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Safer speeds:
an evaluation of public education materials

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ABSTRACT

The association between speed and road safety outcomes is well documented, yet reductions in speed limits continue to meet with resistance from the public. The aim of this report is to review speed education resources in order to identify those that may be used to increase public acceptance of reduced speed limits. Relevant agencies throughout Australia were contacted and web searches were conducted in order to find speed education resources. Public media campaigns were excluded from the review. Seventy resources were identified and included in the study. All were evidence based drawing on one or more of 27 central arguments. Based on consideration of the use of evidence, ease of understanding, potential to influence the general public, and the extent to which the resource supported the speed management principles of the National Road Safety Strategy, nine resources were identified as providing the best examples of speed education. In general the speed education resources were found to adopt predominantly safety-based arguments for reduced speed limits. It is suggested that the efficacy of these materials may be improved further by addressing the ways in which drivers rationalise their speeding behaviour. Four options for using or amending existing resources, or developing a new resource are presented.

KEYWORDS

Speed, Speed limit, Road user education, Evaluation, Road safety

Summary

The current Australian National Road Safety Strategy (NRSS) based on the Safe System approach to road safety has identified the setting of speed limits as an important area. The NRSS aims to achieve "speed limits that reflect a better balance between safety and mobility", that is speed limits that reduce the likelihood of a crash occurring and mitigate the consequences when they do with as little effect on travel time as possible. One of the aims of the strategy with regard to safe speeds is to increase community acceptance by explaining the rationale for lower speed limits and providing information about the safety, economic, and environmental benefits of lower speeds. The National Road Safety Council commissioned the Centre for Automotive Safety Research to identify, collate and review speed education materials used by road agencies and government insurance agencies/commissions throughout Australia.

This study identified educational materials aimed at showing the safety and environmental benefits of reduced speed and the limited impact on travel time caused by small reductions in speed. Road agencies, government insurance agencies/commissions, and police forces around Australia as well as other private and government organisations concerned with road safety were contacted in order to identify potential resources. Resources developed for use in school curricula and by community groups were also explored.

A total of 70 documents addressing speed were included in the study. A review of each identified 27 evidence-based arguments used with some regularity. The most common argument or evidence addressed the reasons why travelling at faster speeds increase the risk of a crash (e.g., less time to react to hazards, increased stopping distances, loss of control, faster speeds lead to more crashes, and higher speeds increase the severity of a crash) followed by the speed risk curve, identifying low level speeding as a safety issue, the use of police crash statistics, explanation of the penalties for speeding, and the benefits of lower speeds in pedestrian crashes. The explanation of stopping distances and impact speeds accounting for reaction times was also common, as was describing the expected benefits associated with reduced speed. As each of the resources were found to draw on similar concepts and evidence, a decision was made to identify the best examples of these in terms of how the evidence was used, how easy they were to understand, the likelihood that they will influence the general public, and the extent to which they support the speed management principles of the NRSS. Based on these criteria, nine resources were considered to provide the best examples of existing speed education resources.

While the majority of resources reviewed focused on the safety aspects of speeding (e.g., risks of crashing, injury severity, or benefits of reduced speed) the better resources tended to address a wider range of evidence and often included information regarding the environmental impacts of speed (e.g. emissions and noise), fuel economy, or travel time. The better resources were also considered to be more accessible to the public both in how the information was presented aesthetically and in terms of the content.

In order to improve speed education resources it is suggested that providing evidence-based counter-arguments to arguments used by the public to rationalise speeding behaviour would be of some benefit. Nine key rationalisations and suggested counter-arguments were identified and described in the report.

Based on the results of the evaluation a number of options regarding the manner in which to best utilise existing speed education resources are presented:

1. Use an existing resource or resources with no change
2. Combine the best elements of each of the seven exemplar resources
3. Extend one or more of the exemplar resources to address the arguments used by the public to rationalise speeding behaviour
4. Develop a new resource

Contents

1 Introduction 1
1.1 Background to the project 1
1.2 The association between speed and crashes 1
1.3 Speed effects on travel time 4
1.4 Environmental effects of speed 4
1.5 Vision zero, safe system, and speed limits 5
2 Evaluation Method 7
2.1 Evaluation process 7
3 Justifications for speeding 9
4 Results 11
4.1 Summary of best speed education resources 16
5 Discussion 19
5.1 Improving upon existing resources 19
5.2 Producing a new resource 20
5.3 Conclusion 21
References 23
Appendix A – Organisations contacted 25
Appendix B – Speed education resource and URL 27
Appendix C – Evidence provided in reviewed resources 30
Appendix D – Organisation contact details 36
Appendix E – Copies of best example resources 39

1 Introduction

1.1 Background to the project

The current Australian National Road Safety Strategy (NRSS) based on the Safe System approach to road safety has identified the setting of speed limits as an important area. The NRSS aims to achieve "speed limits that reflect a better balance between safety and mobility" (ATC, 2011, p. 67), that is speed limits that reduce the likelihood of a crash occurring and mitigate the consequences when they do with as little effect on travel time as possible. One of the aims of the strategy with regard to safe speeds is to increase community acceptance by explaining the rationale for lower speed limits and providing information about the safety, economic, and environmental benefits of lower speeds.

In order to facilitate this process the National Road Safety Council (NRSC) sought to develop an evidence-based resource that could be used to shape public opinion about the safety benefits of complying with speed limits. The resource was intended for use by government agencies, local governments, and community groups. As part of this process, research was commissioned to identify, collate and review speed education materials used by road agencies and government insurance agencies/commissions throughout Australia. The key components of this research were to:

1. Provide advice on the quality of available evidence
2. Identify the best examples of speed education resources
3. Identify resources that could be used without change, or the work necessary to bring existing resources to a point where they would be suitable for dissemination.

Due to the disbanding of the NRSC, the project was completed under the oversight of the Department of Infrastructure and Transport.

1.2 The association between speed and crashes

Speed is recognised as a significant road safety issue by researchers and practitioners throughout the world and there is abundant literature addressing the role of speed in crashes (e.g., Aarts & van Schagen, 2006; Davis, Davuluri, & Pei, 2006; Nilsson, 2004; SWOV, 2012). Kloeden and colleagues (Kloeden, McLean, & Glonek, 2002; Kloeden, Ponte, & McLean, 2001) employed a case control methodology comparing the computer reconstructed speeds of crashed vehicles with the speeds of control vehicles (other vehicles using the road at the same time of day, day of week, time of year, etc.) in two separate studies assessing crash risk on rural and urban roads. On urban roads Kloeden, McLean, and Glonek (2002) found that the risk of an injury crash approximately doubled with every 5 km/h increase in speed over 60 km/h. On rural roads Kloeden, Ponte, and Mclean (2001) found that the risk of an injury crash approximately doubled with every 10km/h over the average speed of vehicles. Kloeden's studies have been described as the best estimates regarding the effect of speed on crash risk (Aarts & van Schagen, 2006) and the findings have been replicated in the USA (Davis, Davuluri, & Pei, 2006).

Based on these risk estimates Doecke, Kloeden, and McLean (2011) sought to estimate the reductions in casualty crashes that could be expected from reducing various levels of speeding. South Australian speed survey data was used to determine the proportion of vehicles travelling at speeds between 1 and 20 km/h over the speed limit. The results indicated that the greatest effect on crashes could be derived from reducing the speeds of vehicles travelling just above the posted speed limit, with the greatest reduction observed for drivers travelling up to 5 km/h over the limit as there are more vehicles speeding in this range than in higher ranges. This study also found that the greatest effect on

casualty crashes would be achieved by reducing low level speeding on high speed roads and that, in general, any reduction in travelling speed, even by as little as 1 km/h would be expected to reduce casualty crashes. Other research (e.g., McColl, 2000) has found that a reduction in travelling speed of 5 km/h could be expected to reduce the number of metropolitan crashes by more than 15%.

In an analysis of travelling speeds and injury outcomes for pedestrians, McLean, Anderson, Farmer, Lee, and Brooks (1994) conducted detailed investigations of 176 fatal pedestrian accidents occurring in the Adelaide area between 1983 and 1991. They found that reducing the travelling speeds of vehicles by 5 km/h could be expected to yield a 30% reduction in the incidence of fatal collisions (with 10% being avoided entirely). In a more recent study, Anderson (2001) demonstrated that a reduction in travelling speed would reduce the number of fatal pedestrian crashes in two key ways: slower speeds would allow more crashes to be avoided due to shorter stopping distances, and those crashes that would still occur would happen at more survivable speeds. Anderson estimated that a reduction in pedestrian fatalities could range from 13% if all drivers obeyed the 60 km/h speed limit to 48% if all drivers were travelling 10 km/h slower.

Long and Hutchinson (2009) evaluated the effect of a speed limit reduction from 100 to 80 km/h in the Adelaide Hills based on a comparison of crash rates before and after the change. A number of estimates were made based on separate assumptions of the crash rate (see Long and Hutchinson, 2009) following the change in speed limit with estimated reductions of between 3% and 36%. The authors concluded that the most likely reduction would be around 15%.

A study of the economic benefits of a reduced default speed limit on Tasmanian roads suggests that speed limits that reduce the free speed of vehicles by 5 km/h would equate to savings of about $35 million (Cameron, 2009). Cameron also reported that a 5 km/h reduction in free travel speed could be expected reduce fatal crashes by 25%, serious injury crashes by 15%, and minor injury crashes by 12%. Significant benefits would also be expected from reduced speed limits even if a 5 km/h reduction is not achieved (Cameron, 2009).

A study examining the effects of a 50 km/h default limit in regional Queensland identified a 13.5% reduction in the number of crashes reported to police (Hosking, Newstead, Hoareau, & Delaney, 2005). The greatest reduction in crashes was observed for higher severity crashes: a 25% reduction for serious casualty (fatal or hospitalisation) and 19.3% for crashes resulting in fatality, hospitalisation, or medical attention. The lower speed limit also had a significant effect on young driver crashes, which were reduced by 17%, including a 36.5% reduction in serious casualty crashes (fatal or hospitalisation), a 29.2% reduction in casualty crashes (fatal, hospitalisation, or medical attention), while speed related crashes were reduced by 31.3% (Hosking, Newstead, Hoareau, & Delaney, 2005). Analysis of speed survey data collected in the periods before, during (i.e., an amnesty period) and after the changed speed limit came into effect demonstrated a small effect on the 85th percentile travelling speeds, but a significant reduction on the number of vehicles travelling at 60 km/h on 50 km/h roads. The authors concluded that the reduction in crashes was associated with the reduction in vehicles travelling in excess of 60 km/h on 50 km/h roads.

In Victoria, the introduction of a 50 km/h speed limit was associated with a 12% reduction in casualty crashes, and a reduction of 25-40% for pedestrian serious injury or fatal crashes (Hoareau, Newstead, & Cameron, 2006).

There are also a number of studies examining the effect of increased speed limits on roads. In the USA the National Maximum Speed Limit law setting the maximum speed limit at 55 mph was first introduced in the early 1970s as a means to conserve oil, however the subsequent reduction in traffic fatalities saw it adopted as a permanent road safety measure (Vernon, Cook, Peterson, & Dean, 2004). However, in the early 1980s the laws were relaxed which saw 44 states raise the speed limit to

65 mph. The National Maximum Speed Limit law was later repealed in 1995 allowing states to control the setting of speed limits within their jurisdiction, many of which chose to raise the speed limits on some roads. As a result of this the maximum speed limit across the USA ranges from 55 mph in some states to 75 mph in others (Grabowski & Morrisey, 2007). The effects of these changes with regard to crashes on different road types have been examined in a number of studies.

Najjar, Russell, Stokes, and Abu-Lebdeh (2002) examined the effects of the new speed limits on crashes and fatalities in the state of Kansas. They found that the crash rate and number of fatal crashes increased following the introduction of higher speed limits, but that the increases were not statistically significant on rural interstate (most of which had a speed limit of 70 mph) or urban interstate (most of which had a speed limit of 65 mph) roads. However, they did note that increasing the speed limit to 65 mph on rural two-lane roads was associated with a significant increase in both crash rates and the number of fatal crashes. Najjar et al., also found that the most significant increases in crash rate (an increase of more than 25%) occurred on 7% of the entire network of rural two-lane roads. These findings would appear to indicate that while the new speed limits may have been appropriate for well-designed interstate roads this was not the case for other roads in the rural network where it would appear that some road sections are more dangerous than others.

Following the repeal of the National Maximum Speed Limit in the US, Vernon, Cook, Peterson, and Dean (2004) evaluated the effect of increased speed limits in Utah by comparing predicted crash trends based on pre-change data (i.e., the expected crash rate if speed limits had remained unchanged) with the actual crash rate observed following the change in speed limits. They found that crashes on urban interstate roads increased significantly, but that fatal and injury crashes did not increase significantly. They also found no significant increase in crashes of any severity on rural interstate roads. While the crash rate on high-speed (60-65 mph) non-interstate highways did not change, a significant increase in fatal crashes on these roads was observed. Road works on a significant section of the interstate network in Salt Lake County, which accounts for almost half of the Utah population, may have effected these findings. While the authors suggest an increase of crashes could have been expected due to the changed traffic conditions it is also possible that factors such as congestion (which leads to slower speeds) or traffic displacement (i.e., more vehicles using alternate routes in order to avoid the road works) may have limited or reduced the crashes where the works were conducted (e.g., Archer, Fotheringham, Symmons, & Corben, 2008), or led to an increase of crashes on other road types (e.g., Grabowski & Morrisey, 2007).

In a system wide evaluation of the effect of increased speed limits following the repeal of the National Maximum Speed Limit Grabowski and Morrisey (2007) found that increasing the speed limit to 65 mph was associated with a 15.7% to 17% increase in fatalities, while limits increased to 70 mph or greater were associated with a 36% to 37% increase in fatalities. The higher speed limits were also found to increase young driver (aged 16 to 25 years) fatalities by 31.1% to 34.5% on 65 mph roads and 40.3% to 45.2% on roads with a limit of 70 mph or higher. The authors also found evidence that increasing the speed limit on rural interstate roads to 70 mph or more was associated with an increase in crashes on rural non-interstate roads, which might suggest an unintended spin-off effect such that the average speed on other rural roads may have increased.

Speed surveys conducted in South Australia since 2002 have demonstrated that the introduction of the default 50 km/h speed limit on urban roads in 2003 lowered the average speed of vehicles (Kloeden & Woolley, 2012).

In total, the above findings suggest that reductions in travel speed reduce the severity and number of crashes that occur, and that lower speed limits effectively reduce the speed of vehicles on roads. The

following sections discuss other issues associated with speed: travel time and environmental considerations.

1.3 Speed effects on travel time

One of the more common objections to reductions in speed limit is an expected increase in travel time (Daly, 2011). Based on the simple assumption that $Travel\,Time = \frac{Distance}{Speed}$ an increase in travel time would be expected following a reduction in the speed limit. However, in a traffic environment there are a number of other factors that affect travel time such that the increase in travel time is not of the magnitude expected (Dutschke & Woolley, 2009). For example, in a review of the impact of lowered speed limits in urban and metropolitan areas Archer, Fotheringham, Symmons, and Corben (2008) suggest that the factors that have the biggest influence on travel time are congestion, traffic delays, intersections, and turning manoeuvres, and that these are unaffected by the posted speed limit. This review also draws on evidence that under some conditions lower speed limits may improve travel time by reducing lane-change friction and the speed dispersion of vehicles, and lead to greater headway between vehicles, all of which lead to a more harmonious traffic flow and reduction in delays caused by crashes.

Dutschke and Woolley (2009) developed a mathematical model to assess the impact of reduced rural speed limits on travel times. The model was based on measurements of actual vehicle speeds taken on South Australian roads prior to and following a reduction of the speed limit from 110 km/h to 100 km/h, and considered a number of issues including the proportion of time spent following slower vehicles and the number of opportunities for safe overtaking. Using this model a microsimulation of travel times based on a distance of 100 km with the fastest vehicles not exceeding the speed limit was undertaken. This revealed that with a reduced speed limit less time was spent travelling behind slower moving vehicles and the need to overtake was much lower than observed with a higher speed limit. Essentially, the lower speed limit was found to reduce the speed differential between faster and slower vehicles – the speed of faster vehicles is reduced while the speed of slower vehicles remains relatively unchanged – which reduces the likelihood of a faster vehicle encountering a slower vehicle (i.e., it takes longer for the faster vehicle to catch up with the slower vehicle). On low-density roads the increase in travel time was estimated to be between 4% and 10%, equating to between 2.2 and 5.5 minutes.

While a reduction in speed associated with reduced speed limits can be expected to increase travel times, research has demonstrated that given the constraints of traffic environments these increases are generally smaller than expected and are not proportional to the reduced limit. In many cases the increase in travel time due to reduced speed limits is negligible (OECD & ECMT, 2006).

1.4 Environmental effects of speed

Further to the expected safety benefits there is the possibility that lower speed limits will have a positive environmental effect by reducing emissions and pollutants produced by cars and other motor vehicles.

In an examination of the safety benefits associated with the adoption of driving styles that lower fuel consumption Haworth and Symmons (2001) found that both lower speed limits and smoother driving style improved fuel economy and reduced emissions. In a similar study Panwai and Dia (2006) examined the differences in travel time between aggressive (characterised by hard accelerations from traffic stoppages) and non-aggressive drivers. They found that over the course of a 44 km trip that aggressive driving resulted in fuel consumption and carbon dioxide emissions that were as much as four times that of non-aggressive drivers and reduced travel time by as little as one minute. Such

studies suggest that the smoother traffic flow and reduced speeds associated with reduced speed limits could be expected to also yield positive environmental benefits, particularly with regard to emissions.

Using microsimulation in conjunction with a mathematical model of vehicle emissions Madireddy De Coensel, Can, Degraeuwe, Beusen, De Vlieger, and Botteldooren (2011) assessed the impact of speed limit reductions on vehicle emissions in an area of Antwerp, Belgium. They found that lower speed limits in residential areas reduced the distance travelled in these areas by 14% (due to vehicles using alternate routes), and carbon dioxide and nitrogen oxide emissions by 27%. On major roads the distance travelled reduced by 0.2% and carbon dioxide and nitrogen oxide emissions were reduced by 9.9% and 10.4% respectively. While the large reduction in emissions observed on residential roads may be partly attributed to a reduction in traffic in these areas, the reduction in emissions on major roads where a negligible change in traffic was observed provides strong evidence that reduced speed limits can be expected to have a positive environmental benefit.

Microsimulation studies conducted by Taylor (2000) and Jurewicz (2010) appeared to show that reductions in speed limits are associated with little, if any, reduction in vehicle emissions. However, Taylor's model of fuel consumption and emissions is based on vehicle speed data obtained under a 60 km/h speed limit and, as Taylor suggests, may not accurately reflect the fuel consumption or emissions of vehicles travelling at slower speeds. As research has shown that reductions in speed limit also reduce vehicle travelling speeds (see above), lower speed limits may also produce a concomitant reduction in fuel consumption and emissions. The simulation undertaken by Jurewicz was based on data for peak traffic, where congestion could be expected to affect both travel speed and vehicle emissions. Research has shown that during peak traffic periods congestion is a greater determinant of vehicle speed than speed limit, thus it is possible that the lack of environmental gains observed by Jurewicz (2010) may be due to vehicle travelling speeds being similar under the lower speed limits modelled.

1.5 Vision zero, safe system, and speed limits

Vision Zero is a road safety strategy originating in Sweden during the mid 1990s. The underlying premise of this strategy is that, in a crash, no road user should be exposed to forces that could result in death or serious injury, with the ultimate vision of zero deaths or injuries due to road crashes. Based on research regarding the biomechanical tolerances of the human body, the maximum speeds allowable before the risk of injury or death is significantly increased (Fildes, Langford, Andrea, & Scully, 2005) are provided in Table 1.1. Based on the principles of Vision Zero the maximum proposed travelling speeds allowable under different traffic conditions are provided in Table 1.2 (Tingvall & Haworth, 1999).

Table 1.1
Maximum impact speeds based on biomechanical tolerance
(from Fildes, Langford, Andrea, & Scully, 2005)

Type of crash	Maximum impact speed
Car v pedestrian	20 to 30 km/h
Car v motorcycle	20 to 30 km/h
Car v tree or pole	30 to 40 km/h
Car v car (side impact)	50 km/h
Car v car (front impact)	70 km/h

Table 1.2
Proposed maximum travel speeds based on Vision Zero
(from Tingvall & Haworth, 1999)

Type of infrastructure and traffic	Maximum proposed travel speed
Location with potential conflict between pedestrians and cars	30 km/h
Intersections with potential side impact between cars	50 km/h
Roads with possible frontal impacts between cars	70 km/h
Roads with no possibility of side or frontal impact (only impact with infrastructure)	100+ km/h

As shown in these tables the maximum safest speeds for urban roads are between 30 and 50 km/h depending on the type of road, while for rural highways and other roads outside of built up areas the maximum safest speeds are between 70 and 100 km/h. On well protected roads such as freeways, speeds greater than 100 km/h may be appropriate.

2 Evaluation Method

Web searches were used to identify educational materials aimed at showing the safety and environmental benefits of reduced speed and the limited impact on travel time caused by small reductions in speed. These included resources produced by road agencies, government insurance agencies/commissions, and police forces around Australia as well as other private and government organisations concerned with road safety. Resources developed for use in school curricula and by community groups were also included. Television, radio, and print-form (including signs/billboards) mass media campaign materials were not included in the evaluation.

Speed educational resources were identified by searching the websites of relevant organisations for content relating to: speed, speed limits, speed education, or speed enforcement. Each organisation was contacted in order to identify any other relevant materials that have been produced or are in development and to obtain permission for including the material in this report. The organisational contacts for obtaining permission to use the material in another context were also identified. A list of the organisations contacted is provided in Appendix A and the contacts in Appendix D.

2.1 Evaluation process

Educational materials addressing speed and the benefits of slower speeds or risks of higher speeds were evaluated against the following criteria:

1. Is it evidence based?
2. Can it be presented in a way that will be understood by the general public?
3. Is it likely to influence public opinion?
4. Does it support the speed management principles presented in the National Road Safety Strategy 2011-2012?

1. Is it evidence based?

This criterion considers the extent to which the content of the educational material or resource is based on current knowledge. Consideration was given to the use of current or recent statistics (e.g., police statistics regarding involvement of speed in crashes), whether the content matches current knowledge, and whether supporting evidence is provided by making reference to relevant research (including citations where appropriate).

2. Can it be presented in a way that will be understood by the general public?

Judgements regarding the ease with which the information presented in each document were made giving consideration to the use of abstract concepts (e.g., “risk”), jargon or other scientific/mathematical terminology, whether the message is explicitly stated or relies on the individual to draw a conclusion from the information provided, and the general simplicity or complexity of the explanation.

3. Is it likely to influence public opinion?

In order to rate the ability of each document to influence public opinion consideration was given to the following issues: ease of understanding (i.e., criterion 2), the length of the document, the extent to which an individual must engage with the material, and the amount of information presented. Some multi-page documents may contain a lot of evidence but may be judged to require too great an effort from a reader. Conversely a single page document requires less effort from a reader but may fail to

provide an adequate explanation or example. It should be noted that documents of varying lengths and complexities will be suitable for different tasks – short, simple answers may be suitable for web-based FAQs (Frequently Asked Questions), while longer, more complicated (in terms of number of topics addressed, presentation of issues, questions, or problems) documents are necessary for classroom based materials. The purpose of the material was not considered in this evaluation.

Furthermore, the OECD & ECMT (2006) report on speed management identified four key approaches that were associated with the most effective educational campaigns. As such, consideration was given with regard to the extent to which each of the documents evaluated in the present report adopted one or more of the following approaches:

- Encompass the logical basis of the speed limit system (i.e., why we have a speed limit system and what are the principles for setting speeds)
- Explain the reasons for implementing speed management measures (i.e., justify the use of a speed management measure)
- Highlight the positive safety outcomes of speed management measures
- Highlight the environmental benefits of moderated speeds

4. Does it support the speed management principles presented in the National Road Safety Strategy 2011-2012?

The speed management principles outlined within the National Road Safety Strategy (NRSS) include:

- Setting speed limits that match the road and environment and reduce crash impact forces to within the range of human tolerance
- Increasing compliance with speed limits

Evaluation against this criterion was primarily based on the extent to which the information provided was judged to be in line with or could be used to explain the theory behind the setting of speed limits to mitigate the role of speed in crashes and crash outcomes. Consideration was also given as to whether the information provided might increase compliance with speed limits.

3 Justifications for speeding

A small workshop involving several experts in the area was undertaken to identify the key arguments used by drivers to rationalise or justify their speeding behaviour. This was done in order to identify the arguments necessary to counter these points of view, identify the evidence or information necessary to support these counter arguments, and compare these with the arguments and information presented in current speed education resources. Drawing on knowledge of the literature and anecdotal evidence the following arguments used to justify speeding were identified.

Normalisation

Justifying speeding due to a belief that almost all other road users are speeding, or in order to keep up with the traffic flow (Aberg, Larsen, & Beilinsson, 1997; Conner, Smith, & McMillan, 2003; Fleiter, Watson, Lennon, & Lewis, 2006; Watson, Siskind, Fleiter, & Watson, 2012).

Perception of risk as minimal

Minimise the risks of speeding due to belief that driving skills are superior to others, that cars are safer, that familiarity with the road reduces risk, that travelling slightly above the speed limit does not pose a threat to safety, or that reaction times are fast enough to reduce risk (Elliott, 2001; Fleiter, Lennon, & Watson, 2010; Stradling, Meadows, & Beatty, 2004).

Excessive speed and hoon drivers are the problem

Many perceive that it is drivers who travel at excessive speeds and drive dangerously that are the real safety issue and that driving at 5 km/h over the limit is not speeding (Lahausse, van Nes, Fildes, & Keall, 2010).

Variability in speed limits causes confusion

Speed limits along some roads can vary through a number of different zones, which some drivers argue causes confusion with regard to the speed at which they should be driving (Lahausse, van Nes, Fildes, & Keall, 2010).

Legitimacy of enforcement

Arguments in this category question the validity of speed enforcement, particularly the use of radars and safety cameras. One of the more common arguments is that speeding enforcement is just an exercise in revenue raising for the government (Hatfield & Job, 2006). Deterrence theory suggests that penalties that are perceived as excessive, undeserved, or unjust may undermine the deterrent effect of enforcement (e.g., Sherman, 1993).

Roads should be made safer

Some argue that if roads are unsafe they should be fixed and that changing the speed limits is a cop out. Community-based motoring organisations often call for other improvements to roads such as median barriers and other means to separate traffic.

Reducing speed will increase travel time

It is commonly argued, particularly with regard to long trips on rural roads, that reduced speed limits will increase travel time (Daly, 2011). In a similar vein, some believe that they can save time by

speeding (Daly, 2011; Hatfield & Job, 2006). Anecdotally some also argue that the expected increase in travel time due to reduced speed limits will increase the risk of crashes due to an increased likelihood of driver fatigue.

Question the logic of speed limits

Two seemingly identical roads or types of road may have differing speed limits for reasons that may not be readily apparent to drivers. Research has also shown that other factors affect driver speed choice, including type of road, geometry, and the design speed of the road such that some drivers have a tendency to travel at a speed that they feel is safe for the road and conditions (Ivan, Garrik, & Hanson, 2009).

Speeding is fun

Some drivers may derive a sense of enjoyment or mastery from driving at faster speeds (Watson, Siskind, Fleiter, & Watson, 2012).

4 Results

A total of 70 documents addressing speed, each available via the internet (see Appendix B for URLs), were included in the study. A review of each identified 27 evidence-based arguments used with some regularity (see Table 4.1 and Appendix C). The most common argument or evidence addressed the reasons why travelling at faster speeds increase the risk of a crash (e.g., less time to react to hazards, increased stopping distances, loss of control, faster speeds lead to more crashes, and higher speeds increase the severity of a crash) followed by the speed risk curve of Kloeden et al. (2002), identifying low level speeding as a safety issue, the use of police crash statistics, explanation of the penalties for speeding (demerit points, fines, etc.), and the benefits of lower speeds for pedestrian crashes (the pedestrian argument – Anderson, 2001). The explanation of stopping distances and impact speeds accounting for reaction times was also common, as were describing the expected benefits associated with reduced speed (e.g., Doecke et al., 2011).

The frequency with which these arguments were encountered can be observed in Table 4.1 and a description of each is provided below.

Reasons why speed causes crashes

The resource outlines the reasons why faster speeds increase the risk of crashes, affects the number of crashes, and affects the injury outcomes of those crashes. The most common reasons used include: less time to react to hazards, longer stopping distances, increased likelihood of losing control, higher speeds result in more crashes, and higher speeds increase the severity of crashes.

Risk-curve (5 km/h over in 60 km/h and 10 km/h in 100 km/h zones doubles the risk of crashing) (e.g., Kloeden et al., 2001; Kloeden et al., 2002)

The resource draws on the work of Kloeden et al. (2001) and Kloeden et al. (2002) to describe the increased risk of an injury crash when travelling at 5 km/h over the speed limit on metropolitan roads or 10 km/h on rural roads. The former is often used in conjunction with describing the problem of low level speeding.

Low level speeding (e.g., Doecke et al., 2011)

The resource identifies low level speeding as a significant safety problem as there are more drivers speeding at lower levels than at excessive levels.

Statistics

The resource uses police crash statistics or road fatality statistics to highlight the problem of speeding. Also included are statistics identifying the number of crashes in which speed is considered to play a role.

Demerit points, fines, and other penalties

The resource provides information regarding, or refers to the penalties associated with, speeding offences. These include demerit points, fines, licence suspension, wheel clamping, impounding, etc.

Pedestrian argument (e.g., Anderson, 2001)

The resource highlights the effect of speed on the severity of crashes involving pedestrians. This includes comparisons of stopping distances and impact speeds for vehicles travelling at different speeds.

Distance to stop at 60 km/h = 38-56m (dependent on reaction time)

The resource utilises examples of stopping distances that highlight the differences between vehicles travelling at various speeds. The differences in stopping distances reported are likely due to variance in the threshold for reaction time included in the calculation of stopping distances across resources.

Safety benefits (e.g., fewer crashes, lower severity, etc.) (e.g., Doecke et el., 2011)

Includes resources that generally indicate that reduced speed limits are associated with a reduction in crashes in general and a reduction in crashes of higher severity (e.g., fatal).

Safe following distance

Identifies the importance of having a safe following distance of at least 3 seconds, often including advice regarding how to determine this distance.

Define speeding

The resource defines the various types of speeding:

- Inappropriate speed for conditions: driving too fast for the prevailing conditions (e.g., weather, light, traffic, condition of the road, etc.)
- Low level speeding: travelling at around 5 km/h over the posted speed limit
- Excessive speeding: deliberately travelling well above the posted speed limit.

Small reductions in speed

The resource explicitly states that small reductions in travelling speed are associated with significant safety benefits.

Risk of fatality curves

The resource highlights the increased risk of fatality associated with increasing travelling and impact speeds.

Costs to community

The resource highlights the costs to the community in terms of loss of life or the financial costs associated with health care.

Selection of sites based on safety (e.g., to reduce crashes)

The resource indicates that roads on which speed limits are to be lowered are selected based on safety concerns that are determined either by number of crashes, or the presence of other hazards such as pedestrians.

Expected safety benefits (e.g., projected reduction in crashes or injuries/fatalities)

The resource reports the safety benefits expected following a reduction in speed limits. These include a reduction in the number of crashes and a reduction in the injury severity of crashes.

Safe system speeds 30/50/70/100 km/h (e.g., Fildes et al., 2005; Tingvall & Hall, 1999)

The resource identifies the safest speeds to ensure minimal injury under different driving and crash conditions. These speeds are outlined in Table 1.1 and Table 1.2.

Energy at impact

The resource describes the increased energy at impact associated with increased speeds. This may be simply stated or include some demonstration of stopping distances and impact speeds associated with different travel speeds.

Minimal travel time effects

The resource highlights the minimal gains in travel time associated with reduced speed limits.

Speed cameras work

The resource provides evidence that speed cameras effectively reduce speeding on roads where they are installed.

Change from 60 km/h to 50 km/h produces 20% reduction (Kloeden et al., 2002)

The resource draws on evaluations showing that reducing speed limits from 60 km/h to 50 km/h has reduced injury crashes in the order of 20%.

Compare to alcohol risk (Kloeden et al., 1997)

The resource compares the risk of crashing when driving at 5 km/h over the speed limit (on 60 km/h roads) to driving with a BAC of .05.

Emissions

The resource suggests that reductions in travel speed will have environmental benefits in terms of reduced emissions. Such arguments may also include reductions in noise.

Fuel economy

The resource provides evidence that reduced travelling speeds associated with reduced speed limits have financial benefits in terms of improved fuel economy.

Speed survey data

The resource draws on evidence from speed survey data to demonstrate the reductions in speed associated with reduced speed limits.

Nilsson's power model (Nilsson, 2004)

The resource explicitly refers to Nilsson’s power model that explains the percentage change (increase or decrease) in injury crashes associated with changes in speed.

Crashing at 50 km/h is equivalent to falling from a three storey building

The resource compares crashing at 50 km/h to falling from a three storey building.

Table 4.1
Evidence used in speed education resources

Evidence	Number of documents
Reasons why speed causes crashes	39
Risk-curve (5km/h = double) (e.g., Kloeden et al., 2001; Kloeden et al., 2002)	31
Low level speeding (e.g., Doecke et al., 2011)	27
Statistics	23
Demerit points, fines, and other penalties	22
Pedestrian argument (e.g., Anderson, 2001)	19
Safety benefits (e.g., fewer crashes, lower severity, etc.) (e.g., Doecke et el., 2011)	17
Distance to stop 60 = 38-56m (dependent on reaction time)	16
Define speeding	15
Costs to community	14
Selection of sites based on safety (e.g., to reduce crashes)	14
Safe following distance	14
Small reductions in speed	13
Risk of fatality curves	12
Energy at impact	12
Minimal travel time effects	10
Expected safety benefits (e.g., projected reduction in crashes or injuries/fatalities)	10
Safe system 30/50/70/100 km/h (e.g., Fildes et al., 2005; Tingvall & Hall, 1999)	9
Speed cameras work	7
Excessive speed	6
Change from 60 to 50 produces 20% reduction	6
Emissions	6
Compare to alcohol risk (Kloeden et al., 1997)	5
Fuel economy	5
Speed survey data	4
Nilsson's power model	3
50km = 3 storey building	2

As each of the educational resources reviewed were found to draw on the same concepts and evidence a decision was made to identify the best examples of these in terms of the use of evidence, how easy they were to understand, the likelihood that they will influence the general public, and the extent to which they support the speed management principles of the NRSS. Based on these criteria nine resources (see Table 4.2) were considered to provide the best examples of existing speed education resources. A summary of each is provided below; copies of each are provided in Appendix E.

The organisations were queried about obtaining permission to use the material in another context. Not every organisation responded, but those who did respond generally indicated that permission would depend on the exact use of the material and should be sought once that use was determined. The contact details for each of the organisations included in this review are provided in Appendix D.

Table 4.2
Evidence used in speed education resources identified as best

	Resource*								
Evidence	1	2	3	4	5	6	7	8	9
Risk of fatality curves	X		X			X	X		X
Pedestrian argument	X		X	X		X		X	X
Risk-curve (5k = double)	X				X	X	X	X	X
Reasons why speed causes crashes	X	X	X	X	X	X	X	X	X
Low level speeding	X		X				X	X	X
Excessive speed			X					X	X
50km= 3 storey building					X				
Safe system 30/50/70/100	X	X			X				
Change from 60 to 50 produces 20% reduction				X	X				
Compare to alcohol risk	X			X					
Speed cameras work		X		X	X				
Distance to stop 60 = 38m OR IS IT 45m? OR 56?				X			X		X
Costs to community						X		X	
Emissions	X	X		X		X			
Minimal travel time effects	X	X		X		X		X	
Demerit points, fines, and other penalties					X	X		X	
Crash statistics	X	X		X	X		X		X
Selection of sites based on safety				X			X	X	
Speed survey data							X		
Expected safety benefits	X	X	X	X					
Fuel economy	X	X							
Safety benefits		X	X		X			X	X
Define speeding			X		X			X	X
Energy at impact					X			X	X
Safe following distance									
Small reductions in speed		X	X	X	X	X			X
Nilsson's power model					X		X		

Note: *resources are arranged in no particular order

Resource 1: Road safety: Speed facts (DPTI, SA)

Resource 2: Towards zero together - safer speeds (DPTI, SA)

Resource 3: Community safety: Speed (Victoria Police)

Resource 4: 50 km/h general urban speed limits: FAQ (DIER, Tasmania)

Resource 5: Speeding (ORS, WA)

Resource 6: Speeding and safety (Vicroads)

Resource 7: The danger of speeding (Justice and Community Safety, ACT)

Resource 8: Why is speeding a problem? (RMS, NSW)

Resource 9: How does speeding increase the chances and severity of a crash? (RMS, NSW)

4.1 Summary of best speed education resources

The following summaries of the best exemplars of speed education resources are provided in no particular order.

Road safety: speed facts

Source: Department of Planning, Transport and Infrastructure (DPTI), South Australia.

Resource type: Information provided via DPTI website

Comments: For the evidence contained in this resource refer to Table 4.2. The information is concise and explains a range of issues using simple concepts. Graphics in the form of charts and images are also used to highlight information where appropriate. In addition to highlighting the safety benefits of reduced speed the resource also outlines the benefits with regard to fuel economy, environmental impact, and travel time that may have a positive influence over the general public. The information provided also supports the speed management principles of the NRSS with regard to reducing the risks associated with speed and reducing speeding.

This resource may be strengthened by providing more information with regard to the effects of speed on fuel consumption, emissions, and travel time.

Towards zero together: Safer speeds

Source: Department of Planning, Transport and Infrastructure (DPTI), South Australia.

Resource type: Information provided via the DPTI website

Comments: For the evidence contained in this resource refer to Table 4.2. The information provided explains the Safer Speeds principles of the Safe System approach that underpins both the South Australian road safety strategy (*Towards zero together*) and the NRSS. In order to adequately convey the required information the evidence is primarily provided as text in short paragraphs, although some charts and images are also used. The ability to influence the public is enhanced by addressing the benefits to fuel economy, environmental impact, and travel time in addition to the expected safety benefits. All speed management principles of the NRSS are supported.

This resource may be improved by presenting the information in a more user-friendly format.

Community safety: Speed

Source: Victoria Police

Resource type: Information provided on the Victoria Police website

Comments: For the evidence contained in this resource refer to Table 4.2. This resource provides simple messages regarding the increased crash risks associated with speed. The information is generally limited to explaining the safety aspects of speed, which may reduce the ability to influence the general public. With regard to the NRSS speed management principles the information is consistent with encouraging lower speeds in order to reduce crashes and injury.

While the simplicity of this resource is its primary strength it is perhaps too one-dimensional in focus and may be improved by addressing the rationale for setting lower speed limits and other benefits of slowing down.

50 km/h general urban speed limits: FAQ

Source: Department of Infrastructure, Energy and Resources (DIER), Tasmania

Resource type: FAQ (Frequently Asked Questions) provided on the DIER Transport website

Comments: For the evidence contained in this resource refer to Table 4.2. The information is provided in a simple question-answer format with the answers providing concise, simple to understand explanations of the relevant issues. In terms of influencing the general public the resource addresses safety, fuel economy, environmental, and travel time benefits of reduced speed in addition to providing evidence for the efficacy of reduced speed limits, which should improve the influence of the resource. The information provided is consistent with the speed management principles of the NRSS.

The question-answer format of this document is perhaps its main strength. However, a lot of information is provided in text format, which may be off-putting to many people. This resource could be improved by presenting the information in a more user-friendly format (i.e., other than “lengthy” prose).

Speeding

Source: The Office of Road Safety (ORS), Western Australia

Resource type: Information provided on the ORS website

Comments: For the evidence contained in this resource refer to Table 4.2. The information presented offers concise and simple explanations of the association between speed and crash risk. It offers evidence of the proven effectiveness of reduced speed limits, which should increase the influence of the information, although other aspects such as fuel economy, travel time, and environmental impact are not included. The information provided is consistent with all of the NRSS principles of speed management.

This resource is considered to provide one of the best examples of how to present information, although the inclusion of information regarding travel times, environmental impact, or fuel economy may improve it further.

Speeding and safety

Source: Vicroads

Resource type: Information provided on the Vicroads website

Comments: For the evidence contained in this resource refer to Table 4.2. The information is presented in a concise and simple format. The ability of this resource to influence the general public is enhanced by addressing aspects of safety, environment, travel time, and the costs to the community associated with loss of life and financial burden of casualty crashes. All speed management principles of the NRSS are addressed.

The danger of speeding

Source: Justice and Community Safety, Australian Capital Territory

Resource type: Pamphlet produced by Justice and Community Safety

Comments: For the evidence contained in this resource refer to Table 4.2. This resource provides a concise overview of the association between speed and crash risk. It is presented in a simple format

and in a manner that is easy to understand. The document is primarily focussed on the safety aspects of speed and does not address travel time, environmental issues, or fuel economy, which may affect its ability to influence the general public. All aspects of the NRSS speed management principles are addressed.

Inclusion of information regarding the environmental impact, etc. may improve this document, although as it is primarily designed to be provided in hard copy, this limits the amount of information that can be provided.

Why is speeding a problem?

Source: Roads and Maritime Services (RMS), New South Wales

Resource type: Fact sheet available from RMS website

Comments: For the evidence contained in this resource refer to Table 4.2. This fact sheet provides information regarding the problems of speeding in a question and answer format, which is simple, easy to understand, and addresses some of the justifications for speeding identified in Section 3. Further to the risks associated with speeding and benefits of reduced speed the resource also addresses travel time and the cost of road trauma to the community. The resource addresses all aspects of the NRSS speed management principles.

The question and answer format of the resource is its key strength, particularly with regard to addressing the issues of drivers thinking they can speed safely, low level speeding, and travel times. Some improvement may be possible by explaining some of the aspects further (e.g., effects of speed on travel time). Information regarding the environmental harms associated with speed may also improve the resource.

How does speeding increase the chances and severity of a crash?

Source: Roads and Maritime Services (RMS), New South Wales

Resource type: Fact sheet available from RMS website

Comments: For the evidence contained in this resource refer to Table 4.2. This fact sheet provides information regarding the risks of speeding in a question and answer format, which is simple and easy to understand. The particular focus of this document is how speed increases the likelihood of crashing and increases the severity of injuries in a crash. The resource addresses all aspects of the NRSS speed management principles.

The question and answer format of this resource is its primary strength. This resource could be improved by the use of diagrams to help explain some of the key points such as reaction time, stopping distance, and impact speeds. The resource may also offer improvements by explaining the minimal impact on travel times and addressing the benefits of reduced speeds further (e.g., environmental and economic).

5 Discussion

A review of 70 public educational resources addressing speed was undertaken in order to identify materials that might be useful in improving acceptance of and compliance with lower, safer speed limits throughout Australia. These resources were found to draw on similar evidence with a total of 27 central arguments employed across the group. As such, any differences in the quality of the resources is likely attributable to the range of information that is presented, and the accessibility of this information to the general public. Based on further assessment of the ease with which the information could be understood, the likelihood that the information will influence the general public, and the extent to which the information presented supports the speed management principles of the NRSS, nine resources were considered to provide the best examples of speed education information. While the majority of resources reviewed tended to focus on the safety aspects of speeding (e.g., risks of crashing, injury severity, or benefits of reduced speed) the better resources tended to address a wider range of evidence and often included information regarding the environmental impacts of speed (e.g. emissions and noise), fuel economy, or travel time. The better resources were also considered to be more accessible to the public both in how the information was presented aesthetically and in terms of the content.

5.1 Improving upon existing resources

It is evident that the present focus of publicly available speed education resources is to promote adherence to speed limits in order to achieve a level of safety on our roads. While there is nothing inherently wrong with such an approach, it is possible that this could be strengthened further with the addition of evidence or information that addresses the reasons why people speed, or offers some counterpoint to the manner in which they rationalise their speeding behaviour.

Some of the ways in which drivers rationalise speeding and suggested counter-arguments include:

1. Normalisation: the perception that everyone else is speeding. To counter this, information highlighting that the majority of road users do in fact drive within the speed limit should be presented.
2. Perception of risks as minimal: driver's perceptions of their own abilities as a driver, of the safety of their vehicle, or the safety of the road minimise the perceived risk of crashing when travelling slightly over the speed limit. To counter this it should be argued that road safety is a problem at the community level and that if everyone slows down the risk of other drivers crashing is also reduced. It might also be beneficial to identify that travelling at a slower speed increases the safety of the driver when unexpected events or other drivers cause a crash.
3. The perception that excessive speed or hoon drivers are the problem: drivers who are reckless and exceed the speed limit by large amounts are the real safety problem. To some extent this is true, however the available evidence (which is reported in the majority of current resources) indicates that people who exceed the speed limit by small amounts also pose a significant safety problem.
4. Variability in speed limits: speed limits along some roads vary so much that it can be confusing and difficult to know what the speed limit is. This may be addressed by either a) increasing the number of speed limit signs or b) reducing the number of speed limits on some roads. Other solutions such as advisory intelligent speed adaptation (ISA) applications would also be of benefit to drivers who find it difficult to identify the speed limit of the road on which they are travelling. In general, a driver is expected to possess the ability to accurately identify the speed limit of a road, however simplifying this task for the driver may increase compliance with speed limits.

5. Questioning the legitimacy of enforcement and enforcement methods: speed limit enforcement is revenue raising, speed cameras are not used for safety. Road safety is an important community issue and increasing compliance with speed limits is an important part of improving road safety for all. Enforcement plays an important role in compliance and takes many forms. Evidence should point to the effectiveness of speed/safety cameras while common sense would also hold that the surest way to avoid punishment is to drive within the speed limit.
6. Make the roads safer to drive at higher speeds. It is possible to improve infrastructure to the point where high speeds are safe and governments do invest large amounts of public funding for this purpose. However, given the extent of the road network, changes to road infrastructure take considerable time and involve enormous costs, making such an approach feasible only for the highest volume roads. On other roads, lowering speed limits is a simple, cost effective alternative that has been proven to yield significant safety benefits in relatively short periods of time.
7. Speeding reduces travel time. In metro areas the largest determinant of travel time is signalised intersections; speeding will yield small if any reductions in travel time but may increase the time spent waiting at signalised intersections. On rural roads the time savings achieved by speeding are minimal which should be outweighed by the significant increase in crash risk associated with speeding. Some of the resources reviewed address this issue.
8. Question the logic of speed limits: roads that appear to be identical have different speed limits causing some drivers to question the logic behind speed limits. A counter to this argument is that there may be some safety issue of which some drivers are not aware calling for a lower speed limit on that road. Resources should highlight that speed limits are set based on safety considerations, as many do.
9. Speed is fun: driving fast provides a thrill or sense of mastery. Risk-taking drivers may be the hardest to reach of all speeding drivers. Resources aimed at this group should seek to increase the perceived risk of detection among this group by highlighting enforcement practices and new technologies to detect speeding, and also the penalties for speeding or hoon driving.

Addressing the arguments that drivers use to justify or rationalise their own speeding behaviour through the use of evidence based counter-arguments has the potential to increase compliance with lower speed limits. The nine arguments outlined above are suggested as a starting point but should not rule out any other arguments that have not been addressed above. The manner in which such information should be provided is beyond the scope of this report, however examples of resources that were considered the best exemplars of speed education have been provided.

Efforts to identify the permission required to utilise the resources included in this review found that, in general, the necessary permission would be dependent upon the manner in which the material was to be used. As such, the agency responsible for the production of the material should be contacted to determine the permission specific to the intended use of the material. However, given that the resources were found to draw on the same evidence it would be possible to develop similar resources without the need for permission beyond the acknowledgement of the sources of information (i.e., references).

5.2 Producing a new resource

There are a number of options available for using or incorporating the identified material into a resource that meets the criteria at the basis of this report. The quality and potential efficacy of the resource would increase from one option to the next. However, the amount of additional development work would also increase.

Option 1

Use any or all of the seven exemplar resources unchanged. Such an approach may prove adequate and would require no further work. Permission to use any of these resources would need to be obtained from the relevant organisation (see Appendix D for contact details).

Option 2

Combine the best elements and evidence from the exemplar resources. This approach would yield a more effective resource but would require some additional development work. Permission to use the resources in this manner would be required.

Option 3

Extend an existing resource (or resources) to address some or all of the nine arguments outlined above. This would enhance the resource further but would also require some additional development work and permission to utilise or edit the chosen resources would be required.

Option 4

Given that all of the resources reviewed, including the seven exemplar resources, use similar evidence it would be possible to develop a new, comprehensive resource that would use the same evidence and ensure all of the arguments outlined above are adequately addressed. This option would require the most additional development work, however, it would not be necessary to obtain permission from other organisations.

5.3 Conclusion

Current speed education resources generally draw on the same evidence in order to highlight the safety aspects of adhering to speed limits or setting lower speed limits. The better resources tended to address a wider range of evidence and often included information regarding the environmental impacts of speed (e.g. emissions and noise), fuel economy, or travel time. The better resources were also considered to be more accessible to the public both in how the information was presented aesthetically and in terms of the content. While there is nothing inherently wrong with an approach that promotes adherence to speed limits in order to achieve a level of safety on our roads, the efficacy of resources could be strengthened further with the addition of evidence or information that addresses the reasons why people speed, or offers some counterpoint to the manner in which they rationalise their speeding behaviour. There are four options with regard to the use of existing educational materials that vary from using resources unchanged or with some amendments to the development of a new, comprehensive resource.

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Appendix A – Organisations contacted

National	Australasian College of Road Safety
	Australian Automobile Association
	Austroads
	BITRE
	National Transport Commission
	RiAUS
ACT	Department of Education and Training
	Department of Justice & Community Safety
	Department of Treasury
NSW	Centre for Road Safety
	Department of Education & Communities
	Injury Risk Management Centre
	Motor Accident Authority
	NRMA
	NSW Police
	Roads & Maritime Services, Transport NSW
	The George Institute
NT	Department of Education & Training
	Northern Territory Police
	NT Transport Group
	Territory Insurance Office
QLD	CARRS-Q
	Department of Education & Training
	Department of Transport & Main Roads
	Motor Accident Insurance Commission
	QLD Police
SA	Department of Education & Children's Services
	Department of Planning, Transport and Infrastructure (DPTI)
	Motor Accident Commission
	RAA
	SA Police (SAPOL)
TAS	Department of Infrastructure, Energy and Resources
	Road Safety Advisory Council
	Motor Accident Insurance Board
	Tasmanian Police

VIC	ARRB Group
	Department of Education & Early Child Development
	MUARC
	RACV
	Transport Accident Commission
	VicRoads (inc. ArriveAlive.com.au)
	Victorian Police
WA	Department of Transport
	Insurance Commission of WA
	Office of Road Safety
	RAC
	RoadWise
	School Drug Education and Road Awareness (SDERA)
	WA Police

Appendix B – Speed education resource and URL

Table A1
URLs for speed education resources included in the review

Document	URL
Speed: Speeding fact sheet (ORS, WA)	http://www.ors.wa.gov.au/Documents/Speed/speed-factsheet-jan2012.aspx
Road safety: New speeding penalties (DPTI, SA)	http://dpti.sa.gov.au/roadsafety/safer_speeds/new_speeding_penalties
FAQ: speed limits save lives (Vicroads)	http://www.roadsafety.vic.gov.au/initiatives/safer_roads_and_roadsides/speed_and_sp/frequently_asked_questions_speed_limits_save_lives.html
Speed management strategy 2010-2013 (TMR, Queensland)	http://www.tmr.qld.gov.au/~/media/Safety/Driver%20guide/Speeding/Speedstrategyfactsheet20102013.pdf
Speed limits (TMR, Queensland)	http://www.tmr.qld.gov.au/Safety/Driver-guide/Speeding/Speed-limits.aspx
Your guide to heavy vehicle speed legislation (DPTI, SA)	http://www.transport.sa.gov.au/freight/heavyvehiclespeed/fact_sheets/FACTSHEET1.pdf
Road safety: Safer speeds (DPTI, SA)	http://www.dpti.sa.gov.au/roadsafety/safer_speeds
Watch out for Creepers (MAC, SA)	http://www.mac.sa.gov.au/campaigns/creepers_2011/watch_out_for_creepers.php
Safe system approach (ACRS)*	http://acrs.org.au/wp-content/uploads/ACRS_Safe-Systems_20100802_FA.pdf
Safe speeds (ORS, WA)	http://www.ors.wa.gov.au/Speeds.aspx
Speed limits (ORS, WA)	http://www.ors.wa.gov.au/Demographic-Pages/Visitor/Speed-Limits
Why we have speed limits (MAC, SA)	http://www.mac.sa.gov.au/campaigns/creepers_2011/why_we_have_speed_limits.php
Speed (RSAC, Tasmania)	http://www.rsac.tas.gov.au/campaigns/speed
Road safety: Speed facts (DPTI, SA)	http://www.dpti.sa.gov.au/roadsafety/safer_speeds/speed_facts
Towards zero together - safer speeds (DPTI, SA)	http://dpti.sa.gov.au/towardszerotogether/saferspeeds
Community safety: Speed (Victoria Police)	http://www.police.vic.gov.au/content.asp?Document_ID=9480
The TAC Wipe Off 5 campaign: A case study (TAC, Victoria)	http://www.tacsafety.com.au/campaigns/speed-campaign/wipe-off-5-case-study
Speed statistics (TAC, Victoria)	http://www.tacsafety.com.au/statistics/speed-statistics
Course materials - speed (TAC, Victoria)	http://www.tacsafety/com.au/jsp/content/NavigationController.do?areaID-6&tierID=3&navID=96E3EE9C7
Road safety (Western Australia Police)	http://www.police.wa.gov.au/Traffic/Roadsafety/tabid/991/Default.aspx
Victoria's speed limits (Vicroads)	http://www.vicroads.vic.gov.au/Home/SafetyAndRules/SafetyIssues/Speed/VictoriasSpeedLimits.htm
Traffic information page Tip 3: Speeding (SA Police)	http://www.police.sa.gov.au/public/download.jsp?id=49623
Road safety: Now 100 (DPTI, SA)	http://www.dpti.sa.gov.au/roadsafety/safer_speeds/speed_limits_and_penalties/now_100
50 km/h general urban speed limits: FAQ	http://www.transport.tas.gov.au/safety/50_kmh_general_urban_speed_limits/faq
Is speeding really that dangerous? (TMR, Queensland)	http://www.tmr.qld.gov.au/Safety/Driver-guide/Speeding/Is-speeding-really-that-dangerous.aspx
Speeding (RMS, NSW)	http://www.rta.nsw.gov.au/roadsafety/speedandspeedcameras/index.html
Consequences of speed (Western Australia Police)	http://www.police.wa.gov.au/Traffic/CamerasCutCrashes/Speed/Consequencesofspeed/tabid/1767/Default.aspx
Geared: Speeding - the number one killer on our roads (RMS, NSW)	http://www.rta.nsw.gov.au/geared/driving/testimonials.html
Geared: Captured on film (RMS, NSW)	http://www.rta.nsw.gov.au/geared/licence/captured_on_film.html
Geared: Speeding penalties (RMS, NSW)	http://www.rta.nsw.gov.au/geared/licence/new_speeding_penalties.html
Stopping distances (TMR, Queensland)	http://www.tmr.qld.gov.au/Safety/Driver-guide/Speeding/Stopping-distances.aspx
The science and myths of low level speeding: years 10-11 (RiAus)	http://riaus.org.au/wp-content/uploads/2012/10/RiAus-PDplus-low-level-speeding-notes-Years-10-11.pdf
Speed (Western Australia Police)	http://www.police.wa.gov.au/Traffic/CamerasCutCrashes/Speed/tabid/1766/Default.aspx

Speed and speeding Victoria's road safety strategy (Vicroads)	http://www.roadsafety.vic.gov.au/strategy/safer_road_users/speed_and_speeding/speed_and_speeding.html
The driver's handbook: Speeding and inappropriate travel speeds (DPTI, SA)	http://www.mylicence.sa.gov.au/the_online_drivers_handbook/speeding_and_inappropriate_travel_speeds
Speed limits (RMS, NSW)	http://www.rta.nsw.gov.au/roadsafety/speedandspeedcameras/40kmhcbdspeedlimit/index.html
State of the road: Speeding (CARRS-Q, Queensland)	http://www.carrsq.qut.edu.au/publications/corporate/speeding_fs.pdf
Speeding (NRMA, NSW)	http://www.mynrma.com.au/motoring/road-safety/safer-driving/country/speeding.htm
Why a lower speed limit (RMS, NSW)	http://www.rta.nsw.gov.au/roadsafety/speedandspeedcameras/40kmhcbdspeedlimit/whyalowerlimit.html
The driver's handbook: Speed limits (DPTI, SA)	http://www.mylicence.sa.gov.au/the_online_drivers_handbook/the-drivers-handbook
Road to solo Driving (Vicroads)	http://www.vicroads.vic.gov.au/Home/Licences/Handbooks/LandPDrivers/RoadToSoloDriving.htm
Queensland speed management strategy 2010-2013 (TMR)	http://www.tmr.qld.gov.au/~/media/Safety/Driver%20guide/Speeding/SpeedManagementStrategy20102013.pdf
The science and myths of low level speeding: years 7-9 (RiAus)	http://riaus.org.au/wp-content/uploads/2012/10/RiAus-PDplus-low-level-speeding-notes-Years-7-9.pdf
VCAL road safety units: Safety in numbers - activity 4 (Vicroads)	http://www.vicroads.vic.gov.au/NR/rdonlyres/53BEA05F-4E59-49F0-8245-D90B1413631F/0/safetyinnumbers.pdf
Fact sheet no. 10: Strategies for managing recidivist speeding (C-MARC, WA)	http://c-marc.curtin.edu.au/local/docs/CMARC_Fact_Sheet_10_Recidivist_speeding.pdf
Kids on the move: Levels 4-5 (Vicroads)	http://www.eduweb.vic.gov.au/edulibrary/public/teachlearn/student/kotmbook3pta.pdf
The RYDA Program Facilitator's manual: Stopping distances (Rotary/RYDA)[a]	http://www.rse.org.au/RYDA.aspx [Manual available in hardcopy only]
Traffic safety essentials for young road users not crash test dummies (TAC, Victoria)	http://www.eduweb.vic.gov.au/edulibrary/public/teachlearn/student/trafficsafetyessentials.pdf
Speeding (ORS, WA)	http://www.ors.wa.gov.au/Demographic-Pages/I-Am-A-Driver/Speed
Speeding and safety (Vicroads)	http://www.vicroads.vic.gov.au/Home/SafetyAndRules/SafetyIssues/Speed/SpeedingandSafety.htm
Speeding (Department of Transport, NT)	http://www.transport.nt.gov.au/safety/road-safety/our-safer-road-users/speeding
The danger of speeding (Justice and Community Safety, ACT)	https://cdn.justice.act.gov.au/resources/uploads/JACS/Road_Safety/PDFs/Brochures/Speeding_Brochure.pdf
The Rider's handbook (DPTI, SA)	http://mylicence.sa.gov.au/the_riders_handbook
Tasmanian road rules (DIER)	http://www.transport.tas.gov.au/__data/assets/pdf_file/0010/49096/road_rules_booklet.pdf
Tasmanian motorcycle rider's handbook (DIER)	http://www.transport.tas.gov.au/licence_information_folder/tasmanian_motorcycle_riders_handbook
Drive safe: A handbook for Western Australian road users (Department of Transport)	http://www.transport.wa.gov.au/mediaFiles/LBU_DL_B_DriveSafeFull.pdf
Ride safe: a handbook for Western Australian road users (Department of Transport)	http://www.transport.wa.gov.au/mediaFiles/LBU_DL_B_RideSafeFull.pdf
ACT road rules handbook (Department of Territory & Municipal Services)	http://www.rego.act.gov.au/licensing/licenceroadruleshbook.htm
ACT motorcycle rider's handbook (Department of Territory & Municipal Services)	http://www.rego.act.gov.au/licensing/licencemotobikehbook.htm
Road user's handbook (RMS, NSW)	http://www.rta.nsw.gov.au/licensing/downloads/gettitestsdrivieduca_dl1.html
Motorcycle rider's handbook (RMS, NSW)	http://www.rta.nsw.gov.au/licensing/downloads/motorcycleridershandbook_dl1.html
Road users' handbook: Driving in the Northern Territory (Department of Transport)	http://transport.nt.gov.au/mvr/licensing/road-users-handbook
Your keys to driving in Queensland (TMR)	http://www.tmr.qld.gov.au/licensing/learning-to-drive/your-keys-to-driving-in-queensland.aspx
Queensland motorcycle riders' guide (TMR)	http://www.tmr.qld.gov.au/Safety/Motorcycle-safety/Queensland-Motorcycle-Riders-Guide.aspx
Why is speeding a problem? (RMS, NSW)	http://www.rta.nsw.gov.au/saferroadsnsw/speeding-why-a-problem.pdf
Why do we need speed limits? (RMS, NSW)	http://www.rta.nsw.gov.au/saferroadsnsw/speedlimits-why.pdf

How are speed limits set and reviewed and how does reducing speed limits save lives? (RMS, NSW)	http://www.rta.nsw.gov.au/saferroadsnsw/how-speedlimits-are-set.pdf
How does speeding increase the chances and severity of a crash? (RMS, NSW)	http://www.rta.nsw.gov.au/saferroadsnsw/speeding_and_crashes.pdf
How widespread a problem is speeding? (RMS, NSW)	http://www.rta.nsw.gov.au/saferroadsnsw/speeding-risks.pdf
'Safe System' – the key to managing road safety (RMS, NSW)	http://www.rta.nsw.gov.au/saferroadsnsw/safe-system.pdf

Appendix C – Evidence provided in reviewed resources

See Table C1 on following page.

Table C1
List of evidence reported in reviewed speed education resources

	Risk of fatality curves	Pedestrian argument	Risk-curve (5k = double)	Reasons why speed causes crashes	Low level speeding	Excessive speed	50km = 3 storey building	Safe system 30/50/70/100	Change from 60 to 50 produces 20% reduction	Compare to alcohol risk	Speed cameras work	Distance to stop at 60 km/h = 38-56m	Costs to community	Emissions	Minimal travel time effects	Demerit points, fines, and other penalties	crash statistics	Selection of sites based on safety	Speed survey data	Expected safety benefits	Fuel economy	Safety benefits	Define speeding	Energy at impact	Safe following distance	Small reductions in speed	Nilsson's power model
Speed: Speeding fact sheet (ORS, WA)			X		X				X								X						X				
Road safety: New speeding penalties (DPTI, SA)	X		X	X	X											X				X						X	
FAQ: speed limits save lives (Vicroads)		X													X		X	X									
Speed management strategy 2010-2013 (TMR, Queensland)				X									X						X								
Speed limits (TMR, Queensland)																		X									
Your guide to heavy vehicle speed legislation (DPTI, SA)																	X										
Road safety: Speed facts (DPTI, SA)	X	X	X	X	X			X		X							X	X									
Watch out for Creepers (MAC, SA)		X	X	X	X																						
Safe system approach (ACRS)*								X																			
Safe speeds (ORS, WA)																				X							
Speed limits (ORS, WA)				X												X		X			X						
Why we have speed limits (MAC, SA)																X						X					
Speed (RSAC, Tasmania)			X								X	X				X	X						X		X		
Road safety: Speed facts (DPTI, SA)	X	X	X	X	X			X		X					X		X			X							
Towards zero together - safer speeds (DPTI, SA)				X				X			X			X	X		X			X	X	X				X	
Community safety: Speed (Victoria Police)	X	X		X	X	X														X		X	X			X	

	Risk of fatality curves	Pedestrian argument	Risk-curve (5k = double)	Reasons why speed causes crashes	Low level speeding	Excessive speed	50km = 3 storey building	Safe system 30/50/70/100	Change from 60 to 50 produces 20% reduction	Compare to alcohol risk	Speed cameras work	Distance to stop at 60 km/h = 38-56m	Costs to community	Emissions	Minimal travel time effects	Demerit points, fines, and other penalties	crash statistics	Selection of sites based on safety	Speed survey data	Expected safety benefits	Fuel economy	Safety benefits	Define speeding	Energy at impact	Safe following distance	Small reductions in speed	Nilsson's power model
The TAC Wipe Off 5 campaign: A case study (TAC, Victoria)		X	X	X	X	X				X		X								X						X	
Speed statistics (TAC, Victoria)			X		X							X								X						X	
Course materials - speed (TAC, Victoria)			X	X	X							X	X			X	X					X					
Road safety (Western Australia Police)				X			X																X				
Victoria's speed limits (Vicroads)		X	X	X	X			X	X																		
Traffic information page Tip 3: Speeding (SA Police)	X	X		X											X	X					X		X				
Road safety: Now 100 (DPTI, SA)														X	X		X	X		X	X			X			
Transport: FAQ (DIER, Tasmania)		X		X					X	X	X	X		X	X		X	X		X						X	
Is speeding really that dangerous? (TMR, Queensland)			X	X	X								X				X					X		X			
Speeding (RMS, NSW)		X	X		X							X	X				X										
Consequences of speed (Western Australia Police)		X	X		X								X									X		X			
Geared: Speeding - the number one killer on our roads (RMS, NSW)			X		X					X		X					X										
Geared: Captured on film (RMS, NSW)			X		X						X																
Geared: Speeding penalties (RMS, NSW)			X	X	X											X						X					
Stopping distances (TMR, Queensland)			X	X	X							X												X			
The science and myths of low level speeding: years 10-11 (RiAus)				X	X								X				X							X			
Speed (Western Australia Police)	X																					X					

	Risk of fatality curves	Pedestrian argument	Risk-curve (5k = double)	Reasons why speed causes crashes	Low level speeding	Excessive speed	50km = 3 storey building	Safe system 30/50/70/100	Change from 60 to 50 produces 20% reduction	Compare to alcohol risk	Speed cameras work	Distance to stop at 60 km/h = 38-56m	Costs to community	Emissions	Minimal travel time effects	Demerit points, fines, and other penalties	crash statistics	Selection of sites based on safety	Speed survey data	Expected safety benefits	Fuel economy	Safety benefits	Define speeding	Energy at impact	Safe following distance	Small reductions in speed	Nilsson's power model
Speed and speeding Victoria's road safety strategy (Vicroads)			X		X																	X					
The driver's handbook: Speeding and inappropriate travel speeds (DPTI, SA)			X	X						X															X		
Speed limits (RMS, NSW)	X	X		X																		X				X	
State of the road: Speeding (CARRS-Q, Queensland)	X	X	X	X				X				X		X	X	X	X				X	X	X	X	X	X	
Speeding (NRMA, NSW)			X		X							X					X	X					X				
Why a lower speed limit (RMS, NSW)	X	X																				X				X	
The driver's handbook: Speed limits (DPTI, SA)																X											
Road to solo Driving (Vicroads)		X		X													X										
Queensland speed management strategy 2010-2013 (TMR)	X		X	X	X						X						X	X	X			X	X				X
The science and myths of low level speeding: years 7-9 (RiAus)			X	X	X				X								X							X		X	
VCAL road safety units: Safety in numbers - activity 4 (Vicroads)																											
Fact sheet no. 10: Strategies for managing recidivist speeding (C-MARC, WA)			X		X	X										X				X			X				
Kids on the move: Levels 4-5 (Vicroads)				X									X														
The RYDA Program Facilitator's manual: Stopping distances (Rotary/RYDA)[a]		X										X															
Traffic safety essentials for young road users not crash test dummies (TAC, Victoria)			X									X															

	Risk of fatality curves	Pedestrian argument	Risk-curve (5k = double)	Reasons why speed causes crashes	Low level speeding	Excessive speed	50km = 3 storey building	Safe system 30/50/70/100	Change from 60 to 50 produces 20% reduction	Compare to alcohol risk	Speed cameras work	Distance to stop at 60 km/h = 38-56m	Costs to community	Emissions	Minimal travel time effects	Demerit points, fines, and other penalties	crash statistics	Selection of sites based on safety	Speed survey data	Expected safety benefits	Fuel economy	Safety benefits	Define speeding	Energy at impact	Safe following distance	Small reductions in speed	Nilsson's power model
Speeding (ORS, WA)			X	X			X	X	X		X					X	X					X	X	X		X	X
Speeding and safety (Vicroads)	X	X	X	X									X	X	X	X										X	
Speeding (Department of Transport, NT)			X	X												X	X										
The danger of speeding (Justice and Community Safety, ACT)	X		X	X	X							X					X	X	X								X
The Rider's handbook (DPTI, SA)				X												X									X		
Tasmanian road rules (DIER)				X								X											X		X		
Tasmanian motorcycle rider's handbook (DIER)				X												X									X		
Drive safe: A handbook for Western Australian road users (Department of Transport)		X		X								X				X							X		X		
Ride safe: a handbook for Western Australian road users (Department of Transport)				X																					X		
ACT road rules handbook (Department of Territory & Municipal Services)								X				X															
ACT motorcycle rider's handbook (Department of Territory & Municipal Services)				X												X									X		
Road user's handbook (RMS, NSW)					X								X										X	X	X		
Motorcycle rider's handbook (RMS, NSW)				X												X									X		
Road users' handbook: Driving in the Northern Territory (Department of Transport)				X																					X		
Your keys to driving in Queensland (TMR)				X							X		X			X									X		
Queensland motorcycle riders' guide (TMR)																									X		

	Risk of fatality curves	Pedestrian argument	Risk-curve (5k = double)	Reasons why speed causes crashes	Low level speeding	Excessive speed	50km = 3 storey building	Safe system 30/50/70/100	Change from 60 to 50 produces 20% reduction	Compare to alcohol risk	Speed cameras work	Distance to stop at 60 km/h = 38-56m	Costs to community	Emissions	Minimal travel time effects	Demerit points, fines, and other penalties	crash statistics	Selection of sites based on safety	Speed survey data	Expected safety benefits	Fuel economy	Safety benefits	Define speeding	Energy at impact	Safe following distance	Small reductions in speed	Nilsson's power model
Why is speeding a problem? (RMS, NSW)		X	X	X	X	X							X		X	X		X				X	X	X			
Why do we need speed limits? (RMS, NSW)													X	X		X	X	X									
How are speed limits set and reviewed and how does reducing speed limits save lives? (RMS, NSW)									X								X	X				X				X	
How does speeding increase the chances and severity of a crash? (RMS, NSW)	X	X	X	X	X	X						X					X					X	X	X		X	
How widespread a problem is speeding? (RMS, NSW)			X		X	X							X						X								
Safe System' – the key to managing road safety (RMS, NSW)	X							X										X						X			

Appendix D – Organisation contact details

National	Australasian College of Road Safety	Claire Howe Executive Officer Australasian College of Road Safety claire.howe@acrs.org.au
	RiAUS	www.riaus.org.au
	RYDA	http://www.rse.org.au/Contact-Us.aspx
ACT	Department of Justice & Community Safety	Gary McDonald, Road Safety Officer, Road Safety, Transport and Road Safety Policy ACT Justice and Community Safety Directorate Gary.McDonald@act.gov.au
	Department of Territory & Municipal Services	Roads & Public Transport Division Territory & Municipal Services ACT Government canberraconnect@act.gov.au
NSW	NRMA	Road Safety Government Relations & Public Policy NRMA Motoring & Services (02) 9276 7233
	Roads & Maritime Services, Transport NSW	Margaret Prendergast General Manager Centre for Road Safety Policy & Regulation, Safer Roads, Transport NSW Margaret.Prendergast@transport.nsw.gov.au
NT	Northern Territory Police	Road Safety Northern Territory Police (08) 8924 7019 roadsafety@nt.gov.au
	Department of Planning & Infrastructure	Jenny Malone Road Safety Policy Sustainability, Strategic Planning and Policy NT Department of Planning and Infrastructure jennifer.malone@nt.gov.au

QLD	CARRS-Q	David Soole Senior Research Officer & Acting Media & Marketing Officer Centre for Accident Research and Road Safety - Queensland (CARRS-Q) d.soole@qut.edu.au
	Department of Transport & Main Roads	Emma Farries Principal Advisor (Safer Speed), Road Safety Transport Safety Department of Transport and Main Roads Emma.J.Farries@tmr.qld.gov.au
	QLD Police	http://www.police.qld.gov.au/forms/contact.asp
SA	Department of Planning, Transport and Infrastructure (DPTI)	Sue McMillan School and Education Coordinator Community Programs Policy, Planning and Programs Division Department of Planning, Transport, and Infrastructure suzanne.mcmillan@sa.gov.au
	Motor Accident Commission	Lucy James Sponsorship & Communications Co-ordinator Motor Acccident Commission lucy.james@sa.gov.au
	SA Police (SAPOL)	Traffic, Tranining and Promotion Section South Australian Police DLSAPOLTrafficTrngandPromotions@police.sa.gov.au
TAS	Department of Infrastructure, Energy and Resources (DIER)	Yasmin Maskiell Manager Policy and Projects Land Transport Safety Policy Department of Infrastructure, Energy & Resources (DIER) Yasmin.Maskiell@dier.tas.gov.au
	Road Safety Advisory Council	Road Safety Advisory Council Tasmania dier@dier.tas.gov.au
VIC	Transport Accident Commission	Liz Waller Major Projects Manager, Road Safety Transport Accident Commission Elizabeth_Waller@tac.vic.gov.au
	VicRoads	Amy Stebbing Senior Road Safety Engineer Road Safety and Network Access VicRoads Amy.Stebbing@roads.vic.gov.au
	Victorian Police	(03) 9247 6666

WA	C-MARC	Curtin Monash Accident Research Centre School of Public Health, Faculty of Health Sciences, Curtin University miri-enquiry@monash.edu
	Department of Transport	13 11 56
	Office of Road Safety	John Doak Event and Project Consultant Office of Road Safety john.doak@mainroads.wa.gov.au
	WA Police	http://www.police.wa.gov.au/Contactus/tabid/922/Default.aspx

Appendix E – Copies of best example resources

Copies of exemplar resources begin on the next page.

Transport

Government of South Australia
Department of Planning, Transport and Infrastructure

Road Safety: Speed facts

Vehicle travel speeds affect both the risk of crash involvement and the severity of crashes, and subsequent injuries. Speed is a critical factor in every serious crash, and speeding was identified as a contributing factor in an estimated 36% of fatal crashes (2007-2011). Reductions in travel speed save lives and injuries. Reductions in the average travel speed across the network is the most effective and swift way to reduce road trauma and would produce significant and immediate road safety benefits.

Why is speeding a problem?

If we all do the right thing and drive within the speed limit, lives will be saved and serious injuries will be prevented. A reduction of 5 km/h in average travel speed would reduce rural casualty crashes by about 30% and urban crashes by about 25%. This is a significant saving of lives and injuries for South Australians.

Stopping distance

A critical factor in the relationship between speed and crashes is stopping distance. There are two components to stopping distance:

1. The distance travelled by the vehicle during the time it takes for the driver to react; and
2. The distance travelled once the brakes have been applied.

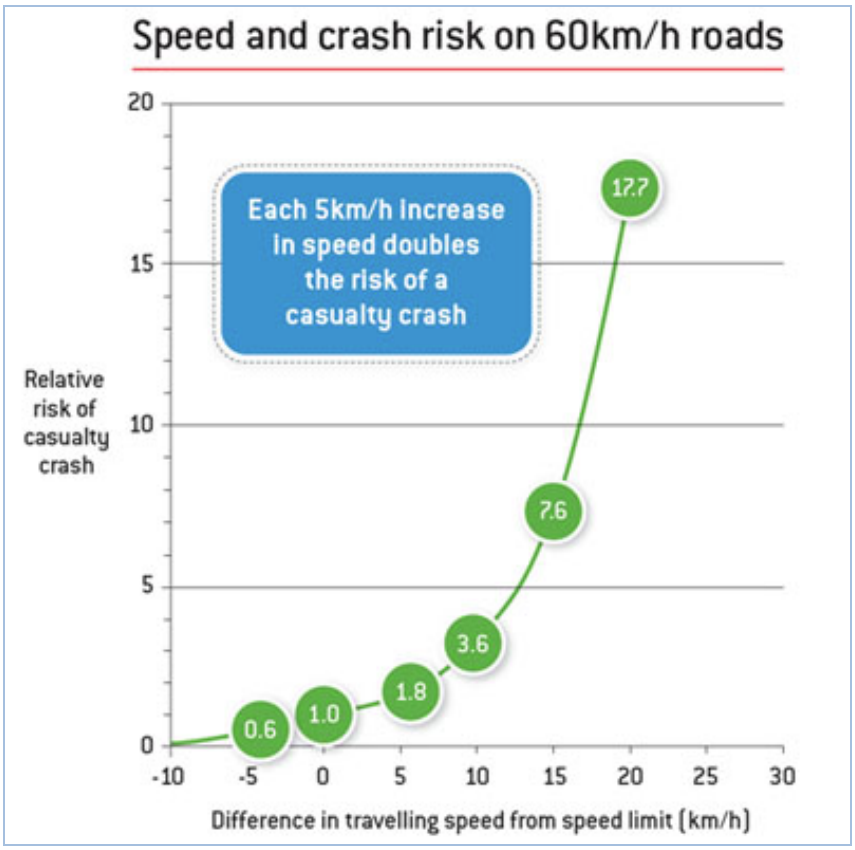
The impact of speeding on crash risk

The risk of a casualty crash approximately doubles with each 5km/h increase in speed on a 60km/h speed limited road, or with each 10km/h increase in speed on 110km/h roads.
It is illegal to drive at any speed above the speed limit.

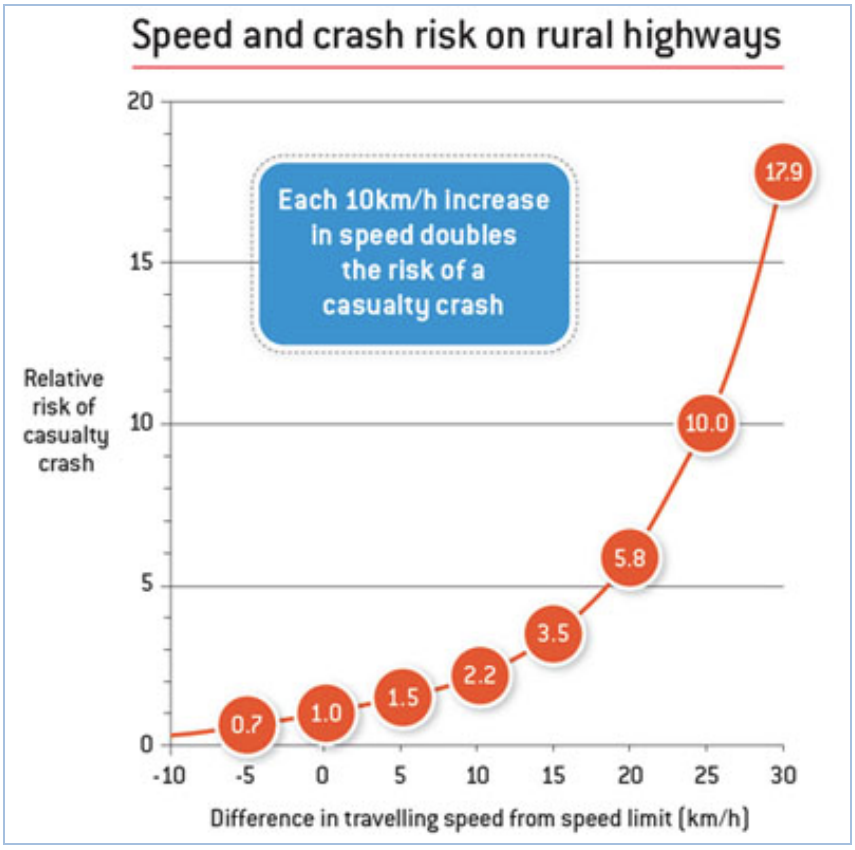
Vehicle travel speeds affect both the risk of crash involvement and the severity of crashes, and subsequent injuries.

Driving over the speed limit:

- increases your chances of being involved in a crash
- means you have less time to react to avoid a crash
- takes longer to stop the vehicle to avoid a crash
- increases the severity of injury in a crash.

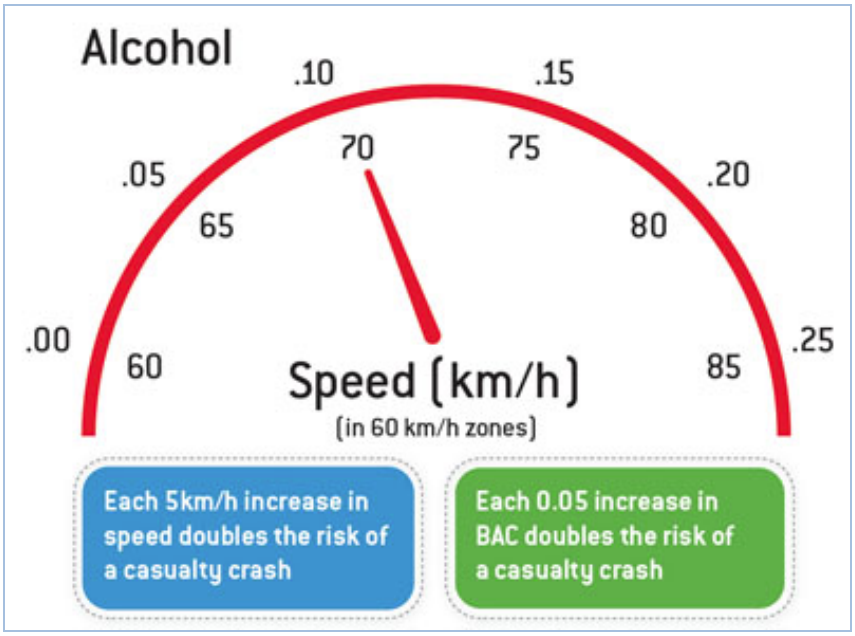


Source: Travelling Speed and the Risk of Crash Involvement, NHMRC road Accident Research Unit, The University of Adelaide, November 1997



Source: Travelling Speed and the Risk of Crash Involvement on Rural Roads, Road Accident Research Unit, The University of Adelaide, July 2001

When travelling 10 km/h over the speed limit in a 60 km/h speed zone, drivers are approximately 4 times more likely to be involved in a casualty crash which is a similar risk to driving with a blood alcohol concentration (BAC) of aroun 0.10 g/100ml, twice the legal limit.



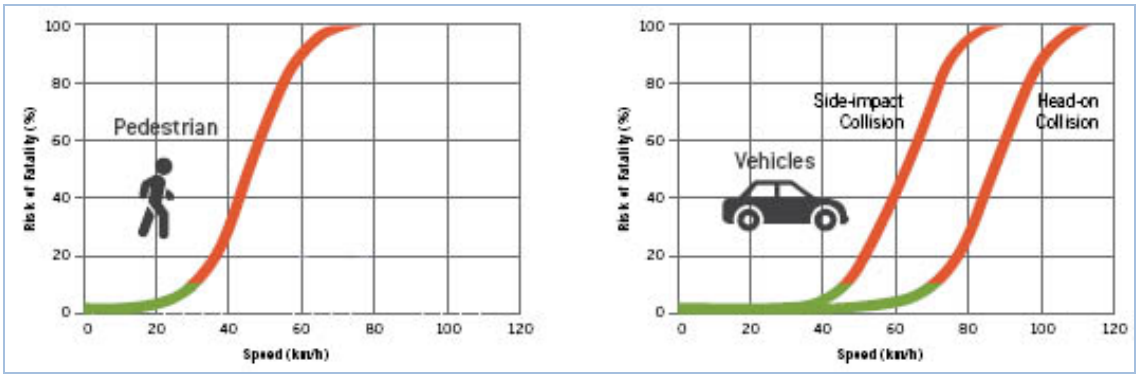
Source: Travelling Speed and the Risk of Crash Involvement, NHMRC road Accident Research Unit, The University of Adelaide, November 1997

Affects on travel time

On most trips, speeding will save very little time. For example, on a 10 km journey, you would only save 46 seconds by increasing your average speed from 60 km/h to 65 km/h. When travelling faster you use more fuel and your vehicle emits more of the gases that contribute to air pollution.

With general traffic congestion, stops at traffic lights and accelerating and decelerating, keeping to the speed limit, particularly for commuter journeys on urban roads, may actually assist with reducing traffic congestion by improving smooth traffic flow.

Force and risk of fatality



Research into the capacity of the human body to absorb crash energy indicates that speeds would ideally be less than 30km/h in where conflict with people walking and cycling is possible, less than 50km/h where vehicle side-impacts are possible and less than 70km/h where head on collisions are possible.

A driver is more likely to collide with another car, hit a pedestrian or run off the road if he or she exceeds the speed limit or drives at a speed that is inappropriate for the conditions. As speed increases, a driver has less time to react to emergencies and requires a greater distance to stop.

Serious injuries
Nov 11 to Oct 12: 786

Fatalities
So far this year: 9
Difference last year: 5
> read more

Target	Fatalities	Serious injuries
2020	< 80	< 800

Safer Speeds

An overall framework for safe and credible speeds requires a stronger functional approach to management of the road network.

Reductions in travel speeds save lives and injuries, and these benefits have been clearly demonstrated on South Australian roads. The 2003 reduction in urban speed limits to 50km/h produced a reduction of over 20% in urban crashes. Other targeted speed limit reductions, such as in parts of the Adelaide Hills where the speed limit was reduced to 80km/h and selected 110km/h rural roads with a lower limit of 100km/h, have produced similar results.

Reductions in average travel speed across the network is the most effective, swift way to reduce road trauma and would produce significant and immediate road safety benefits. A reduction of 5km/h in average travel speed would reduce rural casualty crashes by about 30%, and urban casualty crashes by about 25%. A blanket application of the default speed limit on rural roads (excluding national highways) would be projected to save over 20 fatalities and serious injuries combined each year.

Latest News

Speeding penalties are changing from 1 September 2012

> for more information go to sa.gov.au/towardszerotogether

New speeding penalties from 1 September 2012

Action plan 2011 & 2012

More on Safer Speeds

Travel speeds have consequences for crash risk, and also for injury severity when a crash occurs. Biomechanical research into the capacity of the human body to absorb crash energy without significant harm suggests that safe travel speeds would ideally be less than 30km/h in areas where conflict with people walking and cycling is possible, less than 50km/h where side impacts are possible, and less than 70km/h on roads where head on collisions are possible (see figure 5). This illustrates the need to address speed within a functional approach to road management.

Reductions in speed and speed limits can also be the most publicly contentious way to reduce road trauma. Sustained improvement in speed management will only occur with the support of the community and other stakeholders, and the adoption of a total change management approach. It will be vital for all stakeholders to understand, and be able to explain, the importance of speed management to a safe system, along with the community gains that can be achieved from even small reductions in travelling speed.

The safety benefits of small speed reductions are not always intuitively obvious and more public information will be provided to address the community's overestimation of related costs and underestimation of related benefits. For example, while up to 5 minutes is added to a 100km trip when travelling at 100km/h, rather than 110km/h, travelling at 100km/h uses on average 8% less fuel than travelling at 110km/h.

The wider benefits of reducing speeds, including better fuel consumption, lower greenhouse gas emissions, less traffic noise, and better support for active travel modes, contribute to South Australia's environmental, sustainability, and wellbeing objectives.

Appropriate Speed Limits

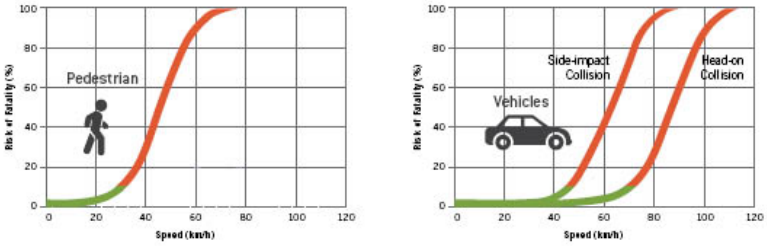
International work has shown that to achieve our vision, speed limits need to be set and enforced taking into account potential crashes and the likely outcomes of these crashes given the physical impact on the human body.

The default speed limit in South Australia is 50km/h in urban areas and 100km/h in rural areas. Speed enforcement and speed limit reductions will be targeted to roads above the default limit with high crash rates or risk, and where land use and infrastructure planning does not justify a limit above the default.

Projects for retrofitting safe and credible speed limits will be progressed in rural and metropolitan areas, taking into account:

- sustainability and liveability aims of the 30 Year Plan for Greater Adelaide, and the need to support safe movement for pedestrians and cyclists
- the concentration of trauma in rural areas close to Adelaide, including fringe areas undergoing changes in traffic volumes and demographics
- increased understanding of the impact of a rural road network of two-way two lane roads with speed limits of 110km/h, which is out of step with countries with the best road safety record.

Figure 5 Collision - force and risk of fatality



Research into the capacity of the human body to absorb crash energy indicates that speeds would ideally be less than 30km/h in where conflict with people walking and cycling is possible, less than 50km/h where vehicle side-impacts are possible and less than 70km/h where head on collisions are possible.

Speed is a critical factor in every serious crash, and speeding was identified as a contributing factor in an estimated 36% of fatal crashes for the 2009-2011 period.

Compliance with Speed Limits

Whatever the speed limit, improved compliance with, and enforcement of, the limit plays a vital role in improving the safety of all road users. The current network of fixed safety cameras in urban areas will expand and include mid-block and pedestrian crossing cameras. These automated enforcement approaches will continue to be supplemented by targeted deployment of SAPOL personnel operating a range of technologies including mobile cameras and mobile radars at their disposal, and targeting roads with high crash risk.

New technologies have the potential to increase the range and effectiveness of enforcement resources. Average speed cameras that measure the speeds of all vehicles between relatively distant points on the road can be more effective and fairer than one-point speed cameras. They can monitor all vehicles over a long section of road continuously as they do not penalise momentary breaches of the speed limit. Focusing on major regional and interstate routes, the development of a comprehensive point-to-point speed enforcement system will initially focus on the key routes into and out of Adelaide.

The penalties in place to deter users who may otherwise flout the law and create unacceptable risk to others are a critical part of the mix of speed compliance interventions. The current range of penalties for speeding offences does not match the fundamental safety risk associated with the offence, whether for lower or higher end offending. Changes will be made so that the penalties for higher level speeding more closely correlates with the road safety risk.

Over the life of this strategy, it is expected that new vehicle technologies, such as intelligent speed adaptation will begin to provide the ultimate support for the vast bulk of drivers who have no intention of breaking the law, but may inadvertently travel above the speed limit. Speed limiting devices could also be targeted to recidivist offenders.

Key strategies for Safer Speeds

- Align speed limits to the function, standard and use of the road, and increase consistency in their application across the State.
- Strengthen public information explaining the impact of speed and speed limits on crashes.
- Target speed limit reductions for roads according to crash rates and a functional road hierarchy.
- Increase the use of new technologies to boost speed limit compliance.
- Increase the penalties for speeding to better match the risk posed.

Performance Indicators	2010
Average metro traffic speed.*	56.1 km/h
Average rural traffic speed.*	102.7 km/h

Percentage of vehicles exceeding stated speed limit.	23.4%

*Free speed with 4 second headway

Community Safety

Speed

Release date: Wed 30 July 2008

Last updated: Mon 10 November 2008

Research shows that even a small decrease in speed significantly reduces the likelihood of a crash. If a crash does occur, slower speeds limit the severity of injuries. According to the Monash University Accident Research Centre, reducing speed by 11 per cent would reduce road deaths by 40 per cent.

Several factors increase the risk and severity of crashing when speeding. These include:

- Less time to notice and react to potential hazards
- A higher likelihood of losing control of your vehicle
- An increase in the distance required to stop your vehicle.

Research has shown that:

- A driver crashing at an impact speed of 80 kilometres per hour is twice as likely to be killed as a driver crashing at 60 km/h.
- The probability of a pedestrian being killed in a collision involving a vehicle increases rapidly if the speed at impact is above 40 km/h.

Types of speeding

All types of speeding are dangerous and place drivers and pedestrians at risk.

Speeding can be divided into three categories:

Low-level speeding

Research shows that the majority of motorists engage in low-level speeding, where the driver travels at a speed marginally over the posted speed limit, typically by around 5 km/h.

Even speeding at 5 km/h above the speed limit increases both the likelihood of a crash occurring and the severity of driver and pedestrian injuries in the event of a crash. Be aware of the speed limit at all times and monitor your speed accordingly.

Inappropriate speeding

In difficult driving conditions, certain speeds, even within the legal limits, may be inappropriate. Wet weather and other influences may mean that driving at the speed limit is inappropriate and dangerous. Be aware of conditions altering your vehicles response time and stopping distances, and adjust your speed accordingly.

Excessive speeding

In certain cases drivers deliberately exceed the speed limit. Doubling your speed requires four times the distance to stop.

TOP OF PAGE

Victoria Police Centre 637 Flinders Street Melbourne 3005 | Ph 03 9247 6666 | Fax 03 9247 5727

DEPARTMENT *of* INFRASTRUCTURE, ENERGY & RESOURCES

DIER

FAQ

1. Why have 50 km/h speed limits?
2. How do 50 km/h speed limits reduce crashes?
3. Where did the idea to introduce 50 km/h speed limits come from?
4. Why is Tasmania (and Australia) heading in this direction?
5. Why a Statewide 50 km/h speed limits model?
6. Has there been any evaluation of the effectiveness of 50 km/h speed limits in Australia?
7. What do I need to know about 50 km/h speed limits?
8. How will it affect my area?
9. Won't 50 km/h speed limits increase travel times and cause traffic congestion?
10. Aren't reduced speed limits bad for the environment?
11. Won't tourists be confused about 50 km/h speed limits?
12. How can I be expected to watch the speedo and drive safely?
13. Why is the Government so concerned about speeding?
14. Where can I get more information?

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1. Why have 50 km/h speed limits?
50 km/h general urban speed limits were introduced to reduce both the number and severity of crashes in suburban areas. There are around 800 casualty crashes in suburban streets each year before 50km/h limits were introduced. 50 km/h speed limits create a safer road environment, especially for vulnerable road users such as the elderly, children and cyclists.

While media attention focuses on high speed crashes on highways, statistics show that 70 percent of all crashes (including 20 percent of fatalities) occurred on roads zoned at 60 km/h. Based on interstate survey results, Tasmania expected a reduction of at least 10 percent in casualty crashes in suburban streets from introducing a 50km/h general urban speed limit, resulting in 80 road users being spared death or serious injury each year. This initiative is about protecting our community.

By reducing this road trauma, as well as saving individual lives, there is a potential saving to the community and the State Government of $8 million each year.

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2. How do 50 km/h speed limits reduce crashes?
A small reduction in speed makes a big difference to the chances of a crash occurring and the consequences of the crashes that do occur. The stopping distance at 50km/h is 12-14 metres shorter than at 60km/h, and this translates to reduced impact speeds and better chances that a crash will be avoided altogether. A pedestrian hit by a vehicle travelling at 60km/h has only a 15% chance of survival, whereas at 50km/h the chances of survival are better than 50%.

Australia's high urban casualty burden has come about because of a four-fold association between speed and road crashes. The higher the speed:

The greater the chance of losing control of the vehicle and consequently running off the road or

into an on-coming vehicle;

- The lower the chances of responding effectively to crash-threatening circumstances, particularly as a consequence of reduced response times and increased braking distances;
- The greater the impact forces in the event of an accident and the more severe the casualty outcomes. Even small increases in speed can produce substantial increases in the amount of consequent energy to be dissipated; and
- The more unpredictable the speeding driver becomes to other drivers and hence the greater the chances of causing an accident.
- A reduction in speed to a maximum of 50km/h moderates these factors.

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3. Where did the idea to introduce 50 km/h speed limits come from?
The National Road Safety Strategy 2001-2010, developed by the Australian Transport Council (which comprises Federal and all State and Territory Ministers with transport responsibilities), has a target to reduce the number of road fatalities by 40% by 2010.

Tasmania then developed the Tasmanian Road Safety Strategy 2002-2006, to set a strategic direction for improving road safety and reducing fatalities and injuries in Tasmania. During the development of the Tasmanian Strategy, the Government released the Tasmanian Road Safety Strategy Discussion Paper, early in 2001, for public comment and consultation and the Department of Infrastructure, Energy and Resources (DIER) received responses from many individuals and organisations.

A number of major issues were of particular concern to respondents, with the introduction of lowered urban speed limits as the most significant of these issues (23.4% of respondents supported this measure). In addition, this initiative has been endorsed by Local Government and the Tasmanian Road Safety Council, which includes membership from the Local Government Association of Tasmania, RACT, Tasmania Police, the Coroner's Office, DIER, Monash University Accident Research Centre (MUARC) and the community.

On 17th December 2001, the Tasmanian Government approved the introduction of a 50 km/h speed limit in suburban streets. The lower speed limit, which was introduced on 1 May 2002, is one of the most significant road safety initiatives to be undertaken in Tasmania in recent years.

The research evidence from Australia and elsewhere strongly supports the claim that a reduced urban speed limit will produce substantial road safety benefits.

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4. Why is Tasmania (and Australia) heading in this direction?
Australia is one of the few countries to persist with a general urban speed limit of 60 km/h. Australia's decision in the 1970s to 'round up rather than down' from the 35 mph limit prior to metrication has cost many thousands of lives and serious injuries over the intervening years. Many countries that have urban speed limits not exceeding 50 km/h also have an average pedestrian fatality rate 30% lower than the average for countries with an urban speed limit of 60 km/h.

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5. Why a Statewide 50 km/h speed limits model?
A number of other Australian jurisdictions have implemented reduced urban speed limits, and various models have been applied. Victoria has implemented a Statewide reduction, WA has announced a Statewide reduction, while NSW and Queensland have implemented reductions in limited areas or specific municipalities.

The Statewide model simplifies the approach for motorists, as all urban roads are 50km/h unless

they are signed at a higher speed. Arterial roads where the speed limit remains at 60km/h or higher are identified by signs. A Statewide approach also makes it easier to educate the community about the change, and prevents motorists having to watch for changed speed limits as they cross municipal boundaries.

Similar to the situation prior to 1 May 2002, there is a default speed limit and suburban streets are not signed, but now you are asked to remember this simple rule, "No signs - Drive 50".

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6. Has there been any evaluation of the effectiveness of 50 km/h speed limits in Australia?
A 50 km/h default speed limit in built up areas was introduced in Victoria in January 2001 and WA in December 2001. As in Tasmania, if there is no sign, the default speed limit is 50 km/h.

Monash University Accident Research Centre (MUARC) in Victoria has conducted an independent evaluation of the new speed limit's effectiveness. MUARC investigated casualty crash data reported by police on streets in both Victoria and WA rezoned 50 km/h and examined it against data collected in other speed zones.

Both reviews found sustained reductions in crashes, including serious casualty crashes. 50km/h speed limits are producing significant road safety benefits to the Victorian and West Australian communities.

Tasmania has conducted n evaluation of the introduction of 50 km/h after two years of operation. While there are limitations on the data available this evaluation shows a strong positive effect of 50 km/h general urban speed limit, with a significant reduction in casualty crashes.

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7. What do I need to know about 50 km/h speed limits?
The State Government went to great lengths to ensure that motorists did not suffer any confusion about speed limits when general urban speed limits were reduced to 50 km/h on 1 May 2002. The State Government has undertaken an extensive public education campaign supporting the introduction of 50 km/h speed limits, "50 in our streets saves lives".

Under the new scheme, very few 50 km/h signs will be used. The key message for drivers is that if you do not see a sign in built up areas, you must assume the speed limit is 50 km/h. Major roads that will keep the 60 km/h limit will have a large number of 60 km/h limit signs but other roads will not generally be signposted. The message to remember is "No sign, Drive 50".

In short:

- The "default" speed limit for urban streets changed from 60 to 50 km/h
- The 50 km/h speed limits applied from 1 May 2002
- Major roads that retain the 60 km/h speed zone are signposted at 60 km/h.

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8. How does it affect my area?
All 29 councils, in conjunction with DIER, developed road hierarchies. A road hierarchy is a well-designed network of arterial and collector roads, which will retained a 60 km/h speed limit. These roads continue to service residential precincts and transport associated industries.

All road hierarchies are adequately signed, so you will know you are in a 60 km/h speed zone. If there is no sign assume it is a 50 km/h zone and drive at 50 km/h.

Some councils produced information for residents within their municipality. The common sense approach taken by councils will help motorists to quickly adjust to the changes. The implementation process for 50 km/h urban speed limits was successful in terms of co-operation between State and Local Government.

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9. Won't 50 km/h speed limits increase travel times and cause traffic congestion?
The following information is based on research conducted in other Australian jurisdictions, and provided by Austroads.

Studies have indicated that most people support reduced speed limits in their own streets. If the needs of those who live in local streets are to be given greater weight than those who drive through them, the speed limit in that street should be lower than that applying to the arterial network. Otherwise, not only are the needs of drivers taking precedence over residents' needs, but there will be little scope for lower speeds in the local network.

Both the time spent and distance travelled in local streets is relatively small for most drivers, so the disadvantages to drivers of lower speed limits should be relatively small. In practice the parts of the journey when a driver is delayed (by other traffic, negotiating corners, or giving way at intersections) will be largely unaffected by a lower speed limit.

The people likely to be disadvantaged by a reduction in speeds in local streets without any compensating gain in amenity are drivers who use local streets to avoid arterial roads whenever possible, even for longer journeys. A South Australian discussion paper points out that, to the extent that such people observed a lower speed limit, their journey times will be affected more than a similar journey on the arterial network. However, these are the very people who cause much of the traffic problem in local streets, which in turn makes expensive traffic calming treatments necessary. Keeping out of local streets, because of increased travel times, might represent a cost to these individuals but would be a benefit for the rest of the community.

The potential impact of lowered urban speed limits on public transport vehicles was considered. Assuming a speed limit on bus routes was reduced from 60 km/h to 50 km/h, bus travel time would increase by a maximum of 8 to 10 seconds per kilometre of travel within local streets. Based on this estimate, the travel time on a typical route of 14 km length, 6 km of which is within local streets, would increase by 50 to 60 seconds at most over the whole route.

Delivery vehicles, taxis and other public vehicles are subject to similar influences and only have their travel times increased in proportion to that part of the journey spent travelling at speeds greater than 50 km/h off the arterial system. This is likely to be small. Australian studies indicate that, based on an estimate of 15,200 million kilometres for travel on urban local streets, when averaged over the entire population, a delay of between 5 and 20 seconds per person per day will be experienced.

Mobility is maintained due to arterial and collector roads retaining a 60 km/h speed limit.

When all factors are taken into account, research indicates that individual drivers are relatively unaffected by the introduction of 50 km/h speed limits in urban areas.

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10. Aren't reduced speed limits bad for the environment?
It is, in fact, likely that reduced speed limits reduce noise and vehicle emissions as well as providing safer access to roads for vulnerable road users.

The question of which speed limit produces more emissions is a complex one. Research results are, as yet, inconclusive. Research indicates that under normal suburban driving conditions

where cruising opportunities are limited, higher speeds produce the potential for more emissions as acceleration tends to dominate differences in different cruising speeds.

The driving phases (acceleration, cruise, deceleration and idle) during the journey become critical in the consideration of emissions. The length of the street is emerging as a critical factor and the type of emission being considered is also important. Engine cold starts also create increased emissions and again the mix of driving phases whilst the engine reaches a stable operating temperature is critical.

It has also been demonstrated that on local streets, maintaining a steady speed of 50 km/h used 4.2 per cent less fuel than it did at 60 km/h. This equates to a saving in total fuel consumption of between .04 per cent and .3 per cent. Although the expected benefits from reduced fuel consumption are therefore small, they nevertheless support the case for using speed limits rather than physical devices to lower speeds.

As with air emissions, measuring noise emissions is not entirely straightforward. For a single average passenger vehicle passing a point at a constant speed, each 10 km/h increase in speed increases the noise by 3dB(A). Therefore, vehicles passing a house at 60 km/h are likely to be louder than vehicles travelling by at 50 km/h. One aspect of acoustics is that sound intensity is logarithmic. In order for apparent loudness to double there has to be a tenfold increase in the traffic volume. The nature of the noise itself is a complicating factor. Freely flowing vehicles in a residential street are unlikely to cause any unusual disturbance, however a heavily accelerating vehicle in the middle of the night is likely to generate complaints. Therefore the time at which the noise occurs and the nature of the noise are the important factors when considering annoyance.

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11. Aren't tourists confused about 50 km/h speed limits?
It's unlikely that interstate or overseas visitors to the State are confused by the new speed limits. Most of Australia, and much of the rest of the world, now has 50 km/h speed limits. Signage, advising that there are 50 km/h speed limits in suburban areas in Tasmania, has been installed at entry points to the State, and at various other sites around the State.

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12. How can I be expected to watch the speedo and drive safely?
Driving is a complex task and demands our full attention. The introduction of 50 km/h speed limits does not make driving any more difficult. Initially, it may take motorists a while to get used to driving at 50 km/h in suburban areas, but it soon became second nature.

Licensed drivers are expected to be able to handle a multitude of complex tasks when driving, (including monitoring the vehicle's speed) without reducing their ability to scan the road environment, assess hazards, identify risks and decide when to slow down, when to overtake, when to change lanes, and make other decisions about driving.

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13. Why is the Government so concerned about speeding?
Some people will remember when drink driving was socially acceptable. Since Random Breath Tests were introduced in 1983, and the legal blood alcohol content for drivers was reduced from 0.08 to 0.05 BAC, the community has changed its perception about drink driving. Drink driving is no longer acceptable.

Road safety practitioners' research indicates that speeding is as dangerous as drink driving, but the community generally feels that it is acceptable behaviour to speed to some degree. It is important that we, as a community, change the way we think about speeding. The Government is working to achieve this change. Since speed cameras were introduced in 1993, there has been

a significant reduction in crashes. Recent laws mean that you can lose your licence for three months or more if you speed in excess of 38 km/h above the posted speed limit. The introduction of 50 km/h speed limits is the next step in reducing crash incidence due to speed.

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14. Where can I get more information?
For more information about reduced general urban speed limits, contact the **TES Hotline on telephone: 1300 851 225**

Speeding

Having trouble with this video? You can download the advertisement here.
View the rest of the campaign material here.

There are three types of speeding - low level, excessive and inappropriate:

- Low-level speeding is where drivers travel 5 km/h above posted limits.
- Excessive speeding is deliberate with drivers travelling well above posted speed limits.
- Inappropriate speeding is driving too fast for the prevailing conditions such as weather, light, traffic and road conditions.

On average, around **65 people are killed on Western Australian roads each year because of speeding-related crashes, with a further 410 people suffering life changing serious injuries**. Either they were speeding, were passengers where the driver was speeding or were struck by speeding motorists.

Speed increases crashes. **The faster you drive the harder you hit.**

Statistics of speeding

Speeding is still the major contributing factor towards death and serious injury on Western Australian roads despite years and years of warnings, education campaigns, speed cameras, radars and police enforcement.

Speeding was a factor in 24% of police-attended fatal crashes in 2010.
Between 2001 and 2010, 19% of speed-related fatal crashes occurred in 60 km/h speed zones.

Males make up about 90% of speeding-related fatal crashes in Western Australia (10 year crash data from 2001-2010).
38% of these men were between 25 and 39 years old.
Young males aged between 17 and 24 comprised 30% of those deaths.

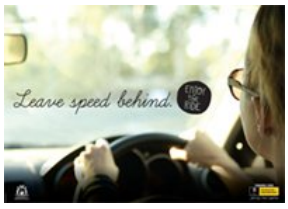
It is no myth that **lower speeds save lives**.

Read more in the Fact Sheet: Speeding Road Safety Fact Sheet (2 page PDF 309 KB)

Find it difficult to slow down?

Often, the way we drive is a symptom of the way we live - too fast. When we go too fast, in life and in our cars, we not only miss the opportunity to enjoy life to the full but it's downright dangerous too.

Slowing down is the single most effective and immediate way to improve road safety. If we all slowed down our chances of crashing, being killed or seriously injured on the road, would dramatically decrease.



When we slow down in life, it allows us to relax. We actually achieve and experience more when we take the time to live in the moment, without rushing to the next.

Slowing down gives us the opportunity to be more considered, deliberate, and thoughtful. It allows us to concentrate on the important things.

When you're driving, nothing is more important than the task at hand. So **slow down and allow yourself the time and focus you need**.

We know slowing down can be difficult, so have put together the Enjoy the Ride website to help you find ways to slow down and enjoy life.

The relationship between travel speed and crashes

It's simple – **the faster you travel, the less time it takes to react to emergencies or to stop**. And if you do crash, the faster you are travelling, even if within the speed limit, the greater the risk of injury to you and your passengers.

The **risk of being involved in a crash resulting in injury in a 60 km/h speed zone is doubled with every 5 km/h increase in driving speed above the limit**. This means travelling at 65 km/h in a 60 km/h speed zone doubles the chance of having a crash resulting in injury. Travelling at 70 km/h increases the chance of crashing by 4 times and travelling at 80 km/h increases this chance by 32 times.

WA ROAD DEATHS AND SERIOUS INJURIES

22 deaths as at 31 January 2013.

186 fatalities in 2012.

Click here for more statistics.

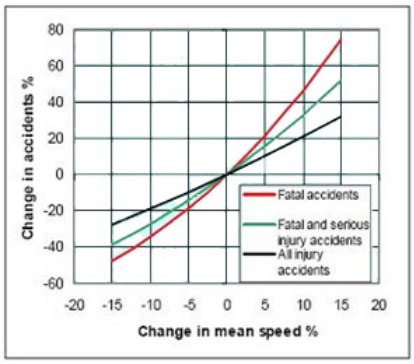
Related Links
Enjoy the Ride
Fact Sheet - Speeding
Speed campaign information

This is due to **kinetic energy**, which a person or object has while it is moving. This energy is gained during acceleration and lost during deceleration. In a collision, the energy is transferred to the other person or object, usually as sound, heat and deformation of objects, including the human occupants.

Travel speed determines the amount of energy transferred in a crash. The human body can only absorb so much impact before death or serious injury result.

The relationship between serious injury crashes, fatal crashes and speed has been modelled by many researchers. The most noted is Nilsson's "Power Model", which leads to the broad relationships between speed and casualty crashes illustrated below.

Nilsson's Power Model



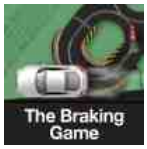
- A 5% **increase** in average speed leads to an approximate 10% increase in all injury crashes and 20% increase in fatal crashes.
- A 5% **decrease** in average speed leads to an approximate 10% decrease in all injury crashes and 20% decrease in fatal crashes.

As the model indicates, reducing speed by a few km/h can greatly reduce the risks of crashes occurring, as well as reducing the severity of injuries resulting from a crash.

This is why **hitting a vehicle or object at 50 km/h is equivalent to dropping a car from a three-storey building**. It's simple physics – the faster you travel, the harder you hit.

While there are many drivers and riders who deliberately speed or take risks on the road, there are others who simply make errors which are also unfortunately the cause of many crashes. Because **speeding is not just driving faster than the speed limit**. It is also driving too fast for the weather, light, traffic and road conditions without full regard for the vehicle condition and driver skills and experience.

So while you may think you're completely safe because you're doing everything right, you or another driver could easily make an error. The faster you're travelling when this error occurs, even if within the speed limit, the greater the risk of injury to you and your passengers.



Test your knowledge of braking distances!

Safe travel speeds

The safe speeds to travel at depends on the type and condition of the road, type of vehicle being driven and even the weather. Generally, during good weather in a safe vehicle with seat belts being worn, the safe travel speeds are as follows.

Road Type	Safe Speed (km/h)
Roads with possible conflicts between cars and unprotected road users	30
Intersections with possible side conflicts between cars	50
Roads with possible head-on conflicts between cars	70
Roads with no possible head-on or side conflicts between road users	>100

Despite the proven safety benefits of reduced travel speeds, **Australian speed zones are amongst the highest in the world**, especially when compared to Europe and the United States. So as an individual driver or rider, it is important for you to be aware of the safe travel speeds and adjust your speed accordingly to keep you, your passengers and other road users as safe as possible.

WA has benefited from lowering travel speeds

The relationship between speed and crashes has been demonstrated in Western Australia with the introduction of **50 km/h speed limits** in built-up areas in 2001.

A 2004 state-wide evaluation of the 50 km/h initiative in Western Australia indicated that a **20% reduction in all crashes on 50 km/h and 60 km/h roads was achieved in the Perth metropolitan area**, together with a 16% reduction in crashes in regional Western Australia.

The evaluation showed that the 50 km/h default built-up area speed limit was extremely positive with respect to vulnerable road user groups, including pedestrians, young drivers and older drivers. There were also decreases in the average crash frequency on 50 km/h and 60 km/h roads for crashes involving bicyclists and motorcyclists.

The WA evaluation is consistent with the findings of evaluations of 50 km/h limits undertaken in other Australian jurisdictions.

These crash savings have required only small reductions in the average speeds of vehicles travelling on both roads that are currently 50 km/h and those that remained at 60 km/h, as well more significant reductions by speeders travelling well in excess (10+ km/h) of the speed limit.

Download the report:

An Evaluation of the Default 50 km/h Speed Limits in Western Australia, December 2004

- Executive Summary (8 page PDF 95 KB)
- Full Report (89 page PDF 3.2 MB)

Enforcing the speed limits

The strong relationship between travel speeds and crashes is why it's important for WA Police to enforce the speed limits with the use of speed cameras and hand-held radars. **Speed enforcement is not about revenue raising**, but is about slowing drivers down to reduce the number of fatal and serious crashes.

Speed cameras have been proven to effectively slow motorists down and reducing crashes around the world. They are placed in or around high-risk areas or crash "black spots". The continuing presence of speed cameras is an ongoing reminder for motorists to slow down.

In Western Australia, 100% of the money collected from speed and red light camera infringements goes into the Road Trauma Trust Account and is spent on various road safety programs such as community education, policy development, research and improving road safety co-ordination.

Research and Reports
Road Safety Council Position Paper – Effectiveness of Speed Cameras and Use in Western Australia, Victoria and New South Wales, August 2010
Policy Advice to Guide the Placement of Fixed and Speed/Red-Light Cameras in Western Australia, August 2010 – Max Cameron
Development of Strategies for Best Practice on Speed Enforcement in Western Australia – Monash University Accident Research Centre:

- Supplementary Report, May 2008 (60 page PDF 658 KB)
- Final Report, September 2006 (88 page PDF 884 KB)

Speed Management report - International Transport Forum – Organisation for Economic Co-operation and Development website

Penalties for speeding

Speed in excess of limits or the prevailing conditions is a major factor in road crashes, contributing to around one third of all fatal crashes in Western Australia.

This information is a guide only and should not be relied on for legal purposes. Full details of traffic offences and penalties are contained in the *Road Traffic Code 2000*.

Speeding by light vehicles
(Cars, motorcycles and other vehicles less than 22.5 tonnes Gross Combination Mass)

km/h over the speed limit	Fine	Demerits*
Not more than 9 km/h	$75	0
More than 9 km/h but not more than 19 km/h	$150	2
More than 19 km/h but not more than 29 km/h	$300	3
More than 29 km/h but not more than 40 km/h	$700	5
More than 40 km/h	$1,000	7

Police can impound the vehicles of drivers who exceed the speed limit by more than 45 km/h.

Speeding by heavy vehicles
(Vehicles with a Gross Combination Mass of 22.5 tonnes or more)

km/h over the speed limit	Fine	Demerits*
Not more than 9 km/h	$150	0
More than 9 km/h but not more than 19 km/h	$250	2
More than 19 km/h but not more than 29 km/h	$400	3
More than 29 km/h but not more than 40 km/h	$850	5
More than 40 km/h	$1,000	7

Police can impound the vehicles of drivers who exceed the speed limit by more than 45 km/h.

* Demerit points are doubled on long weekends and other prescribed holiday periods.

Fact sheets, research and reports

Fact Sheets

Speeding Road Safety Fact Sheet (2 page PDF 309 KB)

Common Areas of Concern with Speeding and Speed Cameras in WA Fact Sheet (2 page PDF 312 KB)

Setting Safer Speeds - Curtin-Monash Accident Research Centre

Safety Benefits of Speed Cameras - Curtin-Monash Accident Research Centre

Strategies for Managing Recidivist Speeding - Curtin-Monach Accident Research Centre

There are various interesting fact sheets on speed on the Dutch Institute for Road Safety Research (SWOV) website.

Intelligent Speed Adaptation Fact Sheet (4 page PDF 184 KB)

Research and Reports

Road Safety Council Position Paper – Effectiveness of Speed Cameras and Use in Western Australia, Victoria and New South Wales, August 2010

Policy Advice to Guide the Placement of Fixed and Speed/Red-Light Cameras in Western Australia, August 2010 – Max Cameron

Development of Strategies for Best Practice on Speed Enforcement in Western Australia – Monash University Accident Research Centre:

- Supplementary Report, May 2008 (60 page PDF 658 KB)
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An Evaluation of the Default 50 km/h Speed Limits in Western Australia, December 2004 – Monash University Accident Research Centre:

- Executive Summary (8 page PDF 95 KB)
- Full Report (89 page PDF 3.2 MB)

Speed Management report - International Transport Forum – Organisation for Economic Co-operation and Development website

Can Safety Warning System (SWS) Signals Received by Users of Radar Detectors Improve Road Safety? (25 page PDF 281 KB)

Speeding & Safety

Speeding increases crashes

Exceeding the speed limit increases the likelihood of a crash. In poor driving conditions, a crash is more likely if you drive at an inappropriate speed. The speed limit is the maximum allowable speed, but sometimes it is necessary to travel below the speed limit to stay safe.

As your speed increases, your ability to react to emergencies is reduced and stopping distances increase. Other road users also find it more difficult to judge how fast you are travelling.

The faster you drive, the harder you hit

At higher speeds there is a greater likelihood of severe injury or death. Even small increases in travel speed can cause disproportionately large increases in the likelihood of a crash that causes death or serious injury. In a crash your body will keep moving at the travel speed of the vehicle.

Small speed reductions save lives

Research shows if you are travelling in a 60 km/h zone, your chances of being involved in a crash double with every 5 km/h increase in speed. Travelling at 65 km/h in a 60 km/h zone, you are twice as likely to be involved in a crash. A car braking from 65 km/h will still be travelling at 32 km/h at the point where a vehicle braking from 60 km/h has stopped.

Pedestrians are vulnerable to speed

For vulnerable road users, such as pedestrians, small differences in travelling speed can mean the difference between life and death. If you collide with a pedestrian, death or serious injury is likely even at relatively low speeds. Although a pedestrian who is hit by a car travelling at 60 km/h has little chance of survival, if the car were travelling at 50 km/h the chance of the pedestrian surviving would be 60 per cent. Lower travelling speeds on our urban roads have contributed to significant reductions in pedestrian fatalities and serious injuries since 2001.

Road trauma costs Victoria

The cost of road trauma to the community is too high. The economic cost of road casualty crashes in Victoria is estimated to be more then $2.9 billion. But the financial cost is nothing compared with the emotional cost to families and friends of losing a loved one on the road.

Slowing down saves lives

Small changes in speed can result in significant reductions in road trauma. Put simply, slowing down saves lives. Research shows that just a 10 per cent reduction in average vehicle travelling speeds could reduce road deaths by 40 per cent.

Speeding saves little time

It's true! Speeding is a major contributor to Victorian road deaths and trauma, and yet brings about only minor reductions in travel time. On a 10 km journey, you would save 46 seconds by increasing your average speed from 60km/h to 65km/h, but you double your chances of being involved in a crash.

Speeding damages the environment

Increasing your speed also increases dangerous vehicle emissions that damage the environment.

Speed limits are enforced

Breaking the speed limit is illegal. Victoria Police vigorously enforces speed limits, so there is a good chance that if you speed you will be caught. If you break the law by exceeding speed limits, you will be subject to heavy penalties, potentially including fines, loss of licence and imprisonment.

Speeding can result in the suspension or cancellation of your licence. In order to regain your licence, you may be required to satisfy certain re licensing requirements.

Young drivers are overrepresented in car crash statistics. For this reason, learner and probationary drivers may have their driving permit or licence suspended for a minimum of three months if they accumulate five or more demerit points in any 12 month period.

Improved detection of speeding

Speed cameras operate throughout Victoria. Current enforcement measures are continually being strengthened. Measures to improve the detection of speeding drivers include the introduction of:

- fixed site cameras
- mobile cameras
- red light, speed camera systems

For information relating to all aspects of the road safety camera network and enforcement of road safety offences, visit the Cameras Save Lives website which is managed by the Department of Justice.

More Information

Monash University Accident Research Centre

Australian Transport Safety Bureau (ATSB)

State Government Victoria

State Government of Victoria Page updated 9 August 2012

Speed Limits in the ACT

The ACT road hierarchy defines road types and is used for determining appropriate speed limits on these roads. The limits depend on the type and condition of the road, the mix of traffic using it and the features of the roadside.

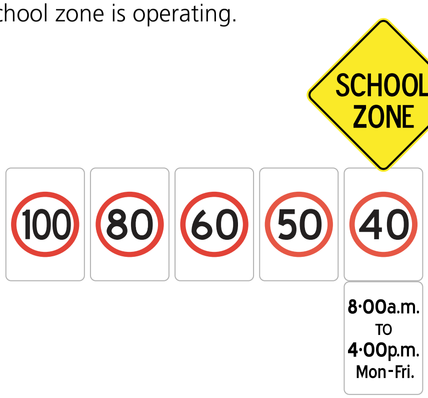
In the ACT, the **default speed limits** are as follows:

› In a built-up area – 50km/h

› In a rural area – 100km/h

When other speed limits apply, signs indicate the start and finish of the special section.

School zones operate on a part-time basis, and vehicles travelling in a school zone must not exceed 40 km/h when the school zone is operating.



Speed limits are the maximum travel speed for any road.

Speed limits in the ACT are enforced by

› police patrols using radar and laser speed measuring devices,

› mobile speed camera vans,

› fixed speed cameras, and

› average speed cameras (point to point).

What the ACT Government is doing

› Setting and reviewing speed limits according to the design capabilities of the roadway.

› Designing and installing traffic calming devices to reduce speeds in residential areas.

› Reducing speed limits in high-risk locations such as outside schools and around worksites.

› Enforcing speed limits through ACT Policing patrols and the ACT Safety Camera Program.

› Implementing awareness campaigns to encourage all road users to respect the speed limit.

What You Can Do

› Speed limits are the maximum travel speed for any road. Drive within the speed limits.

› If you don't see a speed limit sign, remember that the default speed limit is 50km/h in a built-up area and 100km/h in a rural area.

› Remember that speed limits are there to protect all road users.

› Drive according to the prevailing road conditions.

› Slow down to give yourself time to see hazards, time to assess them and time to avoid them.

To obtain more information on this or other road safety topics visit: **www.justice.act.gov.au**

ENGLISH	If you need interpreting help, telephone:
ARABIC	إذا إحتجت للمساعدة بالترجمة الشفوية،إتصل بالهاتف:
CHINESE	如果您需要口译员帮助，请拨电话：
CROATIAN	Ako trebate pomoć tumača telefonirajte:
DARI	اگر به کمک ترجمه شفاهی ضرورت دارید, به این شماره تیلفون کنید:
GREEK	Αν χρειάζεστε διερμηνέα τηλεφωνήσετε στο:
ITALIAN	Se avete bisogno di un interprete, telefonate al numero:
LAO	ຕ້ອງການຄວາມຊ່ວຍເຫລືອກ່ຽວກັບການແປພາສາ, ໃຫ້ໂທຣະສັບຫາ
MALTESE	Jekk għandek bżonn l-għajnuna t'interpretu, ċempel:
PERSIAN	اگر به ترجمه شفاهی احتیاج دارید به این شماره تلفن کنید:
RUSSIAN	Если вам нужна помощь переводчика, звоните по телефону:
SPANISH	Si necessita la asistencia de un intérprete, llame al:
VIETNAMESE	Nếu bạn cần một người thông ngôn hãy gọi điện thoại:

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THE DANGER OF SPEEDING

ROAD SAFETY

It's Everyone's Responsibility

The Problem

There are nearly 30 crashes per day in Canberra, and speed is a significant factor in many of these crashes.

Most Canberrans are aware of the dangers of speeding, and are slowing down. However, some drivers are still not paying attention or consider that driving a little over the speed limit is quite "safe".

Speed surveys undertaken by Roads ACT in 2010 indicated that traffic speeds were contained within the posted limit at only about 35% of the surveyed sites, and that average speeds on many residential streets continue to be higher than the 50km/h default speed limit.

Speeding increases:

- the risk of a crash happening, and
- the severity of injuries sustained when a crash does occur.

Speeding increases the likelihood that a driver will:

- lose control of the vehicle,
- fail to anticipate oncoming hazards, and
- cause other road users to misjudge the speed of the vehicle.

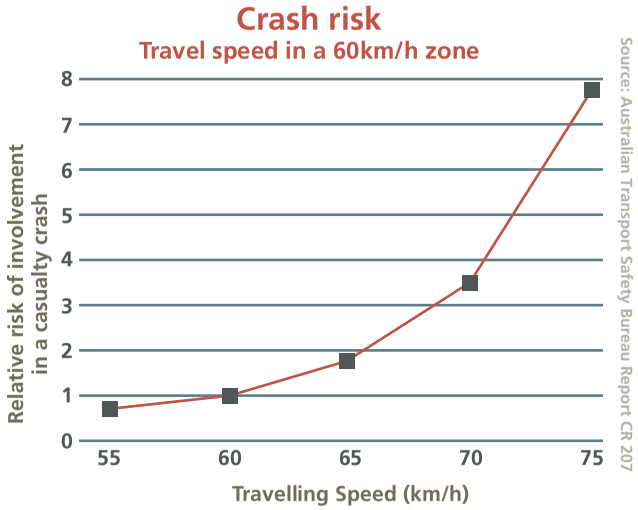
Speeding puts other road users at risk as well as the speeding driver, saves little time on our roads, and costs lives.

Speed and Crash Risk

The risk of a crash occurring increases significantly even with small increases in speed.

Research shows that speeds 5km/h above average in urban areas and 10km/h above average in rural areas double the risk of a casualty crash.

For example, in a 60km/h speed limit area, the risk of involvement in a casualty crash doubles with each 5km/h increase in travelling speed above 60km/h.



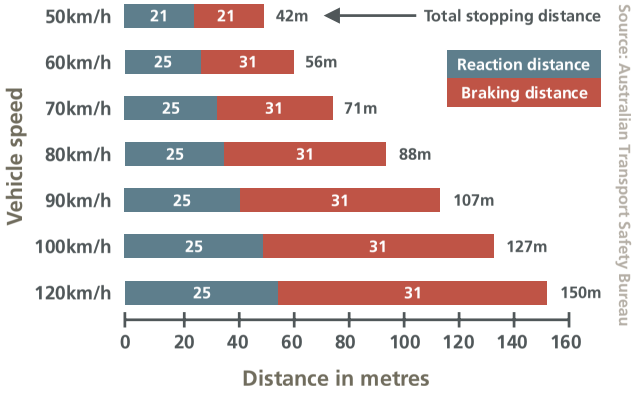
Low-level speeding is very common in the ACT, and accounts for a substantial proportion of the crashes that occur on our roads.

Speeding increases the risk of a crash occurring by dramatically increasing

- the distance travelled during the driver's reaction time, and
- the distance needed to stop – the vehicle braking distance.

When you double the speed of a car, the distance travelled while reacting to a problem doubles and the braking distance quadruples; hence, the faster you travel, the longer it will take for you to stop.

Speed and Stopping Distances



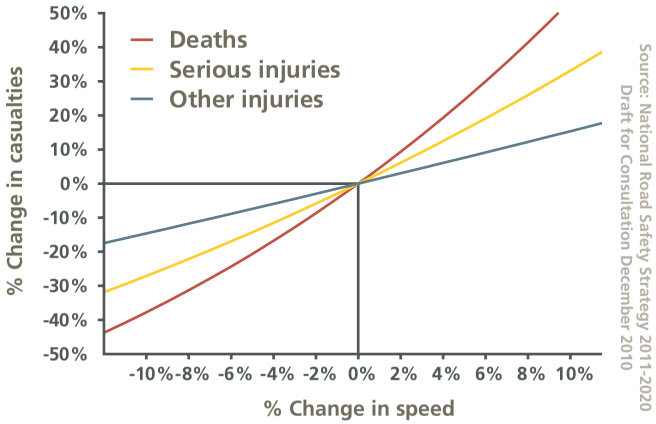
Speed and Crash Severity

Speeding increases the severity of a crash.

All moving vehicles have kinetic energy, and this energy increases exponentially with its speed. When a crash occurs, part of this energy will be absorbed by the vulnerable human body. Therefore, the chances of surviving a crash decrease rapidly with higher speeds.

Research confirms that small reductions in average speeds can result in substantially greater percentage reductions in deaths and injuries.

Changes in Casualties due to changes in Speed



Speeding -
Did you know?

NSW Centre for Road Safety

NSW GOVERNMENT | Transport Roads & Traffic Authority

FACT SHEET 1 of 6

Why is speeding a problem?

1. What is speeding?

If you drive above the maximum speed limit or you drive too fast for the weather, road and/or traffic conditions, even if the posted speed limit is not exceeded – you are speeding! Speeding is one of the most commonly reported factors associated with crashes, yet, few drivers view speeding as an immediate risk to their personal safety.

2. I'm a good driver, so I can speed safely. Can't I?

No. There's no such thing as speeding safely. Speed alone, regardless of any other factors, including how good a car you may be driving or how good a driver you may be, increases both the likelihood and the severity of a crash. Think about it. Any crash with a speeding vehicle could involve you, your passengers, pedestrians and/or the driver and passengers of one or more other vehicles.

3. The faster you drive - the greater your risk of a crash and severe injury.

As your speed increases, so does the distance travelled while processing and reacting to a hazard. At the same time, the distance needed for you to stop also increases - at a considerable rate.

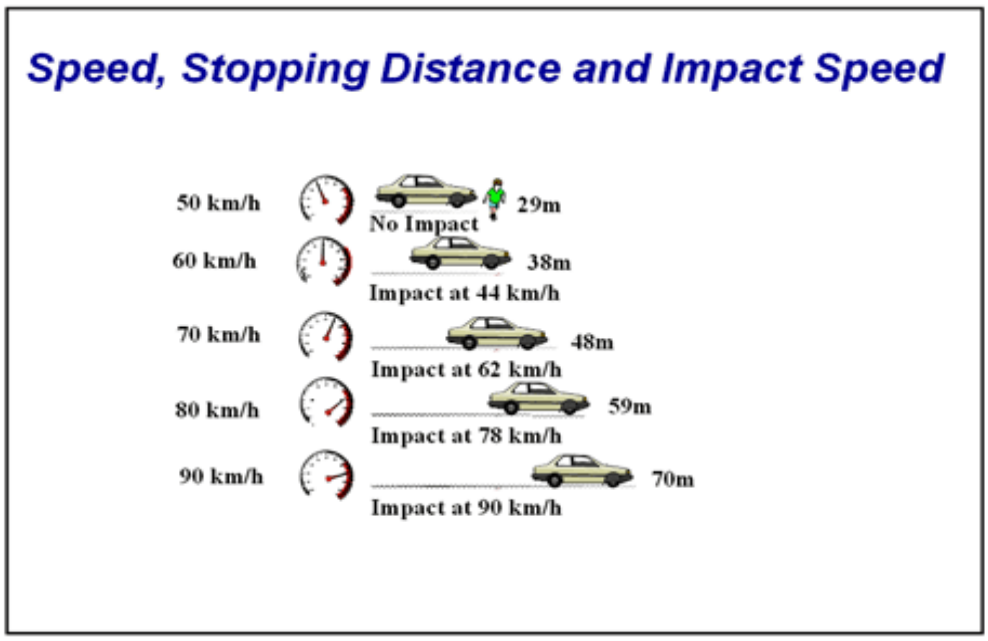
Speeding also contributes to the increased risk of losing vehicle control. At higher speeds, cars become more difficult to manoeuvre - especially on corners or curves or where evasive action is necessary. The forces experienced by the human body in a collision also increase as the speed increases. Driving within the speed limit:

- Allows road users more time to assess hazards and avoid potential crashes.
- Reduces the distance travelled while reacting to hazards.
- Provides a greater opportunity to avoid a collision.
- Makes it less likely that either you or another driver/rider will lose control.
- Reduces the impact forces in the event of a crash, making severe outcomes less likely.

4. The faster you drive - the harder you hit another vehicle, pedestrian or other object in a crash.

Even exceeding the speed limit by a small margin can have a considerable impact. Consider this example: A driver notices a pedestrian crossing the road. If the car is travelling at 50 km/h and the driver brakes when the pedestrian is 29 meters away, there will be enough space in which to stop without hitting the pedestrian. Increase the vehicle speed by just 10 km/h and the situation changes dramatically. At 60 km/h, with the pedestrian 29 meters away and the driver braking at the same point, the car will be travelling at 44 km/h when it hits the pedestrian.

The following diagram illustrates the stopping distances and impact forces at various speeds:



5. I don't speed very often or by much, so, speeding doesn't really matter to me. Does it?

It only takes one driving error, at one moment in time to cause a casualty crash. While high level speeding places that driver and other road users or passengers at great danger, low level speeding is a dangerous community wide issue due to the large number of drivers who speed by a small margin.

Exceeding the speed limit by even a small amount increases the risk of a crash. A study by Kloeden of 151cases in Adelaide found that each additional increase in speed by 5 km/h doubles the risk[i] of a casualty crash. Low level speeding is such a large issue because the cumulative effect of the additional risk associated with low level speeding multiplied by a high number of drivers speeding at these low levels, results in more casualty crashes than high level speeding (Gavin et al)[ii].

6. If I think the speed limit is too low, why should I stick to the limit?

Speed limits are set by road safety experts in accordance with the NSW Speed Zoning Guidelines. Speed limits accurately reflect the safety factors affecting given lengths of road. The factors determining the speed limit may not be immediately apparent to road users who may not appreciate the level of risk associated with speed relative to a particular road.

If you have concerns with the speed limit on a particular road, you can notify us via the Safer Roads NSW website at www.rta.nsw.gov.au.

7. I can save time by driving fast?

Little time is saved by speeding, but if everyone is travelling at a similar speed it will make travel conditions more harmonious and free flowing. It is much easier and safer to judge gaps and there will be fewer disruptions due to crashes.

You save only a maximum of 46 seconds over a 10 kilometre distance if you travel at 65 km/h instead of 60 km/h, however, it doubles the risk of being involved in a casualty crash. In fact delays are more likely to be associated with other traffic, traffic controls such as roundabouts and traffic lights and road geometry such as curves and grades. So, you only save the full 46 seconds in the rare circumstance of a relatively straight road, with no impeding traffic and no signals, stop signs, give ways or roundabouts.

8. Aren't the fines for exceeding the speed limit, just another form of revenue raising?

Reducing the road toll on NSW roads is the RTA's key objective. It is estimated that speeding related crashes cost the NSW community over $900M each year in costs to health, emergency services and lost income. In

addition over $800 million has been spent in road safety initiatives in NSW over the last five years (this is much greater than the revenue generated by fines). Fines are used in conjunction with demerit points to deter drivers from speeding. Penalties from speeding have been shown to be an effective way of managing speed and improving road safety, in Australia and internationally.

The revenue from fines is redirected into the community through various government programs and initiatives, including health, education and road safety.

In addition, if all road users drive their vehicles within the recommended speed limits, there would be no need for deterrents such as fines and penalties, including the demerit points scheme.

Speed limits are enforced by NSW Police Force and the RTA and fines and demerit points are set by legislation in accordance with the seriousness of the offence. Fines and penalties have been shown to be an effective deterrent for most drivers to keep within the speed limit in countries where they exist.

For more information visit: Road rules and regulations

9. But not all crashes are speed related, so, why are we told speeding is such a big problem?

While speeding is not the primary cause of all crashes, higher speeds increase the likelihood of a crash occurring and make the outcome of any crash far more severe. Managing speed will reduce the severity and frequency of all crashes regardless of factors contributing to the crash in the first instance – that is why controlling vehicle speeds is so important to road safety.

Speed is the major cause of many crashes, so, while we don't expect that reducing the speed limit will remove all crashes, reducing speed will certainly reduce both the risk and severity of crashes.

10. More information/contact details

For more information on speed zones and to 'Have Your Say' on speed limits and speed limit signs, visit the RTA's new Safer Roads NSW website at www.rta.nsw.gov.au.

Contact:: safer_roads@rta.nsw.gov.au

References:

[i] Kloeden CN, McLean AJ, Moore VM, and Ponte G (1997). Travelling Speed and the Risk of Crash Involvement, NHMRC Road Accident Research Unit, The University of Adelaide.

[ii] Gavin, A, Walker, E, Murdoch, C, Graham, A, Fernandes, R, Job, RFS (2010). Is a focus on low level speeding justified? Objective determination of the relative contributions of low and high level speeding to the road toll. Proceedings of the Australasian Road Safety Research Policing Education Conference, Canberra, 2010.

Speeding -
Did you know?

NSW Centre for Road Safety

NSW GOVERNMENT | Transport Roads & Traffic Authority

FACT SHEET 4 of 6

How does speeding increase the chances and severity of a crash?

1. What is speeding? How big a factor is speeding in serious and fatal crashes?

Speeding - which encompasses excessive speed (ie, driving above the speed limits) or inappropriate speed (driving too fast for the prevailing conditions) - is unquestionably recognised as a major contributory factor in both the number and severity of traffic crashes (World Health Organisation, 2008) [i].

As a vehicle's speed increases, so does the distance travelled during the driver's reaction time (reaction distance) and the distance needed to stop (braking distance). Also, the higher the speed, the greater the amount of kinetic (moving) energy that must be absorbed by the impact in a crash. Therefore, as well as being identified as a causal factor in around 40 per cent of fatal crashes, speed is an aggravating factor in the severity of all crashes (See Crash Statistics on the RTA website.)

2. What is a driver's reaction time and braking distance?

Reaction time is how long a driver takes to see both a hazard and the time it takes the brain to realise the danger and process a reaction to a hazard for example, starting to brake. The braking distance is the distance that a vehicle travels while slowing to a complete stop.

As your speed increases - so does the distance you travel while your brain is processing information and reacting to it – and so does the distance you need to stop. The average time it takes for most drivers to react to a risky situation on the road is 1.5 seconds. A driver who is fatigued or distracted (eg, using a mobile phone or affected by drugs or alcohol) may take as long as three critical seconds to react.

3. How does speed contribute to the increased risk and severity having a crash?

Speed will increase both the reaction distance, and the braking distance. A driver travelling at faster speeds will have covered more ground in between spotting and reacting to a hazard than a driver travelling at a slower speed, so the speeding driver is more likely to crash.

Speed is also a major contributory factor to the severity of a crash. Consider this example: Two cars of equal weight and braking ability are travelling along the same road. Car 1, travelling at 60 km/h, is overtaking Car 2, which is travelling at 50 km/h. A child on a bicycle – let's call him Sam – emerges from a driveway 29 metres away just as the two cars are side-by-side. The drivers both see Sam at the same time and both take 1.2 seconds before they fully apply their brakes. In the few moments it takes to react and stop, Car 2 would have had enough space in which to stop without hitting Sam. Car 1, on the other hand, would be travelling at 44 km/h when it hits Sam and at this speed, it is highly likely that Car 1 would have seriously injured or even killed Sam.

Speeding also contributes to the increased risk of losing vehicle control. At higher speeds, cars become more difficult to manoeuvre - especially on corners or curves or where evasive action is necessary.

Roads and Traffic Authority of New South Wales

www.rta.nsw.gov.au | 13 22 13

July 11
RTA/Pub. 11.310

http://www.rta.nsw.gov.au/saferroadsnsw/speeding_and_crashes.pdf

4. What is kinetic energy? How does it relate to speed?

The kinetic energy of a moving vehicle is a function of its mass and velocity squared and this energy must be absorbed in a collision by friction, heat, and the damage suffered by the vehicle as a result of the crash.

This means, the more kinetic energy to be absorbed in a collision, the greater the potential for injury to vehicle occupants and anyone hit by the vehicle. Because kinetic energy is determined by the square of the vehicle's speed, rather than by speed alone, the probability of injury, and the severity of injuries that occur in a crash, rapidly becomes greater with vehicle speed. For example, a 30 per cent increase in speed (eg, 80 to 105 km/h) results in a 69 per cent increase in the kinetic energy of a vehicle – more than doubling the probability of injuries occurring and their likely severity.

5. Where does kinetic energy go during a crash?

Following a crash involving a vehicle hitting an object (vehicle, tree, pedestrian, etc), the vehicle eventually comes to rest. Some of the kinetic energy is absorbed by your vehicle (which is why your car is damaged) and some is transferred to the object you hit. For example, a car travelling at 65 km/h will have a force of about 87 tonnes to be absorbed in a crash compared to a force of 74 tonnes needed to be absorbed by the car travelling at 60 km/h.

6. Does lowering speed limits really help decrease the risk and severity of a crash?

Current and past research in Australia and internationally provides compelling evidence that increased travel speeds – even at low levels – are directly related to both the likelihood of a crash occurring and to the severity of crash outcomes.

Many researchers (Woolley) [ii] have demonstrated that lower travel speeds and death tolls usually follow lowering of speed limits and higher travel speeds and death tolls follow increases in speed limits. During the 1970's energy crisis, the maximum speed limit was reduced across the United States of America (USA) from 70 miles per hour (113 km/h) to 55 miles per hour (89 m/h) and the National Highway Traffic Safety Administration board issued a special report, pointing out that this reduction in maximum speed had resulted in a 16.4 percent drop in fatalities. In 1987, the USA lifted the speed limit on rural interstates to 65 miles per hour (105 km/h), which led to a 17 per cent rise in fatalities. A report appearing in the American Journal of Public Health in 2009 has found that a 3.2 per cent increase in road fatalities was attributable to the raised speed limits on all road types in the United States, resulting in 12,500 more deaths between 1995 and 2005.

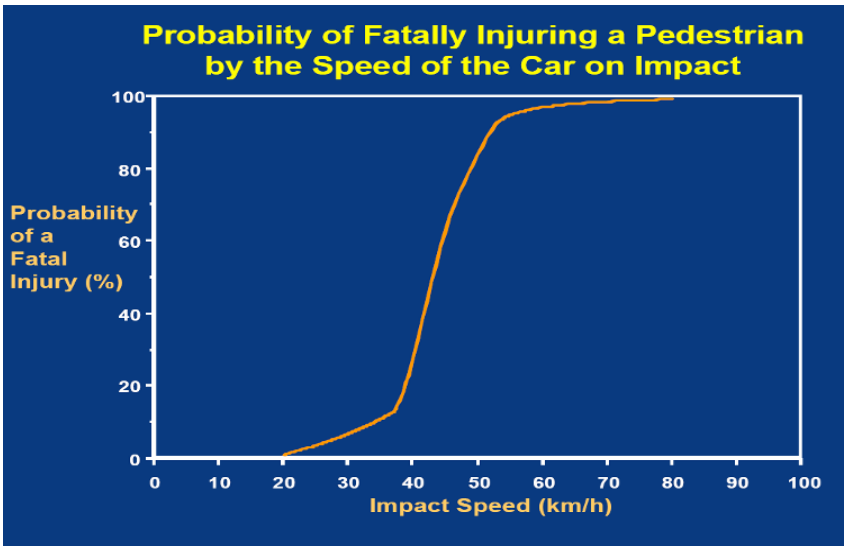
In 1987, Victoria raised the speed limit on its rural and outer Melbourne freeway network to 110 km/h from 100 km/h. There followed an increase in casualties (including fatalities) of 24.6 per cent. In late September 1989, a 100 km/h limit was reintroduced, resulting in a reduction in crashes of 19.3 per cent (Sliogeris, 1992) [iii]. In NSW, recent experience shows that reducing speed limits is an effective measure in reducing the number and severity of crashes including the 26 per cent reduction in casualty crashes on the Great Western Highway after speed limits were reduced from 110 to 100 km/h (Bhatnagar et al)[iv].

7. How does speeding increase the injury or death risks to pedestrians and other road users?

In addition to car occupants, our roads are used by many road users including pedestrians, motorcycle and bicycle riders, who are more vulnerable to injury or death if hit by a speeding vehicle. Studies of the relationship between the survival of a vulnerable road user and vehicle impact speed (the speed at which the vehicle was travelling when it hit the vulnerable road user) show that small increases in travel speed can result in large increases in braking distances and impact speed - substantially increasing the risk of a pedestrian, motorcycle, bicycle rider, or baby in a pram being killed or seriously injured.

Let's take the example of Sam – the bicycle rider in Question 3. If Car 1, travelling at 50 km/h, brakes when Sam is 29 meters away, there will be enough space in which to stop without hitting Sam. If Car 2 is travelling at 60 km/h, when Sam is 29 meters away and the driver brakes at the same point, Car 2 will be travelling at 44 km/h when it hits Sam.

Consistent with this, slight reductions in vehicle speed will significantly reduce the severity of outcomes for pedestrians in the event of a crash. Drivers are twice as likely to kill a pedestrian if they are travelling at 50 km/h than if they are travelling at 40 km/h (see diagram below from Waltz et al).[v].



8. Does it make a difference if a vehicle is hit from the front or side?

In addition to speed greatly increasing the risk of severe or fatal injuries, a number of studies show that side impact or 't-bone' crashes are only survivable by passengers in a vehicle at much lower speeds than frontal crashes. This means that controlling speed at intersections is critical, to reducing crashes and casualties in areas where this type of conflict may occur.

9. Who's more dangerous? The high number of people who speed by a small margin - or the small number of dangerous drivers who sometimes speed excessively?

High level speeding places that driver and other road users or passengers at great danger, however low level speeding is an extremely dangerous community wide issue due to the large number of drivers who speed by a small margin.

In urban areas, exceeding the speed limit by 5 km/h doubles the likelihood of a casualty crash and each additional increase in speed by 5 km/h further doubles the risk (Kloeden et al)[vi]. Low level speeding is such a large issue because the cumulative effect of the additional risk associated with low level speeding multiplied by a high number of drivers speeding at these low levels, results in more casualty crashes than high level speeding (Gavin et al)[vii].

10. More information/contact details

For more information on speed zones and to 'Have Your Say' on speed limits and speed limit signs, visit the RTA's new Safer Roads NSW website at www.rta.nsw.gov.au.

Contact: safer_roads@rta.nsw.gov.au

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