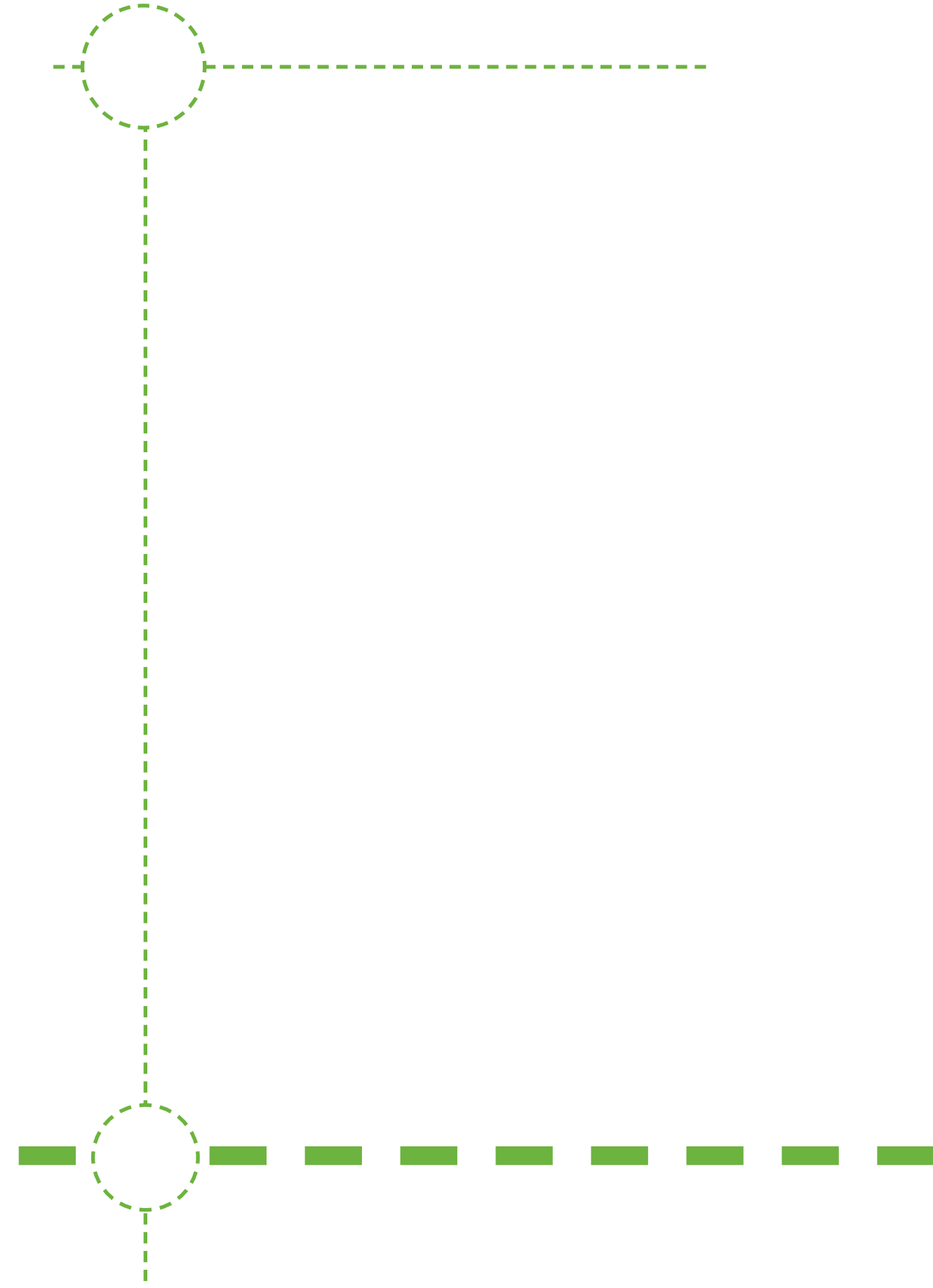
National Road Safety Action Plan 2007 and 2008

Australian Transport Council

National Road Safety Action Plan

2007 and 2008



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Introduction

Despite impressive improvements in road safety since the early 1970s, road trauma continues to impose a massive burden on the Australian community. The annual economic cost of road crashes in Australia has been conservatively estimated at $18 billion. But even this enormous figure cannot adequately convey the pain, grief and suffering of road crash victims, their families, friends and the wider community.

Road crashes disproportionately affect younger members of society and therefore have a relatively large impact on years of productive life lost. For each road death there are about 13 serious injuries – many with long-term impacts involving loss of quality of life and costly rehabilitation.

In Australia, annual road deaths have fallen from a peak of 3,798 in 1970 to current levels of approximately 1,600. Over that period, road travel has increased by almost 150 per cent. Our success in reducing road trauma has resulted from concerted action by governments, the community, industry and road safety professionals.

The *National Road Safety Strategy 2001–2010* aims to reduce the annual number of road deaths per 100,000 population by 40 per cent to no more than 5.6 by December 2010. This target corresponds to at least 560 fewer road deaths per year. Because of data limitations, the Strategy did not adopt a numeric target for injury reductions, but reducing injuries is an important objective, and the actions presented here are expected to reduce injuries as well as deaths. The Strategy is supported by two-yearly action plans of which this is the fourth.

As we now assess progress after the mid-point of the 10-year Strategy, we appear to be at risk of failing to achieve the 2010 national target: though road death rates have dropped by more than 20 per cent in some jurisdictions relative to their pre-Strategy rate.

Road deaths and injuries are preventable. Research and best practice interventions have given us knowledge about strategies and measures that can significantly improve road safety. It is clear that we now need strong and focused efforts to achieve another major *step-down* in road trauma: a substantial and sustained reduction in deaths and injuries. Measures outlined in this Action Plan have the potential to achieve such a result, get us back on track towards the 2010 target, and provide the foundations for longer term improvements.

Road safety involves individual and shared responsibility. All road users have primary responsibility for making safe decisions. Governments' share of the responsibility is to provide the necessary leadership and resourcing to improve road safety, including developing and enforcing laws, providing safer roads, informing the public about road safety issues and fostering improvements in vehicle safety. Employers have the power, and therefore the responsibility, to influence the way the road network is used by ensuring corporate policy and practice support a safety culture on our roads. Vehicle manufacturers can provide leadership in producing safer vehicles and displaying social responsibility in the way vehicles are promoted for sale. Road user, employee and insurance groups also have an important role among their members and policy holders.

This Action Plan has been developed to provide a clear focus on initiatives that offer the most realistic prospect of substantial safety gains. The mix of measures adopted in individual jurisdictions, and the details of specific measures, will vary to reflect local circumstances and priorities. The Action Plan also cannot pre-empt the outcome of community consultation, administrative and legislative processes required before implementation of many of these measures. However, all jurisdictions agree that research supports a focus on these priority areas.

Summary of key directions

Approaches to improving road safety in Australia will continue to be guided by 'safe system' principles, which fundamentally involve two objectives: making the road transport system more forgiving of human error, while acting to minimise the contribution of unsafe road user behaviour to road crashes.

Vigorous action is required in 2007 and 2008 by all jurisdictions to achieve a major step-down in road deaths: to get back on track towards the 2010 National Road Safety Strategy target, and to provide a basis for continuing progress beyond 2010. This will involve concurrent short and longer term actions in several areas:

- education and enforcement measures addressing road user behaviour, with speed management as an important priority
- improving the safety of roads and roadsides
- accelerating the introduction of vehicles with improved safety systems.

Communication strategies will be designed to engage the community in road safety and convey a better understanding of road risk issues to all road users.

All jurisdictions will work towards achieving a more effective performance monitoring and progress measurement system, including the development of a set of key road safety performance indicators.

Recognising that road safety is a major public health issue, more effective partnerships will be built between the road safety and health sectors to raise the national profile of road safety and incorporate the research and perspectives of the health sector in addressing issues.

A high level of cooperation among and within jurisdictions has characterised Australia's progress in road safety.Building on this, road safety agencies, local government authorities, police services and other agencies involved in road safety will collaborate even more comprehensively in implementing a range of measures supported by research and intelligence. More extensive international collaboration and knowledge sharing are also planned.

Specific action items supported by research and analysis are set out in Section 4.

1.0 Background

1.1 Road safety and other social objectives

Approaches to improving road safety should not exist in isolation and it is important to consider the potential for achieving wider community objectives such as those associated with transport efficiency and sustainability.

Road safety initiatives are generally valued solely on the basis of the level of trauma reduced. However, it is important to improve our understanding of the effects of safety policies and assess their wider social benefits. For example, speed reduction can result in reduced fuel consumption, emissions and noise. Low-speed shared road environments are conducive to walking and cycling – improving community cohesion, supporting community health objectives and reducing trauma, particularly for pedestrians.

1.2 Safe system principles

Safe system principles outlined in the *Action Plan for 2005 and 2006* continue to underpin this Action Plan.

A safe road system requires responsible road user behaviour, but human error is an inevitable factor in any transport system. A safe transport system makes allowance for human error, and minimises the consequences: in particular, the risk of death or debilitating injury.

Roads and vehicles should be designed to reduce the risk of crashes, and to reduce the harm to people if a crash does happen.

There are limits to the forces humans can withstand in a crash, and limits to the physical energy that can be absorbed by protective systems. Speed management is a critical factor in limiting the impact energy of crashes.

In managing road safety, the *safe system* approach requires:

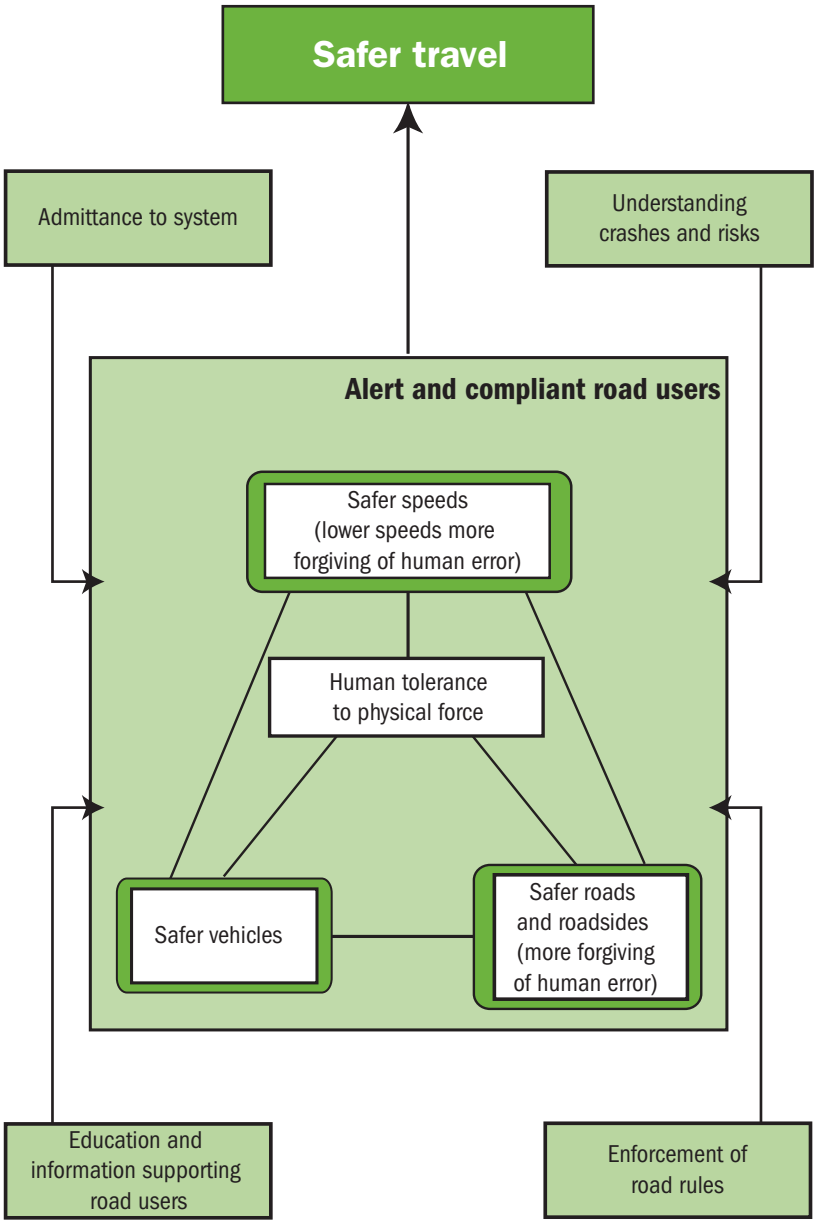
- designing, constructing and maintaining a road system (roads, vehicles and operating requirements) so that forces on the human body generated in crashes are generally less than those resulting in fatal or debilitating injury
- improving roads and roadsides to reduce the risk of crashes and minimise harm: measures for higher speed roads include dividing

traffic, designing 'forgiving' roadsides, and providing clear driver guidance. In areas with large numbers of vulnerable road users or substantial collision risk, speed management supplemented by road and roadside treatments is a key strategy for limiting crash forces

- regulating or encouraging high quality active and passive safety systems in vehicles to reduce impact forces on occupants and on struck pedestrians and cyclists
- managing speeds, taking into account the risks on different parts of the road system
- advising, educating and encouraging road users to obey road rules and to be unimpaired, alert and responsive to potentially high-risk situations
- using enforcement and penalties to deter road users from breaking the rules, including removing the privilege of road use from those who do not comply
- programming research to identify the most cost-effective interventions for particular situations
- promoting public understanding and endorsement of the safe system approach, and public participation in achieving a safer road system.

The safe system framework is shown in Figure 1.

Figure 1: The safe system framework



1.3 A clash of perspectives

There is a fundamental difference in perspective between the 'top down' view of road safety professionals, and the 'bottom up' view of individual road users.[1]

Crash data, analysis and research clearly identify road crashes as a significant public health risk and allow road safety professionals to identify measures that could reduce the aggregate risk. Individual road users tend to under-estimate or ignore many of the risks. Although serious crashes happen every day on our roads, they are rare in the experience of individual road users. Based on personal experience, most road users conclude that whatever they have been doing is 'safe', and that their own risk is negligible when they use the road.

For road safety professionals, communicating an understanding of this issue to road users presents a major challenge.

1.4 The cost of road crashes

The annual economic cost of road crashes in Australia has been conservatively estimated to be at least $18 billion in 2005 (Australian Transport Safety Bureau (ATSB) estimate based on a study by the Bureau of Transport Economics of the cost of crashes in 1996[2]). For most people this figure has little meaning or impact mainly because the costs are distributed across the community: among crash victims and their families, the health system, and many others including vehicle owners through payment of insurance premiums. Resources are consumed in vehicle repair and replacement and in the provision of insurance.

While the aggregate economic cost and its major components are enormous, and generally not well understood, the social, physical and emotional impacts of road crashes are devastating for many individuals.

Perception issues relating to road trauma are highlighted when public and political responses to other destructive events are considered. Appropriately, natural disasters and acts of terrorism activate immediate relief efforts, government support and high levels of emotional empathy, yet deaths and injuries due to these causes are small compared with the approximately 1,600 deaths and 22,000 serious injuries from road crashes in Australia each year. Likewise, responses to airline disasters, rail catastrophes and sinking ships are swift and emotive, while more people die and are seriously injured in road crashes in an average week in Australia than those who are similarly affected in all the other transport modes in a year.

1.5 The National Road Safety Strategy (NRSS)

The National Road Safety Strategy 2001–2010 endorsed by the Australian Transport Council (ATC) of Ministers in November 2000, provides the vision and guiding principles to drive improved road safety performance in Australia.[3] It provides the framework within which all governments implement road safety initiatives and sets the broad goals which form the basis of individual state and territory road safety strategies.

1.5.1 The NRSS target

The NRSS has a target of bringing the annual number of road deaths per 100,000 population below 5.6 by the end of 2010, representing a 40 per cent reduction relative to the benchmark 1999 rate. The target was established through a process of expert analysis and research which took account of evidence of prior performance and assessment of potential gains from ongoing measures and expected new initiatives. Indicative estimates were provided of the contribution of different types of measures to the overall 40 per cent target: improvements in roads (19 per cent); improved road user behaviour (9 per cent); improved vehicle occupant protection (10 per cent); and new technology to reduce human error and its consequences (2 per cent).

Many OECD countries have similar targets. The European Union has a target of a 50 per cent reduction in the number of road deaths in the decade to 2010[4] – a substantially larger percentage reduction in deaths than the Australian target. This reflects the confidence of road safety experts in other countries that a major step-down in road deaths is achievable.

Research suggests that countries which have road safety targets tend to perform better than countries without targets and that countries with ambitious targets generally have better outcomes than those which have less ambitious targets, even if the targets are not achieved. The Australian target was research-based. It was challenging but also realistic.

1.5.2 Responsibility

The responsibility for reducing road trauma is shared among governments, communities, industry, business and individuals. Collaborative action among jurisdictions and among agencies within jurisdictions is a feature of Australian road safety management.

Formal collaborative actions extend beyond government to embrace community groups, business and industry based on the understanding that success requires businesses, community groups and individuals to commit to

safety actions to complement government initiatives. This sense of shared responsibility is a fundamental tenet incorporated in the NRSS.

1.5.3 Action Plans

This is the fourth in a series of biennial action plans – a key driver for achieving the NRSS target. The Action Plans are developed by all Australian jurisdictions in a collaborative process that includes input from the National Road Safety Strategy Panel. Action Plans are endorsed by the Australian Transport Council.

The Action Plans focus on priority issues, rather than list every action that might be taken to improve road safety.

This Action Plan addresses areas where improved performance is needed and represents a focused approach in seeking to meet the target of reducing the road death rate by 40 per cent in the decade to December 2010. It also highlights the need for commitment to some key elements to substantially improve the likelihood of achieving the target. These include:

- accepting *safe system* principles as a basis for action
- achieving a substantial *step-down* in deaths during 2007 and 2008
- raising the public and political profile of death and injury on the roads
- improving community understanding of the factors affecting road trauma
- enhancing the scale of key safety initiatives and doing more of what saves most lives
- increasing the level of collaboration and shared responsibility for action among all stakeholders
- treating death and injury on our roads as a wider public health problem, not just as a transport issue
- monitoring and reporting progress of all planned actions and evaluating results.

1.5.4 Related strategies and coordinating mechanisms

This Action Plan is complemented by other initiatives and strategic processes addressing specific areas in road safety:

- the National Heavy Vehicle Safety Strategy and Action Plan
- the Indigenous Road Safety Working Group
- the International Visitor Road Safety Working Group
- the National Railway Level Crossing Safety Strategy
- the Australian National Cycling Strategy.

2.0 Review

2.1 Progress

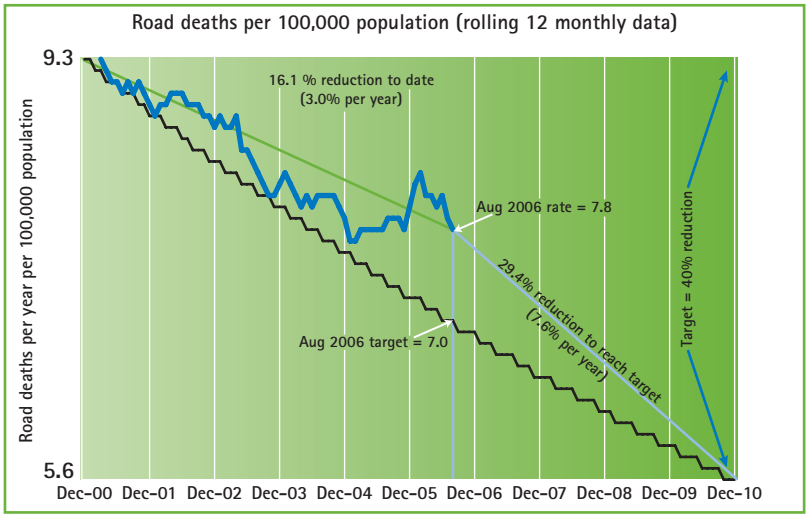
By August 2006, progress towards achieving the NRSS target was well behind the required pro-rata rate. Uniform progress towards the target required a rate of 7.0 fatalities per 100,000 population by the end of August 2006; the actual rate was7.8. There had been a 16.1 per cent reduction relative to the 1999 benchmark rate, compared with a 25.1 per cent reduction required for uniform progress towards the 2010 target.

Figure 2 shows the actual death rate per 100,000 population, relative to a uniformly decreasing trend line. It is evident from the figure that, up to the end of 2004, the death rate was essentially on track to reach the 2010 target, although the trend line has been above the line of uniform progress for most of the period since the NRSS commenced. However, since the end of 2004 a substantial gap has developed between actual outcomes and targeted progress.

Random or inexplicable fluctuations in road death data over short periods are common, and despite the increase in the rate since early 2005 there may still be an underlying long-term downward trend. Even so, the data present a challenge.

To achieve the target, we now need a national death rate reduction of 28.4 per cent over 4¼ years: equivalent to 7.4 per cent per year. The average rate achieved from the commencement of the NRSS has been 3.0 per cent per year. These figures suggest that reaching the target now presents a formidable challenge and requires an intense and sustained effort.

Figure 2: Australian road deaths per 100,000 population



Source: ATSB

Table 1 shows average state and territory death rates for the 24 months to August 2006 compared with the average for 1999 and 2000. All states and territories, with the exception of Tasmania, have shown an improvement in the rate between the two periods.

Table 1: Average jurisdictional road crash death rates per 100,000 population

	NSW	*VIC*	*QLD*	*SA*	*WA*	*TAS*	*NT*	*ACT*	*Aust.*
1999 + 2000	9.2	8.4	8.9	10.5	11.5	10.2	25.7	5.9	9.4
24 months to August 2006	7.6	6.5	8.1	8.9	8.8	10.9	23.9	5.4	7.8
% change	-17%	-23%	-9%	-16%	-24%	+7%	-7%	-9%	-17%

Source: ATSB calculations based on data from states and territories.

2.1.1 Road user groups and crash types

Comparing 2004 and 2005 with 1999 and 2000 (the two years before the commencement of the NRSS), the largest percentage reductions in deaths have been for:

- pedestrians (24 per cent)
- crashes involving articulated trucks (23 per cent)
- vehicle occupants in multiple-vehicle crashes (20 per cent)

- cyclists in multiple-vehicle (motor vehicle and bicycle) crashes (5 per cent).

There has been little reduction in deaths for vehicle occupants in single-vehicle crashes, and motorcycle deaths have increased by 20 per cent for single-vehicle crashes and 15 per cent for multiple-vehicle crashes.

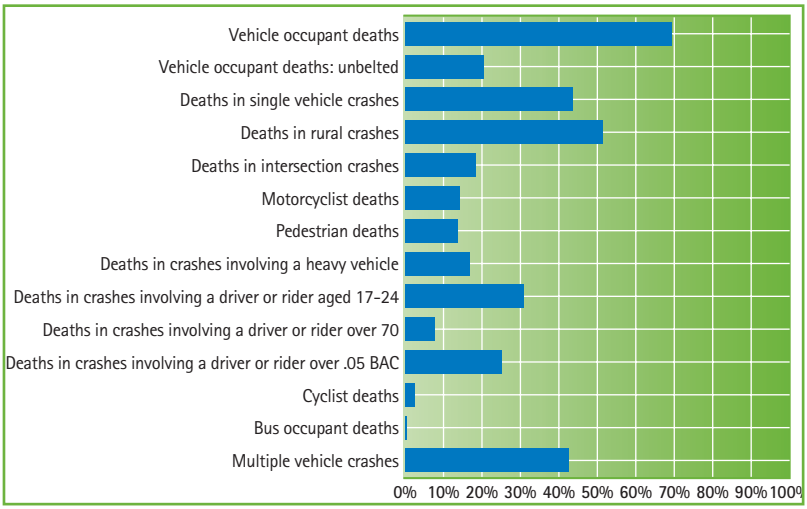
Table 2: Road deaths by road user group and crash type

	1999	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*Change: last two years relative to first two*
Vehicle occupant: single-vehicle crash	577	648	604	658	634	608	603	-1%
Vehicle occupant: multi-vehicle crash	670	654	579	548	532	524	530	-20%
Pedestrian	299	287	290	249	232	223	223	-24%
Motorcyclist: single-vehicle crash	66	80	89	101	61	81	94	+20%
Motorcyclist: multi-vehicle crash	110	111	127	123	127	115	139	+15%
Bicyclist: single-vehicle crash	2	3	3	1	4	10	11	not calculated (small numbers)
Bicyclist: multi-vehicle crash	38	28	43	33	22	33	30	-5%
Deaths involving an articulated truck	191	208	178	200	171	149	158	-23%
All road users*	1764	1817	1737	1715	1621	1598	1635	-10%

** Includes cases with missing data for crash type or road user group*

Figure 3 shows the different road user groups and crash types as a percentage of total Australian road deaths.

Figure 3: Deaths in different road user groups and crash types as a percentage of total Australian road deaths



Note: Based on 2005 data where available; older data used for some categories; categories are not mutually exclusive.

Source: ATSB

2.1.2 Implementation of Action Plan for 2005 and 2006

A comprehensive report on action taken in each area of the Action Plan for 2005 and 2006 has been compiled for all jurisdictions. It is available on the Australian Transport Council Website at http://www.atcouncil.gov.au/documents/atcnrss.aspx. It identifies:

- the wide range of initiatives undertaken to make roads safer
- activities to moderate speeds of drivers and riders
- initiatives to address road user behaviour, including impaired driving (alcohol and drugs)
- action to improve graduated licensing for novice drivers
- some initiatives targeting the growing issue of driver distraction
- action on enabling legislation and piloting of random roadside drug testing
- enhanced enforcement activity.

In other areas of the Action Plan the initiatives have been either small-scale or investigatory in nature.

2.2 Why are outcomes not better?

2.2.1 Exposure factors

Growth in total travel in recent years has been somewhat greater than was expected when the NRSS was developed: from 2001 to 2004 the increase was 11.7 per cent in terms of vehicle-kilometres travelled. The rate of increase in usage has been particularly rapid for motorcycles. Appendix 1 outlines changes in the total amount of travel and the types of vehicle being used.

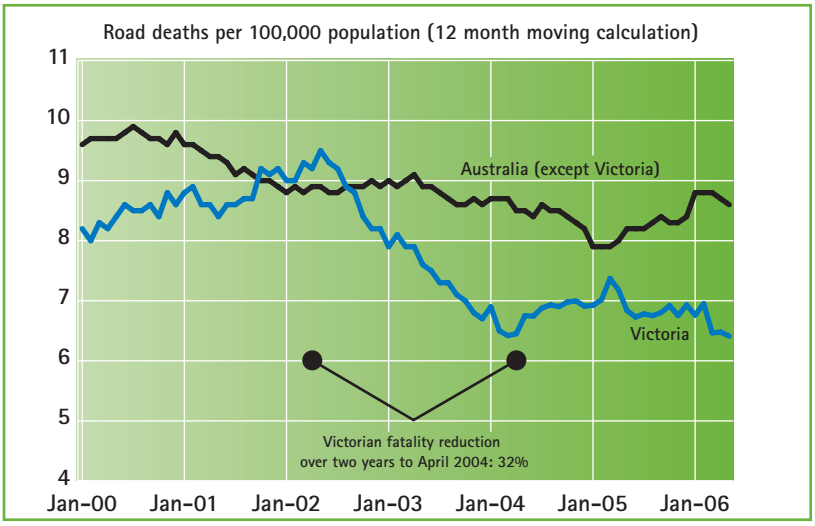
2.2.2 Scale of key activities

There was consensus among experts consulted in the preparation of the Action Plan for 2005 and 2006 that two action areas critical to achieving required reductions in the death rate were speed management and road engineering measures. While much activity has been undertaken in these areas in accordance with the Action Plan, outcomes suggest that the scale of these activities across Australia has not been sufficient.

Speed management

Improvements in speed management have generally been incremental since 2000, but in Victoria large scale integrated speed management initiatives were implemented from early 2002. Measured travel speeds declined on many parts of the road network, not just at enforcement sites. These changes were followed by a large and sustained reduction in road deaths (Figure 4), particularly among vulnerable road users and in urban areas, where the effect of travel speeds was greatest. There is evidence that improved speed management has made a major contribution to the overall improvement in road safety outcomes in Victoria.[5]

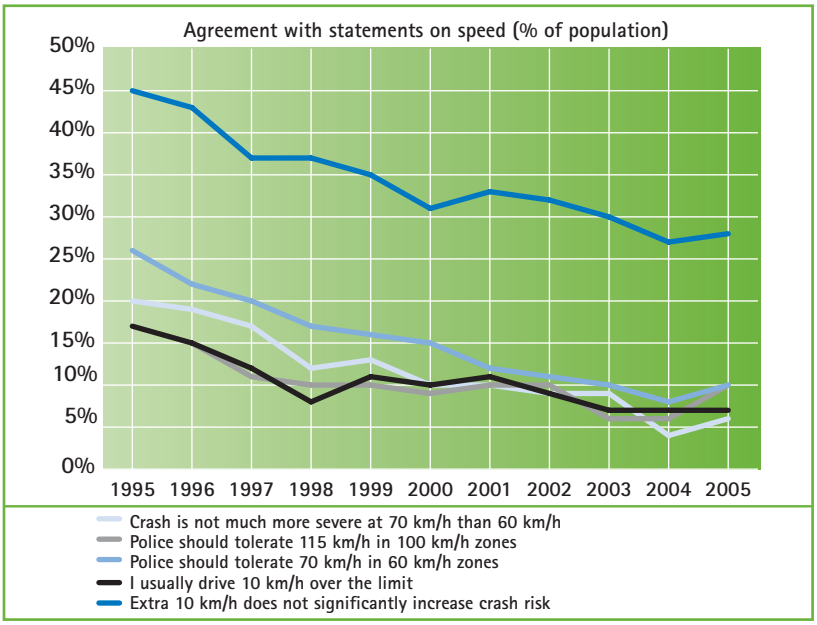
Figure 4: Road death rates in Victoria and the rest of Australia



Source: ATSB

Figure 5 shows that public understanding of the need to reduce vehicle speeds has been growing substantially; however, despite this, the views of those opposed to stricter speed management continue to have influence.

Figure 5: Community attitudes to speed: 1995–2004



Source: ATSB Community Attitudes Surveys.

Safer roads

General investment in road infrastructure maintenance and improvement, and targeted investment in road safety improvements (such as black spot remediation, and application of low-cost, high-effectiveness treatments to lengths of road), are both important for safety outcomes.

Overall road expenditure by the Australian Government remained fairly constant in real terms over the five years to 2005–06, but there will be a substantial increase over the next three years.

The Australian Government has operated Black Spot Programmes since July 1990. The current Programme commenced in July 1996 and involved initial funding of $36.25 million per year. In 2004 the Australian Government decided to spend an additional $90 million in 2006–07 and 2007–08 ($45 million a year) to extend the Programme to June 2008.

Additionally, states and territories have their own safety-targeted road improvement programs, which in aggregate are now larger than the Australian Government program.

For 1999–2000 total state and territory expenditure on such programs was estimated at $44 million, rising to $243 million in 2005–06, giving a national total of $287 million. Average total annual expenditure in the four years to 2004–05 was $230 million.

The economic benefit of such expenditure is estimated to average around $5 per dollar spent,[6] with an accumulating safety benefit of about 24 deaths prevented per year from a $287 million program. Sustained expenditure of $287 million per year over four years would reduce annual deaths by almost 100. Greater investment in these programs would produce commensurately larger benefits.

Vehicle safety

Improvements in vehicle crashworthiness have continued to contribute to reduced injuries consistent with expectations. However, vehicle systems to strongly encourage seat belt use, increase speed awareness, improve dynamic stability and reduce head injuries in side impact crashes have been provided in a minority of new vehicles sold in the last few years.

2.2.3 Other factors

There are several other factors which may have contributed to slower progress in improving safety outcomes. As data relating to these factors are limited or unavailable, it is not possible to assess the degree, if any, of their contribution.

Learning effects

It is possible that 'learning effects' have to some extent eroded the impact of established enforcement programs. Over time, motorists tend to learn when and where enforcement is likely or unlikely. Offending without detection can be a significant behaviour-reinforcing experience leading to repeated or habitual behaviour. If enforcement information is publicly available (for example, the locations of speed cameras) it can strengthen these adverse learning effects.

The limited resources for enforcement across the vast Australian road network can compound these problems. Over half of all fatal crashes occur in rural or remote areas of Australia.

Distraction

A number of research studies have shown that using mobile phones – both hand-held and hands-free – while driving is a significant cause of distraction. The 2005 ATSB Community Attitudes Survey found that 84 per cent of active drivers had a mobile phone and 47 per cent reported having used it while driving. According to the survey, around 16 per cent of drivers read text messages while driving and about 8 per cent sent messages while driving.

Research has shown that there are a number of other sources of in-vehicle distraction including eating, smoking, conversation, passenger behaviour, navigation systems and audio and video equipment. The proliferation of potential external sources of distraction such as advertising billboards and traffic signs has also tended to increase the complexity of the driving task.

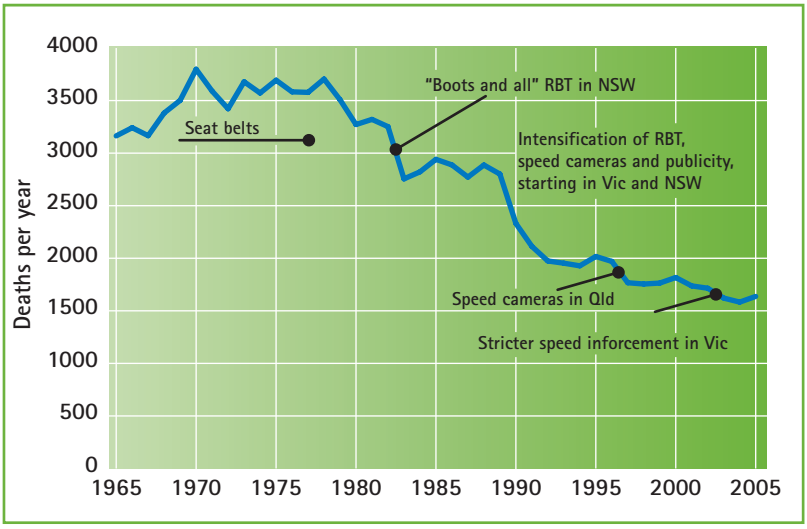
3.0 The Challenge to meet the 2010 Target

As noted earlier, achieving the NRSS target of no more than 5.6 fatalities per 100,000 population by December 2010 has now become a formidable challenge. It is clear that maintaining the incremental improvements expected from the range of measures currently in operation and their level of implementation in each jurisdiction will not produce the required result.

Experience indicates that progress in road safety has been characterised by short periods of major casualty reductions (large downward steps) followed by longer periods of consolidation of these benefits with smaller incremental gains. Figure 6 shows periods associated with major road safety initiatives. In several cases, major initiatives in just one or two jurisdictions produced effects large enough to show up in the aggregate national data. Concerted action is required to achieve another big step-down in deaths to bring the 2010 target back within reach.

Rapid step changes in total road casualty figures are usually the result of programs that target high-risk road user behaviour. The benefits of vehicle and road infrastructure measures accrue more gradually, but are critically important to the end result over a period of years.

Figure 6: Road deaths in Australia: 1965 to 2005



Source: ATSB

3.1 Step-down strategy

Jurisdictions are of the view that vigorous action must be taken during the life of this Action Plan to generate a substantial and sustained reduction in road deaths and injuries – a major *step-down* – if there is to be any prospect of getting close to the target or reaching it by the end of 2010.

The action proposed to bring the target within reach is based on commitment by jurisdictions to implementing major initiatives designed to achieve a *step-down* in casualty numbers. Consistent with the safe system framework, the *step-down* strategy involves parallel application of complementary measures addressing road user behaviour, roads and vehicle safety. Expansion of road-based safety treatments and improved speed management are essential elements of the package. In both areas, outcomes will depend on the scale of the measures implemented. The overall package will continue to reduce road trauma beyond the two-year horizon of this Action Plan.

A major step-down in road deaths: the French experience

There were 5,731 road deaths in France in 2003 – a 21 per cent reduction (1,511 deaths) compared with 2002.

This impressive improvement resulted from behaviour change programs commencing in 2002 following a decision by President Jacques Chirac to make road safety one of three major focuses of his term of office.

Measures proposed by the French Inter-ministerial Committee on Road Safety in December 2002 were implemented in 2003. These measures included an increase in penalties for failing to wear seatbelts or helmets, for using mobile telephones while driving and for driving under the influence of alcohol.

Enforcement measures relating to speed and alcohol were intensified and the increased penalties were applied for violations. The effectiveness of these measures was enhanced by wide media coverage and resulted in a significant change in behaviour relating to driving under the influence of alcohol, speeding and seatbelt wearing.

The improvement in safety on roads in France in 2003 compared with 2002 included reductions of: 22 per cent in deaths on open country roads; 27 per cent in deaths on national roads; 28 per cent in pedestrian deaths; 24 per cent in motorist deaths and 24 per cent in deaths in the 25–44 year age group.

The measures intensively applied in France in 2003 have been proven by research and experience. Most were introduced in Australia many years ago. However, the French experience shows that intensive implementation of proven measures can bring about the step-down change now required in Australia.

3.2 Performance monitoring

More effective performance monitoring and progress measurement will be implemented by all jurisdictions. These include: measures to assess the scale of programs (inputs); measures to assess shifts in behaviours or attitudes as a result of programs (outputs); and measures to monitor safety improvements across each of the key areas of safer roads, safer road users and safer vehicles (outcomes).

Outcome measures will include effects on numbers of deaths and, where possible, assessment of progress in reducing injury. Features of the performance monitoring regime to be adopted include:

- implementing a revised system of reporting on actions against the Action Plan designed to distinguish key initiatives from research and other investigations
- reaching agreement across jurisdictions about definitions of road deaths and injuries to enable consistent reporting at the national level
- establishing new performance indicators for behavioural and community perspectives
- selecting specific enforcement activity measures to apply across all jurisdictions.

3.3 Public health

Building partnerships with health professionals is a means of achieving linkages across professional disciplines and facilitating effective collaboration.

For example, fostering increased use of emergency crash notification systems (section 4.3) provides the opportunity for jurisdictional road safety agencies to help the health sector improve the delivery of medical assistance.

At a broader level, activities intended to enable road safety to be perceived as a major public health issue are a key feature of the Action Plan. Road trauma is a major contributor to diminished public health. It is the leading cause of death among young Australians and needs to be addressed with similar priorities and approaches as major diseases such as heart disease, cerebrovascular disease, major depression, HIV/AIDS and cancer.

Reductions in road trauma have immediate and significant benefits in public health with lower numbers of people requiring treatment and rehabilitation which is often of a long-term nature. The medical, rehabilitation, ambulance and long-term care costs comprise about 28 per cent of the human costs and 16 per cent of the total costs of road crashes in Australia. On average, the economic cost of a road crash death is $1.9 million, a serious injury, $407,000 and a minor injury, $15,000 (2005 dollar values). Substantial proportions of these costs are sustained by the health system; allocating these resources to road crash casualties means that correspondingly less resources are available to address other public health priorities. Improving road safety would mean releasing hospital bed-days and medical resources

for treating other patients. Additional benefits to the health sector could accrue by way of a lower incidence of lifestyle-related diseases due to safer cycling and pedestrian activity.

There is scope for greater involvement of health authorities and agencies in the cooperative arrangements for managing road safety, researching trauma care and fitness to drive issues and raising the level of road safety advocacy. There is also potential for closer collaboration with health and hospital authorities to gather better data on serious injuries due to road crashes, including data on long-term rehabilitation.

3.4 Collaboration

Implementation of this Action Plan will feature even greater levels of collaborative action among jurisdictions and agencies to achieve positive outcomes. Effective partnerships, multi-departmental management arrangements and multi-disciplinary interventions are a feature of Australian implementation of road safety policy that has been recognised and lauded internationally.[7]

Building on this success, jurisdictions have identified the need for more comprehensive collaboration including:

- collaboration in engaging the community in road safety
- combining activities across jurisdictions to expedite the introduction of vehicle safety innovations as standard inclusions in vehicles sold in Australia
- forging closer links between road safety agencies, police and other agencies involved in implementing electronic enforcement methods such as speed-and-red-light cameras and point-to-point speed enforcement
- engaging with the vehicle industry on access to research and data
- developing means for disseminating knowledge of effective road and roadside treatments arising from recent initiatives
- cooperating to avoid overlap or duplication of activities addressing innovative technologies and their application
- coordinated participation in international forums to share knowledge on successful initiatives and to learn from the experiences of other countries.

Additionally, more extensive collaboration will be undertaken on a global level as part of Australia's contribution to emerging world initiatives on road

safety. Participation, to the extent possible, in global road safety programs through provision of Australian expertise and knowledge, particularly in the Asia-Pacific region, will be a feature of this collaboration. Australia has much to give in this context, and increasingly much to learn, as all countries address the enormous global challenge of road crash injury.

3.5 Engaging the community

Road safety is a community health and welfare issue and road safety interventions need to be supported and accepted by the public. A number of key principles have been outlined which underpin both the National Road Safety Strategy and this Action Plan. Generating public support for the interventions in this Action Plan requires measures to engage the community and to extend community understanding of these principles.

The general public needs to be constantly provided with information about the influence of speed on deaths and injuries, and the substantial benefits resulting from even small reductions in speed. Bi-partisan support and leadership are required to maximise community acceptance of speed reduction initiatives.

Similarly, improved public understanding of the road trauma impacts on livelihood and lifestyle, the research basis for growing problems such as driver distraction, and the benefits of expenditure on safer roads is critical for continuing support of the range of actions proposed in this Action Plan.

Additionally, segments of the wider community that have substantial influence must be engaged to ensure understanding and cooperation. Links with the health and environment sectors need to be established or strengthened. The benefits of reduced road trauma to the health system by way of reduced demand for hospital bed-days and emergency and intensive care resources need to be highlighted to generate greater support of the health sector.

There has been a tendency in some areas of motoring journalism to attempt to undermine speed management and other safety interventions. It is important to establish stronger links with this sector to promote sound understanding of the scientific and research basis for road safety interventions.

Support for the key principles underlying this Action Plan from those involved in the broad political process will be essential. These principles include the safe system philosophy, the fact that a major step-down in road trauma is possible, and the benefits of the interventions outlined in this Action Plan.

4.0 Action areas for 2007–2008

This Action Plan provides both the rationale and the information base to undertake effective community engagement. Jurisdictions will work individually and collaboratively to achieve such engagement.

This section sets out the major areas in which action is required in 2007 and 2008. Research-based findings for each action area are set out together with key actions and key performance indicators.

4.1 Safer Speeds

Moderation of speeds chosen by drivers and riders is critical in establishing a safer road system. Speed reduction has a dual impact on road trauma because travel speeds influence the number of crashes that occur as well as the severity of crashes. The number of crashes that occur reduces at lower speeds because road users have more time for decision making, are less likely to lose control, and can stop in a shorter distance. Additionally, lower speeds result in reduced injury severity in crashes which do occur because of the lower levels of crash impact energy involved.

What is known

- Speeds just 5 km/h above average in urban areas and 10 km/h above average in rural areas are sufficient to double the risk of a casualty crash. This is roughly equivalent to the increase in risk associated with a blood alcohol concentration of 0.05.[8]
- Small reductions in average speeds (even 1 or 2 per cent) result in substantially greater percentage reductions in deaths and injuries.[9]
- The chances of surviving a crash decrease rapidly above certain impact speeds, depending on the nature of the collision[10]:
  - car/pedestrian: 20-30 km/h
  - car/motorcyclist 20-30 km/h
  - car/tree or pole: 30-40 km/h
  - car/car (side-impact): 50 km/h
  - car/car (head-on): 70 km/h.

- Past improvements to speed enforcement have resulted in substantial reductions in deaths and injuries.[11]
- Advisory intelligent speed adaptation (ISA) systems have been field-tested in a number of countries, including Australia. These in-vehicle systems are able to detect when a vehicle is exceeding the speed limit on a particular road, and warn the driver. There is evidence that systems with good user acceptability can provide significant safety benefits.[12]

Highest-impact actions

- Implement best practice speed management incorporating consistent speed zoning, improved enforcement, public awareness campaigns, 'anytime, anywhere' enforcement and selectively-reduced speed zones.
- Implement targeted, automated speed enforcement, including point-to-point automatic speed detection, where appropriate.
- Combine unmarked speed enforcement methods with high-visibility approaches and tight enforcement tolerances.
- Identify high-risk roads or road sections for speed limit reductions if road improvement is not feasible in the short term.
- Develop supporting systems for advisory intelligent speed adaptation technology.
- Pursue actions on speed management listed in the *National Heavy Vehicle Safety Action Plan 2005–2007*.

Supporting actions

- Establish a best practice model for rehabilitation of repeat speeding offenders.
- Enhance speed limit enforcement through legislative or regulatory change to require clear identification of all motor vehicles (front and rear number plates or other identification technology).
- Implement a review of criteria for setting speed limits that considers a safe system/harm minimisation perspective in setting limits.

- Counter the depiction of speeding (and other unsafe practices) in advertisements and monitor industry response to the Federal Chamber of Automotive Industries (FCAI) Voluntary Code of Practice for Motor Vehicle Advertising.
- Examine the possibility of developing a national campaign on the risks of low-level speeding.

Complementary action under the *safe system* framework

- Action to make road infrastructure safer: see Section 4.2.

Safer speeds performance indicators

- Publicise community perspectives on speeding resulting from community attitude surveys.
- Monitor and publicise information on travel speeds on different road types in the network.
- Monitor average vehicle speeds and 85th percentile vehicle speeds in travel speed studies.
- Monitor pedestrian injury levels as an indicator of changes in speed behaviour in urban environments.
- Collect and monitor information on speeding offences per hour of enforcement and the total number of vehicles checked for speed, with separate figures for different types of enforcement (such as fixed cameras, mobile cameras, hand-held speed measuring devices, etc).

Safety benefits of rural speed limit reductions in South Australia

In July 2003, the speed limit was reduced from 110 km/h to 100 km/h on about 1,100 kilometres of rural arterial roads (73 zones on 48 roads) in South Australia.

The roads were chosen for the speed limit reduction because of concerns about the number and severity of casualty crashes associated with them. However, the targeted roads were average arterial roads with average traffic volumes.

The crashes on these road sections in the two years before and the two years after the change were compared with those on the other 8,671 kilometre sections of road where the 110 km/h limit was not changed.

Casualty crashes dropped by 32 per cent on the sections of road where the speed limit was reduced from 110 km/h to 100 km/h and by 12 per cent on the sections of road where the 110 km/h speed limit was not changed. In the absence of other known factors, it appears that the additional 20 per cent reduction in casualty crashes can be attributed to the reduction in speed limit.

An average speed reduction of 2 km/h (about 2 per cent) was found at six representative sites where speeds before and after the speed limit reduction were recorded.

This result suggests that using a similar speed management approach with roads having higher casualty numbers and traffic volumes would yield significant safety gains from quite small reductions in actual travel speeds. This is consistent with results obtained from many similar studies worldwide.

Source: South Australian Department of Transport, Energy and Infrastructure, based on research by the Centre for Automotive Safety Research (CASR)[13]

4.2 Safer roads and roadsides

Improvement in the safety of different road types is another area with major potential to reduce road trauma. Improvement in the safety of roads results from two areas of activity. One area is the safety improvement generated by continuing investment in road infrastructure. This includes new high standard roads, duplication of roads and rehabilitation of deteriorated roads. Such major road works are primarily associated with mobility and economic performance benefits, with safety being an important ancillary benefit. Together with ongoing maintenance expenditure, this category accounts for over 95 per cent of aggregate road funding.

The other area is expenditure on safety-focused road works. 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 ('mass action'). This expenditure provides relatively high levels of improved safety to the community. For example, the BTE's 2001 evaluation of the Federal Black Spot Programme for the period 1996–97 to 1998–99 found that it generated a social benefit of $14 per dollar of expenditure.

Total national expenditure in this area has been estimated at $82 million in 1999–2000 and $287 million in 2005–06. While there has been a substantial increase in spending, a review of the mix of general and safety-focused road funding would help to determine if a reallocation of resources could improve safety while achieving other transport objectives. Increased funding for safety-focused road works would be an important contributor to improved safety outcomes. There is currently substantial variation in per capita spending among states.

What is known

- Australian black spot programs have been assessed as having benefit–cost ratios between about 4 and 14.[14]
- Low-cost safety-focused road treatments such as tactile edge lining, sealed shoulders[15] and erecting roadside barriers are associated with substantial crash and injury reductions.
- General road construction projects (freeways, divided roads, additional lanes, overpasses, etc.) are implemented primarily for their mobility benefits, but can also have significant safety benefits. Because these projects account for large amounts of road spending, their aggregate effect on safety outcomes is substantial, but per unit of investment their safety benefits are much lower than for safety-focused treatments.[16]

Highest-impact actions

- Maintain and increase the current level of investment in black spot and other safety-targeted road programs.
- Implement route risk assessment and treatment programs for major routes, (including hazard removal, shoulder sealing, audible edge lining and protective barriers, to address the problem of run-off-road crashes).
- Adopt the safe system approach as a priority from conception to completion of new road works and maintenance works.

Supporting actions

- Governments (federal, state and territory) to review the balance between general road investment and funding for safety-focused works.
- Increase the use of cost-effective measures to improve safety at intersections (such as signage, delineation, and red-light/speed cameras).
- Increase the number of intersections and approaches assessed for skid resistance and treated where resistance levels are low.

Complementary action under the *safe system* framework

- Speed management actions listed in Section 4.1, including
  - Identify high-risk roads or road sections for speed limit reductions if road improvement is not feasible in the short term.

Safer roads performance indicators

- Monitor and report the number of kilometres of roads where longitudinal treatments such as sealed shoulders, edge lining and barrier treatments are applied, and the number of intersections treated.
- Monitor and report on changes in single-vehicle crashes and injuries as surrogate measures of effectiveness of road treatment programs, particularly in rural areas.
- Determine crash rates for different road types and report on changes as road treatments are undertaken.
- Monitor and report on crash and injury changes at treated black spot locations.
- Report on black spot and other safety-targeted expenditure per head of population.

arrive alive!

Safer Roads Program addresses run-off-road crashes

The arrive alive! Safer Roads Program is a Victorian Government initiative to help achieve a 20 per cent reduction in deaths and serious injuries on Victoria's roads by 2007.

Funded by the Transport Accident Commission and delivered by VicRoads, this $240 million program is the first to significantly address run-off-road crashes in Victoria.

Run-off-road crashes – where a motorist loses control of the vehicle and runs into trees and other objects on the roadside at high speed, particularly in rural areas – represent a substantial proportion of road deaths. Over the past five years in country Victoria, around 40 per cent of fatal crashes and around 35 per cent of serious injury crashes involved vehicles running off the road and colliding with objects on the roadside. In the outer metropolitan area, run-off-road crashes account for 32 per cent of fatal crashes and 25 per cent of serious injury crashes.

The Safer Roads Program aims to reduce these crashes and their severity through targeted safety improvements to the road environment in rural and outer metropolitan areas. Building on the success of former black spot programs, the new Safer Roads Program also targets intersection crashes and road improvements in outer metropolitan areas.

The Safer Roads Program is expected to significantly reduce road trauma. To achieve this reduction a number of measures having a proven record in reducing fatal and serious injury crashes are being implemented at high-risk locations across the state. These include: roadside safety barriers; shoulder sealing; removal of roadside hazards; audio-tactile edge line marking; and improving road curves, road markings and signage. Intersection improvements include roundabouts, traffic lights, additional lanes for turning traffic, and better lane marking.

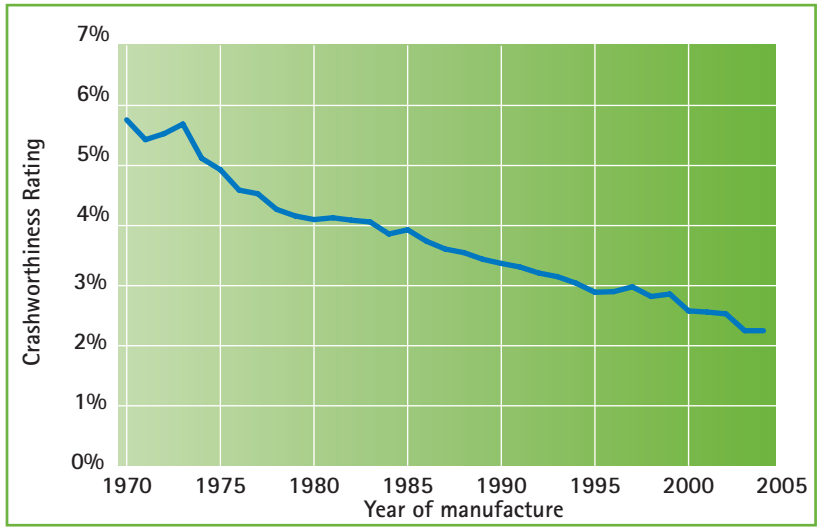
The program is expected to reduce the annual number of deaths and serious injuries on Victorian roads by between 300 and 480.

4.3 Safer vehicles

Improving vehicle safety has long-term benefits rather than immediate effects on crash and injury levels. Benefits of improvements in the safety of new vehicles accrue over many years, as vehicles with the new features gradually replace existing vehicles in the total fleet. In Australia, new vehicle sales represent about 7 per cent of the total vehicle fleet in a typical year, and the median age of vehicles involved in casualty crashes in Australia is about 9 years.

Figure 7 illustrates the extent to which the average occupant protection performance of recent model vehicles has improved, relative to vehicles that were manufactured in previous decades. In cars sold over the last few years, the risk of death or serious injury for drivers involved in a tow-away crash is less than half the figure for cars built in the early 1970s.

Figure 7: Risk of death or serious injury by year of vehicle manufacture



(Scores represent risk of death or serious injury for drivers involved in a tow-away crash)
Source: MUARC Used Car Safety Ratings Project

Vehicle safety innovations are of two main types. Passive safety improvements are generally designed to improve the crashworthiness of vehicles and reduce injuries for vehicle occupants and other road users if a crash occurs. Seat belts, airbags, crumple zones, side impact protection, pedestrian-friendly bonnet designs and seat belt pre-tensioners are examples. Active (or dynamic) safety features are intended to reduce the chance of a crash and are often referred to as 'crash avoidance technologies'. Advanced suspension systems, tyre technology, low centre of gravity design, ABS brakes and electronic stability program (ESP) technology

are examples. However, the line between active and passive technologies is blurring. The more advanced vehicle systems combine crash prevention features with systems that prepare vehicles and their occupants if a crash is imminent. These include visibility assistance, lane guidance and collision warning systems. Intelligent speed adaptation systems can reduce both crash risk and crash severity. Crash notification systems can reduce emergency response times after a crash has occurred.

Such examples of 'intelligent transport systems' technologies are developing at a very rapid rate. Governments are monitoring these developments internationally to ensure that the take up of advanced systems is not impeded by existing regulation, but also to avoid possible downsides such as the potential for drivers to be given misplaced confidence to attempt risky manoeuvres, or to become distracted or overloaded by information provided through these systems.

Australia's mandated safety and emissions standards are developed collaboratively with other governments as international regulations under international agreement provisions. The global nature of the vehicle industry and the rapid pace of new technologies in vehicles mean that new approaches are necessary to provide the most effective framework for advanced vehicle safety features to penetrate the market quickly. Governments are now looking to alternative approaches that are quicker and less cumbersome than developing regulations. These include partnerships with industry, consumer awareness programs, using fleet purchasing power to apply market pressure for enhanced safety features to be included in fleet vehicles and parallel programs such as the Australian New Car Assessment Program (ANCAP).

What is known

- The Monash University Accident Research Centre has estimated that if everyone bought the safest car in each class (small, medium, large) road trauma involving light passenger vehicles could be reduced by 26 per cent. If each vehicle incorporated the safest design elements for vehicles in its class, then such trauma could be reduced by 40 per cent.[17]
- Use of seat belts has been assessed as reducing the risk of death by a minimum of 40 per cent.
- Airbags have been associated with a further reduction of injury for belted occupants of around 10 per cent.[18]
- Recent overseas studies on cars equipped with ESP have shown fatal crash reductions of the order of one-third for single-vehicle crashes.[19]

- About half of new vehicles sold in Australia are purchased by businesses or government agencies. These vehicles are usually sold into the wider Australian vehicle pool two to three years after purchase.

Highest-impact actions

- Governments to run campaigns to publicise the benefits of ESP, side impact head protection, intelligent speed adaptation, emergency crash notification and other safety technologies, and to encourage consumers to purchase vehicles with such technologies.
- Governments to implement vehicle fleet purchasing policies that have regard to high vehicle safety standards for both occupants and pedestrians, and that promote uptake in the general fleet of effective advanced safety features such as ESP. Encourage private sector organisations to adopt similar policies.
- Governments to explore partnership opportunities with the Australian vehicle industry to promote steps to improve vehicle safety (including, for example, discouraging the practice of bundling optional safety features with high-cost non-safety options).
- Implement fleet safety programs in government fleets and encourage private sector organisations to run similar programs.
- Australia to be an active partner in international standard-setting forums to expedite the introduction of new safety features in vehicles – for example, the European Union e-safety program.
- Continue existing levels of support for ANCAP and Used Car Safety Ratings, and promote public awareness and understanding of results.

Supporting actions

- The Australian Government to engage with stakeholders (e.g. the insurance industry) to participate in joint or complementary programs to stimulate consumer demand for vehicles with state of the art safety features.
- Continue research programs as part of internationally coordinated efforts to improve our understanding of vehicle occupant and pedestrian protection and to upgrade standards.

- Publish information for young drivers on the safety levels of their first car purchase, and vehicle safety information designed for elderly vehicle buyers.
- Liaise with motoring journalists to engender a more positive response to safety features and driving behaviour in the specialist motoring press.
- Pursue vehicle safety actions listed in the *National Heavy Vehicle Safety Action Plan 2005–2007*.

Safer vehicles performance indicators

- Percentage of new vehicles sold that have a minimum of 4 star ANCAP occupant protection rating.
- Monitor percentage of new vehicles sold with ESP.
- Improved performance of newer vehicles as evidenced in real-world crash performance data compiled for the Used Car Safety Ratings.
- Consumer surveys on importance of safety items in new car purchasing decisions.

4.4 Safer road users and safer behaviour

A key means for improving the safety of road users is to encourage continual improvement in road user behaviour so that unsafe behaviours are exhibited less frequently. Unsafe behaviours are those where research has identified a close relationship with crashes. These behaviours include speeding, drink and drug impaired driving, driving while fatigued, being distracted or aggressive while driving, and not using, or incorrectly using, safety devices (seat belts, child restraints, motorcycle and bicycle helmets). In this Action Plan speeding is highlighted as a key action, so the focus here is on other behaviours.

Road users may be motivated to change their behaviour over short time periods by effective deterrent and publicity measures such as a combination of police enforcement and public education campaigns. This approach is dependent on road users being concerned with being 'caught' and having to deal with the consequences. Because many drivers believe their risk of crashing is very low, fear of penalties is often stronger than the fear of being involved in a crash. However, measures to inform and educate motorists about risk factors and to motivate longer-lasting behaviour modification are also required. Measures to limit the level of risk faced by novice drivers are a means of achieving improved safety for this high-risk group.

What is known

- Over 1 in 5 drivers and riders killed have a blood alcohol level exceeding the legal limit.
- Random breath testing results show that on average 1 in 300 drivers tested exceed the legal limit.
- Casualty crash risk doubles when driving with an alcohol level just in excess of 0.05 BAC,[20] and risk of involvement in a fatal crash rises even more sharply.[21]
- A high proportion of recidivist drink drivers have clinical alcohol-dependence problems.
- There is evidence linking certain illegal drugs to elevated crash risk: though alcohol still makes a bigger contribution to the number of road deaths and injuries.[22]
- About 1 in 4 vehicle occupants killed in crashes are not wearing a seat belt.
- Seat belt surveys show that less than 1 in 20 front seat passengers and 2 in 10 rear seat passengers do not wear seat belts.

4.4.1 Drink and drug driving

Highest-impact actions

- Maximise the effectiveness of enforcement and public education: particularly in rural areas
  - for example, improve rural RBT effectiveness through innovative combinations of general deterrence and targeted operations.

Supporting actions

- Implement community education initiatives and extend responsible serving of alcohol programs.
- Develop integrated programs for recidivist drink drivers, including:
  - a best practice alcohol rehabilitation program
  - increased use of alcohol ignition interlocks
  - assessment of alcohol-dependence problems, prior to re-issue of licence.

- Undertake further research on the size of the drug driving problem incorporating access to coronial records, and routine drug and alcohol testing of drivers and riders killed in crashes.
- Establish a partnership with health administrators and hospitals to identify what is required to introduce blood sampling and drug testing for all drivers involved in fatal and serious injury crashes.
- Conduct research on the key elements behind the extensive shift in attitudes to drink driving in Australia as a guide to changing other behaviours.
- Pursue actions on alcohol and drugs listed in the *National Heavy Vehicle Safety Action Plan 2005–2007*.

Drink and drug driving performance indicators

- Monitor and report on incidence of alcohol and drug use by drivers and riders killed in crashes.
- Monitor and report on crash incidence during 'high alcohol' periods.
- Monitor incidence of drink driving reported from RBT operations.
- Monitor incidence of illegal alcohol and drug levels per 1000 tests.
- Monitor and report on community perspectives of the level of RBT enforcement and likelihood of being tested.
- Collect information on the levels and circumstances of roadside alcohol and drug testing and the types of drivers being tested.
- Record the number of offenders and non-offenders using alcohol interlocks.

4.4.2 Restraint use

Highest-impact actions

- Increase seat belt wearing enforcement, particularly in rural areas.
- The Australian Government to continue high-level liaison with the vehicle industry to encourage inclusion of effective seat belt reminder systems in Australian vehicles and achieve cooperative agreement on improved performance beyond existing ADR requirements.

- Continue support for the ANCAP program and review specifications for seat belt warning devices to earn points in the program.
- Include seat belt warning systems in selection criteria for new vehicles purchased by government fleets.
- Pursue action listed in the *National Heavy Vehicle Safety Action Plan 2005–2007* to improve restraint use by heavy vehicle drivers.
- Increase emphasis and training on correct fitting and use of child restraints.

Supporting actions

- Monitor and report on research on improving restraint use.

Restraint performance indicators

- Monitor and report on vehicle occupants killed who were not wearing restraints, including location data and historical data to provide trend lines.
- Implement a national seat belt wearing observation study every two to three years.

4.4.3 Fatigue and distracted driving

Fatigue is a known contributing factor to road crashes but the number of crashes in which fatigue plays a part is difficult to accurately determine. Fatigue is more likely to be a contributing factor in crashes which have involved long trips, extensive periods of continuous driving and trips during normal sleeping times when the driver has been previously deprived of sleep.

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 TV, satellite navigation, complex sound systems, climate controls, and audible and visual signals for an array of vehicle operations which compete for driver attention. Surveys show that many drivers still use hand-held mobile phones while driving despite it being illegal in all Australian jurisdictions.

Drivers operate in a complex road environment with advertising billboards; public and promotional lighting; and advisory, regulatory and directional signage. The combined and interactive effects of the stimuli both inside and outside the vehicle generate much potential for distraction.

What is known

- There has been extensive research aimed at developing fatigue monitoring devices to reduce fatigue risks, but the real-world effectiveness of such devices as a crash prevention measure is unproven.
- Road engineering treatments that address run-off-road and head-on crashes can be a cost-effective way of reducing deaths and injuries resulting from driver fatigue, inattention and other errors.
- Laboratory research and crash studies indicate that use of both hand-held and hands-free mobile phones impair driver performance and substantially increase crash risk.[23]

Highest-impact actions

- Liaise with business, unions and industry to raise awareness of driver fatigue and distraction and facilitate arrangements for preventing fatigued workers driving from workplaces, or in the course of their work.
- Pursue action on heavy vehicle driver fatigue listed in the *National Heavy Vehicle Safety Action Plan 2005–2007*.
- Enforce the prohibition on use of hand-held mobile phones while driving, and discourage use of mobile phones of any type while driving, particularly for novice drivers.

Supporting actions

- Implement public education programs targeting better understanding of circadian rhythms and other influences on fatigue.
- Reinforce current telecommunications industry policies promoting the responsible use of mobile phones.
- Investigate, and if appropriate trial, the use of electronic enforcement of mobile phone usage laws.
- Monitor findings of research on driver fatigue and driver distraction.

Fatigue and distracted driving performance indicators

- Publish performance indicators relating to hazard mitigation treatments for specific routes and road lengths.

- Undertake surveys to determine the impact of distraction from in-vehicle and external sources and the incidence of fatigue.
- Conduct and report on results of observation studies of mobile phone use by drivers.

4.4.4 Safe use of fleet vehicles

Corporate safety programs can be an important means of promoting safe road use. Crashes involving fleet vehicles account for about one-quarter of total road deaths and about two-fifths of all work-related deaths.

Employers have legal responsibilities for promoting safe use of fleet vehicles, and are in a position to promote higher standards than are required by road traffic law. Effective fleet safety programs can provide significant business benefits.

Governments are major employers, and can provide leadership by example.

Highest-impact actions

- Implement fleet safety programs in government fleets and encourage private sector organisations to run similar programs.
- Develop and provide fleet safety guidelines for use by government and private sector fleets which identify duty of care issues under occupational health and safety (OH&S) guidelines for employees whose work involves driving vehicles. The guidelines should emphasise: safe driving behaviour; required use of seat belts; discouraging any mobile phone use while the vehicle is in motion; and a zero BAC requirement.

Fleet safety measures relating to safer vehicles are addressed in Section 4.3.

4.4.5 Novice drivers

Young and novice drivers face high levels of risk when making the transition from supervised to solo driving. Lack of experience, propensity for risk-taking, and a number of potential sources of distraction all contribute to elevated crash rates for novice drivers. Young drivers also tend to be on the roads during periods of relatively high risk.

An extensive body of research has shown that conventional skills-based driver training programs provide little benefit and often produce worse outcomes than if such training is not undertaken. Recent approaches have focused on encouraging increased supervised practice during the learner phase and building this experience into graduated licensing

arrangements. Best practice post-licence education interventions focus on improving higher-order cognitive skills, including building self awareness and self monitoring of driving behaviour, and better understanding of the consequences of actions.

This section lists actions specific to novice drivers. However, measures that do not target novice drivers specifically are very important to improving novice driver safety (see Figure 8). For example, general speed management measures are very important to novice driver safety because excessive speed is a major risk factor for many novice drivers and because novices – particularly young males – are unlikely to comply with speed limits if they observe that older and more experienced drivers do not do so. Road measures that reduce deaths and injuries from run-off-road crashes are also particularly relevant to young drivers, because they have a high incidence of such crashes.

What is known

- Novice drivers are over-represented in crash data by a ratio of at least 3:1.
- Young novice drivers are over-represented among speeding motorists.
- Young drivers generally use less safe older vehicles because they are more affordable, hence injury risk in a crash is higher.
- Young driver crash rates are elevated sharply when they drive late at night and during early morning hours and when carrying two or more passengers.

Highest-impact actions

- Implement and evaluate best practice educational programs and graduated licensing systems for novice drivers.
- Encourage community and industry participation in key graduated licensing initiatives.
- Increase public awareness of the safety benefits for novice drivers of:
  - extensive supervised experience before solo driving is permitted, and
  - limiting access to higher risk driving, such as late night driving, driving with peer passengers, and drinking and driving.

Supporting actions

- Develop better methods for engaging young people in road safety issues.
- Monitor and report on research into novice driver development, risk factors, and the effectiveness of different interventions.

Novice driver performance indicators

- Monitor crash and injury incidence for the 17–25 year age group, including data on crash circumstances.
- Establish and report on a matrix of graduated licensing provisions.

Figure 8: Relevance of the general action areas to road user groups

				Safer road user behaviour		
	Safer Speeds	Safer roads and roadsides	Safer Vehicles	Drink and drug driving	Restraint use	Fatigue and distracted driving
Motorcyclists	■■■	■■■	■	■■■		■■
Cyclists	■■■	■■	■	■		■■
Pedestrians	■■■	■■	■	■		■■
Young drivers	■■■	■■■	■■	■■■	■■■	■■■
Older drivers	■■■	■■	■■■	■	■■	■■
Indigenous road users	■■■	■■■	■■	■■■	■■■	■■
International visitors	■■■	■■■	■■■	■■■	■■■	■■■
Rural road users	■■■	■■■	■■■	■■■	■■■	■■■

(The number of 'boxes' reflects the relative benefits expected to accrue to each group)

Figure 8 provides a summary of how the broad action areas proposed in this plan are expected to benefit different road user groups. It illustrates the fact that general measures are often very important for specific groups and issues.

4.4.6 Motorcyclists

Data from all jurisdictions indicate that serious crashes involving motorcyclists have increased in recent years. The FCAI reports substantial sales growth for motorcycles and motor scooters (Appendix 1).

The major initiatives in this Action Plan will have a direct effect on improving the safety of motorcyclists (Figure 8), particularly actions in the

area of speeding and safer roads. Nevertheless, the case for additional action focused specifically on motorcycle safety is compelling.

What is known

- Motorcyclists face a fatal crash risk about 20 times higher than drivers; their relative risk of serious injury is even higher.
- Over 40 per cent of fatal motorcycle crashes are single-vehicle crashes.
- The severity of injuries faced by motorcyclists is higher than for other road user groups.
- Road surface issues have a greater impact on safety for motorcyclists than for other motor vehicle drivers.

Specific motorcycle safety actions

- Implement public education programs focused on the greater risk faced by motorcyclists and measures to mitigate this risk.
- Ensure that motorcycle-specific issues are taken into account in the design and construction of new roads and improvements to existing roads, including maintenance and selection of safety treatments, particularly on popular motorcycle routes.
- Promote to riders the safety advantages of ABS and linked braking systems in motorcycles, and encourage the motorcycle industry to increase the availability of motorcycles with these features.
- Consider options for a best practice graduated licensing system for novice riders.

4.4.7 Pedestrians and bicyclists

Improvements in both pedestrian and cyclist safety are important elements in achieving the NRSS target. A number of key initiatives in this Action Plan are expected to have major impacts on trauma levels of pedestrians and cyclists (Figure 8).

What is known

- There is evidence that past improvements in speed management have been a major factor in reducing pedestrian deaths, and that a safe system approach combining infrastructure and speed

management measures would produce further substantial safety gains for pedestrians and cyclists.

- About four in ten pedestrians killed have a blood alcohol concentration over 0.05 and about three quarters of these are over 0.15 BAC; incidence of intoxication is highest among male pedestrians aged between 15 and 54 years.
- Bicycle helmets substantially reduce the risk of death or brain injury for cyclists.

Specific actions for pedestrians and bicyclists

- Develop infrastructure which reduces the risk of collisions between motor vehicles and cyclists and pedestrians.
- Raise community awareness of risks associated with pedestrian intoxication, and encourage extension of responsible serving of alcohol programs.
- Undertake community education to increase the rate of bicycle helmet use, particularly among adolescents.
- Undertake community education related to cyclist conspicuity, including lighting issues.

Appendix 1
Exposure factors that may be affecting road death rates

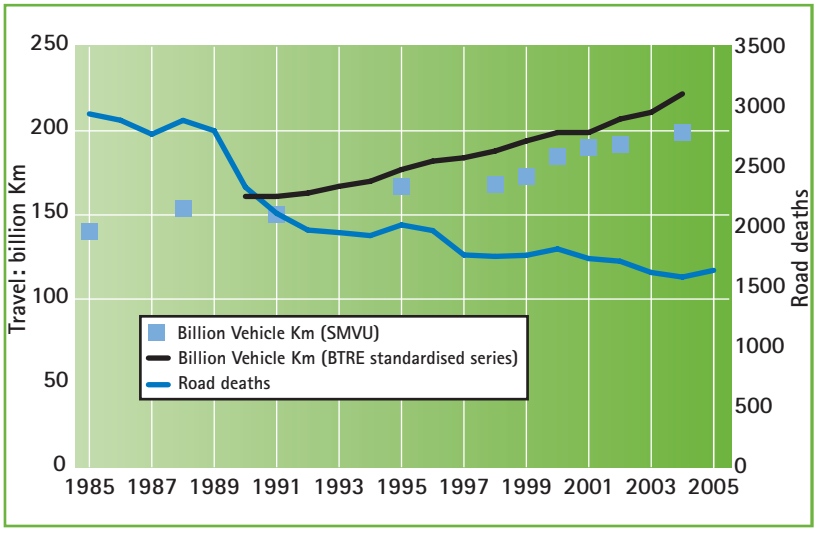
In considering the reasons for the disappointing progress, it is necessary to bear in mind that the gap between the actual and expected death rate has substantially widened only over the past 18 months.

Economic factors and changes in vehicle usage

Australia has had an extended period of economic growth. Studies have shown that increased economic activity and discretionary income are generally associated with higher levels of road trauma due to increased travel, including more travel during high-risk periods in the 24-hour cycle.

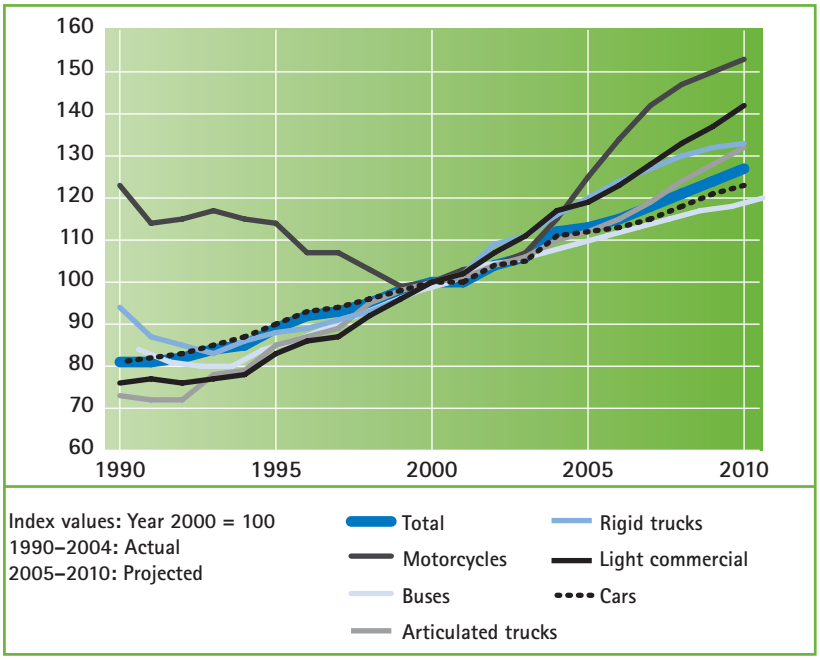
Figure 9 shows the trend in risk exposure (expressed as vehicle-kilometres travelled – VKT) and the trend in the number of road deaths since1985. Growth in VKT in recent years has been greater than was expected when the NRSS was developed. The growth in VKT over the period 2001 to 2004 was 11.7 per cent. The rate of increase in usage has been particularly rapid for motorcycles, trucks and light commercial vehicles (Figure 10).

Figure 9: Vehicle-kilometres travelled and number of road deaths, 1985–2005



Source: Based on Australian Bureau of Statistics Survey of Motor Vehicle Usage (SMVU) and Bureau of Transport and Regional Economics (BTRE) data.

Figure 10: Vehicle-kilometres travelled by different vehicle types (index values: Year 2000 = 100)



Source: ATSB calculations based on BTRE data.

Unexpected increase in motorcycle usage and motorcycle trauma

The increase in deaths due to the growth in popularity of motorcycling has been greater than predicted in the NRSS. The Federal Chamber of Automotive Industries (FCAI)[24] reports sales averaging 2,100 motorcycles per month in 2002, rising to 2,989 per month in 2003 and 7,278 per month in the first half of 2006. While around half of these numbers are off-road motorcycles, there has been a substantial increase in on-road machines leading to increases in risk exposure among those involved in the highest risk road use activity.

The ATSB reports a 33 per cent increase in motorcyclist deaths from 1999 to 2005. From 2004 to 2005 the number of motorcyclist deaths increased by 38, which accounted for most of the increase in total road deaths (54).

Vehicle compatibility

The substantial growth in sales of large four wheel drive (4WD) vehicles has increased the diversity in size and mass among vehicles in the fleet. FCAI data for new vehicle sales show that these vehicles have grown from 13.3 per cent of the market in 2000 to 16.5 per cent of the market in 2003. The increasing proportion of vehicles of greater mass in the fleet means that occupants of smaller vehicles have a significantly higher risk of injury in crashes involving 4WDs. However, increasing fuel prices could result in a moderation or reversal of this trend.

References

1 Rumar K, *Road transport past, present and future road safety work in ECMT*, paper prepared for the Bucharest session of the European Conference of Ministers of Transport, 2002.

2 Bureau of Transport and Economics, *Road crash costs in Australia*, BTE report 102, Canberra, 2000.

3 Australian Transport Council. *National Road Safety Strategy 2001-2010*. http://www.atcouncil.gov.au/documents/atcnrss.aspx

4 Joint OECD / ECMT Transport Research Centre: Working Group On Achieving Ambitious Road Safety Targets, *Country reports on road safety performance*, July 2006. http://www.cemt.org/JTRC/WorkingGroups/RoadSafety/performance.htm

5 Auditor General Victoria, *Making travel safer: Victoria's speed enforcement program*, July 2006. http://www.audit.vic.gov.au/reports_par/agp116cv.html

6 Vulcan P and Corben B, *Options for a National Road Safety Strategy*, report to the National Road Transport Commission, May 1999.

7 US Department of Transportation, Federal Highway Administration, *Halving roadway fatalities: a case study from Victoria, Australia 1989–2004*, International Technology Scanning Program, 2006.

8 Kloeden CN, Ponte G and McLean AJ, *Travelling speed and the risk of crash involvement on rural roads*, Australian Transport Safety Bureau report CR204, Canberra, 2001. http://www.atsb.gov.au/publications/2001/Rural_Speed_1.aspx
Kloeden CN, McLean AJ and Glonek G, *Reanalysis of travelling speed and the risk of crash involvement in Adelaide South Australia*, Australian Transport Safety Bureau report CR207, Canberra, 2002. http://www.atsb.gov.au/publications/2002/Speed_Risk_3.aspx

9 Elvik R, Christensen P and Amundsen A H, *Speed and road accidents: an evaluation of the Power Model*. Institute of Transport Economics (TOI), Oslo, 2004. http://www.toi.no/getfile.php/Publikasjoner/T%D8I%20rapporter/2004/740-2004/740-2004.pdf

10 Austroads, *Balance between harm reduction and mobility in setting speed limits: a feasibility study*. Austroads report AP-R272/05, Sydney, July 2005. http://www.onlinepublications.austroads.com.au/script/FreeDownload.asp?DocN=AS752543147234
Oxley J, Corben B, Koppel S, Fildes B, Jacques N, Symmons M and Johnston I, Cost effective infrastructure measures on rural roads, Monash University Accident Research Centre report 217, Melbourne, 2004.

11 Cameron M, Delaney A, Diamantopoulou K and Lough B, *Scientific basis for the strategic directions of the safety camera program in Victoria*, Monash University Accident Research Centre report 202, Melbourne, 2003.
http://www.monash.edu.au/muarc/reports/muarc202.html
Newstead SV, Cameron MH and Leggett MW, The crash reduction effectiveness of a network-wide traffic police deployment system, *Accident Analysis and Prevention* (33), pp. 393–406, 2001.
Accident Compensation Corporation and Land Transport Safety Authority, *Down with speed: a review of the literature, and the impact of speed on New Zealanders*, New Zealand, 2000.
http://www.acc.co.nz/wcm001/groups/external_ip/documents/internet/wcm000021.pdf
Zaidel D, *The impact of enforcement on accidents*, Deliverable 3, ESCAPE, project funded by the European Commission under the Transport RTD Programme of the 4th Framework Programme, 2002.

12 Austroads, *A review of literature and trials of intelligent speed adaptation devices for light and heavy vehicles,* Austroads report AP-R237, Sydney, 2003.

13 Long AD, Kloeden CN and Hutchinson TP, *Reduction of speed limit from 110 km/h to 100 km/h on certain roads in South Australia: a preliminary evaluation*, Centre for Automotive Safety Research, The University of Adelaide, report CASR024, August 2006.
http://casr.adelaide.edu.au/reports/CASR024.pdf

14 Bureau of Transport and Economics, *The Black Spot Program 1996–2002: an evaluation of the first three years,* BTE report 104, Canberra, 2001.
Bureau of Transport and Communications Economics, *Evaluation of the Black Spot Program,* BTCE report 95, Canberra, 1995.

15 Tziotis M, Mabbott N, Edmonston C, Sheehan M and Dwyer J, *Road safety in rural and remote areas of Australia*, Austroads report AP-R273/05, Sydney, 2005.
http://www.onlinepublications.austroads.com.au/script/Details.asp?docn=AS632008461039

16 Vulcan P and Corben B, *Options for a National Road Safety Strategy,* report to the National Road Transport Commission, May 1999.

17 Newstead S, Delaney A, Watson L and Cameron M, *A model for considering the 'total safety' of the light passenger vehicle fleet*, Monash University Accident Research Centre report 228, 2004.

18 Zador and Ciccone, *Driver fatalities in frontal impacts: comparisons between cars with air bags and manual belts,* Insurance Institute for Highway Safety, 1991

19 Insurance Institute for Highway Safety, *Status Report*, Vol 41, No 5, June 13, 2006
http://www.iihs.org/sr/pdfs/sr4105.pdf
Farmer CM, Effect of electronic stability control on automobile crash risk, *Traffic Injury Prevention*, 5:317–325, 2004. http://www.perryhaas.com/PDF/IIHS%202004.pdf

20 McLean AJ, Holubowycz OT and Sandow BL, *Alcohol and crashes: identification of relevant factors in this association*, Federal Office of Road Safety report CR11, Canberra, 1980.

21 Zador PL, Krawchuck SA and Voas RB, *Relative risk of fatal and crash involvement by bac, age and gender,* National Highway traffic Safety Administration, 2000. http://www.nhtsa.dot.gov/people/injury/alcohol/809-050pdf.pdf

22 Austroads, *Drugs and driving in Australia*, Austroads Working Group on Drugs and Driving, Austroads report AP-R172, Sydney, 2000.
Austroads, *Role of cannabis in road crashes*, Australasian Road Safety Handbook, Volume 1, Chapter 6, Austroads report AP–R234/03, Sydney, 2003.
Drummer OH, Gerostamoulos J, Batziris H, Chu M, Caplehorn JRM, Robertson MD and Swann P, The incidence of drugs in drivers killed in Australian road traffic crashes, *Forensic Science International*, 134, 154–162, 2003.
Drummer OH, Gerostamoulos J, Batziris H, Caplehorn JRM, Robertson MD and Swann P, The involvement of drugs in drivers of motor vehicles killed in Australian road traffic crashes. *Accident Analysis and Prevention*, 943, 1–10, 2003.

23 McEvoy SP, Stevenson MR, McCartt AT, Woodward M, Haworth C, Palamara P, Cercarelli R, *Role of mobile phones in motor vehicle crashes resulting in hospital attendance: a case-crossover study*, BMJ, 2005.
http://bmj.bmjjournals.com/cgi/rapidpdf/bmj.38537.397512.55v1
Bellavance F, *Linking data from different sources to estimate the risk of a collision when using a cell phone while driving*, International Conference on Distracted Driving, Toronto, October 2-5, 2005.

24 Federal Chamber of Automotive Industries (FCAI), Media releases December 2002, June 2003 and June 2006; FCAI Motorcycle Group National Sales Report, July 2006.
http://www.fcai.com.au/files/Comparison_Jan-June_2006_with_Jan-June_2005.pdf

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