolidation and incremental improvement. Evaluation evidence indicates that many of these gains can be attributed to specific road safety interventions, some of which have been big and bold enough (such as the introduction of seatbelt laws and random breath testing) to fundamentally change the road safety landscape.

However, the rate of progress has been slow in recent years. Between 2005 and 2010, the average annual reduction in road fatality numbers was 3.3 per cent. Hospital admissions data also point to little, if any, national

improvement in the number of people who were seriously injured in road crashes.

Australia ranked 16th out of 27 OECD[3] countries in terms of road fatalities per capita in 2009 (Figure 2). Our population fatality rate now stands at 6.1 deaths per 100,000 people, while the best performing countries (United Kingdom, Sweden and the Netherlands) have achieved rates below 4.0 — and some of these countries have set targets to cut their road casualty numbers by a further 33 per cent or more over the coming decade.
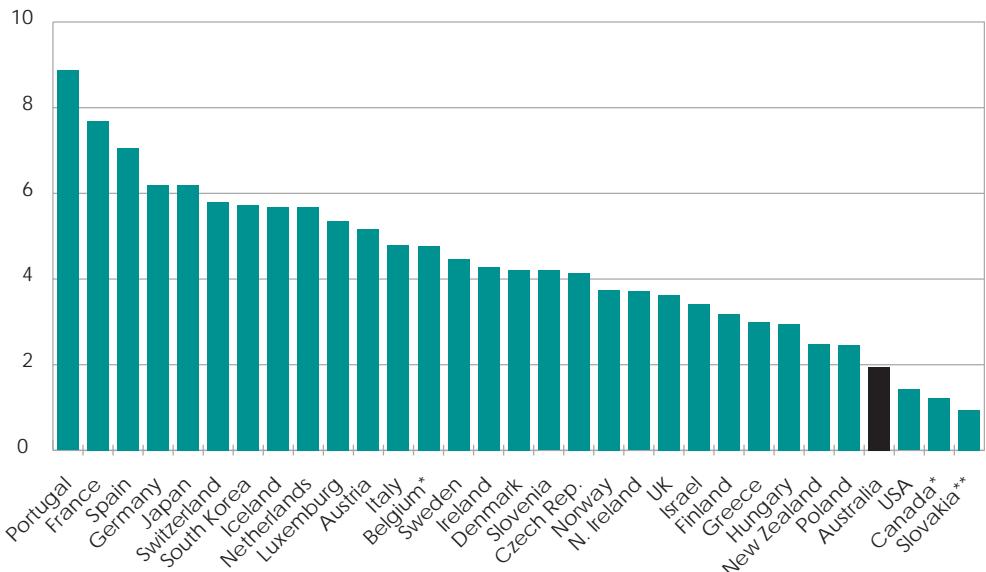
Figure 2:   Road fatality rates per 100,000 population among OECD countries, 2009

These simple statistical comparisons do not recognise the effects of different social, demographic and geographic circumstances on road fatality rates. However, there is evidence that Australia's relative road safety performance internationally has slipped in recent times. Figure 3 shows that Australia's rate of improvement over the last decade was lower than most other OECD countries.

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3   Organisation for Economic Co-operation and Development

Figure 3:   Average annual percentage decrease in road deaths
             among OECD countries, 1999-2009

* Refers to the period 1999–2008
** Refers to the period 1999–2007
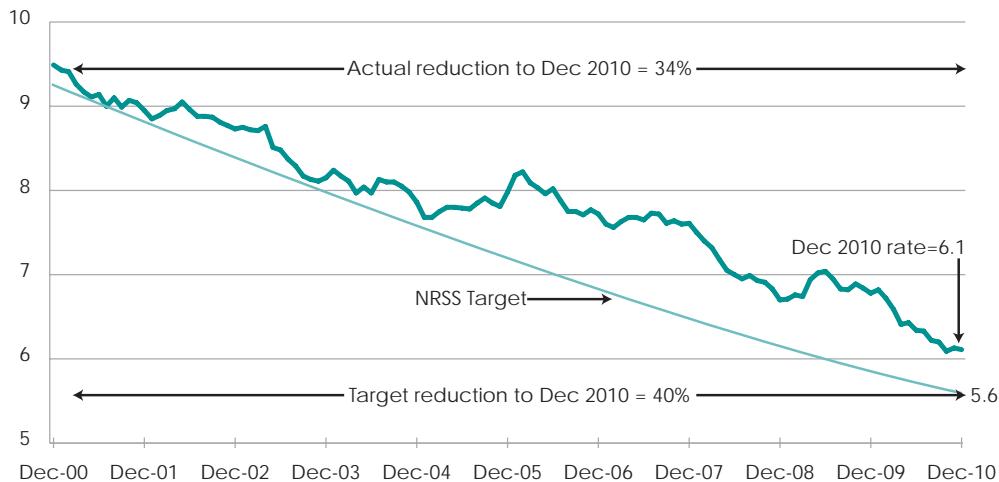
National Road Safety Strategy 2001–2010

In November 2000, Australia's transport Ministers endorsed the National Road Safety Strategy 2001–2010. The strategy provided a framework for prioritising the road safety activities of federal, state, territory and local governments, as well as other organisations that could influence road safety outcomes. Its target was to reduce the annual road fatality rate by at least 40 per cent over the 10-year period to the end of 2010: from 9.3 deaths to no more than 5.6 deaths per 100,000 population.

Despite significant gains over the decade, the 40 per cent reduction target was not reached. By the end of 2010 an actual reduction of 34 per cent had been achieved and the fatality rate stood at 6.1 deaths per 100,000 population — some way short of the 5.6 target (Figure 4).

Figure 4:   Australian road fatality rate per 100,000 population, 2000 to 2010

Note: based on a moving 12-month calculation

As shown in Table 1, the trends have not been uniform across the nation. Between 1999 and 2010, reductions in fatality rates varied across states and territories from 16.1 per cent to 45.7 per cent and average reductions per year ranged from 1.7 to 4.8 per cent.

Table 1: Road fatality rates per 100,000 population

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Aust
1999	9.0	8.2	9.0	10.1	11.8	11.2	25.4	6.1	9.3
2000	9.3	8.6	8.9	11.0	11.3	9.1	26.1	5.7	9.5
2001	8.0	9.2	8.9	10.1	8.7	12.9	25.3	5.0	8.9
2002	8.5	8.2	8.7	10.1	9.3	7.8	27.6	3.1	8.7
2003	8.1	6.7	8.1	10.3	9.2	8.6	26.5	3.4	8.1
2004	7.6	6.9	8.0	9.0	9.0	12.0	17.3	2.7	7.9
2005	7.5	6.9	8.3	9.5	8.1	10.5	26.7	7.9	8.0
2006	7.3	6.6	8.2	7.5	9.7	11.2	21.8	3.9	7.7
2007	6.3	6.4	8.6	7.8	11.1	9.1	27.0	4.1	7.6
2008	5.3	5.7	7.6	6.2	9.4	7.8	34.0	4.0	6.7
2009	6.4	5.3	7.5	7.3	8.5	12.5	13.7	3.4	6.8
2010	5.8	5.2	5.5	7.2	8.4	6.1	21.3	5.0	6.1
Ave. annual change[a]	-4.4%	-4.8%	-2.8%	-4.5%	-1.7%	-2.1%	-2.0%	-1.9%	-3.6%
1999-2010 change[b]	-35.5%	-36.5%	-38.5%	-28.8%	-28.7%	-45.7%	-16.1%	-17.6%	-34.4%

Note: Annual rates in smaller jurisdictions (Tasmania, Northern Territory and ACT) can change substantially from year to year because of the relatively low fatality numbers compared with larger jurisdictions.

a. Average annual change is based on the exponential trend for the eleven 12-month periods from 1999 to 2010.

b. The 40 per cent reduction target in the NRSS 2001-2010 was based on benchmark data for 1999.

Australia made significant road safety gains under the 2001–2010 strategy, both statistically and in terms of major policy action. Some of the important achievements are outlined in the next section. However, it must not be overlooked that more than 15,000 people have lost their lives on Australian roads in this period, and some 300,000 have been hospitalised with serious injuries.

Over the past several decades, Australia has earned an international reputation as a model country in many areas of road safety intervention. But the overall performance in recent times has not kept pace with the achievements of other developed countries, and there is a need for a major shift in thinking by governments and the community.

The time is ripe for a fresh approach — for a new National Road Safety Strategy that will address the safety deficiencies in the road transport system and deliver significant further reductions in trauma levels.

What factors have influenced national trends over the past decade?

- Australia experienced conditions of relatively high economic growth, partly driven by the minerals booms in Western Australia and Queensland, until the global financial crisis brought a downturn towards the end of the decade. Periods of increased economic activity and discretionary spending are often associated with higher crash rates — and vice versa. While the relationships are indirect, the effects are typically linked to changes in vehicle usage patterns, including the amount of travel during high-risk times of the day.

- When Australia's 2010 fatality reduction target was set at the start of the last decade, a key consideration was the expected increase in the number of vehicles on our roads. The projections at the time anticipated an increase of 2 per cent per year. However, the annual increase in vehicle numbers actually jumped to 3 per cent after 2004.

- Another measure of vehicle usage commonly linked to road trauma trends is the number of vehicle-kilometres travelled (VKT). Over the last ten years, total VKT in Australia increased by about 14 per cent. While this aggregate growth in road travel was not unusually high compared with previous decades, the increase in usage varied markedly across state borders and vehicle categories:

  » Western Australia and Queensland recorded VKT increases of more than 20 per cent

  » in the commercial transport sector, heavy truck VKT increased by 20 per cent and light commercial vehicle VKT by 25 per cent

  » the growth in motorcycle (and scooter) usage was a very high 82 per cent.

- The rapid expansion of motorcycling activity — reflected in both VKT estimates and new motorcycle sales data — was unforeseen at the start of the decade and contributed to a 17 per cent increase in annual rider fatalities between 2000 and 2010.

What were the important road safety initiatives?
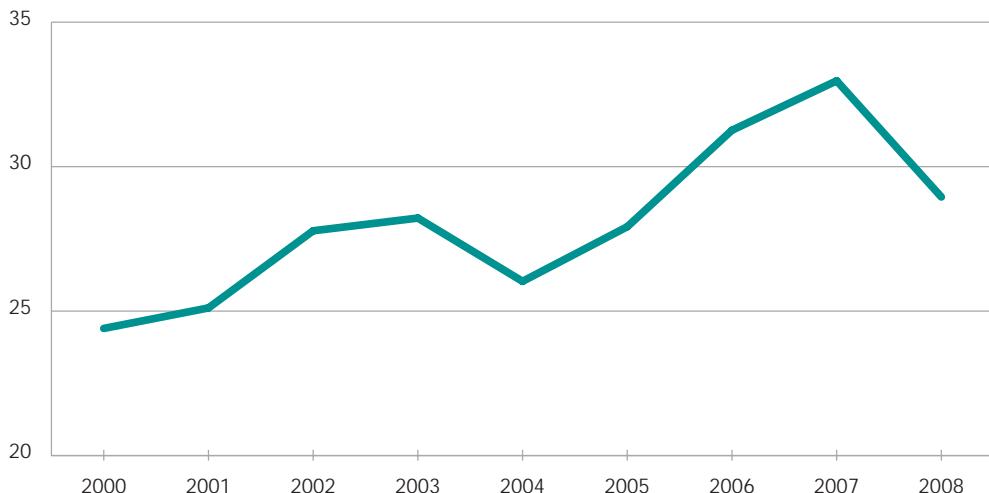
Australia has a strong record of road safety achievement and we have led the world with key behavioural measures such as compulsory seatbelt wearing, random breath testing (RBT), intensive speed camera programs and, more recently, roadside drug testing. A study by the Bureau of Infrastructure, Transport and Regional Economics (BITRE) has shown that the combined effects of seatbelt wearing, RBT and speed camera programs have been a major influence on road fatality reductions over the last 40 years [2].

Between 2001 and 2010, efforts continued to target the entrenched behavioural causes of serious road crashes. But there were also significant improvements in the passive and active safety performance of our vehicle fleet, and increasing attention was given to some of the more systemic problem areas in the road transport system.

- Early in the decade, a 50 km/h urban default speed limit was introduced. This was linked to a 20 per cent reduction in casualty crashes, with greater reductions for crashes involving serious injuries and fatalities; some evaluation studies identified particular benefits for pedestrians and other vulnerable groups [3,4,5]. Community surveys found that public support for the reduced limit increased after the change [6].

- Safety outcomes in higher-risk pedestrian and school areas were improved through the introduction of 40 km/h and lower limits. For example, School Speed Zones adopted in Victoria in 2003 resulted in a 23 per cent reduction in casualty crashes and a 24 per cent reduction in all pedestrian and bicyclist crashes outside schools. [7].

- Enforcement of speed limits was strengthened, particularly in urban areas, using covert and overt speed cameras and other measures to address the significant risks associated with low-range speeding. Evaluation evidence showed substantial safety gains from these initiatives [see the Victorian case study on page 61].

- There was some strengthening of drink driving measures over the decade, including adoption of tougher sanctions and the introduction of alcohol interlock programs for repeat or high-range offenders. However, while drink driving behaviour has been contained to a small proportion of the driver (and rider) population, it continues to be a major cause of serious road trauma — and there is evidence that a substantial proportion of drink drivers have serious alcohol abuse problems. In recent years there has been increasing focus on interventions targeting this 'hard core' minority of offenders.

Chapter 2

The chart in Figure 5 below suggests that deaths among alcohol-impaired drivers may have increased in recent years.
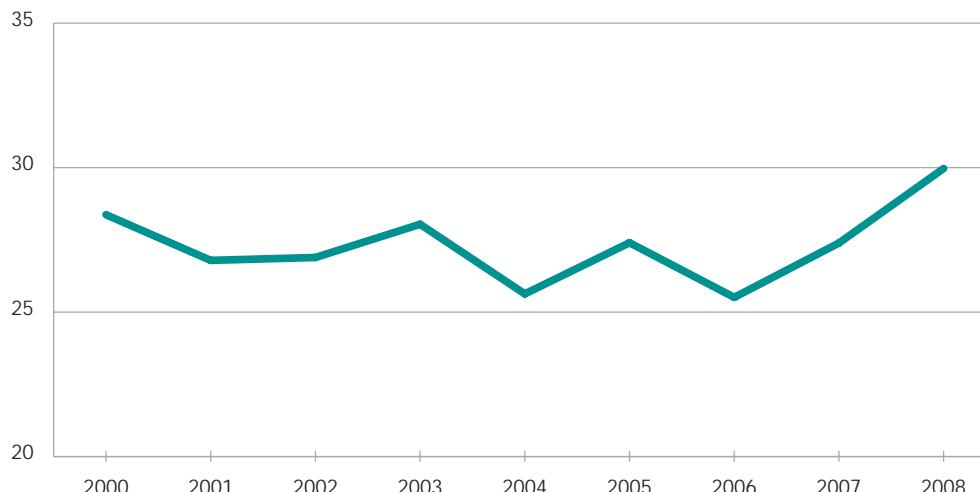
Figure 5:   Percentage of killed vehicle operators over the BAC limit, 2000 to 2008

Note: Percentages are based on cases with known BAC status.

- Three-point seatbelts were mandated for all seats in new passenger car models and   seatbelt and child restraint regulations were strengthened to ensure that all children, up to the age of seven years, are appropriately restrained in passenger vehicles. While deaths among unrestrained occupants declined slightly in absolute numbers over the last decade, this problem continued to account for 26–30 per cent of all occupant fatalities on Australian roads (Figure 6).

Figure 6:   Percentage of killed vehicle occupants who were not restrained, 2000 to 2008
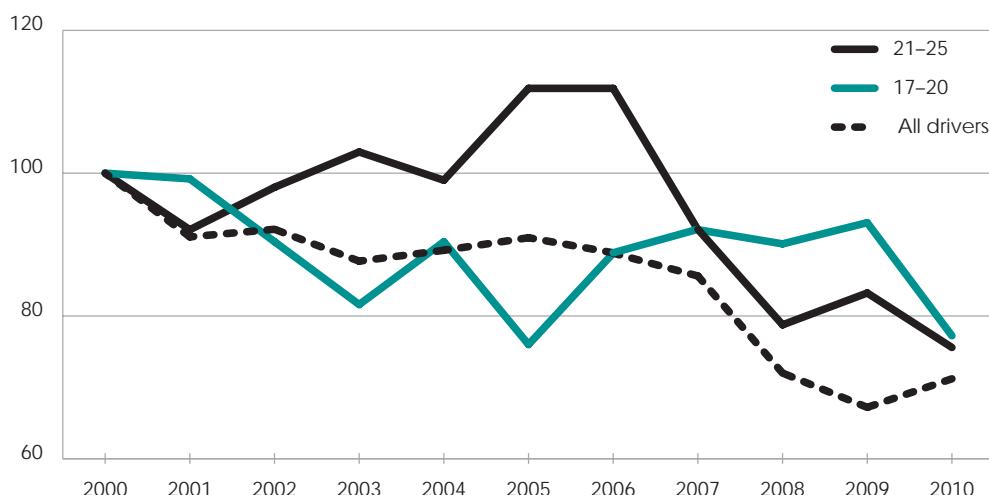
Note: Percentages are based on cases with known restraint status.

- States and territories progressively strengthened their respective graduated licensing systems (GLS), with measures including: increased supervised driving requirements; peer passenger and night driving restrictions; mobile phone bans; zero blood alcohol concentration limits; restricted access to high-powered vehicles; and targeted increases in offence penalties (especially for speeding). While these GLS components are generally supported by research on the safety benefits, further investigation is needed to establish the optimal approach in Australian conditions.

The following chart shows annual fatality trends over the last decade (indexed to the year 2000) for young drivers and all drivers. The chart shows an overall decline in young driver deaths that was broadly in line with the trend for all drivers. However, there is some evidence of a higher rate of improvement among 17 to 20 year-olds (the typical 'P-plate' years) than for 21 to 25 year-olds.

Figure 7:   Driver deaths by age group, 2000 to 2010
              (indexed: year 2000 = 100)
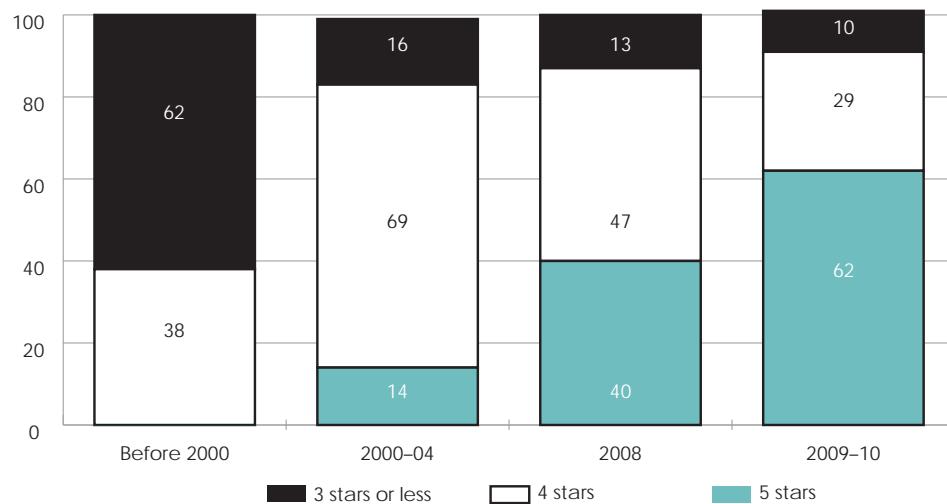
- Most states introduced roadside drug testing programs targeting driver impairment from commonly used illicit drugs. While the road safety impact of these programs requires further assessment, they have produced relatively high detection rates and helped to increase community awareness of drug-driving issues.

- Targeted treatment of crash locations continued through federal and state black spot programs. Evaluation research has estimated that the National Black Spot Program delivered a 30 per cent reduction in fatality and casualty crashes at treated sites, with the overall safety benefits of the program substantially greater than the costs[4] [8].

- There was progress in infrastructure safety, with some states implementing major reviews and remedial programs to improve the safety of high-risk routes [see the NSW case study on the Pacific Highway on page 54].

- Pedestrian and bicyclist safety was improved through better crossing facilities, cycleways, reduced speed limits (especially at school zones) and barriers to protect pedestrians.

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4   Estimates of the program benefit-cost ratio ranged from 4.7 to 7.7, depending on the applied discount rate.

- Standards for Dynamic Side Impact Occupant Protection and Offset Frontal Impact Occupant Protection were mandated for all new vehicles.
- Efforts to promote the benefits of vehicle safety were escalated through public information campaigns and support for consumer ratings initiatives such as the Australasian New Car Assessment Program (ANCAP) and the Used Car Safety Rating (UCSR) scheme (Figure 8).
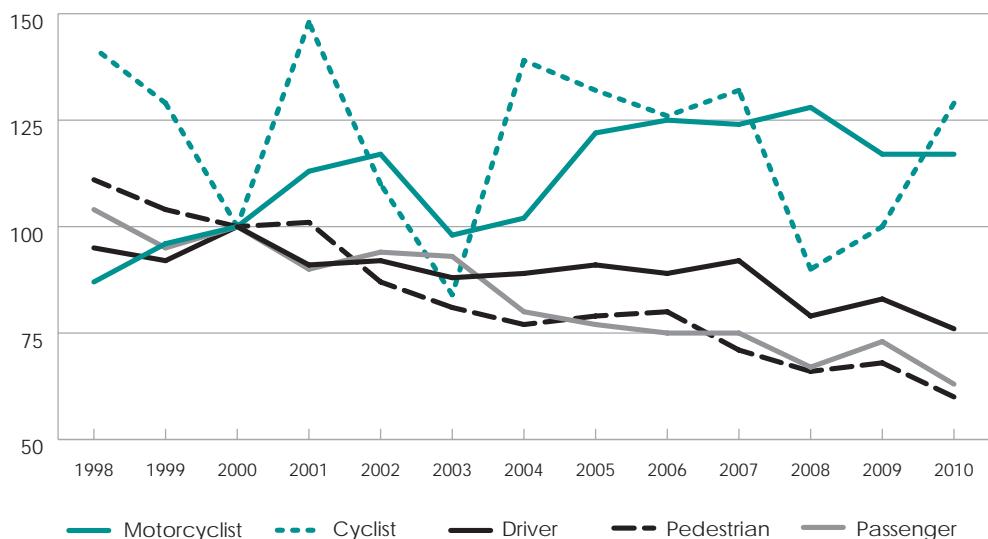
Figure 8: Percentage distribution of star-ratings awarded to ANCAP tested vehicles

Note: Percentages based on rated models by year(s) of ANCAP publication.

- Important national fatigue management, compliance and enforcement, and speed reforms were initiated to support the development of a safer heavy vehicle transport sector.
- Figure 9 below illustrates the fatality trends over the last decade for different road user categories (indexed to the year 2000). Motorcycle riders stand out as a group that has experienced a clear upward trend in deaths, though it is important to note that motorcycle usage over this period grew by about 80 per cent. Because the frequency of bicyclist deaths is relatively low compared with other road user categories, the numbers tend to fluctuate from year to year.
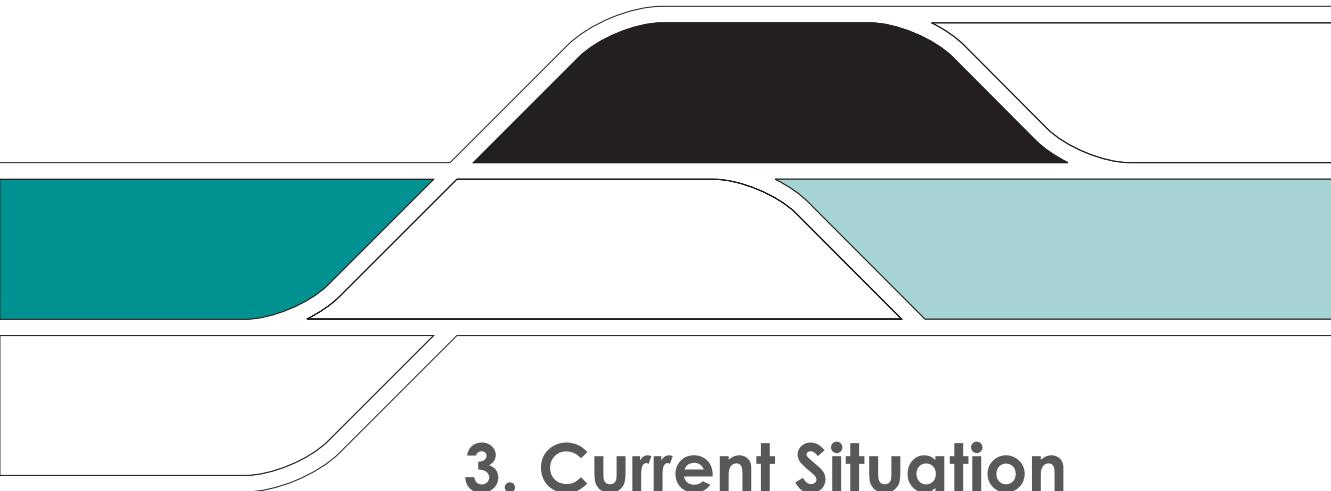
Figure 9:   Deaths by road user group, 1998 to 2010
            (indexed: year 2000=100)

What lessons have been learned?

- Road trauma levels are influenced by a vast array of factors. Many of these — including changing economic conditions, pervasive social trends and the emergence of new technologies — are difficult to predict and are beyond the direct control of governments and road safety organisations. Road safety strategies need to be alert to such challenges and flexible in their responses. This requires a commitment to: continuous environmental scanning; effective data collection, analysis and performance monitoring, periodic review of long-term directions and short-term actions; and a willingness to adjust priorities in response to new information.

- Australia has given a high priority to enforcement and education measures designed to curb high-risk behaviours. Behavioural programs targeting driver impairment (alcohol, drugs, fatigue), seatbelt wearing, speeding and inexperience have produced substantial gains. These programs still have a crucial strategic role to play in Australian road safety — but they must be maintained and refreshed to ensure they continue to be effective.

- Greater emphasis is now required on non-behavioural means of improving the safety of our road transport system. Most importantly, we need to:

  » invest in safer infrastructure, aiming to create a more protective road environment for motorists and other road users

> » find ways of accelerating safety improvements in our vehicle fleet, recognising that new vehicle safety features currently take many years to reach the majority of Australian motorists

> » make greater use of technological aids, including the new and emerging range of intelligent transport systems, as well as the untapped potential of established technologies that can support behaviour-change objectives: such as alcohol interlocks, intrusive seatbelt reminder systems and intelligent speed adaptation technologies.

- Speed management has occupied an important place in road safety thinking for many years. This is not just about speed limit enforcement and compliance. It is about using all available measures — speed limits, infrastructure treatments, enforcement and driver assist technologies, and driver education — to achieve safe traffic speeds across the road network. As noted in the previous section, Australia made some significant road safety gains from speed reduction measures over the last decade. However, there is ample evidence that much more could have been — and still can be — achieved in this area. Part of the challenge in this regard is to engage more effectively with the community on the role of speed in road safety.

- In Australia's federal system, individual state and territory governments have direct responsibility for most areas of road safety regulation and management. There are advantages in this arrangement, not least being the opportunity for jurisdictions to learn from each other about the effectiveness of different initiatives. However, there is scope for greater national collaboration to determine and implement 'best practice' approaches in key road safety areas.

- It is known that road trauma rates increase with distance from major cities. This is due to a number of factors, including higher speed environments leading to more severe outcomes in the case of a crash, vehicles with lower safety standards, poorer quality infrastructure, and less enforcement activity. There is also some evidence that road trauma trends over the last decade have varied between metropolitan, regional and remote areas of Australia, though more work is required to better understand and respond to the road safety issues affecting people in different parts of our country.

3. Current Situation

3.   Current Situation

Size and nature of the problem
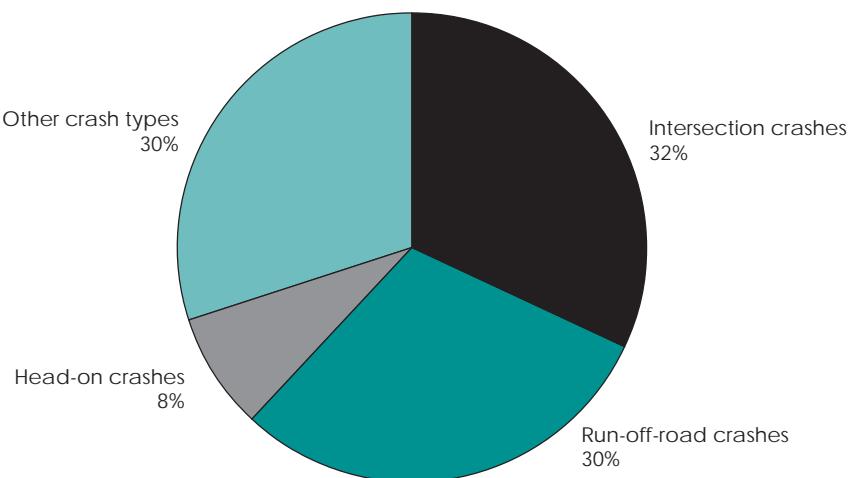
Each year, road crashes kill about 1,400 Australians and hospitalise another 32,500. The total estimated cost to society is $27 billion [1][5] and the direct human impacts are devastating: in addition to the many lives cut tragically short, debilitating injuries often result in lifelong pain, grief and suffering among road crash victims, their families and communities.

The following analysis of serious casualty (death and serious injury) data[6] offers some insight into the nature of Australia's road trauma problem and the issues requiring remedial attention.

Major crash types

A large proportion of serious casualties involve three common crash types, as shown below.

Figure 10: Serious casualties by crash type

Run-off-road crashes, typically involving a single vehicle, account for about 30 per cent of all serious casualties (and a higher proportion of fatalities).

Crashes at intersections are the cause of another one-third of serious casualties.

5   Based on a willingness-to-pay method of valuing human life – see further explanation in the box on page 50.
6   The statistics in this Chapter are drawn from several data sources to provide national estimates. They should be regarded as approximations only.

Chapter 3

Heavy vehicle crashes

Heavy trucks and buses make up only three per cent of registered vehicles but account for about eight per cent of the vehicle-kilometres travelled (VKT) on Australia's roads. As Table 2 shows, these vehicles are involved in a relatively large proportion of road fatalities.

Table 2:   Deaths and serious injuries involving heavy vehicles

Crashes involving:	Proportion of total VKT (%)	Proportion of total deaths (%)	Proportion of total serious injuries (%)
Articulated trucks	3	11	n.a.
Rigid trucks	4	6	n.a.
Buses	1	2	n.a.
All heavy vehicles	8	18	3

Note: Serious injury estimates are not available for individual heavy vehicle categories; percentages for deaths sum to more than the total as some deaths were from crashes involving more than one type of heavy vehicle.

Road user groups

The following table lists a number of particularly vulnerable or high-risk road user groups, defined by their mode of transport, demographic profile or licence status.

Table 3:   Deaths and serious injuries among vulnerable road user groups

	Proportion of total deaths (%)	Proportion of total serious injuries (%)
Pedestrians	13	9
Motorcyclists	16	22
Bicyclists	3	15
Young drivers (17-25 years)	12	10
Older people (65+ years)	16	10
Children (0-14 years)	4	10
Indigenous people	5	3
Unlicensed motorists	6	n.a.

Note: categories are not mutually exclusive.

Behavioural factors

Certain behavioural factors continue to be implicated in many serious casualty crashes. The most significant are identified below.

Table 4: Deaths and serious injuries by main behavioural factor

	Proportion of total deaths (%)	Proportion of total serious injuries (%)
Speeding	34	13
Drink driving	30	9
Drug driving	7[a]	2
Restraint non-use	20	4
Fatigue	20–30[b]	8

Note: categories are not mutually exclusive.

a.   Estimate excludes fatalities involving both alcohol and other drugs, which are included in the drink driving estimate.

b.   Estimates of fatigue involvement in serious casualty crashes vary considerably. However, it is widely recognised as a significant contributing factor.
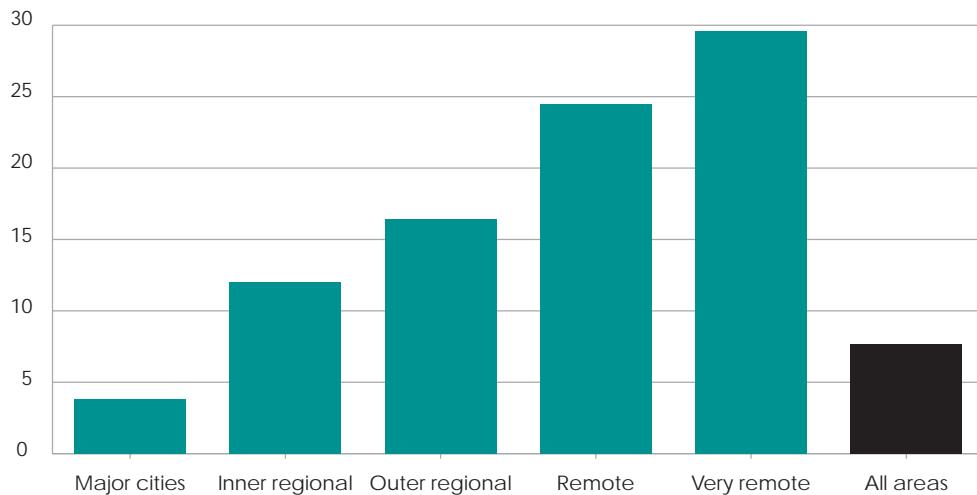
Geographic distribution of crashes

As indicated in Table 5, crashes are widely dispersed across Australia's metropolitan, regional and remote areas. Furthermore, Figure 11 shows that the incidence of fatal crashes on a population basis is substantially higher in the outer regional and remote parts of the country. The issues in different areas can vary considerably, even though there are substantial underlying similarities. What is materially important in one area may not be as important in another.

Table 5:   Distribution of fatal road crashes by remoteness area, 2002–06

	NSW (%)	Vic (%)	Qld (%)	SA (%)	WA (%)	Tas (%)	NT (%)	ACT (%)	Aust (%)
Major cities	35	40	29	38	36	0	0	88	34
Inner regional	28	40	33	27	21	37	0	7	30
Outer regional	15	13	23	23	17	50	29	0	18
Remote	1	1	7	5	9	10	23	0	4
Very remote	1	0	4	5	14	1	44	0	4
Unknown	20	6	4	1	3	2	4	5	9
Total	100	100	100	100	100	100	100	100	100

Chapter 3

Figure 11: Road deaths per 100,000 population by remoteness area, Australia, 2006

Key challenges

The statistics outlined above are far from comprehensive, but they indicate the complexity of road trauma and the wide range of factors that need to be considered by road safety organisations. They also point to some of the major systemic problems on our roads, such as the frequent occurrence of three basic crash types: run-off-road, intersection and head-on.

Much of Australia's past road safety effort has focused on countering illegal behaviours. While the benefits of this have been clear, it is now understood that a large proportion of casualty crashes result from drivers — or other road users — making mistakes. To achieve substantially greater gains in the future, much greater emphasis needs to be placed on initiatives that improve the inherent safety of the road transport system.

Some of the major strategic challenges for Australian road safety are to:

• Reduce the number of serious casualty crashes involving the three major crash types: single vehicle run-off-road, intersection and head-on crashes.

• Reduce the number of crashes involving heavy vehicles.

  » Heavy trucks and buses make up only three per cent of the vehicle fleet, but are involved in 18 per cent of all road fatalities — about 250 deaths each year.

• Reduce the number of serious casualties among pedestrians and cyclists.

- Reduce the number of serious casualty motorcycle crashes.
  - » Motorcycle riders make up 22 per cent of serious casualties, yet motorcycle usage accounts for one per cent of vehicle-kilometres travelled.
  - » Motorcycling activity has grown rapidly — motorcycle registrations increased by 56 per cent between 2005 and 2010.
  - » Between 2000 and 2010 the number of motorcyclist deaths increased by 17 per cent.
  - » Single vehicle crashes account for 42 per cent of motorcyclist deaths.
- Protect young road users, particularly novice drivers.
  - » People aged 17 to 25 years make up 25 per cent of drivers killed or seriously injured, but represent only 16 per cent of the adult population.
- Reduce poor road user behaviour and the consequences of such behaviour, particularly
  - » drink driving (28 per cent of fatality injured drivers are over the legal limit)
  - » failing to wear seatbelts (28 per cent of vehicle occupant fatalities are unbelted[7])
  - » illegal and inappropriate speed (a major causal factor in 34 per cent of deaths).
- Develop interventions that respond to the different needs and circumstances of urban, regional and remote Australia.
  - » The predominant crash types and risk factors vary between these broad areas.
  - » Fatality rates per population are significantly higher in regional and remote areas.
- Reduce serious casualties on roads controlled by local government.
  - » Local roads account for more than 50 per cent of serious casualties in some states.
- Reduce the incidence of serious casualties within Indigenous communities and among other disadvantaged people.

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7   This is the equivalent to 20% of total road deaths, as presented in Table 4 on page 25.

4. The Way Forward

4.   The Way Forward

This strategy embraces the Safe System approach to road safety improvement. It is guided by an ambitious vision for Australian road safety, backed by challenging but realistic 10-year targets and performance indicators. Achieving the targets will require a range of strategic interventions and commitment to a road safety management system that will build towards the realisation of this vision.

Our vision

No person should be killed or seriously injured on Australia's roads

Australians should not regard death and serious injury as an inevitable cost of road travel. Crashes will continue to occur on our roads because humans will always make mistakes no matter how informed and compliant they are. But we do not have to accept a transport system that allows people to be killed or severely injured as a consequence.

While we will continue to educate road users and enforce the road rules to encourage safe behaviours, Safe System principles demand a holistic approach to the safety of our road system. This means we must manage the combined effects of the speeds at which we travel, the safety of the vehicles we use, and the level of protection provided by our roads — not only to minimise the number of crashes, but to ensure that when crashes do occur they do not result in death or serious injury.

This is a new way of thinking about road safety in Australia. This strategy marks the start of a journey to build an inherently safe road transport system. It reflects a high level of intolerance to road trauma, a focus on the overall safety performance of our road transport system and attention to each of the elements that make up the system.

We are not likely to see the elimination of death and serious injury on Australia's roads by the year 2020. However, the implementation of actions in this strategy will lay the foundations for a genuinely safe system of road travel — a legacy that will benefit our future generations.

The journey towards our vision will require significant effort to enhance the quality of our roads, to strengthen regulation and demand for safer vehicles, to improve road user compliance with traffic laws and to create a safety culture through all levels of our society. We will need to move beyond current standards and practice, to innovate and find solutions that build a safe road transport system.

This strategy describes the steps needed now, and in years to come, to put safety at the very heart of our road transport system.

Building a national road safety culture—our strategic objective

Road safety is a shared responsibility. Achieving lasting change in road safety will require governments, industry and the broader community to work together. It will also require significant improvements in the way governments and other organisations manage the safety of our road transport system.

This means we all need to change the way we think and act in relation to road safety. We need to respond directly to our long-term vision by asking questions such as *what would we need to do to prevent serious crashes in this situation?* While our achievements may be modest in the first instance, the transformation in our approach will lay down the foundations of the Safe System during the life of this strategy.

Each one of us has a role — whether we are road planners, designers or builders, vehicle engineers or fleet operators, policy makers or business professionals, or individual road users going about our everyday activity. Our collective task is to build a culture where safety is an inherent part of all decision-making that affects the road system, its operation and its use. We must strive to implement Safe System solutions that allow for human error and provide forgiving environments that prevent serious injury or death when crashes occur.

It is also recognised that Australia will continue to support developing countries, which may draw on our successes to improve their own road safety performance.

Targets

As a step towards realising Australia's long-term road safety vision, the strategy has set the following casualty reduction targets to be achieved by the end of 2020[8]:

• to reduce the annual number of road crash fatalities by at least 30 per cent

• to reduce the annual number of serious road crash injuries by at least 30 per cent.

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8   Target reductions are relative to the average numbers of fatalities and serious injuries in the baseline period 2008–2010.

Under the previous *National Road Safety Strategy 2001–2010*, a target was set to reduce the annual rate of road fatalities per 100,000 population by 40 per cent. This was approximately equivalent to a 30 per cent reduction in the absolute number of fatalities. The actual reduction achieved in absolute numbers was 23 per cent.

While the previous strategy set a target for fatalities only, this new strategy is giving greater attention to the serious injury dimension of the road trauma problem. There is currently no reliable national collection of serious injury crash data, largely because of jurisdictional differences in injury definitions and reporting arrangements. As a matter of priority, road transport agencies will work towards the adoption of nationally consistent road crash classification definitions and an improved national serious injury database. This will be essential for effective monitoring of progress towards the serious injury target.

To assist the target-setting process for this strategy, data modelling was carried out by the Monash University Accident Research Centre (MUARC). This work was informed by a review of Australian and overseas research on the effectiveness of a number of road safety interventions. The main purpose of the modelling was to estimate the level of serious casualty reduction that could be achieved during the life of this strategy and to indicate at a very broad level what kind of action would be required to bring this about.

The modelling was only one input into the target setting. The targets set for this strategy are intended to strike a balance — reflecting the evidence about what can realistically be achieved in the next ten years, but also presenting a significant challenge that will require commitment and innovation.

Achieving these targets will require a concerted effort to implement effective road safety measures. A range of proposed initiatives is set out in Chapters 7 to 10 of this strategy.

Safe System principles

The strategy is based on the Safe System approach to improving road safety. Safe System principles require a holistic view of the road transport system and the interactions among roads and roadsides, travel speeds, vehicles and road users. This is an inclusive approach that caters for all groups using the road system, including drivers, motorcyclists, passengers, pedestrians, bicyclists, and commercial and heavy vehicle drivers. Consistent with our long-term road safety vision, it recognises that people will always make mistakes and may have road crashes — but the system should be forgiving and those crashes should not result in death or serious injury.

Chapter 4

The Safe System approach was adopted in Australia during the period of the previous national strategy, through the National Road Safety Action Plans and the strategies of individual states and territories. It is consistent with the approaches adopted by the safest countries in the world, and is a central theme of the landmark OECD report *Towards Zero: Ambitious road safety targets and the safe system approach,* published in 2008 [9].

There are several guiding principles to this approach:

1. **People make mistakes.** Humans will continue to make mistakes, and the transport system must accommodate these. The transport system should not result in death or serious injury as a consequence of errors on the roads.

2. **Human physical frailty.** There are known physical limits to the amount of force our bodies can take before we are injured.

3. **A 'forgiving' road transport system.** A Safe System ensures that the forces in collisions do not exceed the limits of human tolerance. Speeds must be managed so that humans are not exposed to impact forces beyond their physical tolerance. System designers and operators need to take into account the limits of the human body in designing and maintaining roads, vehicles and speeds.

Shared responsibility

Responsibility for road safety is shared by all.

While individual road users are expected to be responsible for complying with traffic laws and behaving in a safe manner, it can no longer be assumed that the burden of road safety responsibility simply rests with the individual road user. Many organisations — the 'system managers' — have a primary responsibility to provide a safe operating environment for road users. They include the government and industry organisations that design, build, maintain and regulate roads and vehicles. These and a range of other parties involved in the performance of the road transport system, and the way roads and roadsides are used, all have responsibility for ensuring that the system is forgiving when people make mistakes.

Road safety responsibilities also extend to various professional groups, as well as the broader community. For example: health professionals have a role in helping their clients to manage their safety on the roads; and parents contribute significantly to the road safety education of their children — not only through their direct supervision of learner drivers, but also by modelling their own driving and road user behaviour.

Corporate responsibility

Companies and other employers will play a major role in building a road safety culture for Australia, particularly in the area of workplace reforms.

The links between work and road crashes are well established. On average, company drivers travel more than twice the annual distance of private car drivers and have about 50 per cent more incidents. This suggests fertile ground and great potential rewards from improving road behaviour by working closely with organisations and employers.

The potential costs of inaction are high. Overall, work-related road crashes in Australia account for about half of all occupational fatalities [10] and 15 per cent of national road deaths, and many people are killed or seriously injured in motor vehicles or as bicyclists or pedestrians getting to and from work.

Corporate action can reduce employee involvement in road crashes through workplace policies and practices that value and promote road safety, encourage safe road user behaviour among employees and contractors, and provide for the purchase of vehicles with high safety ratings.

Organisations have legal responsibilities to provide a safe workplace and actively manage for a safety-focussed environment. Specific Australian legislation designed to ensure organisations meet this primary obligation can be found in:

- *The Corporations Act 2001,* and
- *Occupational Health and Safety Act 2004*

A number of Australian companies and organisations have already implemented road safety related policies. Important innovations include:

- introducing workplace road safety policies (for example, requiring strict compliance with the road laws from employee drivers and encouraging a focus on reducing driver distractions by requiring pulling over to answer mobile phone calls

- focusing on safety behaviours in recruitment and selection

- including road safety requirements and skills in induction programs to embed a safe driving culture

- prioritising road safety records in fleet selection and maintenance (for example, requiring 5-star ANCAP rated vehicles where possible and ensuring key safety features are fitted to all new vehicles)

- providing ongoing training and education of staff to build road safety awareness and skills

International collaboration

Australia will continue to collaborate in the global effort to improve road safety by participating in the work of international forums and bodies including Asia Pacific Economic Cooperation (APEC), the World Road Association (PIARC) and the Organization for Economic Cooperation and Development (OECD) to share knowledge and expertise and to learn from the experiences of other countries.

Our contribution to global road safety improvement will include projects funded by AusAID, and work carried out by the Commonwealth Department of Infrastructure and Transport, Austroads, state and territory government road safety agencies and a number of dedicated road safety research institutions.

Australia is making a significant contribution to developing ISO 39001 — the world's first road traffic safety management standard. The standard, which is scheduled to be published in 2012, will be a voluntarily-adopted tool to assist organisations to embed the Safe System approach in their everyday operations.

Decade of Action for Road Safety 2011–2020

In March 2010 the United Nations General Assembly unanimously adopted a resolution proclaiming 2011 to 2020 as the Decade of Action for Road Safety. The resolution was introduced by the Russian Federation and co-sponsored by 100 countries including Australia. The goal of the Decade is to stabilise and then reduce the forecast level of road deaths worldwide by 2020 by increasing road safety activities at national, regional and global levels.

The resolution invites all member states to set their own national road traffic casualty reduction targets for the decade and calls for the implementation of road safety activities, particularly in the areas of road safety management, road infrastructure, vehicle safety, road user behaviour, road safety education and post-crash response. These objectives are supported by the Global Plan for the Decade of Action for Road Safety 2011–2020 [11], which provides a guiding implementation framework based on Safe System principles.

Australia's *National Road Safety Strategy 2011–2010* is closely aligned with the Global Plan — and it forms an important part of our country's response to the Decade of Action for Road Safety.

Interventions

Achieving the 10-year casualty reduction targets, and building a platform for the strategy's longer-term aspirations, will require a range of specific road safety actions or interventions. These are grouped under the following four 'cornerstone' areas of the strategy:

- Safe roads
- Safe speeds
- Safe vehicles
- Safe people

The cornerstone areas and interventions are described in detail in Chapters 5 to 9 of this strategy.

Under the Safe System approach, the cornerstone interventions listed in this strategy will provide safety improvements for everyone using or interacting with the road system: including while walking, cycling, riding motorcycles or scooters, travelling in cars and other light vehicles, and in heavy vehicles. In some cases additional or specific actions are included to address a particular at-risk group or risk factor, such as novice drivers, or travel in remote areas. These may be found in more than one cornerstone area: for example, specific actions to improve road safety outcomes for Indigenous people are included in both Safe Roads and Safe People.

The strategy recognises that heavy vehicles are over-represented in crash statistics. A number of national reforms have been introduced over recent years and the impact of these will take some time to assess. There are some initiatives in the strategy that are specific to heavy vehicles, but many of the other actions will also address heavy vehicle safety.

Similarly, interventions spread throughout the document will generate benefits for bicyclists and pedestrians (including children and older people), such as infrastructure improvements, initiatives to reduce vehicle speeds, and actions aimed to minimise driving while impaired. Safe alternative transport options are to be encouraged, including the use of public transport.

The rapid increase in motorcycle use over the past decade has increased the exposure of riders and the strategy recommends a number of interventions in terms of infrastructure treatments, licensing, technology and speed management that will assist in reducing road trauma for these road users.

Separate road safety strategies for different user groups are not necessary, as the Safe System addresses all users. Under the principle of shared responsibility, specific actions can be developed and implemented at regional or local level by different stakeholders, using the Safe System and the four cornerstones.

Chapter 4

The strategy highlights the influence technology will have in reducing road trauma. New ways of communicating between vehicles such as between trucks and trains near level crossings (vehicle to vehicle communication) and between vehicles and surrounding infrastructure (vehicle to infrastructure communication) are likely to be introduced over the next ten years. Technology that assists in speed and fatigue management already exists and will be enhanced. Vehicle safety will see significant technological innovation.

The Safe System requires an holistic approach. Although the initiatives are presented in four separate cornerstones, there are many interactions between initiatives which contribute to the overall benefits. For example, safer speeds in urban areas might be achieved through a combination of infrastructure measures, changes to speed limits, and enforcement, with significant benefits, in particular, for vulnerable road users.

Making it happen

The cornerstone interventions must be supported by a series of management functions focused on achieving results. These are addressed in Chapter 10, which outlines the priorities for:

- adopting a results focus for implementation of the strategy
- ensuring effective coordination of activity among all key players
- ensuring rules are in place to back commitment to road safety
- identifying funding and prioritising allocation of resources to safety
- promoting a shared responsibility for road safety
- monitoring and evaluating road safety progress
- investing in research and development, and knowledge transfer
- continuing to monitor road safety technology trends and advances domestically and internationally.

5. Strategy Interventions

5.   Strategy Interventions

Presentation of interventions in this strategy

As indicated in Chapter 4, this strategy is based on four cornerstone areas of intervention. The next Chapters (6 to 9) describe the interventions intended for priority implementation, as well as others for further consideration, for each of these areas. Table 6 describes the strategic aim of improvements for each cornerstone.

Table 6: Strategic intent in each of the cornerstone areas

Safe Roads	Roads and roadsides designed and maintained to reduce the risk of crashes occurring and to lessen the severity of injury if a crash does occur. Safe roads prevent unintended use through design and encourage safe behaviour by users.
Safe Speeds	Speed limits complementing the road environment to manage crash impact forces to within human tolerance; and all road users complying with the speed limits.
Safe Vehicles	Vehicles which not only lessen the likelihood of a crash and protect occupants, but also simplify the driving task and protect vulnerable users. Increasingly this will involve vehicles that communicate with roads and other vehicles, while automating protective systems when crash risk is elevated.
Safe People	Encourage safe, consistent and compliant behaviour through well-informed and educated road users. Licensing, education, road rules, enforcement and sanctions are all part of the Safe System.

In Chapters 6 to 9 on each of the four cornerstone areas, the specific aims and actions to be pursued through this strategy are presented under the following headings:

Directions — what the strategy aims to achieve by 2020

This is a broad picture of the major changes expected to take place over the period of the strategy.

Chapter 5

First Steps — actions for the first three years

These initiatives represent specific commitments to action in the early years of the strategy.

Future Steps — what else will be considered?

These are some of the possible longer-term initiatives that will be given further consideration as the strategy progresses. Many of these represent measures which will require considerable discussion with the community about how they might be implemented and why they are important. In the medium-term, some of these may not proceed as initially envisaged. Inclusion of the more forward looking initiatives will provide a basis for on-going consultation.

A review of the strategy will be conducted in 2014, with a further review in 2017. This will include an assessment of progress in delivering each of the initiatives listed under First Steps and further consideration to implementing other proposed initiatives.

Developing interventions to address the most important road safety issues

To guide the development of a combination of initiatives which are likely to help reach the ten-year casualty reduction targets, first the major crash risk issues were identified (see Chapter 3) and then the types of intervention most likely to be effective in tackling these issues. These broad areas for improvement became the focus for developing more detailed measures in each cornerstone area. They need to:

- have considerable potential to yield benefits based on available evidence, and
- not present the community with a potentially unreasonable burden.

Table 7 below shows how actions in each of the four cornerstone areas address the major crash problems identified in Chapter 3, and the benefits they can be expected to provide for specific road user groups.

Table 7:   Crash problem areas mapped to the strategy cornerstone areas

Crash problem areas (See Chapter 3)	Strategy initiatives			
	Safe Roads	Safe Speeds	Safe Vehicles	Safe People
Crash type				
Intersections	substantial	substantial	substantial	some or indirect
Run-off-road	substantial	substantial	substantial	some or indirect
Head-on	substantial	substantial	moderate	some or indirect
Crashes involving heavy vehicles	substantial	substantial	moderate	moderate
Behaviours				
Speeding	substantial	substantial	moderate	substantial
Fatigue	moderate	moderate	some or indirect	some or indirect
Distraction	moderate	moderate	some or indirect	some or indirect
Drug driving	moderate	moderate	some or indirect	some or indirect
Drink driving	moderate	moderate	moderate	substantial
Restraint non-use	moderate	moderate	moderate	substantial
Road user groups				
Novice drivers	substantial	substantial	substantial	moderate
Motorcyclists	substantial	moderate	moderate	moderate
Indigenous road users	moderate	substantial	moderate	moderate
Pedestrians	substantial	substantial	moderate	some or indirect
Bicyclists	substantial	substantial	some or indirect	some or indirect
Older road users	substantial	substantial	moderate	some or indirect
Unlicensed motorists	moderate	some or indirect	some or indirect	moderate

Key to relative benefits: some or indirect benefit only | moderate benefit | substantial benefit

Where there is insufficient proof or community support for particular measures, establishing demonstration or pilot projects may provide a means of demonstrating the practical application and benefits of new initiatives.

Identification, monitoring, and responding to new and emerging crash risk issues will continue, particularly in geographic sub-areas, or specific road user/demographic groups, with a high crash risk.

Chapter 5

Tailoring interventions for different areas

A large proportion of Australia's fatalities (65 per cent) and serious injuries (59 per cent) occur in regional areas and the fatality rates per population are significantly higher in both regional and remote areas.

It is important that interventions are developed to respond to the different needs and circumstances of metropolitan, regional and remote Australia. It is just as important to acknowledge and respond to the differences encountered in each jurisdiction. This process must take into account not only differences in the most common crash types and risk factors, but also the relative practicality and feasibility of certain interventions for different areas.

The following table shows how some of the key interventions will have a particular impact in certain locations.

Table 8:   Key areas of intervention by cornerstone and geographical location.

Area	Safe roads	Safe speeds	Safe vehicles	Safe road use
All of Australia	All road projects to comply with Safe System principles. Safer roads programs targeting key crash types.	Best practice speed enforcement. Public information about the community benefits of lower travel speeds. Introduction of risk-based national speed limit guidelines.	Improved vehicle safety standards. Increased uptake of crash avoidance and occupant protection measures.	Ongoing behaviour change programs to meet geographic needs.
Metropolitan areas	Safer roads programs targeting intersection and roadside crashes and protecting vulnerable road users.	Reduce speed limits at intersections. More speed limits of 40 km/h or lower in pedestrian and cycling areas.	Improved intersection crash avoidance and pedestrian and bicyclist protection.	
Regional and remote areas	Safer roads programs targeting run-off-road and head-on crash risk, and safer intersection treatments.	Review of speed limits on higher crash risk routes.	Focus on countering run-off-road crashes.	Improved access to graduated licensing for disadvantaged groups.

Safety Performance Indicators

The primary measure of success of this strategy will be the actual reduction in the number of serious casualties on the roads. This measure will be used to monitor ongoing progress towards the 2020 fatality and serious injury targets.

As shown in Table 9 below, a range of other high-level outcome indicators will also be used to track Australia's road safety performance over the decade.

Table 9: High-level outcome measures

Number of deaths/serious injuries resulting from road crashes
Number of road crashes resulting in deaths/serious injuries
Number of deaths/serious injuries per 100,000 population
Number of deaths/serious injuries per 100 million vehicle-kilometres travelled
Number of deaths/serious injuries per 10,000 registered vehicles

In addition, a range of Safety Performance Indicators (SPIs) will be established to help assess progress in implementing the specific strategy interventions. These will be based on measured changes in serious casualty outcomes relating to key strategic directions, and indicators of intermediate effects (such as changes in the availability of key vehicle safety features) relating to particular initiatives.

A number of initial SPIs have been identified and are presented in the following Chapters for each cornerstone, under the heading "How will progress be assessed?" This initial list is necessarily limited to indicators that can be supported by existing data collections. However, work will continue on the development of suitable SPIs and associated data collection arrangements prior to the strategy review in 2014.

Chapter 5

6. Safe Roads

6.   Safe Roads

Safety treatments to the road and roadside have a major influence in preventing crashes or minimising the consequences of a crash.

Infrastructure investment

Road safety improvements derive from two broad categories of infrastructure investment:

- Investment in new road construction and major upgrades, including highway duplication. This activity is primarily associated with mobility and economic performance benefits, with safety being an ancillary benefit. Together with ongoing maintenance work, it accounts for most of the road funding in Australia.

- Expenditure on safety-focused road works. This includes black spot remedial programs, but also covers route-based (mass-action) treatments to improve the risk profile of larger sections of the network. Such investment is associated with high benefit-cost ratios in general and high safety returns in particular.

Compared with many other countries, Australia has a very large road network and a relatively small population. This places limits on the level of expenditure on infrastructure and infrastructure safety per kilometre of network, and on the proportion of highways that are likely to ever be converted to dual carriageway. It is therefore important to maximise the safety benefit of the overall investment in the nation's road infrastructure.

Total national expenditure on specific safety-focused road works is expected to be $506 million in 2010–11[9]. This includes expenditure on black spot remedial treatments, as well as more broadly based safety-focused activities such as route risk assessment and treatment, road safety audits and treatments applied over large sections of road networks. While safety-targeted spending has increased substantially over recent years, it still represents only five per cent of the total investment in Australia's road infrastructure. There may be scope to adjust the mix of general and safety-focused road funding to substantially increase road safety outcomes while still achieving other important transport objectives.

Investment decisions are informed by the estimated value of expected safety benefits. However, such estimates are influenced by the particular methods used to place an economic value on human life. Best practice in this area favours the use of a valuation method known as the willingness-to-pay approach, which tends to produce higher estimates than other, more traditional, methods [see the box below]. There is a need for Australia to develop and adopt suitable willingness-to-pay estimates at a national level.

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9   This estimate reflects total Commonwealth, state and territory road funding allocations for dedicated safety programs, such as black spot treatment programs.

Chapter 6

Valuation of life for economic purposes — alternative estimation methods

Australian approaches to estimating the economic benefits of safety measures have conventionally been based on the **human capital** method of valuing human life. This technique treats an individual as a productive entity. Its application to transport safety involves estimating the victim's earning stream from the time of their premature death to the end of their actuarially expected lifetime.

The **willingness-to-pay** approach is an alternative method that relies on individual preferences for reducing risk to life. Estimates are based on the amounts that individuals are prepared to pay for reduced risk (or to accept in compensation for bearing risk). For a particular type of risk, a value for society is generally calculated by aggregating and averaging values obtained from a representative sample of individuals.

While the willingness-to-pay approach is widely regarded as superior [1], the techniques for determining willingness-to-pay values vary and are quite complex. Willingness-to-pay estimates are used in some areas of transport safety valuation; however, there is growing acceptance that this practice should be adopted more widely and more consistently in Australia. When it comes to making investment decisions, particularly on road infrastructure projects, this would be expected to increase the economic justification for projects with a substantial safety component.

Road function and vehicle speeds

The function of a road needs to be taken into account in designing the road and applying infrastructure treatments. Different roads have different functions and should be designed and modified so they are 'self-explaining' to road users. Motorways and highways are high speed environments while residential streets operate in a completely different speed environment. Infrastructure treatments can assist in making it obvious how the function of the road changes. For example, vulnerable road users such as cyclists can be assisted by implementing traffic calming measures on roads to slow cars down. On higher speed roads, separation of cyclists from motorised vehicles is desirable. Cycle lanes are one option but physical separation is more effective and likely to encourage greater cycling activity. Likewise, in residential streets where limited vehicle access is needed, pedestrians benefit from lower travel speeds through physical treatments and/or lower speed limits. Pedestrian crossings help concentrate pedestrian movements but they need to allow clear vision, and illegal parking near a crossing or intersection can limit this dramatically.

Land use planning

The Safe System approach requires a holistic view of the road transport system. There are opportunities to improve overall safety, and in some cases avoid the need for expensive remedial treatments, by considering the road safety implications of land use planning decisions. This could ensure, for example, that strip shopping centres on major roads incorporate safe access facilities for all road users, and that high speed roads are not built with uncontrolled access points.

EVIDENCE — what is known

- The majority of serious road casualties result from the following crash types: intersection crashes (about 32 per cent); run-off-road crashes (about 30 per cent); head-on crashes (about 8 per cent).
- There are many uncontrolled accesses to the arterial high-speed network per kilometre.
- A low proportion of the network is fitted with median barriers to separate opposing flows and side barrier protection.
- There are many high-speed intersections in rural areas and limited use of roundabouts and raised platforms at intersections.
- There are many narrow traffic lanes and unsealed and narrow shoulders on many routes.
- There is limited use of tactile line treatments (rumble strips) on road medians and edges.
- Many roads have insufficient clear zones, which can be treated with increased clear zones, sealed shoulders and/or appropriate barriers.
- Roads in Indigenous communities are generally not included in government road construction and maintenance programs. Many of these roads are of a very poor standard, which is one of the contributors to the higher rates of road trauma for Indigenous people.

These factors indicate that there is a substantial ongoing opportunity for targeted improvement of infrastructure safety. Many of the treatments are relatively low cost but collectively will require considerable funding.

Infrastructure improvements can have a major effect on reducing crashes. In many cases these interventions are relatively low cost and can provide community benefit worth many times the cost. Examples of treatments known to provide significant casualty crash reduction benefits on high-speed rural roads are: installation of a roundabout (70 per cent), sealing shoulders (30 per cent), adding a right turn lane at an intersection (32 per cent), edge lining on the shoulder of the road (24 per cent), and installation of barrier systems (90 per cent of serious casualties involving errant vehicles) [12].

Substantial reductions in casualty crashes can also be achieved by lowering speed limits on the approaches to intersections, with or without supporting infrastructure treatments [13].

Run-off-road crashes can be avoided or reduced in severity through:

- Infrastructure treatments including safety barriers, tactile edgelines, shoulder sealing, and removal/relocation of roadside hazards and objects.

- Setting speed limits according to the safety standards of roads and roadsides.

- Effective management and clear accountability for removal and trimming of vegetation in order to maintain the safety and efficiency of the road.

Head-on crashes can be the result of poor overtaking decisions but more often come from drivers straying over the centre line due to inattention, fatigue, or losing control of the vehicle for some other reason. This is particularly a problem on higher-speed rural roads. A variety of proven treatments can be undertaken on standard two-lane or one-lane undivided roads to create more secure separation:

- This can be achieved with the addition of wire rope barriers in the median and on the side of the road (see photo to right), with some provision of overtaking opportunities.

- Median wire rope barriers can also be used to convert single lane roads with wide shoulders to '2+1 roads' (an approach employed in Sweden), with two lanes in one direction and one lane in the other, alternating every few kilometres.

- Median wire rope with clear zones either side also has the potential to yield dramatic improvement. A recent study of this type of treatment on the Pacific Highway in NSW indicates that the number and severity of crashes have been substantially reduced along the treated sections of the highway [14].

- Separation of opposing traffic on rural roads through wider (one metre) medians (see photo to right) has also been shown to reduce casualty crashes [14].

All of these options are considerably less expensive than dual carriageway and can deliver significant safety benefits.

Intersection crashes can be reduced through:

- Roundabouts — the most effective safety treatment at intersections because they require motorists to significantly reduce their speed when approaching and travelling through an intersection.

- Platforms — raised pavement through an intersection to slow traffic, usually in urban areas.

- Traffic separation — can improve safety at intersections by creating a better separation between traffic turning and travelling through the intersection. Improvements can include better lane marking, traffic islands and separate lanes (but still under signal control) for left and right turning vehicles; as well as separation of vulnerable road users where possible in higher traffic areas.

- Rumble strips — can be installed at certain locations which will alert motorists that they are approaching intersections and rail level crossings.

- Reducing the speed limit on the approach to the intersection.

- Appropriate and safe amenity for pedestrians.

Although black spot programs do a good job of fixing problems in specific locations with poor crash records, the majority of crash sites are widely dispersed across the road network. A broader, more strategic (and more resource intensive) approach to improving the safety of the road network can be achieved by treating high-risk sections. These include lengths of road that have a history of serious casualty crashes (black links) or that have been identified as high-risk through a safety review process. The aim is to progressively make the overall network safer over time through the strategic application of effective treatments.

Road infrastructure has a life of 25 or more years, so the investment made today will not only save lives over the next 10 years, but will continue to save lives and avoid serious injuries well beyond the life of this strategy.

Up to 50 per cent of serious casualty crashes occur on roads controlled by local governments. Local governments will need support to apply the Safe System approach and to find and apply cost-effective and innovative solutions.

Chapter 6

Case study — road safety review of the Pacific Highway[10]

A comprehensive, multi-disciplinary road safety review was undertaken for the Pacific Highway in NSW from Hexham to the Queensland border. The review focused on identifying measures able to protect motorists from the consequences of error. It involved inspections of the entire length of the highway, analysis of all fatal crash locations for the last five years, and detailed crash data analysis. Based on this review, a program of engineering works was developed, and the implementation of these works resulted in the annual number of fatalities being reduced from 55 to 25 and injuries being reduced from 617 to 483 (between 2003 and 2006). The benefit-cost ratios for the works were estimated to be over 10.

A similar review and resulting works on the Princes Highway also resulted in dramatic reductions in annual fatalities from 25 to 4, and injuries from 324 to 294 (between 2004 and 2006).

DIRECTIONS — what the strategy aims to achieve by 2020

- Adoption of improved standards for road design, construction and operation to reflect Safe System principles[11].
- All new roads and upgrades of existing roads will be designed, built and operated in accordance with Safe System principles.
- A substantial reduction in serious casualties due to run-off-road, head-on and intersection crashes.
- All levels of government to:
  » have assessed risk on their road network and re-focused road investment programs to treat higher-risk sections of the road network (road segments, traffic routes and defined areas) in addition to more targeted black spot programs
  » have adopted and applied the willingness-to-pay methodology[12] to value reductions in fatalities and injuries (as discussed on page 50)
  » be assessing the benefits and costs of safety treatments using a whole-of-life assessment
  » have accepted accountability and responsibility for the road safety performance of their networks in accordance with Safe System principles.

10 Supplied by the Roads and Traffic Authority, NSW.
11 Guidelines being developed by Austroads.
12 Willingness-to-pay is an economic method of valuing human life to inform investment decisions – see further explanation in box on page 50.

FIRST STEPS — actions for the first three years

1. Road authorities at all government levels will ensure that Safe System principles are applied to all new road projects, including road upgrades.

2. Modify infrastructure funding guidelines and agreements to increase the safety benefits resulting from expenditure on roads.

3. Target infrastructure treatments to:

   a. Address run-off-road and head-on casualty crashes. Road sections prioritised according to crash history will be treated with infrastructure treatments such as protective barriers (for example, wire rope), and/or reduced speed limits.

   b. Address serious casualty crashes at intersections. Sites prioritised according to crash history will be treated with infrastructure treatments and/or speed reduction measures.

   c. Address safety issues for vulnerable road users, for example: safety improvements on popular motorcycle routes; infrastructure improvements for bicyclists, older road users, people accessing public transport and pedestrians.

   d. Address safety on key arterial routes, prioritised by crash history. Route safety reviews to be undertaken and findings implemented.

4. Develop a nationally agreed approach to applying the willingness-to-pay methodology to value safety.

5. Ensure that roads in and around Indigenous communities are included in infrastructure treatment programs.

6. Complete Austroads risk-based assessment model; and then systematically assess risk levels for highest volume roads and prioritise road sections for safety improvement.

7. Implement and evaluate Safe System demonstration projects in specific local government areas and Indigenous communities.

Chapter 6

FUTURE STEPS — what else will be considered?

- Implementing innovative infrastructure safety treatments where feasible and cost-effective, including 2+1[13] schemes and new types of safety barriers on major highways.

- Working with local governments to develop and deliver infrastructure improvement strategies that include cost-effective safety treatments (for example, flexible barriers, roundabouts, shoulder sealing, rumble strips).

- Implementing infrastructure measures to physically separate bicyclists and motor vehicles on higher-speed roads with significant bicycle usage.

- Introducing motorcycle black spot/black length programs in all jurisdictions, potentially funded by a levy on compulsory third-party injury insurance for motorcyclists (as Victoria has done).

- Improving land use planning to reflect Safe System principles, including greater control of roadside development for safety.

How will progress be assessed?
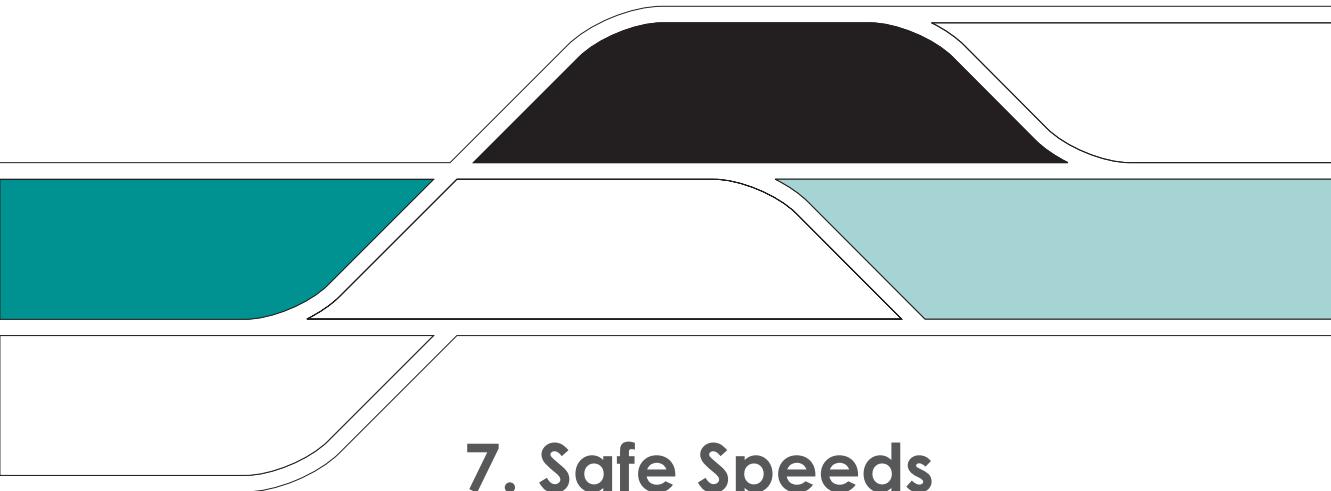
Ongoing

- Number of deaths from head-on crashes
- Number of deaths from single-vehicle crashes
- Number of deaths from intersection crashes
- Number of deaths from crashes occurring on:
  » metropolitan roads
  » regional roads
  » remote roads

By 2014

- Report on delivery of action items 1 to 7.

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13 2+1 roads are created using wire-rope barriers to create two lanes in one direction and one lane in the other, alternating every few kilometres.

7. Safe Speeds

7.   Safe Speeds

Speed is highly implicated in a large proportion of serious casualty crashes. As well as having a direct causal role in many instances, speed contributes significantly to the severity of most crashes. Measures addressing vehicle speed can mitigate the severity of crashes regardless of the underlying reasons for the crash. The speed problem is partly a behavioural issue, with motorists frequently choosing to travel at illegal or inappropriate speeds. However, speed limits across the network should be aligned with Safe System principles.
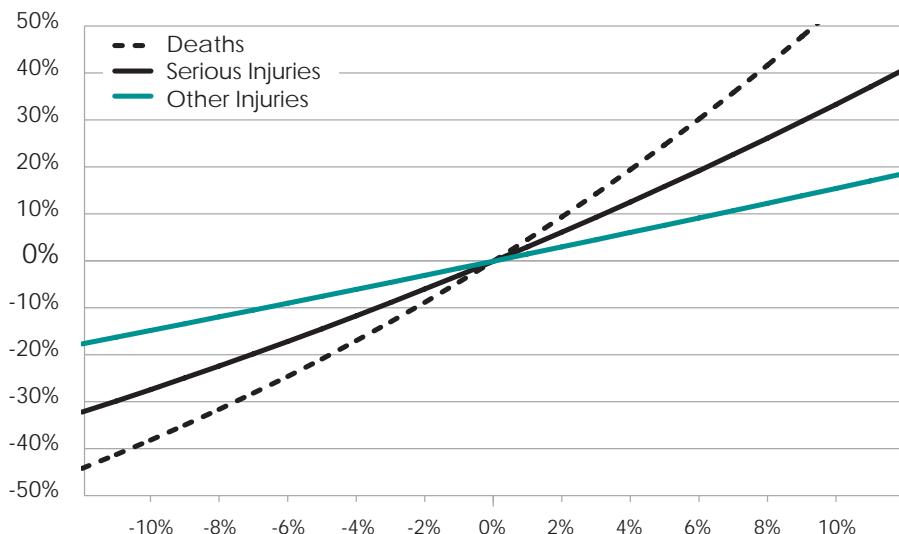
EVIDENCE — what is known

Crash risk evidence

The likelihood of being involved in a serious casualty crash rises significantly with even minor changes in travelling speed. For example, Australian research has shown that the risk of a serious casualty crash doubles with just a 5 km/h speed increase on 60 km/h urban roads or with a 10 km/h increase on rural highways [15, 16].

Internationally accepted research by Nilsson [17] has established a clear relationship between changes in average traffic speed and crash outcomes. As shown in Figure 12 below, the Nilsson model shows a 5 per cent speed increase leads to around a 15 per cent increase in serious injury crashes and a 22 per cent increase in fatal crashes. Similarly, for a 5 per cent decrease in mean speed, there are typically about 15 per cent fewer serious injury crashes and 20 per cent fewer fatal crashes.

Figure 12: Relationship between change in mean speed and crashes

Chapter 7
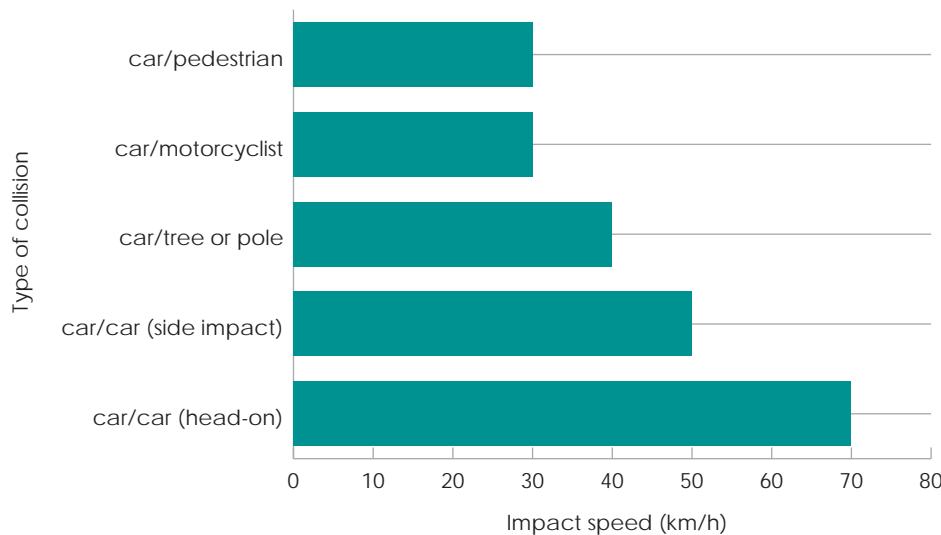
Recent analysis in Western Australia has shown that if every road user in that state slowed down by 1 km/h for a year they would contribute to a community benefit of ten fewer people killed (5% of fatalities in 2009) and about 90 people from going to hospital (3.5% of people who were seriously injured in 2009).

Survivability of crashes

The chances of surviving a crash decrease rapidly above certain impact speeds, depending on the nature of the collision [18]:

• car/pedestrian: 30 km/h

• car/motorcyclist 30 km/h

• car/tree or pole: 40 km/h

• car/car (side-impact): 50 km/h

• car/car (head-on): 70 km/h.

Figure 13: Survivable impact speeds for different crash scenarios

Note: The range of impact speeds shown for each crash type are considered to be survivable in most cases.

Compliance

Non-compliance with speed limits contributes directly to a large proportion of serious casualty crashes. Crash statistics conservatively identify speeding as a major causal factor in around 30 per cent of fatal crashes.

Speeds up to 15km/h over the speed limit contribute to a large proportion of serious casualties: speeding in this range is not as risky as higher-level speeding, but it is far more common.

While site-based speed cameras can be a very cost-effective way of reducing serious casualties at high-risk locations, large reductions in serious casualties can be achieved from enforcement programs aimed at improving speed compliance more broadly across the network (as shown in the case study below).

There is evidence that motorcycles are over-represented in speed-related crashes and that current enforcement approaches as not as effective in deterring motorcycle speeding.

A speed enforcement case study

In 2000, Victoria had a relatively intensive enforcement program, including covert speed cameras, backed by an extensive speed-related public information program. Starting in December 2000, Victoria progressively introduced a package of measures to improve speed compliance, including:

- increasing speed camera operating hours by about 50 per cent
- making enforcement more covert and unpredictable
- increasing the number of enforcement sites in use
- lowering the speed camera enforcement tolerance
- reducing the thresholds for penalties applying to different levels of speeding offence
- increasing the amount of speed-related advertising.

A comprehensive statistical evaluation of the impact of this package found that by the latter half of 2004 it had resulted in a 10 per cent reduction in all casualty crashes (involving death or injury) and a 27 per cent reduction in fatal crashes [19].

Chapter 7

Point-to-point speed enforcement

Point to point speed camera technology allows continuous automated speed enforcement to be applied over an extended length of road. While fixed speed cameras are an effective mechanism for dealing with a specific location with known crash history[14], point-to-point cameras extend this over a much longer length of road and hence have a greater influence on drivers. Instead of checking the spot speed of vehicles at a fixed point on the road, the cameras measure the average speed of vehicles over a substantial distance. In this way, point-to-point enforcement targets sustained speeding behaviour and can be more acceptable to the public than single-camera enforcement [20, 21].

Point-to-point systems are used widely in Europe including in the UK (20 fixed systems and 20 temporary systems at road works), Italy (44 systems), Austria (2 fixed and 2 mobile systems) and the Netherlands (16 systems). Other European countries are trialling point-to-point systems.

Evaluations have demonstrated that point-to-point enforcement reduces speeding, resulting in a low infringement rate and significant reductions in deaths and serious injuries. In the UK, reductions in the number of people killed or seriously injured typically exceed 50 per cent. In Northamptonshire, fatal and serious injuries reduced by 78 per cent in the first five years of operation on the A43 and by 85 per cent in the first four years of operation on the A428.

Point-to-point enforcement has a high level of public support. It has been described as fairer than spot speed enforcement because speeding is detected over a greater distance, demonstrating the behaviour was intentional and not due to a momentary lapse of concentration. [20, 21, 22]

Intelligent Speed Adaptation (ISA) systems are vehicle-based devices incorporating digital speed limit maps and satellite navigation technology. They have proven effectiveness in improving driver compliance with posted speed limits by warning drivers when they are speeding or (in more interventionist approaches) by physically limiting the speed of the vehicle. Evaluation studies have found substantial crash reduction benefits for the speed limiting systems. Implementation approaches could include voluntary driver assist systems for the general community, speed limiting systems for fleet operations, and/or mandatory ISA systems for high-risk groups (such as repeat speeding offenders).

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14 An independent evaluation of 28 fixed speed cameras in New South Wales revealed a 71 per cent reduction in speeding, resulting in a 90 per cent reduction in fatalities and a 20 per cent reduction in casualty crashes at the treated locations.[2].

More work needs to be done at a national level to enable the uptake of this technology, such as developing and maintaining updateable digital speed limit maps across all networks and jurisdictions, and investigating options to encourage and/or require uptake by vehicle manufacturers.

Speed limits

Australia has relatively high speed limits across much its road network compared with the speed limits on similar roads in most OECD countries.

The majority of regional roads in Australia are single-carriageways where the default speed limit applies (100 km/h in most jurisdictions). These roads have been found to consistently have much higher fatal crash rates than other road stereotypes [24].

As suggested by the images below, the safety standard of Australia's regional roads varies considerably and some may not be of an appropriate standard for their current speed limit. Identifying and applying suitable speed limits are necessary measures to improve safety. Alternatively, for higher volume routes, infrastructure safety investment will be needed to maintain speeds.

Chapter 7

Crash risk and speed limits

The speed limit in each of these photographs is 100km/h. With the exception of the divided road (first image), the crash rates on each of these road types are higher than the average rate for regional arterial roads in that state.

The 100 km/h limits above all meet the current speed limit setting criteria. Yet the consequences of driver error leading to a head-on, run-off-road or intersection (driveway access) crash in the situations shown above are highly likely to be fatal.

Despite the legacy effect of these inconsistent crash risk situations, actual or perceived community pressure makes it very difficult for roads authorities to address these issues in a systematic manner. The community is entitled to expect that speed limit setting criteria would result in a level of crash risk that is reasonably consistent and not above average for that category of road.

Many lives could be saved if appropriate speed limits could be applied on higher crash rate roads. The decisions on speed limits are a matter for road authorities. Opportunities to review speed limits and apply changes would reduce crash risk and improve safety.

There is a large body of Australian and overseas evaluation evidence to show that significant casualty reductions flow from reductions in speed limits.

Speed limits case studies

Victoria

Speed limits were increased on a number of Victorian regional highways in 1987 from 100 km/h to 110 km/h. This resulted in a 20 per cent annual increase in casualty crashes on those roads.

Two years later, the speed limits were returned to 100 km/h, leading to a 20 per cent annual reduction in casualty crashes [25].

South Australia

In July 2003, the speed limit was reduced from 110 km/h to 100 km/h on about 1,100 kilometres of regional arterial roads in South Australia. These were typical arterial roads with typical traffic volumes.

The casualty crashes on these roads in the two years before and after the change were compared with crashes on 8,600 kilometres of road sections where the speed limit remained at 110 km/h. The evaluation study concluded that a 20 per cent reduction in casualty crashes on the affected roads could be attributed to the lowered speed limit [26].

New South Wales[15]

In early 2000, the speed limit on a 40 kilometre length of the Great Western Highway between Bathurst and Lithgow was reduced from 110 km/h to 100 km/h. This part of the Great Western Highway is a typical undivided regional highway and provides an important freight function though central west NSW. The road passes through undulating countryside with adjacent farms, forests and bushland. There was substantial community concern raised at the time; however, it was demonstrated that increases to travel time were minimal and that the lower speed limit would create a safer travel environment for all road users. A comparison based on before and after the speed limit was lowered shows there has been a 26 per cent reduction in casualty crashes.

There is potential to obtain major national benefits by systematically reviewing crash rates and travel speeds, leading to either infrastructure improvements (as detailed in Section 5) and/or speed limit reductions on higher-risk roads.

15   Supplied by the Roads and Traffic Authority, NSW.

Speed limit reviews and targeted infrastructure safety investment: two complementary and alternative means to reduce crash risk

Effective management of the road transport system aims to deliver timely, safe and convenient travel. The preferred way of reducing crash risk on the more dangerous parts of the road network is therefore to invest in safety upgrades of the infrastructure. However, given the finite availability of road improvement funds, road authorities need to consider speed limit reductions as an alternative means of reducing crash risk. One of the challenges then, is to determine when to invest in road improvement and when to lower speed limits.

An analysis of road crash data in Victoria suggests that for the higher speed parts of the network (greater than 80 km/h), infrastructure solutions to crash risk are particularly cost-effective on roads with higher traffic volumes (greater than 4,000 vehicles per day). Conversely, speed limit solutions may be more cost-effective on roads carrying less than 2,000 vehicles per day.

The notion of reducing speed limits where travel times are little affected, and improving the road and roadside infrastructure to allow high travel speeds on important commuter roads and roads of national significance, is a balanced means to improve overall safety. Such an approach indicates how speed limit changes can be managed in a considered manner, while recognising the functional requirements for a viable and effective transport system.

Community acceptance

The community generally recognises that speed is an essential consideration of any road safety strategy but there is reluctance by some to accept lower speed limits. Pedestrians and bicyclists strongly support lower speed limits because they make sharing the roads safer and less stressful and improve public amenity in urban areas.

There are mixed reactions to proposals for general reductions in speed limits on metropolitan, regional and remote roads. Although evidence concludes travel times are only increased by seconds on typical urban journeys and less than five minutes for every hour on open road trips, the community is concerned that speed limit reductions would increase travel times and could affect mobility.

The community has an expectation that travel speeds will be as high as possible, while providing for safe travel. National surveys over the decade to 2004 show a gradual increase in public understanding of speed-related risk and public support for progressive speed management measures [27]. However, there has been little further change in recent years, and the views of those opposed

to stricter speed management continue to have considerable influence in Australia. Achieving further substantial change in this area will require ongoing public engagement to build sufficient acceptance of new initiatives. This will include:

- an ongoing dialogue with motoring organisations and other key stakeholder groups
- a focus on improving community understanding of the importance of speed limit compliance, including an appreciation of the social costs associated with 'low-level' speed offences: while the risk for individuals may be relatively small, the aggregate contribution to road trauma is large
- a national community dialogue explaining the safety rationale for speed management actions and the complementary environmental and economic benefits relating to reduced emissions, fuel consumption and noise.

DIRECTIONS — what the strategy aims to achieve by 2020

- Speed limits that reflect a better balance between safety and mobility objectives.
- A substantial improvement in overall compliance with speed limits, particularly on highly trafficked and/or higher-risk sections of the road network.
- Network-wide alignment of speed limits with the inherent risk and function of the road and roadside environment.

Chapter 7

FIRST STEPS — actions for the first three years

8. Improve compliance with speed limits across the road network:

    a. Adopt best practice enforcement, including a combination of on-road policing and speed camera technologies, with a mix of covert and overt strategies.

    b. Install where appropriate point-to-point cameras to improve speed compliance among all vehicles.

    c. Examine options for improved enforcement of motorcycle speeding.

9. Improve the use of sanctions to more effectively deter people from speeding.

10. Develop a national public information campaign about the community safety benefits of complying with speed limits. This will provide education resources suitable for use by government agencies, local governments and community forums.

11. Review speed limits where risk levels are high and engineering solutions are not feasible or cost-effective:

    a. Set safe speed limits on road lengths that are narrow, have substantial levels of roadside hazards, have many intersections or property entrances, are winding or undulating, or have higher than average serious casualty crash rates.

    b. Reduce speed limits at high-risk intersections, especially on high-volume outer urban arterials.

    c. Work with local governments to expand the number and scope of projects that implement safe speed limits in areas of high pedestrian and cycling activity.

12. Develop new risk-based national speed limit guidelines for different road categories/functions. Guidelines should encourage consistent limits based on measured risk/crash rates, while minimising multiple speed zones over short distances.

13. Facilitate the implementation of Intelligent Speed Adaptation (ISA) systems:

    a. Encourage the development of digital speed limit maps.

    b. Examine the scope to require advisory ISA in all government fleets; and mandatory speed limiting ISA and/or other technologies for recidivist speeders and P-plate drivers.

    c. Initiate discussion with insurers to encourage voluntary fitting of ISA and recorders through lower insurance premiums, especially for young drivers.

14. Increase the effective application of chain of responsibility legislation to prosecute heavy vehicle speeding (including speed limiter) offences, and harmonise legislation to assist cross-border enforcement.

FUTURE STEPS — what else will be considered?

- Investigating the case for promoting or mandating speedometer displays which place more emphasis on the range of Australia's legally permissible speeds, and limit the display of higher speeds.

- Promoting or mandating speed governing and ISA in a broader range of vehicles.

- Developing telematics as a regulatory tool for heavy vehicle speeding.

- Improving the effectiveness of registration sanctions for heavy vehicles that have non-operational speed limiters.

- Working with toll road operators to implement point-to-point speed enforcement on motorways.

How will progress be assessed?
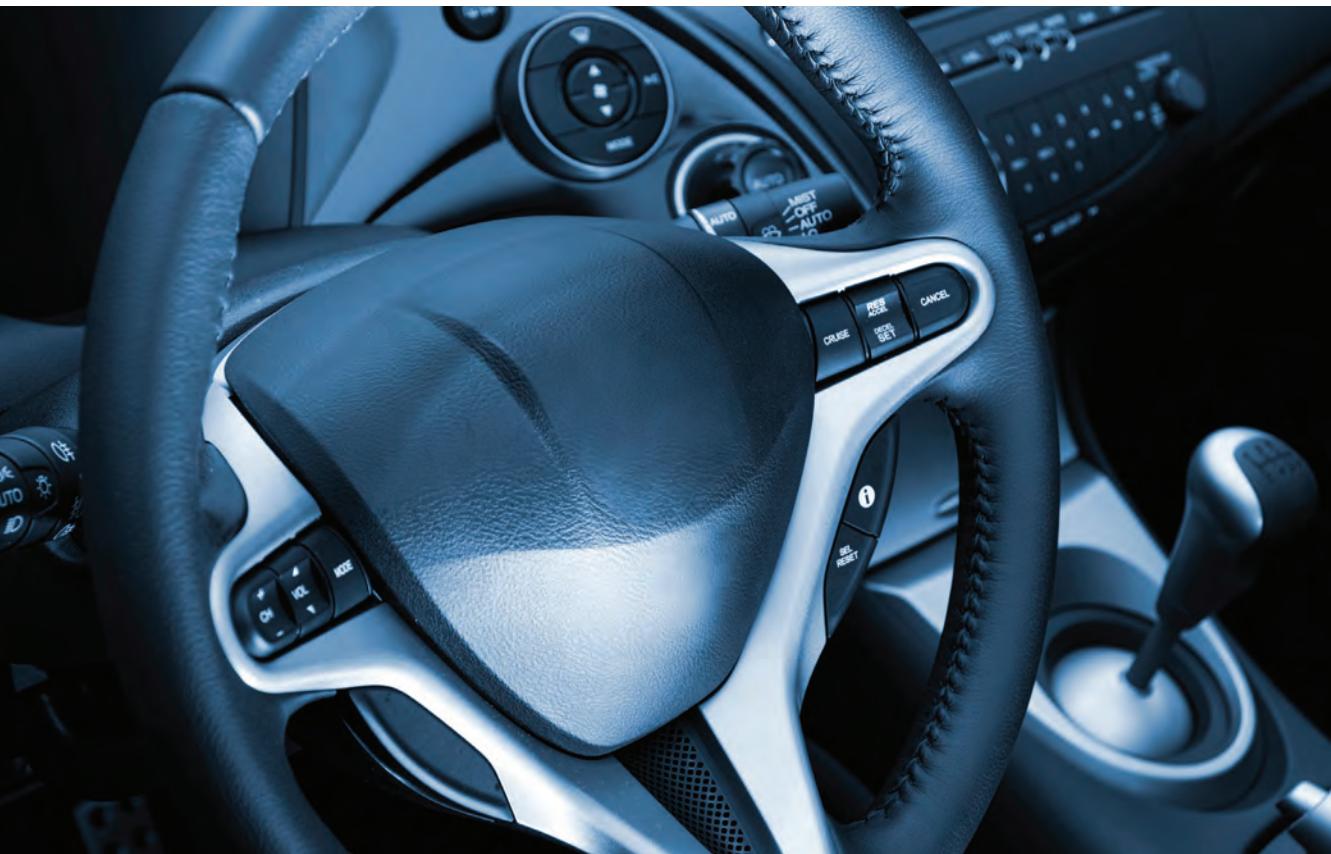
Ongoing

- Number of deaths from crashes where vehicle speed was a contributory factor

By 2014

- Report on delivery of action items 8 to 14

8. Safe Vehicles

8   Safe Vehicles

Improvements in vehicle safety have contributed significantly to road trauma reduction. These improvements reflect steady advances in automotive safety design, including occupant protection performance, braking, handling and lighting and the inclusion of life saving safety features such as seatbelts and airbags.

The Australian vehicle fleet has an average age of around 10 years, so new vehicle safety features can take several years to permeate through the fleet. Improvements in occupant protection such as crumple zones and airbags, as a result of regulation introduced in the late 1990s and early 2000s, will continue to produce benefits throughout the period 2011–20. Mandatory electronic stability control (ESC) — which helps drivers avoid crashes — for light passenger vehicles, and front underrun protection for heavy vehicles from 2011, will have considerable effect over the next 10 years. Measures in this strategy will therefore be important in improving vehicle safety in 2011–20, but even more for the period beyond.

New options based on advances in computing and sensor technologies have paved the way for new primary safety systems such as lane departure warning devices, collision avoidance warning and other advanced braking and driver management systems. There are also a number of vehicle safety technologies currently available or under development with the potential to target illegal driving behaviours, including Intelligent Speed Adaptation (ISA), alcohol interlocks, and seatbelt reminders and interlocks.

Continued progress will be achieved through a combination of manufacturers' evolving designs, consumer information programs and other non-regulatory means, such as fleet purchasing policies and industry codes of practice, as well as mandated standards. Initiatives adopted need to be as responsive as possible to advances in vehicle safety design and technology while distinguishing these from the ever-increasing range of features being promoted by manufacturers.

Where the approach to be adopted involves regulation, standards for new vehicles in Australia are set in the Australian Design Rules (ADRs) by the Commonwealth, in consultation with the states and territories, industry and the community. There are over 50 ADRs relating to vehicle safety. They are generally harmonised with United Nations Economic Commission for Europe (UNECE) vehicle regulations and Global Technical Regulations (GTRs), which are the peak international standards, because over 85 per cent of vehicles are imported into Australia and Australia constitutes only one per cent of the global vehicle market. There are also some local ADRs such as the Full Frontal Occupant Protection ADR.

Chapter 8

All standard setting must be justified by a Regulation Impact Statement (RIS) through which industry and the community are consulted about how the intended standard will impact and at what cost. Maintaining harmonisation with the active program of international standards development will provide the greatest safety benefit at the least cost, ensuring that new vehicles remain as affordable as possible.

In-service regulatory standards for vehicles are set by the states and territories, which generally require continuing conformance with relevant ADRs.

Among consumer information programs, the Australasian New Car Assessment Program (ANCAP) provides star ratings for vehicles — up to five stars — based on crash testing and inclusion of safety features. ANCAP continually reviews the criteria required for a vehicle to have a five-star rating. For example, in 2008, ESC was added to requirements for a five-star rating prior to agreement on an international vehicle regulation on ESC and mandating it in Australia.

The Commonwealth, states and territories, and motoring and other organisations fund ANCAP and a recent increase in funding will significantly expand its crash test program. Used Car Safety Ratings are also produced by a consortium of government and motoring organisations. Work is currently underway to increase public awareness and usage of these ratings, particularly among younger drivers.

EVIDENCE — what is known

- Australia has a relatively high average age of vehicles (around 10 years).
- There has been a marked increase in the number of two-wheeled vehicles in the Australian fleet.
- Older vehicles are often used by higher-risk motorists such as novice drivers.
- The risk of death or serious injury in a crash is lower for later model vehicles: the risk in a vehicle made in 2007 is about half that of a vehicle made in 1987 [28].
- The proportion of ANCAP tested cars to be awarded a five-star rating has grown from less than 10 per cent in 2003 to over 60 per cent in 2009.

- It has been estimated that if everyone drove the safest car in its category, road trauma involving light passenger vehicles could be reduced by 26 per cent. If each vehicle incorporated the safest design elements for its class, such trauma could be reduced by 40 per cent. [29]

- Safety in light commercial vehicles has not kept pace with light passenger vehicle safety, in terms of ANCAP star ratings and inclusion of safety features. These vehicles are used in both the business and family environment.

- Considerable work is currently underway regarding vehicle to vehicle and vehicle to infrastructure communication. A frequency for these communications has been reserved (5.9 GHz) and research is active regarding potential applications.

- Substantial work on vehicle safety is underway internationally on Intelligent Transport Systems (ITS), including the development of guidelines for in-vehicle information systems.

- A large proportion of new vehicles in Australia are purchased for private sector and government fleet use. As these vehicles are generally sold for private use within a few years, there is an opportunity to improve the uptake of safety features in Australian vehicles by encouraging fleet purchasers to demand them.

- Australia has a uniquely diverse range of heavy vehicles, which makes it important to ensure braking technologies are compatible. The National Heavy Vehicle Braking Strategy released in 2008 recommended the development of Australia's brake regulations to capitalise on the significant safety improvements achievable with new braking technologies.

DIRECTIONS — what the strategy aims to achieve by 2020

- A regulatory system ensuring that proven safety design features and technologies are mandated in new Australian vehicles as quickly as possible.

- A greater penetration of five-star ANCAP rated vehicles in the general fleet, with ANCAP star ratings available for all new vehicles.

- A reduction in the average fleet age in Australia.

- Enhanced safety commitment from the commercial sector,

including a demand for fleets to be equipped with key safety features such as five-star ANCAP rated vehicles, ESC, side curtain airbags, alcohol and seatbelt interlocks, and ISA.

- A substantial increase in the proportion of heavy vehicles with advanced braking systems and other safety technologies.
- Significant improvement in the safety of the light commercial vehicle fleet.

FIRST STEPS — actions for the first three years

15. Facilitate the adoption of nationally-agreed best-practice fleet purchasing policies:

   a. Develop nationally-agreed fleet purchasing policies with practical, evidence-based safety criteria that drive an increase in the safety features required for vehicle purchases.

   b. Require all government fleets to implement nationally-agreed fleet purchasing policies and encourage adoption by other fleet operators.

16. Improve safety regulations for new vehicles:

   a. Improve the ADR process to ensure that minor changes to UNECE regulations are accepted automatically, timely consideration is given to new and amended UNECE regulations and GTRs, and priority is given to implementing new and amended ADRs that can deliver the greatest safety benefits.

   b. Subject to the final outcomes of Regulatory Impact Statements (RISs), mandate the following vehicle safety features for new vehicles: advanced seatbelt reminders (driver's seat); provision for ISOFIX child restraint fittings; ESC in light commercial vehicles; Anti-lock Braking Systems (ABS) / load proportioning brake systems for heavy vehicles and trailers.

   c. Prepare RISs to consider mandating of ABS for motorcycles, increased heavy vehicle cabin strength, ESC and Lane Departure Warning Systems for heavy vehicles, and Brake Assist Systems for light passenger vehicles.

   d. Lead international development of a pole side impact standard, which will require strong protective measures for vehicle occupants involved in side impacts, including provision of effective side curtain airbags or other airbag configurations.

17. Improve and promote the ANCAP program:

    a. Expand the ANCAP program to increase the coverage of crash test results across the full range of new vehicles on the Australian market, including light commercial vehicles, and develop a crash test standard and protocol for rollover crashes.

    b. Support the implementation of a national 'Stars on Cars' program to increase consumer demand for safe vehicles through the promotion of ANCAP safety ratings.

    c. Encourage vehicle manufacturers to support ANCAP through the provision of vehicles ahead of their release to the market.

18. Encourage vehicle manufacturers to develop industry codes of practice committing to incorporation of vehicle safety features, while ensuring that safety features are not packaged only with luxury or comfort features.

19. Investigate incentives relating to vehicle purchases:

    a. Investigate incentives (including tax-based, registration-based and insurance incentives) and promote options to encourage purchase of safer vehicles, greater turnover of the vehicle fleet and/or the inclusion of enhanced safety features.

    b. Investigate incentives to encourage young drivers and their parents to purchase safer new or used cars.

20. Evaluate community concerns and work with the vehicle industry to ensure vehicle advertising avoids display and promotion of unsafe and illegal behaviours.

21. Strengthen regulation of post-production modifications and additions (for example by limiting the raising of vehicles) which may compromise the safety of the vehicle as manufactured.

22. Investigate further regulation of speed and other safety features for powered alternative vehicles (for example, mobility scooters and power-assisted bicycles).

23. Investigate options to maximise the efficiency and safety of restricted-access heavy vehicle operations.

24. Investigate technology-based options to minimise driver distraction from in-vehicle devices.

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FUTURE STEPS — what else will be considered?

- Mandating the following vehicle safety features for new vehicles, subject to the outcomes of a RIS: Advanced Emergency Braking Systems for heavy and possibly light vehicles; battery and system safety and protection of servicing and emergency services personnel for electric and hybrid vehicles; crash protection of occupants from high voltage vehicle systems; rear impact injury mitigation (head restraints); adaptive lighting[16]; the expansion of advanced seatbelt reminders or interlocks to other vehicle categories and seating positions.

- Investigating the scope for regulatory action to further improve stability, traction and braking standards on motorcycles supplied to the Australian market.

- Working with ANCAP, so that it continues to encourage the latest high-benefit vehicle safety innovations in areas where regulation cannot be justified or is still being developed and supplements regulatory crash test requirements.

- Introducing automatic crash notification similar to the European eCall system.

- Developing telematics as heavy vehicle regulatory tools to enforce speed and mass limits, to minimise road damage and maintain optimal vehicle braking and handling performance.

- Working with industry to secure good community understanding of vehicle safety ratings systems, including evaluating the case to mandate display of safety ratings at point of sale on all new vehicles.

- Implementing international standards to improve light commercial vehicle safety and achieve alignment with best practice passenger vehicle standards.

- Review the current ADRs for vehicle occupant protection with a view to raising the safety standards of Australia's vehicle fleet.

- Working with the vehicle industry and emergency services to ensure that vehicle design and manufacture does not compromise the safety and efficiency of road crash rescue operations.

How will progress be assessed?

Ongoing

- Average age of the Australian vehicle fleet
- Percentage of new vehicles sold with a 5-star ANCAP rating
- Percentage of new vehicles sold with key safety features

By 2014

- Report on delivery of action items 15 to 24.

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16 Headlights that switch on automatically in low-light conditions.

9. Safe People

9. Safe People

Most road users respect the law, have good safety awareness and use the roads in a sensible manner. But even these people make unintended mistakes — and sometimes those mistakes result in death or serious injury. Improved road safety systems can be developed to reduce the level of road user error and provide greater forgiveness or protection in the event of a crash occurring.

But people do not always use the roads in a responsible way. Some people frequently break the road laws, putting themselves and others at unacceptable risk, and contribute disproportionately to the number of casualties on the roads. There is a need to further reduce dangerous behaviours on the roads through enhancing enforcement and ensuring penalties are effective.

Since the early 1970s, Australia has had great success in changing dangerous behaviours. Through a combination of enforcement and education, rather than education alone [30], community attitudes and social norms have shifted in areas such as drink driving and not wearing a seatbelt — these behaviours are now widely regarded as unacceptable in our community and road users are generally more compliant with traffic laws. However, such risky behaviours are still prevalent among an irresponsible minority and they continue to play a big role in serious casualty crashes. The aim is to increase support for responsible road use while toughening responses towards those who use the roads irresponsibly. There is a need to maintain deterrence because many responsible drivers are kept responsible by the threat of detection and sanctions.

Responsible road use

EVIDENCE — what is known

It has been estimated that people making mistakes contribute to more than 50 per cent of serious casualty road crashes. There are many types of mistakes and many underlying issues. A large part of the solution lies in improving the safety design of roads, vehicles and speed limits — to make them more forgiving of human error — but there is also a need to help people avoid making mistakes in the first place.

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This can be done by improving licensing, education and information systems. Other ways of supporting responsible road use also will be explored. This is relevant to all road users; however, some groups of road users are particularly vulnerable:

- Young drivers are over-represented, making up about 14 per cent of all licence holders but being involved in about 25 per cent of all serious crashes. This reflects a number of factors, including inexperience in driving, under-developed higher-order cognitive and decision-making skills and a greater propensity to take risks, especially among young males. It is known that young drivers are most at risk of crashing in the first 6-12 months of gaining their licence.

- Research shows that raising the licensing age for young drivers to 18 would save young lives, but would also have an impact on the mobility of 17 year olds, particularly in regional areas.

- National competency based licence testing and trainer qualification standards for heavy vehicle drivers have recently been approved to ensure consistency for heavy vehicle operators. However, any changes to the graduated licensing process to attract and qualify heavy vehicle drivers should address risks for road safety. As an example, drivers under the age of 26 years hold only two per cent of NSW heavy truck licences but are represented in four per cent of fatal and five per cent of injury crashes. Although based on relatively low numbers of licenses, those under 26 years have a higher fatal and injury crash involvement rate than older heavy vehicle drivers.

- Evidence from studies examining brain maturation supports the notion that driving may be affected by the lack of maturation until late adolescence or beyond. In particular, physiological studies show that the brain areas responsible for response inhibition and emotional self-regulation continue to develop over adolescence and early adulthood [31, 32]. This evidence warrants particular concerns with heavy vehicle licences for young drivers.

- Motorcyclists are highly vulnerable compared with other motorists due to the lack of vehicle crash protection as well as the inherent difficulty of handling a vehicle with only two wheels.

- Australian children are safer than ever but the road death rate for children aged 0 to 14 years is still high compared with other OECD countries, with Australia ranked 18th in 2006. Children are particularly vulnerable as unrestrained or incorrectly restrained passengers and also as pedestrians.

- Older drivers do not have a high level of crash involvement. However, their relative fragility makes them more likely to be seriously injured or killed in a crash than younger people and their numbers are expected to grow substantially as our population ages.

- Indigenous people have three times the rate of road death compared with non-Indigenous people. There is a complex range of factors involved, including over-representation in crashes involving alcohol and non-wearing of seatbelts, in crashes on lower-standard remote roads, and in vehicles that are often of a lower safety standard. Many Indigenous people experience poor access to licensing services and support systems.

- Graduated licensing arrangements are intended to allow novice drivers and riders to develop experience in reduced risk conditions in the first few years of licensing. Research evidence supports a graduated approach with restrictions and sanctions that are progressively reduced as experience is gained. Australian states and territories have progressively strengthened their graduated systems over recent years.

- While there is a lack of evidence that school road safety education programs reduce road crashes, it is important that children and young people are taught to use the roads safely as pedestrians, bicyclists and later as riders and drivers. Programs designed to instil safe attitudes and behaviours from an early age are strongly supported by parents and the wider community.

- There is community support for driver education programs; however, the research evidence on the effectiveness of such programs in reducing serious crashes remains disappointing.

- It is often observed that there is more effort put into punishing bad behaviour on the roads than rewarding good behaviour. While there have been some attempts to encourage responsible road use through incentive schemes, the effectiveness of this approach is unproven.

Fatigue

The effects of fatigue on serious road casualties are difficult to quantify, but is recognised as a major and potentially growing problem area. Fatigue is a contributing factor in crashes which involve long trips and extensive periods of continuous driving, and also in short trips when the driver has previously been deprived of sleep. Shift workers are particularly at risk.

There is evidence that sleep deprivation can have similar hazardous effects to alcohol consumption. Studies have found that people driving after being awake 17 to 19 hours perform more poorly than those with a BAC of 0.05, and after 21 hours their performance is about the same as driving at 0.15 BAC [33, 34].

While infrastructure treatments are presently the main response to the fatigue problem, research on direct remedies (including technological solutions) should be supported and evaluated.

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Driver distraction

Driving is a complex task and sources of driver distraction, both within the vehicle and in the general road environment, have increased substantially in recent years. Modern vehicles can include on-board DVD, satellite navigation, complex sound systems, climate controls, and audible and visual signals for an array of vehicle operations which compete for driver attention. Although it is very difficult to quantify the effect of all of these and other sources of distraction on serious road casualties, they are recognised as a major and potentially growing problem area.

Mobile phones are a widely recognised form of distraction (see section below on 'Irresponsible road use'). Other sources of distraction, both inside and outside vehicles, should be monitored. People will continue to be distracted while driving, particularly by technology, and it is not possible to eradicate or outlaw every form of distraction. A harm minimisation approach would enable emerging problems to be addressed before having fully effective management responses by:

- supply reduction, through laws, technology design, planning guides and infrastructure design;
- demand reduction, using voluntary actions, technology design and deterrence;
- vehicle technologies that help drivers avoid the harmful consequences of distraction; and
- allowing more information to directly influence the vehicle (for example, speed limiting) rather than bombarding the driver with more information.

DIRECTIONS — what the strategy aims to achieve by 2020

- Australia will have a best practice graduated licensing scheme for novice drivers and riders.
- Increased use of effective protective equipment by motorcyclists.
- Substantially improved access to graduated licensing, and to vehicles with higher safety ratings, for Indigenous people.
- A best practice framework for the assessment of older drivers' fitness to drive will be available and all jurisdictions will have effective processes for managing older driver licensing.
- Development of suitable technology to combat driver fatigue.
- Road safety education resources will be developed and available to the pre-primary sector and all primary and high schools.

FIRST STEPS — actions for the first three years

25. Improve driver and rider licensing arrangements:

    a. Develop an evidence-based model of graduated driver licensing for car drivers. Elements for examination include minimum supervised driving hours, minimum provisional licence age, passenger restrictions, night driving restrictions, mobile phone bans, vehicle power restrictions, speed and alcohol restrictions, and more effective sanctions for speed and alcohol offences.

    b. Review licensing arrangements for motorcycle riders. Elements for examination include graduated restrictions for novice riders (including minimum period with a car licence before motorcycle licensing) and education and training if proven to deliver road safety benefits.

    c. Investigate licensing options to improve the safety of returning motorcycle riders.

    d. Review licensing arrangements for heavy vehicle drivers, including options for the adoption of competency based standards.

26. Develop and implement a national helmet assessment and rating program to stimulate market demand for the safest motorcycle helmets — and examine options for other protective gear.

27. Implement programs addressing the road safety needs of Indigenous communities and disadvantaged groups:

    a. Develop and implement programs to increase the opportunities for driving practice for disadvantaged learner drivers, particularly in Indigenous communities.

    b. Implement locally relevant and culturally appropriate Indigenous community education campaigns promoting key road safety messages.

    c. Implement education campaigns to meet the road safety needs of culturally and linguistically diverse groups.

28. Implement, and promote the use of, new Fitness to Drive guidelines to improve the management of at-risk and medically-impaired drivers.

29. Pilot electronic work diaries for heavy vehicle drivers as an alternative to paper-based diaries to improve fatigue management.

30. Mandate seatbelt wearing for taxi drivers.

31. Pilot operational field trials of driver and vehicle devices that measure drowsiness crash risk using metrics based on ocular dynamics or carriageway position, including back-to-base monitoring of data.

32. Develop public information campaigns and education resources about fatigue for all road users, with a particular focus on educating novice drivers.

33. Expand the provision of rest areas, including in regional towns ('rest towns'), to help motorists manage fatigue.

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FUTURE STEPS — what else will be considered?

- Addressing the substantial increase in crash risk at the beginning of the unrestricted licence period through more gradual relief from the provisional licensing restrictions.

- Continuing to explore the case for a national post-licence driver education program, taking account of evaluation results of driver education interventions with proven road safety benefits.

- Promoting alternative mobility options for older drivers through local government community transport programs.

- In partnership with agencies responsible for delivering school education, developing road safety resources for parents of pre-school children, and for primary and secondary school students prior to licensing.

- Developing educational and regulatory interventions to minimise the effects of driver distraction.

- Investigating the use of new technologies to minimise driver error and automatically monitor driver performance.

How will progress be assessed?

Ongoing
- Number of young driver and motorcycle rider deaths
- Number of older driver and motorcycle rider deaths
- Number of motorcyclist deaths
- Number of bicyclist deaths
- Number of pedestrian deaths
- Number of deaths from crashes involving a heavy vehicle

By 2014
- Report on delivery of action items 25 to 33.

Irresponsible road use

Effective deterrent and publicity measures, such as a combination of police enforcement and public education campaigns, can motivate road users to change their behaviour, if they are concerned with being 'caught' and having to deal with the consequences. This concern is driven by the perceived probability of being caught and the efficacy of the penalty. Because many drivers believe their risk of crashing is very low, fear of penalties is often more effective than the fear of being involved in a crash. However, measures to inform and educate road users about risk factors and to motivate longer-lasting behaviour modification are also required.

Emerging vehicle technologies also offer potential assistance in addressing illegal behaviours (including drink driving, speeding, non-use of seatbelts, driving fatigued or distracted) by the relatively small non-compliant proportion of the driving population. This will be an important opportunity for road safety improvement.

There are three key challenges over the life of this strategy:

- To shift the social norm for speeding in the way it has been shifted for drink driving and seatbelts.
- To further reduce the high risk behaviours of drink driving, not wearing a seatbelt and drug driving by a minority of people. While these behaviours are now considered socially unacceptable, they still feature significantly in crashes causing serious injury and death.
- To respond to the well-established link between driving without a licence and involvement in serious crashes.

EVIDENCE — what is known

Speed compliance

Speed is one of the key road user behaviour issues, with motorists frequently travelling at illegal or inappropriate speeds, leading to increased crash risk and increased severity of crashes. Illegal and inappropriate speed is a major factor in 30 per cent of fatal crashes.
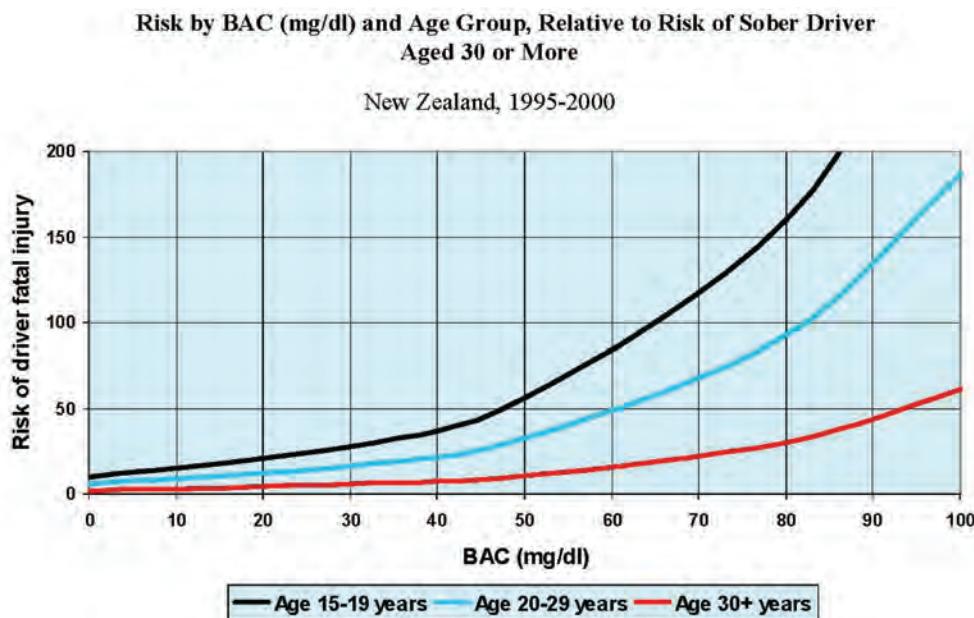
- Specific objectives and measures to address this problem are covered in the Safe Speeds Section.

Drink and drug driving

Alcohol continues to be a major factor in serious casualties, with more than a quarter of fatal crashes involving a driver over the legal Blood Alcohol Concentration (BAC) limit. There is a large body of research evidence showing that the risk of involvement in a casualty crash increases rapidly

with increasing BAC levels. This is true for all motorists; however, studies have shown that the risks are significantly higher for younger drivers.

Figure 14: Risk of driver fatality by BAC level and age [35]

Risk by BAC (mg/dl) and Age Group, Relative to Risk of Sober Driver Aged 30 or More

New Zealand, 1995-2000

Source: Adapted from Keall *et al.*, 2004.

Note: Chart reproduced from the OECD report Young Drivers: the Road to Safety [36].

In Victoria, those aged 18-25 represent only 13 per cent of licensed drivers, but 36 per cent of all drink drivers killed in road crashes. When the 18-25 age group is split into groups aged 18-20 and 21-25, the over-representation of young drivers in drink driving casualties increases for the older group.

Lower BAC limits

Under current Australian drink driving laws, it is an offence for any motorist to drive with a BAC of 0.05 or greater; and in most jurisdictions, novice drivers (learners and P-platers) and professional drivers are required to have a BAC of zero. It has generally been accepted that these laws strike the right balance between social values and public safety in relation to alcohol use.

The evidence would need to be examined in much greater detail to determine whether or not there is a case for changing Australia's long-standing BAC laws. Furthermore, any specific proposal to reduce existing BAC limits would need to be developed in close consultation with the community.

There is a body of community opinion that favours a more restrictive approach to drinking and driving. It has been proposed, for example, that the present zero BAC requirements for certain licence categories should be extended to a broader range of higher-risk groups — such as all young drivers under the age of 26 years, or all motorcycle and scooter riders. Some have further suggested that Australia should follow the example of Sweden in reducing the general BAC offence threshold from 0.05 to 0.02.

Points made by those who advocate lower limits include:

- Studies on the effects of Sweden's lowering of the BAC limit have reported a 10 per cent reduction in fatal crashes related to drink driving after the change [37].

- Previous Australian experience in lowering BAC limits suggests that the effects on drink driving behaviour were quite far-reaching. For example, when the ACT reduced the BAC limit from 0.08 to 0.05, random breath testing (RBT) showed a 34 per cent reduction in the number of drivers with a BAC between 0.15 and 0.20, and a 58 per cent reduction in the number with a BAC above 0.20 [38].

- The age-based risk evidence suggests that extending the current zero BAC requirement for novices to all drivers under 26 years of age would prevent a significant number of deaths and serious injuries per year across Australia.

- A prescribed zero limit has the advantage of not relying on drivers' perceptions of how much alcohol they can consume to stay under a legal limit.

- As well as providing motorists with greater certainty, adoption of a general zero (or 0.02) BAC limit would strongly reinforce the message that drinking and driving should be separate activities.

Alcohol interlocks

A substantial proportion of drink drivers — particularly recidivist offenders — are not responsive to mainstream deterrence measures due to serious alcohol abuse and broader social problems.

Alcohol interlock programs have had some success in changing the behaviour of serious offenders. There is scope to extend the application of alcohol interlocks to cover a wider segment of the driver population, initially focusing on offenders and other higher-risk groups such as novice drivers.

The majority of the community ride or drive responsibly, but may lapse occasionally. If the community supported the widespread implementation of alcohol interlocks, then in the next ten years drink driving could almost be eliminated. Some countries are creating initial markets to support the eventual widespread uptake of alcohol interlocks through fleets, in buses,

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taxis and trucks as a quality assurance action by responsible companies and employees.

Drug driving

There is a range of evidence linking certain illegal and prescription drugs to elevated crash risk, though alcohol still makes a bigger overall contribution to the number of serious casualties.

Roadside drug testing has been introduced in many jurisdictions in recent years. There is scope to develop a consistent national approach to roadside testing for illicit drugs, based on both evidence and recent experience, as well as a national approach to improved management of impaired driving due to medical conditions or use of prescription medication.

Mobile phones

There is evidence from epidemiological studies and other research suggesting that mobile phone use produces a significant increase in casualty crash risk, regardless of whether the phone is hand-held or hands-free [39]. The research indicates that using mobile phones to write or read text messages while driving is particularly risky, and that the risks of mobile phone use and other distracting activities are higher for novice drivers than for more experienced drivers.

Several jurisdictions include restrictions on the use of hands-free phones as part of their graduated licensing arrangements for P plate drivers, though in some cases this applies to the 'P1' stage only.

National surveys show that many drivers still use hand-held mobile phones while driving, despite it being illegal in all Australian jurisdictions. A recent survey found that 61 per cent of drivers reported using mobile a phone while driving, with 30 per cent admitting to reading text messages and 16 per cent to sending them [27].

Emerging evidence from naturalistic driving studies reinforces concerns about phone-related tasks such as dialling and text messaging, but appears to suggest that the risks associated with talking or listening may be comparable to other common driver activities [40].

Further investigation is required to fully understand the safety impacts of mobile phones and other potentially distracting devices, and to inform the development of appropriate countermeasures. Any consideration of changes to existing mobile phone laws would require a thorough analysis of the potential safety benefits and other impacts on the community, as well as the scope for effective detection and enforcement of offences under the changed laws.

Seatbelt use

The majority of Australians always wear seatbelts when travelling in motor vehicles. However, a significant minority sometimes do not wear seatbelts, which is a very significant risk factor. Some 28 per cent of vehicle fatalities are unbelted, where restraint use is known.

There is evidence that seat belt reminders in vehicles can improve seatbelt wearing rates. Coordinated enforcement and publicity efforts are also necessary to improve and maintain public understanding and acceptance of the importance of seatbelts, including properly fitted child restraints.

The Safe Vehicles Chapter includes an action to examine the scope to introduce an ADR requiring seatbelt reminders for the driver's seat as an early priority and to later consider mandating reminders for all seating positions.

There is strong community demand for seatbelts in school buses, particularly on higher speed roads and/or higher risk routes. Serious crashes involving school buses are very infrequent in Australia. However, there is clearly potential for many children to be severely hurt or killed in a major crash and jurisdictions have taken steps in recent years to increase the availability of buses equipped with seatbelts. There is scope to do more in this regard, and to encourage greater wearing of bus seatbelts when they are available.

Unlicensed driving

Unlicensed driving has been identified by police as a factor in about 16 per cent of fatal crashes. Of course, simply being unlicensed does not imply that a driver is more likely to behave dangerously, but many unlicensed drivers have had their licences removed for earlier dangerous behaviour. Because unlicensed drivers are unlikely to be deterred by the normal licensing sanctions (for example, loss of demerit points), there is a need to look at other detection and deterrence measures to target this group. There has been some recent success in tackling this issue with the introduction of vehicle sanctions and improved detection through automatic number plate recognition cameras. However, further work needs to be undertaken to enhance these initiatives and apply them in a more strategic and coordinated manner at the national level.

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DIRECTIONS — what the strategy aims to achieve by 2020

- Elimination of driving while impaired by alcohol or drugs as significant contributors to road trauma.
- Elimination of illegal mobile phone use while driving.
- A substantial reduction in the rate of driving by those without a licence.
- All vehicle occupants are effectively restrained.

FIRST STEPS — actions for the first three years

34. Work in partnership with police to strengthen the deterrence effects of random breath testing programs (RBT) and random roadside drug testing programs, and to improve public awareness of these programs.

35. Review, in consultation with stakeholders and the community, the application of BAC limits currently applying to certain licence categories.

36. In relation to alcohol interlocks:

    a. Extend the application of alcohol interlocks to cover a wider segment of drink driving offenders.

    b. Undertake research on options to extend alcohol interlock applications to other high-risk road user groups and potentially to the broader driver population.

    c. Encourage voluntary use of alcohol interlocks by corporate fleets and other drivers.

    d. Investigate the option of requiring demonstrated rehabilitation from alcohol-dependence before removal of interlock conditions.

37. Expand the use of vehicle sanctions for repeat drink and drug driving offences.

38. Review (with liquor control commissions and the health and police sectors) the adequacy of operating responsibilities applying to venues for responsible alcohol serving.

39. In relation to mobile phones:

    a. Strengthen education and enforcement measures to improve compliance with current laws.

    b. Promote the safety benefits of phone-off policies (including hands-free) with all fleet operators.

    c. Examine the case for extending the coverage of novice driver prohibitions on mobile phone use (including hands-free) to include, for example, all 'P2' drivers or all young drivers under 26 years of age.

40. Address the risk associated with unlicensed drivers and unregistered vehicles:

    a. Increase traffic surveillance to improve detection of unregistered vehicles and unlicensed drivers.

    b. Extend the use of vehicle sanctions to drivers of unregistered vehicles, and unlicensed or suspended drivers.

41. Assess the risks on school bus routes and address risks through infrastructure improvements, vehicle safety features such as seatbelts and road user awareness programs.

42. Review international best practice and identify cost-effective interventions for dealing with high risk and repeat traffic offenders.

FUTURE STEPS — what else will be considered?

- In consultation with stakeholders and the community, examining the scope to reduce the legal blood alcohol concentration (BAC) limit for all drivers.

- Developing national workplace random drug testing standards for commercial vehicle industry application. Companies with testing regimes in place which meet this standard would have a defence against chain of responsibility prosecutions for drug driving.

- Investigating the use of emerging roadside drug testing technology to apply to other illicit and licit drugs.

- Compulsory blood testing for drugs and alcohol for all drivers involved in serious casualty crashes.

- Monitoring and assessing the evidence on driver distraction associated with mobile phones and other communication devices, for identification of potential countermeasures (including for professional drivers).

- Examining the use of seatbelt interlocks and other regulatory means to increase seatbelt wearing by heavy vehicle drivers.

How will progress be assessed?

Ongoing

- Number of drivers and motorcycle riders killed who had a blood alcohol concentration (BAC) above the legal limit

- Number of deaths from crashes involving an unlicensed driver or motorcycle rider

- Number of vehicle occupants killed who were not wearing a restraint

By 2014

- Report on delivery of action items 34 to 42.

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10. Making It Happen

10. Making It Happen

This strategy has the potential to achieve large and lasting road safety benefits for all Australians.

Realising that potential will require significant commitment by government agencies to implementing the targeted actions in this strategy, and by non-government agents to giving effect to the strategic directions in this strategy in those areas where they can influence road safety outcomes. It will also demand ongoing attention to the following management functions that will help to implement the evidence-based countermeasures needed to achieve the targets.

Results focus

Government responsibilities for road safety delivery are spread across multiple jurisdictions and among different agencies within jurisdictions. To achieve the best road safety outcomes, an overall management framework is required in each jurisdiction with a clear results focus. Other major participants within the community are encouraged to consider how they will contribute to improved road safety in Australia.

FIRST STEPS — actions within the first three years.

43. Examine the scope to improve institutional structures, capacities and delivery arrangements at a national level to optimise road safety efforts ahead of a scheduled review of this strategy in 2014.

44. If adopted by the International Standards Organisation, consider adopting and promoting the new standard for road traffic safety management systems (ISO 39001) — this is intended for all organisations wishing to reduce death and serious injury related to road travel, and will help them to define their contribution to this goal.

A stronger results focus and improved performance assessment for road safety will help bring all elements together (a long term vision to eliminate serious road trauma, interim targets over the next decade as a step towards that vision, and a series of interventions to achieve those targets) into a management approach that will ensure this strategy is delivered.

Linkages and Synergies

An integrated approach to road safety

This strategy provides a focus and direction for road safety policy and action over the next ten years. It does not exist in isolation and recognises

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that policy, decisions and action in many other areas can and do impact on the achievement of road safety outcomes and outcomes in other areas of society.

Road safety has close links with policies on transport, infrastructure, police, health, education, emergency services, energy, environment, employment, youth, research, innovation and technology, justice, insurance, trade and foreign affairs, among others.

Most importantly it is vital that while this strategy focuses on reducing the end result of injury or death on our roads, the roads and their use are a reflection and a part of our broader societal values, culture and behaviour.

There are many factors that will impact on road safety performance into the future. Economic conditions, environmental priorities and a range of other issues in society will bring many and varied transport challenges. Based on Safe System principles, much of road safety activity can be considered as a means to support:

- a more sustainable and active lifestyle
- improved environmental outcomes, which will reduce energy consumption and reduce greenhouse gas emissions
- reduced pressure on health and hospital systems from trauma and substance abuse
- improved workplace safety
- improved land use planning and urban amenity
- productive economic activity resulting from fewer crashes, reliable travel times and associated effects.

Viewing and approaching road safety from a broader public health perspective instead of just a transport perspective will allow for stronger linkages and synergies with broader actions to reduce issues like alcohol-related harm in our community. In this light road safety has strong links with the work of the Australian Government in preventative health where the National Health Preventative Task Force has established a vision of *Australia: the healthiest country by 2020*.

The health impacts of our road system include not only the deaths and injuries from vehicle traffic crashes, but also the disease cases due to exposure to road transport: air pollution, traffic noise, lack of daily physical activity due to vehicle travel rather than active transport (walking or cycling) and likely future health effects due to greenhouse emissions.

Major road safety linkages and synergies exist with the priority objectives of the National Health Preventative taskforce in contributing to:

- reducing the prevalence of harmful drinking for all Australians by 30%

- halting and reducing the rise in overweight and obesity
- meeting the *Closing the Gap* target for Indigenous people, reducing the 17-year life expectancy gap between Indigenous and non-Indigenous people.

Road safety, environmental and other health considerations have traditionally been dealt with individually or using a fragmented approach. The integration demonstrated by the shift of focus in this strategy is a substantial change compared with the present situation, and will allow authorities to:

- identify and address possible conflicts and inconsistencies at an early stage, when various decision options are still open
- achieve more efficient use of resources
- increase benefits when an action can contribute to addressing other issues
- achieve optimisation when an action contributes positively to one aspect and negatively to another by solving this dilemma before final decisions are made.

Increasing use of public transport is a good example of how this new approach can generate greater synergies between road safety and other societal factors. Buses and trains are safer modes of travel than cars and motorcycles, and the fewer people using light vehicles on the roads, the fewer road deaths and serious injuries will occur. Increasing the use of alternative modes of transport, as well as land use planning that reduces the demand for travel, will improve safety for all road users, improve health outcomes, reduce congestion and vehicle emissions, and support sustainable communities.

Government efforts to improve road safety benefit from strong partnerships between transport agencies and agencies in other key sectors, particularly health, police and education — recognising that road safety is, above all, a major public health issue.

This strategy is complemented by other national strategies and activities that are addressing specific areas of road safety, including:

- the *National Railway Level Crossing Safety Strategy 2010–2020*
- the *National Cycling Strategy*
- state and territory road safety strategies.

Coordination

Road safety progress depends on coordinating strong road safety partnerships effectively across all sectors — government, industry, business and community. Achieving the ambitions expressed in this strategy will require key government agencies to be well-aligned with the strategy.

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There will need to be engagement with those organisations that can directly influence and build community support for road safety.

FIRST STEPS — actions within the first three years.

45. Engage with organisations that can influence and build community support for road safety:

    a. Form a closer alliance between road, transport and police agencies to support the enforcement elements of the strategy.

    b. Work with and support local governments in improving the safety of local roads and communities.

    c. Work with the motor vehicle industry to advance the safety of Australia's vehicle fleet.

    d. Work with the National Road Safety Council to raise the profile of road safety as a major public health issue across government, industry, business and community sectors.

    e. Work with the National Heavy Vehicle Regulator and the National Rail Safety Regulator.

    f. Engage with key stakeholders to exchange expertise, experiences and research.

Legislation, regulation and standards

Legislation, regulation and standards will be needed to support some new directions to improve the safety net for road users in Australia. Some initiatives, such as nationwide improvements to driver licensing, will require decisions at a national level in order for them to be implemented effectively. Others will need to be left to individual jurisdictions to progress.

Funding and resource allocation

Sufficient resources will be required to meet these targets, from government, industry and the community. This will require additional investment or reallocation or reprioritisation of resources throughout the life of the strategy. Some interventions are significant and expensive, but there is opportunity to develop, trial and implement alternative low-cost measures.

Some initiatives are likely to require additional funding and options for this could include:

• Current funding being re-prioritised to activities which are deemed more important

• Additional funding being provided for specific initiatives

• A partnership arrangement with stakeholders

In each case, funding at all jurisdictional levels needs to be considered.

FIRST STEPS — actions within the first three years.

46. Explore opportunities to secure alternative sources of funding or shared funding arrangements for road safety activities, including targeted infrastructure investment[17].

47. Explore the allocation of monies collected for penalties imposed for camera detected offences, in excess of the administrative cost, to road safety education and awareness programs, injury rehabilitation programs, and road funding to improve the safety of sections of state and territory controlled roads.

Promotion and education

The ultimate success of the strategy will depend on the willingness of individual community members and organisations to support the changes that are needed to improve the safety of the road transport system. They will also need to accept their share of responsibility for road safety improvement. To this end, there is a need to promote public understanding of key policy directions in road safety and encourage public discussion about new road safety proposals.

FIRST STEPS — actions within the first three years.

48. Develop and maintain a National Road Safety Strategy website as a prime means of sharing road safety information and reporting on progress.

49. Ensure public education campaigns and resources are aligned with the Safe System objectives of this strategy.

Accountability

Adopting a system-wide perspective on road safety places primary responsibility on the 'system managers' — the organisations that design, build, maintain and regulate roads and vehicles — for ensuring safe conditions for all who use the road transport system.

The primary measure of success of this strategy will be the actual reduction in the number of serious casualties on the roads. This measure will be used to monitor progress towards the 2020 targets. Governments are responsible for planning, designing and managing the operation of a safe road transport system. They are expected to contribute leadership and resources to improving road safety, including developing and enforcing

17 For example, with the injury insurance industry (which would potentially see a commercial return on investment.

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laws, setting standards, providing safer roads, informing the public about road safety issues and requiring improvements in vehicle safety.

The Australian Government is responsible for allocating agreed infrastructure resources, including for safety, across the national highway and the local road networks, and for regulating safety standards for new vehicles.

State and territory governments are responsible for the funding, planning, design and operation of the road network, managing vehicle registration and driver licensing systems, and enforcing road user responsibilities.

Local governments are responsible for funding, planning, design and operation of the road networks in their local areas.

A broader range of individuals and organisations also influence the way the road transport system functions and the level of safety enjoyed by Australians. Chief among these are vehicle suppliers, employers (who have considerable power to ensure that their corporate policy and practice support a safety culture), freight companies, the vehicle marketing industry (which is expected to display social responsibility in the way it promotes vehicles for sale), automobile clubs and insurance groups (who have an important role in encouraging safety among their members and policy holders, as well as acting as advocates for safety), and transport and land use planning authorities.

Road safety practitioners need to work with these decision-makers to achieve mutually beneficial partnerships and improvements. All of these parties must work collaboratively towards the provision of a safe transport system.

FIRST STEPS — actions within the first three years.

50. Work with local governments to promote the development and implementation of local or regional road strategies.

51. From 2012 each Minister responsible for road safety (state, territory and federal) to report annually to their parliament on the progress in road safety, including safety performance indicators.

52. A review of the strategy will be undertaken before the end of 2014, including an assessment of the implementation progress, a review of the strategy objectives and targets, and identification of priority actions for the next three years.

Monitoring and evaluation

Progress towards the 10-year casualty reduction targets will depend on many factors, some of which are beyond the control of governments.

However, a feature of this strategy is a commitment to public accountability for its delivery. To this end, arrangements will be established to monitor national road safety progress, report on performance in implementing agreed actions, and periodically review the key elements of the strategy.

FIRST STEPS — actions within the first three years.

53. Publish and regularly update the key statistical measures of road safety progress.

54. Present an annual report to the Australian Transport Council documenting progress in implementing this strategy.

Capacity development, research and knowledge transfer

Continued research and development effort is required to ensure that road safety risk factors, and the most effective safety measures, are understood by road safety professionals and the wider community. Safe System thinking needs to be better understood and adopted in practice by all parties involved in the development and management of the road transport system, including road agencies, traffic managers and regulators, urban planners, the vehicle industry and transport operators. Australian road safety policy has always been firmly based on robust evidence and continued investment in research and data. However, there are gaps in national data collections that need attention; and ongoing research, analysis and evaluation activities will have an important role in informing road safety actions.

International assessments of capacity to deliver road safety have identified the need for lead agencies for road safety, with appropriate governance arrangements. Reviews of arrangements have allowed improvements, even in well performing countries such as Sweden.

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FIRST STEPS: Actions for the first three years

55. Work towards the adoption of nationally consistent road crash classification definitions and the development of an improved national serious injury database.

56. Work towards the creation of a national vehicle safety database to provide real-time research data on the characteristics of the Australian vehicle fleet and crashes.

57. Ensure that jurisdictional and Austroads road safety research programs adequately support the objectives of this strategy

58. Consider the scope for road safety management capacity reviews within each jurisdiction.

Training and staff development

Road safety experts typically evolve and learn on the job rather than coming into the field from degree courses in road safety. Typically road safety experts begin with qualifications and expertise in related fields such as engineering, road design, psychology or behavioural sciences, statistics, public health, health care, education or public policy. More formal training in road safety may help ensure best practice, evidence-based advice in road safety.

FIRST STEPS: Actions for the first three years

59. Review the training of road safety specialists and the value of offering more formal training/education opportunities in road safety.

Appendix 1

Organisations that contributed to the development of this strategy

The following organisations contributed to the development of the strategy, either via direct consultation or through lodging a submission:

AECOM

Alternative Technology Association

Amy Gillett Foundation, Bicycle NSW, Bicycle Transport Alliance WA, Cycling Australia, Cycling Promotion Fund, Retail Cycle Traders Association

ANCAP Australasia Ltd

ARRB Group Ltd

Australasian College of Road Safety

Australasian Fleet Managers Association

Australasian Road Rescue Organisation

Australasian Sleep Association

Australian Automobile Association

Australian Automotive Aftermarket Association

Australian Council of State Schools Organisations

Australian Driver Trainers Association (Victoria)

Australian Driver Trainers Association (National)

Australian Driver Trainers Association (South Australia)

Australian Hotels Association

Australian Injury Prevention Network

Australian Logistics Council

Australian Mobile Telecommunications Association

Australian Motorcycle Council

Australian Road Safety Foundation

Australian Trucking Association

Bankstown City Council

Belt Up for Safety [B.U.S.] Action Group

Bicycle Institute of SA

Bicycle Queensland

Bicycle Transport Alliance

Blue Mountains City Council

Bushwalking Australia

Bus Industry Confederation

Cairns Regional Council

Camden Council

Canberra Pedestrian Forum

The CarKit Company

Caulfield Community Health Service

Centre for Accident Research and Road Safety - Queensland

Centre for Automotive Safety Research

City of Unley

Clarence City Council

Council on the Ageing (NSW)

Curtin-Monash Accident Research Centre

CycleSafe, Armidale

Dalgarno Institute

Darebin City Council

The Drive 1 Team

Engineers Australia

Fairfield City Council

Fatality Free Friday Road Safety Foundation

Federal Chamber of Automotive Industries

Freight Metrics Pty Ltd

The George Institute for Global Health

Honda Australia Motorcycles & Power Equipment

Injury Risk Management Research Centre

Institute of Public Works Engineering Australia (NSW)

Institute of Public Works Engineering Australia (QLD)

Institute of Transportation Engineers, Australia & New Zealand Section

International Road Assessment Programme (iRAP)

Isolated Children's Parents' Association of NSW

Kids and Traffic — Early Childhood Road Safety Education Program, Macquarie University

Kidsafe — The Child Accident Protection Foundation of Australia

Liberal Democratic Party

Liverpool City Council

Local Government Association of NSW

Local Government Association of South Australia

Monash University Accident Research Centre

Motor Accident Commission SA

Motorcycle Council of NSW

Motorcycle Riders Association of Queensland

Motorcycling Australia

National Heart Foundation

National Infrastructure Coordinator

National Motorists Association

National Road Safety Council

National Transport Commission

Native Vegetation Council

NRMA Insurance, SGIO, SGIC

NSW Department of Health

NSW Driver Trainers Association

NSW Police Force

NSW Roads & Traffic Authority

Older People Speak Out

Pedestrian Council of Australia

People for Ecologically Sustainable Transport

Public Health Association of Australia, NT Branch

Public Transport Users Association

Queensland Road Safety Advisory Group and Queensland Motorcycle Safety Advisory Group

RACQ

Regional Development Australia — Townsville and North West Queensland

Research on Alcohol Drugs and Driving (RoADD) Group

Royal Australasian College of Surgeons

Safe Speed Interest Group

School Drug Education and Road Aware

Shire of Plantagenet

South Australian Farmers Federation

South Australian Freight Council

South Australia Police

Suncorp

3M Traffic Safety Systems Division

Townsville and Districts Motorcycle Riders' Association

Transport Workers Union (Victorian/Tasmanian Branch)

Transport Workers' Union of Australia

Transurban

Truck Industry Council

Ulysses Club

Victoria Police

Victorian Automobile Chamber of Commerce

Victorian Freight and Logistics Council

Victorian Transport Association

WA Department of Education

WA Local Government Association

WA Minister for Police, Emergency Services, and Road Safety

Women's Christian Temperance Union

Willoughby City Council

Working Against Culpable Driving

Youth Affairs Council of South Australia

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