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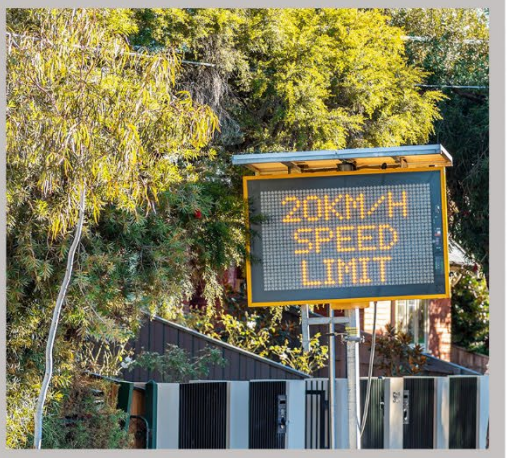

Facilitating Speed Management Change: Example Case Studies from Australia and New Zealand

Facilitating Speed Management Change: Example Case Studies from Australia and New Zealand

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Abstract

This report is a case study-based examination of the information and approaches that can be used to counter some of the most significant myths and barriers relating to speed management. Speed is a key contributor to crash risk, affecting the likelihood and severity of the outcome. The evidence base is strong for this link between speed and safety outcomes. There is also comprehensive information on the effectiveness of different types of interventions that can be used to better manage speeds. Many of these have been found to be highly effective, and greater adoption of these interventions is likely to lead to significant road safety benefits. However, there are barriers to change that often prevent required improvements. The evidence provided in this report can be used to better engage with the public and decision-makers about the need for speed change and the broad benefits that this change will bring.

Keywords

Speed management, communications, engagement, barriers, blockers, enablers

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About Austroads

Austroads is the association of Australasian transport agencies.

Austroads' purpose is to support our member organisations to deliver an improved Australasian road transport network. To succeed in this task, we undertake leading-edge road and transport research which underpins our input to policy development and published guidance on the design, construction and management of the road network and its associated infrastructure.

Austroads provides a collective approach that delivers value for money, encourages shared knowledge and drives consistency for road users.

Austroads is governed by a Board consisting of senior executive representatives from each of its eleven member organisations:

- Transport for NSW
- Department of Transport and Planning (Transport Victoria)
- Queensland Department of Transport and Main Roads
- Main Roads Western Australia
- Department for Infrastructure and Transport South Australia
- Department of State Growth Tasmania
- Department of Logistics and Infrastructure Northern Territory
- Transport Canberra and City Services Directorate, Australian Capital Territory
- Department of Infrastructure, Transport, Regional Development, Communications and the Arts
- Australian Local Government Association
- NZ Transport Agency Waka Kotahi.

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This report has been prepared for Austroads as part of its work to promote improved Australian and New Zealand transport outcomes by providing expert technical input on road and road transport issues.

Individual road agencies will determine their response to this report following consideration of their legislative or administrative arrangements, available funding, as well as local circumstances and priorities.

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Summary

Speed has been identified as a significant contributor to road trauma. It increases the likelihood of crash occurrence and is also the major determinant of crash severity for all crashes, regardless of the initial cause. An extensive amount of research exists to quantify this relationship, showing that even small changes in speed can result in significant safety impacts. Similarly, there is comprehensive evidence of the solutions that might be used to address this issue. Many of these are highly effective, and greater use of these measures is likely to produce significant road safety benefits. However, progress in management of speed has been slow due to the perceived barriers to the use of more effective speed limits and the measures to support them.

This report provides support for speed management changes through case study examples of speed-related activities. The focus is on communications, engagement and partnerships, and key evidence that might be used to engage on this issue. The report provides information on 28 topics. Each topic is illustrated by one or more case studies based on activities undertaken in Australia and New Zealand. These topics include issues relating to the benefits of speed change; the collection of speed data and surveys, and use of this data to help convince stakeholders of the need for speed change; and other supporting activities.

The conclusions drawn from these case studies include the following:

- Speed reductions produce clear road safety benefits for both urban and rural roads. The evidence from Australia and New Zealand is clear and matches the extensive overseas research on this topic. However, there are many benefits beyond improvements in safety, including lower emissions, improved economic impacts, improved health, fewer impacts with wildlife and even improved traffic flow. These broader benefits need to be made clearer to the community and decision-makers.
- Community support for speed change is often very strong, especially when communities are made aware of the reasons for change and the likely benefits. Some initial reluctance to change (a ‘status quo’ bias) is typical, especially in rural and remote areas, but this reluctance often turns to support following the change. There is a need to prepare for possible opposition and to note that this often comes from a vocal minority. Where there is reluctance to change, targeted community surveys can help provide reassurance to decision-makers.
- There is often strong community support for better speed management, with local government and community champions demanding this change. Community sentiment in favour of safe speeds is increasing over time, and there is a need for national and state or territory guidance to keep pace with this change.
- Data is important for successful engagement on speed management, with examples provided of the use of evidence to help inform decision-makers. However, data or facts alone may not be enough to convince some. The use of case studies and engagement with community members or other champions can help present a compelling argument for change. Combining both ‘science’ and ‘story’ is an effective means of generating support for the required change.
- There are many myths about speed change, and these myths need to be countered with evidence. For example, it is often believed that speed reductions will lead to substantial increases in journey times and costs to the community. Both statements are false. More effective speed management has very little impact on journey times and can improve economic outcomes. It is possible to anticipate the barriers to change and especially the myths. Evidence is available to counter each of these barriers, and there is a need to prepare for any likely challenge.

Further examples are provided throughout the report on various other tools and methods to help engage communities and decision-makers on the need for change, and on the beneficial outcomes that are likely to occur. Different audiences respond to different messages, and it is likely that a combination of approaches will be required to help shift public and decision-maker sentiment about the importance of safe speeds.

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1. Introduction

The purpose of this report is to set out approaches and evidence from case studies that can be used to overcome barriers to speed management and gain support from the community and decision-makers through effective engagement.

1.1 Purpose

Speed has been identified as a significant contributor to road trauma. Extensive research exists to quantify this relationship as well as the solutions that might be used to address this issue. Speed-related crashes include vehicles travelling above the speed limit, or vehicles travelling too fast for the conditions when travelling within the speed limit. Speed is typically estimated to be a contributing factor in around a third of all road deaths, but it is likely that the real contribution is much higher (Job and Brodie 2022; Fondzenyuy et al. 2024). Speed contributes to the likelihood of a crash occurring and also to the severity of the outcome. The evidence base for the relationship between a change in speed and the impact on safety is well established and robust. A similarly robust evidence base exists on the effectiveness of different speed interventions. Not only do many of the interventions provide impactful safety improvements, but they are also highly cost effective. Speed management is therefore considered a key method for improving road safety outcomes.

Higher vehicle speeds are associated with other negative outcomes in addition to the increase in road crashes, including higher levels of emissions, increases in vehicle operating costs including fuel consumption, and other detrimental health impacts, including from noise and reduced incentives for active modes of travel (walking and cycling) that bring broader health benefits (Turner et al. 2024).

Despite this knowledge, progress on effective management of speed has been slow in Australia and New Zealand. Both countries are now out of step in terms of the speed limits used on urban and rural roads when compared to the best-performing OECD peers (ITF 2023). There are many perceived barriers to the use of more effective speed limits and supporting measures (Turner et al. 2024). These barriers are likely to limit efforts to make further speed-related change despite the demonstrated benefits. However, there are also many success stories from Australia and New Zealand of effective management of speed.

This Austroads project aims to identify case studies of speed management activities to support Austroads and its members improve speed management activity. The focus is on information and activities related to communications, engagement and partnerships – elements of speed management that have been identified as barriers to effective change. The key purpose is to document lessons about success factors as well as issues that impacted desired outcomes in a negative way. The focus is broad and includes a range of interventions and processes, documenting the actions taken, especially the engagement and communications activities.

1.2 Scope

The project focuses on speed-related case studies from Australia and New Zealand and does not include other international examples. Topics related to the introduction of speed limits and the measures that can be used to support these limits are included. These measures include infrastructure support, enforcement and vehicle technologies, and advocacy, engagement and communications activities. The case studies do not document the effectiveness of these measures per se (although some information about this is included), but rather the lessons from implementation. Key lessons from these activities, whether these are positive or negative, are included.

Many good speed-related activities are undertaken across Australia and New Zealand. The topics in this report capture only a subset of relevant speed activities, but a lack of inclusion does not mean these approaches are not of value. The examples provided for each topic give only a snapshot of case studies from around Australia and New Zealand. There may be other locations that are also conducting similar activities that have not been captured in this report.

The information in this report is based on interviews and desktop analysis, including of documents provided. The summaries do not necessarily reflect the findings, policy or opinions of road agencies or those interviewed.

1.3 Methodology

Interviews were held with representatives from jurisdictions and other relevant organisations to identify example activities. Initial workshops were held with representatives from each Austroads jurisdiction (including nominated local government representatives) to outline requirements and identify possible case studies along with the key learnings from these. Workshops were held either virtually or in-person and took between 60 and 90 minutes. In each case, a presentation was provided to set the context, and a structured approach was used to identify relevant activity. After these initial workshops, additional discussions were held with representatives from local government, industry and academia to gather further details on case studies of interest.

Following these discussions, a list of case studies for each jurisdiction was prepared and circulated to workshop attendees. In many cases, further case study ideas were provided in the feedback, or amendments were made to existing case studies.

In total, around 190 case study ideas were identified. An assessment was made and involved grouping case studies into similar topics across jurisdictions and removing less relevant topics. This led to a revised list of around 60 speed-related topics. For each of these topics, a subjective assessment was made on the importance as well as the difficulty in collecting the required data and producing a useful summary. The topics were ranked based on this initial assessment and presented to the Austroads Speed Technical Reference Group for discussion. The list of topics assessed at this step is provided in Appendix A. Given resource constraints, a total of 28 case study topics were selected for inclusion in this report. Most of these topics included more than one example of speed-related activity.

Information was collected for each of the identified topics and documented using an agreed structure. The initial text was then sent to contacts for checking and further refinement. Common themes were identified, and topics were arranged based on these themes. Key lessons across all themes, including some of the findings from discussions with stakeholders not included in case studies, were gathered to form a summary chapter.

1.4 Report structure

The sections in this report are arranged by topic. The main themes include:

- benefits from speed change (Section 2)
- collecting and using speed data and surveys (Section 3)
- use of data to engage and convince (Section 4)
- other supporting activities and measures (Section 5).

Each section is further divided by case study topics. Key findings are summarised at the start of each topic, highlighting why it contributes to knowledge regarding speed limit implementation. Broad background is provided to set the context for each topic, followed by specific case study examples from Australia and New Zealand.

In total, the report sections summarise 28 case study topics.

1.5 How to use this report

It is envisaged that practitioners, community groups and decision-makers find practical, real-life examples of speed management activities in this report that provide information, guidance and evidence relevant to their circumstances. The case studies under each topic can be selected according to location, relevance of the evidence or the persuasiveness of the ‘story’. As well as the comprehensive reference list at the end of this report, individual topics include full reference details so that they can be used as standalone documents.

2. Benefits from Speed Change

This section presents case study topics about the safety and other benefits of lower speeds. Each topic includes summaries of specific speed management activities in Australia and New Zealand that illustrate the various benefits.

2.1 Safety impact of speed change – rural

Key finding

Examples show consistent and significant safety benefits from targeted speed reductions on rural roads. There is a solid evidence base on this issue that is consistent with positive findings from international studies.

2.1.1 Description of activity

Rural roads often have higher fatality rates compared to urban roads due to factors such as higher speeds, longer emergency response times and varying road conditions. One effective measure to enhance road safety in rural areas is the implementation of lower speed limits. This case study topic examines the safety impacts of lower speed limits in rural areas, drawing on specific examples from New Zealand and Australia.

Lowering speeds on rural roads can be challenging, especially in remote areas where traffic volumes may be lower and distances vast. There are often concerns such as increased travel time (see Section 4.1). However, reduced speeds on rural roads can produce significant road safety benefits. Research has consistently shown that reduced speeds lead to fewer crashes and less severe injuries when crashes do occur. This is primarily because lower speeds reduce the stopping distance required for a vehicle, provide drivers with more time to react to unexpected hazards and decrease the kinetic energy involved in a collision. The kinetic energy involved is proportional to the square of the speed. Therefore, even small reductions in speed can lead to significant decreases in the energy involved in a collision, reducing the severity of injuries and the likelihood of fatalities.

International studies have provided substantial evidence supporting the safety benefits of lower speed limits on rural roads. Models have been developed based on dozens of examples that compare change in speed limit, change in average speed and road safety outcomes. For example, the ‘power model’ of speed indicates that, for a 5% reduction in speed (for example, from 85 km/h to 80 km/h), a 20% reduction in fatalities could be expected (Elvik 2009).

2.1.2 Outcomes

Mornington Peninsula Shire, Victoria

The Mornington Peninsula Shire in Victoria is an example of a rural area that has successfully implemented lower speed limits to enhance road safety. Due to a high risk of fatal and serious injury crashes, a trial started in 2019 for reduced speed limits on 33 sectors of local sealed roads. Speed limits were reduced from either 100 km/h or 90 km/h to 80 km/h. An evaluation of the speed limit reductions indicated a significant decrease in vehicle speeds and in the number of crashes. The average travel speed reduced by an initial 3–5 km/h, and there was a greater reduction of around 7 km/h on a subset of higher volume roads. Speeds reduced by up to 10 km/h on roads that had the highest vehicle speeds before the 80 km/h speed limits (Mornington Peninsula Shire 2022).

Figure 2.1: Speed limit reductions, Mornington Peninsula

Source: Provided to author by Mornington Peninsula Shire, 31 October 2024.

As of October 2024, there were no fatal crashes on any sections of roads with reduced speed limits, compared to 6 in 2019 before the 80 km/h, and 32 in the past 20 years. An evaluation found that fatal and serious injuries reduced by 68%, although numbers also reduced on similar roads, most likely due to travel restrictions due to COVID19. Internal modelling of some former 100 km/h routes shows estimated reductions as high as 39%. Further evaluations are likely to be undertaken soon.

Surveys of community responses to the speed limit changes showed majority support for the trial as well as for further 80 km/h speed limits, and for the expansion of safer speed limits to unsealed roads in the municipality (Mornington Peninsula Shire 2022).

As highlighted in other case studies (see Section 4.1), the journey time increases based on earlier changes from 2012 were not substantial, and there are likely to be other benefits from these changes, including reduced emissions and less injury to wildlife.

Adelaide Hills, South Australia

The Adelaide Hills region in South Australia is another notable example of rural speed limit change. The speed limit was reduced from 100 km/h to 80 km/h at the start of 2002 on 18 sections of roads managed by the state government. The total length of change was almost 128 km, with roads selected based on their configuration (for example, alignment). Further changes were made on local rural roads but were not included in the evaluation. Crashes in a five-year period before and after the change were compared, with general trends in safety controlled through data collected at sites that were not treated. The study concluded that the most likely reduction in crashes at the treated locations was 15% (Long and Hutchinson 2009).

More recent changes have been made at this location by the City of Onkaparinga. Following resident requests for safer speeds, the council sought reductions from 80 km/h speed limits to 70 and 60 km/h on 8 roads totalling almost 19 km. To counter an expected negative response from sections of the community, a coordinated communications strategy was developed, commencing with general ‘drive safe’ messaging followed by information on the general risk of speeding. Council’s elected members were also kept informed throughout the whole process. The new lower speed limits became operational on 30 November 2023 following approval from state government. The changes were extensively communicated via social media, a community engagement website and news articles. Probe speed data using the Compass IoT platform was obtained to identify the change in travel speeds, before and after the speed limits were changed.

Results in the 9 months following the change in speed limits indicated that travel speeds were reduced. The 85th percentile point-to-point speeds (the speeds at which 85 percent of vehicles travelled over a set length) were reduced by an average of 5.8 km/h. At control sites where no speed limit change occurred, more limited reductions were observed during the same period (2.6 km/h). Estimates using the exponential speed model (Global Road Safety Facility 2024b) indicate that this would equate to reductions of 36% for fatal crashes and 28.6% for serious injury crashes at the treated locations. Accounting for the reductions observed at comparison sites where no speed limit changes were made, this would equate to a real reduction in fatal crashes as a result of the speed limit change of around 16% for fatal crashes and 14% for serious injury crashes (Williams 2024).

Speed limit changes in New Zealand

Rural speed reduction initiatives have been undertaken in New Zealand over several decades. A number of these changes have now been evaluated, with very positive results regarding safety improvements.

An evaluation by WSP (WSP New Zealand Ltd 2022) provides an in-depth analysis of 3 key locations where speed limit reductions were implemented.

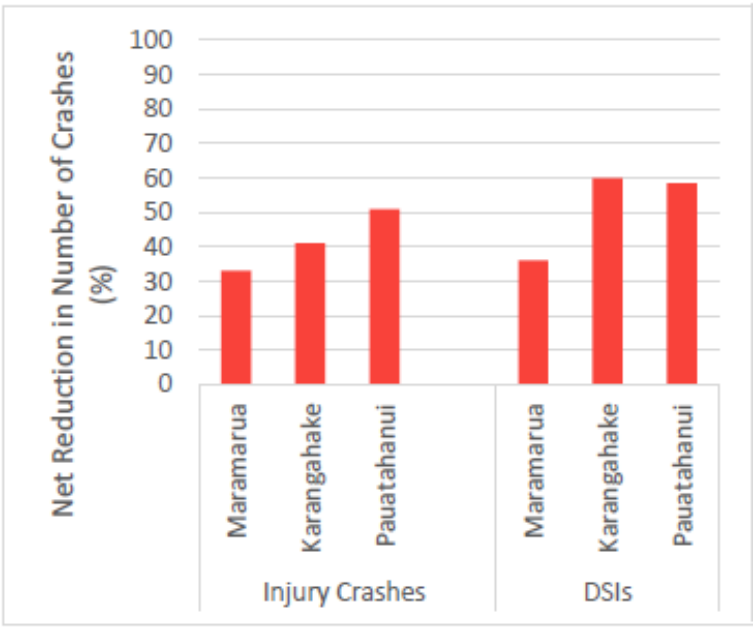
SH2 Maramarua: The speed limit was reduced from 100 km/h to 90 km/h in December 2011. This reduction led to a 9 km/h decrease in mean operating speed, resulting in a 41.2% reduction in reported injury crashes for the treated section. However, there was also a decrease in injury crashes at the untreated comparison site of around 12%. Therefore, the net benefit of this speed reduction was estimated at a 33% reduction. When examining just the deaths and serious injuries (DSIs), the net benefit at the treated location was 36.1%. When taking account of traffic volumes, the reduction in crash rates was slightly higher with a net benefit of 36% for all injury crashes and 39% for DSIs.

SH2 Karangahake Gorge: In November 2005, the speed limit was reduced from 100 km/h to 80 km/h over an 8.5 km length of highway. Vehicle speeds were collected before and after the change. It is notable that in all cases, the average speed was well below the existing speed limit of 100 km/h in the before period. Speed after the change reduced by between 4–6 km/h for straight sections, and by 2 km/h for a section with tight curves. Taking account of safety outcomes at control site locations, injury crashes reduced by 41%, while the net reduction for DSIs was 60%, although the sample size was low. The injury crash rate per 100 million vehicle kilometres travelled (VKT) dropped by 23% at the treated site compared to a 3% reduction at the comparison site (WSP New Zealand Ltd 2022).

SH58 around Pāuatahanui Harbour: The speed limit was reduced from 100 km/h to 80 km/h in 2005 to 2006, but it was noted that for this section of SH58 there were numerous curves with advisory speeds less than 80 km/h. Speed data at this site was not available. There was a minimal reduction in injury crashes at treated sites with a 4% change. However, injury crashes increased by 47% at comparison sites, indicating a likely safety benefit of around 50% at the treated location. The reduction in DSIs was more substantial, with a net reduction of 58.5% at the treated sites.

The WSP study confirmed that the interventions were successful in improving road user safety. It also found that crash reductions were generally in keeping with or even exceeded those documented in international literature for these types of speed limit changes (WSP New Zealand Ltd 2022).

Figure 2.2: Net reductions in numbers of crashes at treated sites



Source: WSP New Zealand Ltd (2022).

A study of more recent changes in Auckland (Abley 2022) also produced significant results based on an initial evaluation. In 2020, Auckland Transport implemented a program of safe and appropriate speed limits on just over 880 km of roads, around 11% of Auckland's local road network. Roads included a mixture of high-risk roads and others where operating speeds were lower than the existing speed limit. The program included roads from high-risk rural areas, the city centre, several town centres, residential areas and urban roads. After the first 24-month period, an evaluation of the overall program (both urban and rural) identified a reduction in DSI crashes of 22%, and a 27% reduction in fatal crashes. The results for rural roads produced the most significant reduction, with a 45.7% decrease in fatal crashes and a 26.9% decrease in death and serious injury collisions. All injury crashes on rural roads decreased by 17.1%. These findings were identified as being consistent with other research.

Figure 2.3: Reduction in fatal, serious and minor crashes, Auckland Transport

Workstream	Fatal Crashes per year - Before	Fatal Crashes per year - After	Serious Crashes per year - Before	Serious Crashes per year - After	Minor Crashes per year - Before	Minor Crashes per year - After
Rural	4.6	2.5	26.2	20	93.4	80.5

Source: Abley (2022).

Based on this early success, Auckland Transport changed a further 2,000 km of road network to lower speeds on rural roads and around schools. This has led to an estimated 39% of the Auckland road network having safe and appropriate speeds. The change is expected to lead to a 25% reduction in death and serious injuries on Auckland roads (Abley 2022).

2.1.3 Conclusion

Lower speed limits on rural roads have proven to be an effective measure for enhancing road safety. The examples from New Zealand and Australia discussed above, which are consistent with international evidence, demonstrate the significant benefits of reduced speeds in terms of crash reduction and injury severity. By implementing and enforcing lower speed limits, rural areas can achieve safer road environments, ultimately saving lives and reducing the burden of road traffic injuries.

A further point of interest in the above case studies is that the speed limit changes were produced without the need for supporting infrastructure. Often, a change in speed limit sign alone can produce significant safety benefits, making this a very cost-effective intervention.

2.1.4 References

Abley (2022) *Safe Speeds Phase 1: 24 Month Interim Evaluation*, report prepared for Auckland Transport, Abley Limited, Christchurch, New Zealand.

Elvik R (2009) The power model of the relationship between speed and road safety: Update and new analyses, Institute of Transport Economics, Norwegian Centre for Transport Research, Oslo, Norway.

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Williams B (30 September–3 October 2024) 'Managing periurban local roads by setting safer speed limits', [extended abstract], *Australasian Road Safety Conference*, Hobart, Tasmania.

WSP New Zealand Ltd (2022) *The impact of change in speed limit at three sites*, Project Number: 5-C4024.00, WSP, Wellington, New Zealand.

2.2 Safety impact of speed change – urban

Key finding

Targeted reductions in speed limits on urban roads can produce significant road safety benefits. A solid evidence base is building from Australian and New Zealand experience.

2.2.1 Description of activity

Lower speed limits can reduce the severity and frequency of crashes in urban areas and improve the safety outcomes for all road users. The following case studies from Australia and New Zealand examine the impact of reduced speed limits in urban areas on road safety outcomes.

In recent years, there has been a notable trend towards the reduction of speed limits in urban areas. This trend is driven by a growing recognition of the benefits associated with lower speeds, including improved safety outcomes, but also broader outcomes such as reduced noise, more pleasant environments for walking and cycling (with associated health benefits), and reduced emissions.

Lower speed limits and subsequent reductions in speed can influence safety outcomes in several ways. The main reason is the direct relationship between speed and the severity of crashes. Higher speeds result in greater kinetic energy during a collision, leading to more severe injuries or fatalities. Reduced speeds also give drivers more time to react to unexpected hazards, decreasing the likelihood of crashes.

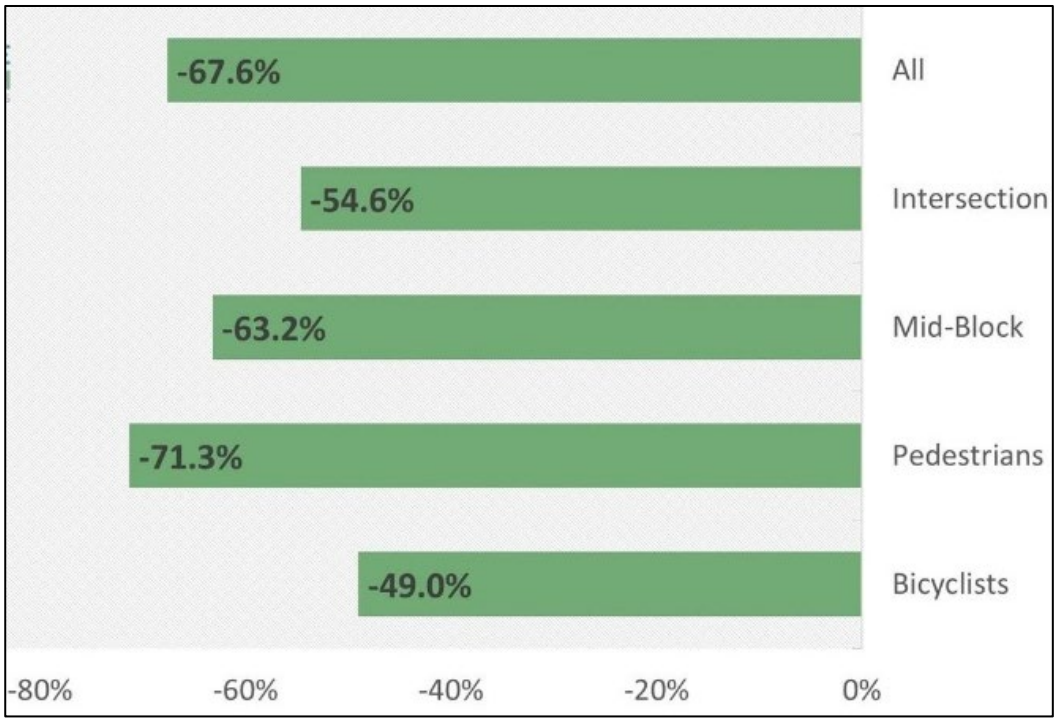
Even small reductions in speeds can have significant impacts on road safety. Based on examples from many countries, models have been developed that examine the impact from changes in speed on safety outcomes. The power model indicates that a change in speed from 50 km/h to 45 km/h would result in a 27% reduction in fatalities, and a 19% reduction in serious injury (Elvik 2009).

2.2.2 Outcomes

Yarra City Council, Melbourne, Australia

In 2018, Yarra City Council initiated a trial to reduce speed limits from 40 km/h to 30 km/h. The trial area was bordered by Johnston Street to the south, Nicholson Street to the west, Hoddle Street to the east and Alexandra Parade to the north. The project was funded by the Transport Accident Commission (TAC) and supported by the Department of Transport and Planning, along with the Victorian State Government. A study conducted by Sobhani (2024) evaluated the impact of the speed reduction. The study focused on serious injuries involving pedestrians and cyclists, who were the only road users involved in such injuries both before and after the intervention. Accounting for general trends from a control location, the study found a statistically significant 67.6% reduction in serious injuries, with reductions in serious injuries of 71.3% for pedestrians and 49% for cyclists. However, the results were adjusted to account for regression to the mean, producing a more conservative 42.6% reduction overall in serious injuries for these road users following the speed limit change (Sobhani 2024).

Figure 2.4: Expected crash reduction, unadjusted for regression to the mean



Source: Author's personal communication.

Auckland, New Zealand

Auckland Transport introduced reductions in speed limits across its road network in 2020. Speed limits were reduced on just over 880km of roads, around 11% of Auckland's local road network. In urban areas, speed limits were reduced from 50 km/h to 30 km/h in many residential and commercial zones. Early data from Auckland Transport indicates there was a 18.1% decrease in death and serious injury collisions and a 32.5% decrease in all injuries (Abley 2022).

Christchurch, New Zealand

Christchurch implemented speed limit reductions in several suburbs, including Addington, Sumner, and Papanui, where speeds were reduced from 50 km/h to 30 km/h. The results showed a significant reduction in crashes when combining data from all 3 sites, with injury crashes decreasing by 59.1% across the treated sites (data provided by Koorey 2023).

Hobart and Glenorchy City, Tasmania

Hobart City Council implemented speed limit reductions from 60 km/h to 50 km/h across a range of urban streets. While Tasmania had implemented a default urban speed limit of 50 km/h in 2002, a number of higher volume local and state roads had remained at 60 km/h. The change was based on extensive national and international research showing that reducing speed limits in urban areas results in safer roads for all – for vehicle users as well as vulnerable road users like pedestrians and cyclists. The change was undertaken in 2 stages: stage 1 in 2011 and stage 2 in 2014. A total of 14 roads had speed limits reduced in stage 1, while 9 roads had speed limits reduced in stage 2. When compared with a similar control site location where no speed change occurred, it was identified that the change resulted in a decline in road crashes of 15% for stage 1 and 28% for stage 2 (author's personal communication with the Department of State Growth, Tasmania, 4 October 2024).

In 2013, Glenorchy City Council implemented speed limit reductions across roads in its local network, including main roads and collector roads. Speed limits were reduced from 60 km/h to 50 km/h. Ten separate roads had speed limits reduced. The analysis of impacts identified a 21% reduction comparing pre- and post-implementation crashes, compared to no change at the control site location.

New South Wales

New South Wales implemented a large number of permanent 40 km/h speed limits in urban areas through a program targeting high pedestrian activity areas (HPAAs) that started in 2003. The outcomes from these speed limit changes were included in an evaluation by Transport for NSW (2018). This included consideration of 188 HPAA zones covering 343 km of roads. For zones where implementation dates were known, a statistically significant reduction of between 13–16% in casualty crashes was identified when comparing before and after the change. An analysis of all sites indicated a reduction in serious injury of 33% (compared with a non-statistically significant decrease of 4% at control sites during the same period); a 46% reduction in serious pedestrian injury (compared with a 19% reduction at control sites); and a 100% reduction in fatal crashes for all road users (compared with a 29% reduction at control sites for the same period) (Transport for NSW 2018).

Along with the safety improvements, there was also strong community support for the change. According to community surveys, 78% of respondents were at least moderately in favour of 40 km/h speed limits on roads with many pedestrians.

2.2.3 Conclusion

The reduction of speed limits in urban areas has proven to be an effective measure for improving road safety outcomes. The examples from Australia and New Zealand demonstrate significant reductions in crashes and severe injuries following the implementation of lower speed limits. The evidence base has been building with a recent increase in the number of locations making speed limit changes in urban areas. These changes align with broader international trends and are driven by a holistic approach to urban mobility that prioritises safety, environmental sustainability and quality of life.

2.2.4 References

Abley (2022) *Safe Speeds Phase 1: 24 Month Interim Evaluation*, report prepared for Auckland Transport, Abley Limited, Christchurch, New Zealand.

Elvik R (2009) *The power model of the relationship between speed and road safety: Update and new analyses*, Institute of Transport Economics, Norwegian Centre for Transport Research, Oslo, Norway.

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Sobhani A (30 September–3 October 2024) 'Evaluating the impact of 30 km/h speed limit trial' [conference presentation], *Australasian Road Safety Conference*, Hobart, Tasmania.

Transport for NSW (2018) *Evaluation of permanent 40 km/h speed limits: Summary report*, TfNSW website, accessed 18 February 2025.

2.3 Co-benefits – Economic impact on freight business

Key finding

The adoption of lower speed limits by commercial organisations, particularly freight and trucking companies, can lead to significant economic benefits, including in improved safety and fuel savings. These benefits outweigh any increases in journey time. Companies self-regulate their own reduced speed policy, indicating that they see this commercial benefit.

2.3.1 Description of activity

Lower speeds can reduce the chances of crashes, including for freight organisations. This can reduce costs through less damage to vehicles and freight, and less downtime due to injured drivers. However, there are also other benefits. This case study topic explores how commercial organisations, especially freight and trucking companies, are using lower speed limits to improve productivity, primarily by saving fuel. According to the US Department of Energy, speeds of 80 km/h are optimal for fuel economy and measures to help drivers comply with speed limits can improve fuel efficiency by around 10%. This reduction translates into substantial cost savings for companies, especially those with large fleets. Lower speeds also reduce wear and tear on vehicles, leading to lower maintenance and operational costs. When trucks travel at higher speeds, the strain on the engine, tyres and other mechanical components increases, leading to more frequent repairs and replacements. By maintaining lower speeds, companies can extend the lifespan of their vehicles and reduce downtime due to maintenance (US Department of Energy n.d.).

In addition to economic benefits, lower speed limits contribute to environmental benefits. Reduced fuel consumption results in lower greenhouse gas emissions, helping companies meet environmental targets and improving their corporate social responsibility profiles. This can enhance the company's reputation and foster goodwill among stakeholders.

2.3.2 Outcomes

Simon National Carriers[1] has a fleet of over 100 trucks and travels over 20 million kilometres a year with its total fleet, including utility vehicles (utes) and other support vehicles. It is a leading provider of transport, warehousing and distribution services in Australia. The company has a strong safety culture and was the first major trucking company on the East Coast to instigate a 90 km/h speed limit in the 1980s. Along with expected safety improvements, the initiative reduced fuel consumption while adding only minimally to journey times. For example, it is estimated that only minutes in trip time are added on the Townsville–Mackay route and there are no measurable impacts on the Dubbo–Adelaide route.

A global positioning system (GPS) is used to geofence areas with specific speed limits, including permit travel conditions and high-risk roads. The system also monitors driver speeds and provides live alerts to drivers to reinforce safe driving practices. It also produces reports on breaches. Activities such as travelling over the speed limit and harsh braking are monitored and managed. Contractors represent a significant proportion of the interstate activity, and the speed behaviour of these drivers is also monitored.

The initiative links to the company’s environmental policy, with a recognition that the 90 km/h speed limit not only reduces fuel consumption but also results in reduced greenhouse gas emissions and other wastes by an estimated 7% on certain routes.

Safety and compliance are identified as important for business growth. Identified benefits from this safety culture include the following:

- Business investment in compliance and safety can create growth and long-term partnerships with ‘blue chip’ customers.

[1] Case study provided by the National Road Safety Partnership Program (NRSPP 2014).

- Safety initiatives translate into cost savings, such as reduced insurance premiums.
- Investment in strong compliance and safety values pays back as an effective business and marketing tool.
- Being safe also drives productivity and environmental benefits via fuel savings.
- Speed limiting trucks to 90 km/h creates tangible safety and bottom-line savings with minimal impact on journey times.

The company takes a Safe Systems approach to safety and has not had a rollover incident for several years. Most incidents are minor and tend to be within the yards and at low speeds.

Since this early example, several other small and large freight companies have implemented lower speed limit policies to improve safety and productivity. Another example is Linfox. The company speed-limits vehicles and has rolled out eco-drive training. Speed on certain types of roads are limited to 80 km/h, identified as the optimal speed for fuel economy given trade-offs in drivers' wages, engine performance and fuel costs. This mainly occurs on multilane roadways, where it is safe for other vehicles to overtake the slower moving vehicles (Department of Infrastructure, Transport, Regional Development and Local Government 2009).

2.3.3 Conclusion

The adoption of lower speed limits by commercial organisations, particularly freight and trucking companies, can lead to significant economic benefits, including fuel savings, reduced maintenance costs and improved operational efficiency. Examples from Australia and New Zealand demonstrate that these initiatives not only contribute to cost savings but also enhance road safety and environmental sustainability.

2.3.4 References

Department of Infrastructure, Transport, Regional Development and Local Government (2009) *Ecodrive as a road safety tool for Australian conditions*, Road Safety Grant Report No. 2009-004, DITRDLG website, accessed 18 February 2025.

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US Department of Energy (n.d.) *Driving more efficiently*, US Department of Energy website, accessed 18 February 2025.

2.4 Co-benefits – Health and safety on unsealed roads

Key finding

Businesses are implementing reduced speed limits on unsealed roads to help improve safety outcomes. Emerging evidence indicates that this can produce significant health and safety benefits.

2.4.1 Description of activity

Unsealed roads pose unique challenges and hazards for drivers, including loose surfaces, dust and reduced visibility (NRSPP n.d.). By reducing speeds, road users can significantly enhance road safety through improved vehicle control and decreased stopping distances. In the event of a crash, the severity of outcomes will also be reduced at lower speeds due to the lower amount of kinetic energy involved.

There are similar safety benefits for commercial vehicle operators. In addition, they may benefit from reduced maintenance costs (less wear and tear on vehicles, particularly on rough surfaces), lower fuel consumption, and less damage to goods due to road roughness or when crashes occur. There may also be environmental benefits because lower speeds produce less dust and emissions.

Companies have legal and ethical obligations over and above those of members of the public. Employers must provide safe working conditions, and this includes minimising risks associated with driving on hazardous road surfaces. Implementing lower speed limits on unsealed roads is a practical measure to comply with these obligations and protect the wellbeing of employees in addition to the other benefits highlighted above.

Several companies have recognised the specific risks from driving at high speeds on unsealed roads and have implemented speed policies to help mitigate these risks as well as realise these additional benefits.

2.4.2 Outcomes

The Queensland Natural Gas Exploration and Production Industry Safety Forum (also known as ‘Safer Together’) is a not-for-profit, member-led organisation with a focus on building a strong safety culture in the oil and gas exploration industry. Safer Together was founded in 2013 and includes more than 200 member companies. It has endorsed a specification for in-vehicle monitoring systems (IVMS) for heavy and light vehicles operating in rural and remote areas. The specification applies to all participating operators as well as contractor and subcontractor partner companies. The specification requires that an IVMS unit be securely and permanently fixed into all vehicles. It includes information on settings, exceptions and reporting, including for speed-related events and for exceeding the speed limit. The speed settings apply a maximum speed of 80 km/h to all unsealed public roads unless a lower speed is signposted (Safer Together 2020).

Santos is a leading oil and gas company in Australia and is a member of Safer Together. Its vehicles travel 40 million km per year across South Australia, Queensland, Northern Territory, Western Australia and Papua New Guinea. Santos has implemented a comprehensive land transportation procedure (Santos Ltd 2022) to mitigate risks associated with driving in their operations. Santos's health and safety policy emphasises the importance of managing risks to the health and safety of drivers, passengers and other road users. Their procedure includes driver training and competency, in-vehicle monitoring of drivers, vehicle safety and journey management.

Previously Santos limited the speed of all vehicles to an 80 km/h maximum speed limit on unsealed roads, but this was changed in 2020 following several incidents involving light vehicles, especially in wet weather. Santos amended the 80 km/h speed policy to 60 km/h, with safety as the primary reason. Since the change, there have been no major injuries resulting from vehicle incidents on unsealed roads.

Santos works closely with local communities, ensuring that other road users are not unduly impacted by the lower speeds of their drivers. This includes pulling over and allowing other vehicles to overtake when required.

The changes have had an impact on journey times, especially on long distance routes, but this has not been a consideration for the company, as safety is the number one priority.

2.4.3 Conclusion

Lower speed limits have been adopted on unsealed roads by various companies and are seen as an effective way to improve business outcomes, including the safety of the workforce and local communities. Voluntary reductions in speed limits have proven to be highly beneficial for companies, with the Santos case study demonstrating significant improvements in road safety. By prioritising reduced speeds, companies not only enhance the safety of their drivers but are also likely to achieve broader operational and environmental benefits.

2.4.4 References

NRSPP (National Road Safety Partnership Program) (n.d.) *Safe driving on gravel roads,* NRSPP website, accessed 18 February 2025.

Safer Together (2020) *IVMS specification*, Safer Together website, accessed 18 February 2025.

Santos Ltd (2022) *Work activity hazard management: SMS-HSS-OS2-PD08 land transportation procedure*, Version 4.0, Santos website, accessed 18 February 2025.

2.5 Co-benefits – Emissions

Key finding

Lower speeds can reduce harmful vehicle emissions, including CO_2. The international evidence is clear on this issue for rural roads and the evidence is building that it also applies to urban speed reductions.

2.5.1 Description of activity

Vehicle emissions are a significant contributor to air pollution. This case study topic explores the impact of reduced speed limits on vehicle emissions, focusing on CO_2, with evidence from New Zealand. It is important to note that vehicles produce a variety of emissions besides CO_2, including some that are damaging to health (such as nitrogen oxides and fine particulate matter). These are not discussed in this topic, but further research is available on the negative impact from these emissions.

Lower speed limits can influence vehicle emissions through several mechanisms. Although the situation can be complex given different types of vehicles and different environments, vehicles tend to operate more efficiently at lower speeds, especially on rural roads, reducing fuel consumption and emissions. In urban areas, the stop-and-start nature of traffic can increase emissions.

On rural roads, studies have shown that maintaining a steady speed within the optimal range of fuel efficiency (typically between 50–80 km/h for most vehicles) results in lower CO_2 and other pollutant emissions.

In urban settings, lower speed limits can reduce emissions by minimising the frequency and severity of acceleration and deceleration events. Urban driving typically involves more idling, acceleration and braking. This is less fuel efficient and produces higher emissions. Implementing lower speed limits can smooth traffic flow, reduce congestion and improve overall fuel efficiency. Locations with safer speeds can also lead to an increase in walking and cycling and a decrease in motorised traffic. This can contribute to the reduction in emissions in urban environments. Several studies indicate that the impact on emissions from reduced speeds in urban areas is likely to be quite minor on a ‘per car’ basis, but rather it is the expected reduction in traffic that is likely to produce the biggest emissions reduction benefit.

2.5.2 Outcomes

Various studies have identified the likely impacts of reduced speed limits on emissions. The Auckland Transport Speed Management Plan assessment (Flow Transportation Specialists 2022) assessed various strategic approaches to speed management, focusing on reducing speed limits around schools and high-risk roads. The study evaluated 4 approaches and estimated their economic impacts, including vehicle emissions. The approaches varied in scope from extensive permanent speed limit reductions to more limited, variable speed limits around schools.

Approach 1 involved implementing 30 km/h permanent speed limits on all non-arterial roads within 1,000 m of a school gate, along with variable speed limits on arterial roads during school hours. Additionally, 40 km/h (and some 30 km/h) permanent limits were applied to selected high-risk arterial roads. This approach was forecast to save a significant number of deaths and serious injuries (DSIs) over 10 years, with a benefit-cost ratio (BCR) of 9.0. Emissions were calculated directly from outputs from the Auckland Macro Strategic Model (MSM), a multi-modal (vehicles and passenger transport) travel demand model for the region. The calculation included mode shift assumptions and applied the NZ Transport Agency’s *Monetised benefits and costs manual* (NZTA 2024) parameters for greenhouse gases and harmful air pollutants[2] and the value of these emissions. The estimate for Approach 1 over a 20-year period was NZ$46 million of emissions reductions (Flow Transportation Specialists 2022).

[2] PM_{10}, CO_2, CO and NOx emissions.

Auckland Transport commissioned further work on the issue of emissions (Metcalfe 2023). The work included:

- a review of information and literature about the effect of speed limits on emissions
- a review of literature about the effect of traffic calming measures on emissions
- modelling to estimate the impacts of speed management in Auckland City.

In summary, the literature reviews identified:

- Many factors can impact emissions, including speed, but the types of vehicles in the fleet is the most significant.
- Speed limit reductions in urban areas will not significantly impact greenhouse gas emissions; reductions in the 100 km/h to 80 km/h range will reduce greenhouse gas emissions by less than 10%.
- The impact of traffic calming measures is likely to be small.

The modelling utilised MSM data. Estimates of vehicle emissions for each link in the network were based on the NZ Transport Agency's Vehicle Emission Prediction Model (VEPM) (NZTA 2023a). Estimates based on the VEPM identified that changes in speed limits would have minimal impact (less than 1%) on harmful air pollutants and CO_2 emissions.

The report also concluded that, to achieve significant reductions in emissions, an increase in journeys undertaken by walking, cycling and public transport is needed. Speed reduction to ensure safe speeds for walking and cycling is therefore 'a critical part of the emission reduction pathway for Auckland and New Zealand' (Metcalfe 2023).

2.5.3 Conclusion

Speed reduction can have a positive impact on emissions reduction. The evidence for this is clear for rural roads, while there is emerging evidence of these benefits from urban roads.

2.5.4 References

Flow Transportation Specialists (2022) *Auckland speed management plan: High level economic assessment of strategic approaches*, Technical note prepared for Auckland Transport, Flow Transportation Specialists, Auckland, New Zealand.

Metcalfe J (2023) *The effect of speed on emissions: Summary report*, prepared by Emission Impossible Ltd for Waka Kotahi NZ Transport Agency and Auckland Transport, Auckland Transport website, accessed 18 February 2025.

NZTA (NZ Transport Agency Waka Kotahi) (2023a) *Vehicle emissions prediction model*, NZTA website, accessed 18 February 2025.

NZTA (NZ Transport Agency Waka Kotahi) (2024) *Monetised benefits and costs manual*, NZTA website, accessed 18 February 2025.

2.6 Co-benefits – Economic impact on local business

Key finding

Speed limits are being introduced in urban areas to bolster economic activity. Contrary to popular belief, the reduction in speeds can produce a positive impact on economic outcomes as well as improve safety and other objectives.

2.6.1 Description of activity

Lower speed limits have increasingly been adopted in urban areas to improve road safety and create more liveable environments. But there is still some reluctance to reduce speed limits in urban commercial areas because of concerns about potential negative economic impacts on businesses.

However, there is emerging evidence that reduced speeds can create more pleasant environments, encourage greater economic activity and improve economic outcomes for businesses. This case study topic examines the impacts of reduced speed limits in urban areas in Australia and New Zealand, emphasising the advantages for businesses.

Starting more than 2 decades ago, urban speed limits have been reduced in shopping precincts and CBDs in Australia. In 2004, only a small number of Sydney's local government area had limits of 40 km/h, but this has now reached three-quarters of the roads, and there are plans to reduce CBD speeds to 30 km/h. Melbourne's city streets dropped to 40 km/h more than 10 years ago, and several inner city suburbs have now moved to 30 km/h speed limits. In Auckland, speeds reduced to 30 km/h in 2019, with Wellington and Christchurch following in 2022.

One of the most significant benefits of lower speed limits is the reduction in the number and severity of traffic crashes. This improvement in safety translates directly into increased foot traffic, which is crucial for businesses, particularly those in retail and hospitality. Lower speed limits contribute to the overall attractiveness of urban areas. When streets are safer and more pedestrian friendly, they become more appealing places to live and visit. This increased liveability can draw more tourists and local visitors, enhancing economic activity. Businesses may also benefit from higher property values and increased investment in areas with lower speed limits. Safer, more attractive urban environments may make these locations desirable for commercial ventures and real estate investments. Lower speed limits encourage the use of active transport modes such as walking and cycling. This shift not only benefits public health but also reduces congestion, making urban areas more accessible. Businesses have seen positive outcomes from increased cycling and walking, as these modes of transport bring more people directly to storefronts and reduce the need for extensive car parking facilities.

2.6.2 Outcomes

Auckland, New Zealand

Auckland's initiative to lower speed limits to 30 km/h in its city centre has not only reduced crashes but also contributed to a more vibrant and welcoming urban space. It is hoped that this will attract more visitors and, consequently, benefit businesses. The transformation of Fort Street precinct in Auckland into a shared street showcases how such changes can turn a street environment dominated by motorised traffic into a destination. In 2008, the Fort Street area was identified as having potential for improvement to a more user-friendly environment. Several streets in the area received high quality upgrades, including the removal of conventional kerbs, installation of a single level paving surface across the full street width, streetscape improvements to calm and reduce the traffic and provision of seating areas. An evaluation was undertaken, including on the impact for local businesses (Global Designing Cities Initiative 2025). This identified that there was a:

- 5–9 km/h reduction in average vehicle speed
- 50% Increase in pedestrians during peak hours
- 25% Less vehicle volume
- no injury or crashes reported since completion.

Most relevant to this particular case study is that there was a 47% increase in consumer spending in the precinct, providing a significant benefit to local businesses.

In addition, 80% of those surveyed felt safer in the area than they did previously, especially at night, and over 75% of property owners said it was valuable being sited near or adjacent to a shared space. The project has resulted in significant benefits for local businesses.

Figure 2.5: Fort Steet precinct, Auckland

Source: Auckland Design Manual (2024).

Orange, New South Wales

In Orange, New South Wales, a reduction in speed limits from 50 km/h to 40 km/h was implemented in the CBD to enhance pedestrian safety, but also with the intention to stimulate economic activity (Transport for NSW 2023a). The decision was driven by a significant number of pedestrian crashes, including 8 crashes in 2019, one of which was fatal. However, the reduction in speed limits was part of a broader strategy to make the area more pedestrian friendly, attracting more foot traffic and benefiting local businesses. In simple terms, the speed change was in part driven from an economic development perspective, with an approach to ‘get them here / keep them here’ by making them feel safe and secure. This initiative was supported by Transport for NSW with funding for signs and threshold treatments. The outcomes from these improvements will be monitored and evaluated.

Figure 2.6: The Orange Central Business District (CBD)

Source: Orange City Council (2023).

Cairns, Queensland

The Safer Speeds team at the Queensland Department of Transport and Main Roads (TMR) conducted a project whereby the speed limit in the Cairns CBD was reduced in response to the high number of crashes in the area, particularly involving pedestrians and people riding bicycles.

A contributor to achieving the speed limit reduction was the stakeholder engagement approach. While the project was led by Cairns Regional Council, supported by TMR officers, endorsement of the proposal was sought from local community and industry representatives, such as the Chamber of Commerce and tourism promoters. Information sharing was used to encourage support during the stakeholder engagement process, including crash details and high level ‘myth-busting’ about perceived impacts on travel times and cost to transport operators.

Due to the onset of COVID-19, a reliable evaluation could not be conducted. A basic before-and-after review of crashes indicated a reduction and, accordingly, any reduction in crashes is associated with a reduction in costs to the community (author’s personal communication with TMR, 9 July 2024). Particularly for Cairns as a tourism destination, the economic outcomes of the speed limit change could not be separated from the impacts of COVID. However, review of community sentiment from government correspondence and social media at the time of the change did not reveal concerns from the public about economic benefits. Some years later, the Cairns Regional Council expanded the reduced speed limit area under a grant from TMR.

2.6.3 Conclusion

The implementation of lower speed limits in urban areas in Australia and New Zealand has yielded significant benefits. Counter to popular belief, this also includes benefits for businesses. Enhanced safety, increased foot traffic, improved urban liveability, higher property values and better customer experiences are just a few of the positive outcomes. These benefits demonstrate that lower speed limits can be a valuable tool in creating vibrant, economically thriving urban environments.

2.6.4 References

Auckland Design Manual (2020) *Case study: Fort Street Precinct*, Auckland Design Manual website, accessed 6 June 2024.

Global Designing Cities Initiative (2025) *Case study: Fort Street, Auckland, New Zealand*, GDCI website, accessed 18 February 2025.

Orange City Council (1 December 2023) 'Orange's CBD safer for pedestrians', *Council Media*, Orange City Council website, accessed 26 February 2025.

Transport for NSW (2023a) *Lower speed limits in Orange CBD to boost pedestrian safety*, TFNSW website, accessed 18 February 2025.

2.7 Co-benefits – Health and walkability

Key finding

Examples demonstrate the emerging evidence of the effectiveness of lower speed limits in enhancing walkability, with likely flow-on benefits for public health.

2.7.1 Description of activity

Lowering speed limits in urban areas is increasingly recognised as an effective strategy to promote walking and broader health benefits. This case study topic explores why lower speeds might help encourage walking and the health benefits that result from increased pedestrian activity. Examples are provided from New Zealand and Australia. The topic does not touch on cycle provision, but many of the benefits outlined below are equally applicable to cycling as well.

The concept of ‘walkability’ refers to how friendly an area is for walking. Walkable areas typically have safe, accessible and enjoyable environments for pedestrians. Lower speed limits are a crucial factor in enhancing walkability for several reasons, including the reduced likelihood and severity of traffic crashes involving pedestrians. According to Hussain et al. (2019), pedestrians have a 95% chance of surviving a crash at 30 km/h, but only a 70% chance at 50 km/h. Reducing speed limits can therefore make walking safer, encouraging more people to walk. Lower speed limits can also improve pedestrians' perception of safety. When people feel safer, they are more likely to walk. Aside from these safety benefits, lower vehicle speeds can reduce noise and air pollution. These improvements in environmental quality can make urban areas more pleasant for walking and other outdoor activities. Lastly, lower speeds and increases in walking can produce wider health benefits. Regular walking can reduce the risk of chronic diseases such as heart disease, diabetes and obesity. It also improves cardiovascular fitness, muscle strength and overall endurance. Walking has been shown to reduce stress, anxiety and depression, and it encourages social interactions, potentially fostering a sense of community and reducing feelings of isolation.

There are many examples from Australia and New Zealand where the broader benefits from active travel (such as walking) were a part or a driving force of the decision to reduce speeds.

2.7.2 Outcomes

Safe Active Streets, Western Australia

The Safe Active Streets Pilot Program is a notable example from Western Australia (Department of Transport 2024). The program involved reducing speed limits on selected streets to create safer and more inviting environments for walking and cycling. The program used local area traffic management treatments to create 30 km/h speed environments and included an evaluation of the changes in safety and active travel. Nineteen local governments participated in the pilot program, which included 23 safe active streets. Although these sites are still being monitored, emerging results from the pilot show increases in walking and cycling at many of the sites.

Figure 2.7: Safe Active Street in Sterling, Western Australia

Source: Department of Transport (2023).

Vincent, Western Australia

The City of Vincent in Western Australia implemented lower speed limits as part of its strategy to increase walkability. The city reduced speed limits to 40 km/h in residential areas and observed a subsequent increase in walking and cycling of around 17% in the one-year period following the change. This change was part of a broader initiative to promote active transport and improve public health (GHD 2020).

High Pedestrian Activity Areas, NSW

New South Wales has designated high pedestrian activity areas (HPAAs), where speed limits are reduced to improve pedestrian safety and comfort. These areas typically have speed limits of 40 km/h or lower and are marked by enhanced pedestrian infrastructure such as wider footpaths, pedestrian crossings and traffic calming measures. The HPAA program was launched in 2003 and provides funding for councils to design and implement traffic calming projects to create a 40 km/h speed environment. An evaluation identified that, as of May 2016, there were 188 HPAA zones covering 343 km of roads. It was identified that the measures significantly reduce the number of pedestrian injuries and increase walking activity (Transport for NSW 2018). There was also popular support for the changes, with 78% of residents indicating that they were at least moderately in favour of 40 km/h speed limits on roads where lots of people are walking (Transport for NSW 2018).

Figure 2.8: Merrylands' raised platform with pedestrian crossing

Source: Transport for NSW (2018).

Mildura, Victoria

In Mildura, Victoria, efforts to enhance walkability have resulted in implementing lower speed limits. The city launched its CBD Access & Mobility Strategy in 2020. A primary goal of the strategy is to encourage walking, cycling and scootering into the CBD rather than driving. One key recommendation is to reduce speed limits in the CBD to 30 km/h as part of broader walking and cycling initiatives (Mildura Rural City Council 2025).

In April 2023, the strategy led to a one-year trial of a 30 km/h speed limit within 9 CBD blocks. In the post-trial sentiment study, 31% of respondents supported retaining the 30 km/h speed limit, citing enhanced safety for most road users, while 61% opposed it, citing negative personal driving impacts. Despite the majority opposition, in the July 2024 council meeting, the councillors challenged public opinion by supporting the strategy and voting to permanently retain the 30 km/h speed limit (Mildura Rural City Council 2024). This decision was based on the evidence of positive safety benefits, but also the wider benefits from the speed limit change including increased walkability. It was also noted that there was very limited response to the study (only 8 responses from several hundred local traders), and so the result was not likely to be reflective of broader community sentiment.

Figure 2.9: Installation of Thermoplastic pavement markings in Mildura

Source: Supplied by Vision Zero Australia.

The Mildura CBD Access & Mobility Strategy was awarded the 2023 Best Strategic Planning Project (Victoria Division) by the Planning Institute of Australia. The institute noted that the strategy 'sets up a template [for local government authorities] of what is possible in car dependent regional towns', 'leverages Victoria's DTP's Movement and Place methodology' and lauded the council for its 'introduction of a 30km per hour speed limit within the CBD' (quotes provided to author by Mildura Rural City Council).

The 30 km/h CBD speed limit reduction followed comprehensive speed reductions to 40 km/h, supported by area speed limit threshold infrastructure, on all residential streets in Mildura (also see Section 4.5).

2.7.3 Conclusion

Lower speed limits in urban areas play a critical role in promoting walking and bringing about broader health benefits. Creating safer and more pleasant environments for pedestrians encourages more people to walk, leading to improved physical and mental health outcomes. The examples demonstrate the emerging evidence of the effectiveness of lower speed limits in enhancing walkability, with likely flow-on benefits for public health. As cities continue to prioritise walkability, lowering speed limits will be an essential strategy in creating healthier and more vibrant communities.

2.7.4 References

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2.8 Co-benefits – Improved traffic flow

Key finding

Reducing speeds can improve traffic flow as well as road safety outcomes. This is contrary to popular belief that reduced speeds produce increased congestion and increases in journey times.

2.8.1 Description of activity

Managed freeways, also known as smart motorways, utilise advanced technologies and traffic management strategies to improve traffic flow, enhance safety and reduce congestion. These systems integrate various tools such as lane use management, variable speed limits, ramp metering and traveller information systems to actively manage traffic conditions in real time. The primary objective is to optimise the efficiency and reliability of the freeway network, ensuring smoother and more predictable journeys for motorists.

One of the key theories underlying managed freeways is the concept of ‘flow breakdown’. When traffic demand exceeds the capacity of a freeway, it can lead to a sudden and significant drop in speed and an increase in congestion. By proactively managing the flow of vehicles entering the freeway and adjusting speed limits dynamically, managed freeways can prevent flow breakdown and maintain a steady traffic flow.

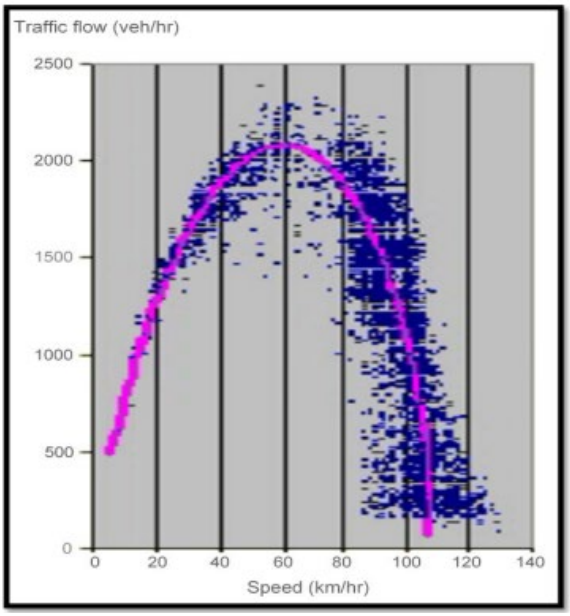
Part of the approach involves adjusting speed limits by using variable speed limit signs. As traffic increases towards the peak, the flow often becomes unstable. The speed distribution of vehicles can be high, with some vehicles travelling at high speeds, while others start to slow due to the increasing number of vehicles. This can lead to ‘shockwaves’ in the traffic flow. This results from vehicle braking and lane changing behaviour. When one vehicle brakes, the following vehicles also slow, leading to a chain reaction of braking behaviour.

Figure 2.10:Monash Freeway

Source: VicRoads (2013).

Contrary to intuition, reducing speed limits on a congested freeway can actually lead to higher overall throughput and shorter travel times. This counterintuitive outcome is explained by the fundamental diagram of traffic flow, which illustrates the relationship between traffic density, speed and flow rate. At high densities, reductions in speed limits can reduce the variability in speeds between vehicles, which decreases the likelihood of crashes and the associated delays.

Figure 2.11:Relationship between speed and traffic flow



Source: Job and Mbugua (2020).

Managed freeway systems have been used in several cities in Australia and New Zealand. Australia has been at the forefront of implementing managed freeway technologies, with several significant projects demonstrating the benefits of this approach. The Monash Freeway upgrade in Victoria and the M4 Smart Motorway project in New South Wales are 2 notable examples. Other examples include applications in Queensland and Auckland, New Zealand.

Victoria's Monash Freeway upgrade, part of the broader managed motorway program initiated in 2006, showcases the successful application of managed freeway principles over a 75 km corridor. The upgrade includes coordinated ramp signalling, variable speed limits and comprehensive traveller information systems.

The M4 Smart Motorway project in New South Wales, completed in stages from 2017 to 2020, aimed to improve the efficiency and safety of a 50km stretch of the M4 Motorway. The project involved the installation of intelligent traffic management systems including variable speed limit signs, ramp metering at freeway entry points, lane use management systems and real-time traveller information signs.

2.8.2 Outcomes

Monash Freeway upgrade

The Monash Freeway upgrade led to an initial 30% reduction in crash rates and enhanced overall traffic flow. The integration of traffic management technologies has enabled more effective incident management, reducing the impact of crashes and other disruptions on traffic flow. The Monash Freeway upgrade also demonstrated the following significant positive impacts on travel times and travel time reliability:

- travel times improved by up to 30% during peak periods
- travel time reliability increased significantly, with a marked reduction in the frequency and duration of severe congestion incidents.

M4 Smart Motorway, New South Wales

The measures on the M4 Smart Motorway have led to significant improvements in traffic flow, with reductions in travel times and crash rates (Transport for NSW 2023b). The implementation of variable speed limits and ramp metering has helped maintain consistent traffic speeds and prevent the abrupt flow breakdowns that commonly cause congestion. The project led to notable improvements in travel times and travel time reliability. The introduction of managed freeway elements, particularly variable speed limits and ramp metering, resulted in:

- reduced average travel times during peak periods
- enhanced travel time reliability, with a reduction in the variability of travel times.

These results mirror similar projects overseas. The M25 in London experienced a 5% improvement in journey times on converted sections of motorway. The improvements resulted in enhanced travel time reliability, with more consistent journey times and reduced congestion. Safety was also improved, with a 10% reduction in injury crashes.

2.8.3 Conclusion

This case study topic provides clear examples of the effective management of speed improving traffic flow as well as road safety outcomes. With reduced speed limits, traffic flows were smoother and there were fewer shockwaves. This is counter to the common belief that reducing speed limits increases congestion and journey times. As discussed in Section 4.1, the impact on journey times is usually much less than people expect, and as seen from the examples described above, journey times can even be improved.

2.8.4 References

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2.9 Co-benefits – Protecting wildlife

Key finding

Examples exist where speed limits have been reduced to protect local wildlife. Some jurisdictions have amended speed guidance to formalise this as a criterion for consideration when reviewing speed limits.

2.9.1 Description of activity

Speed limit changes have not traditionally been made based on injury to wildlife, but there are a growing number of case studies where presence of animals is influencing the decision, and even examples where this is one of the main reasons for change.

Phillip Island, a popular tourist destination in Victoria, and Camp Hill, a suburb in Brisbane, Queensland, have both faced significant challenges related to road safety and wildlife conservation. Both regions have implemented measures aimed at reducing road fatalities and protecting native wildlife. There are also other examples from Australia and New Zealand where the issue of wildlife is a factor when considering speed limit change.

Figure 2.12:Wildlife zone, New South Wales

Source: NSW Government (2020).

2.9.2 Outcomes

On Phillip Island in Victoria, speed limits on 11 roads were reduced, with 8 roads changed from 100 km/h to 80 km/h, 2 from 80 km/h to 60 km/h, and one from 100 km/h to 60 km/h (Herald Sun 13 December 2021). This initiative was a response to the high incidence of road crashes, with 3 fatalities and 12 serious injuries reported over 5 years. The decision to lower speed limits was influenced by the presence of wildlife. A study was conducted by researchers from Deakin University (Rendall et al. 2021) into methods for protecting wildlife from motorised traffic, with one of the findings from this indicating that roadkill rates were highest on roads with speed limits between 70–80 km/h, influenced by traffic volume, roadside vegetation and proximity to road crests.

Similarly, in Camp Hill, Brisbane, the speed limit on Boundary Road was reduced from 70 km/h to 60 km/h to protect local wildlife, particularly koalas around the Whites Hill Reserve (Camp Hill Today 23 August 2023). This change aimed to mitigate the risk of vehicle collisions with koalas, especially during night-time when these nocturnal animals are most active. Conservation groups advocated for even lower speed limits to provide better protection following several wildlife deaths in the area.

There is no prescriptive guidance in Queensland for the consideration of wildlife activity when determining speed limits. However, this does not preclude consideration of wildlife in speed limit setting. There are opportunities throughout the speed limit review process to consider 'other factors' in the determination of an appropriate speed limit. A registered professional engineer of Queensland (RPEQ) can make changes to a posted speed limit to improve road safety near wildlife. Interest in this issue has led to Queensland guidance being amended to make it clearer that wildlife has always been a valid consideration in speed limit setting.

On Phillip Island, studies from 1998–1999 and 2014 provided valuable insights into the factors contributing to roadkill, such as traffic volume and wildlife population changes. In Camp Hill, the recommendation to reduce the speed limit was supported by a speed limit review conducted by a registered professional engineer and endorsed by the local Speed Management Committee, which considered the need to protect local koala populations and address road safety concerns.

In other areas, concerns are sometimes raised by members of the community regarding the safety of wildlife, and calls made for safety improvements, including the reduction of speed limits. One local government indicated that, although they are not currently looking into specific speed limits for wildlife, there are quite a few wildlife groups and community members who are passionate about wildlife safety on the roads. From a road safety point of view, the council is also concerned about the safety of vehicle occupants when striking large wildlife like kangaroos or swerving to avoid wildlife. Requests are received from the community and wildlife groups to reduce speed limits on particular roads to improve wildlife safety and reduce roadkill. Given that wildlife is not specifically mentioned in the relevant state speed zoning guidelines, the response is generally that the presence of wildlife is not a factor on its own to reduce a speed limit, and it would be challenging get approval for speed limit changes on this basis. It was also highlighted that even if the council could reduce speed limits due to wildlife, it would be very difficult to develop a criterion for when a speed limit change is warranted due to wildlife. On the other hand, if safe and appropriate speed limits can be implemented on all roads, then the roads would also be safer for wildlife compared to any inappropriate speed limits that currently exist.

Mornington Peninsula Shire in Victoria indicated that they do have some locations with advisory speed subplates with kangaroo warning signs. In addition, there are some solar powered variable message signs that can be moved around areas with the highest risk of kangaroos at dawn and dusk. The signs detect an approaching vehicle and flash a silhouette of a kangaroo, prompting motorists to slow down and take greater care while driving. When vehicles are travelling above the speed limit, the signs also flash a ‘Slow Down’ message.

Figure 2.13: Wildlife warning sign, Mornington Peninsula

Source: Author's personal communication with Mornington Peninsula Shire, 31 October 2024.

Based on limited evaluations, it was reported that the signs were effective at reducing collisions with wildlife. Recently, Koala awareness signs have been installed in Mornington Peninsula during the breeding season (spring and summer) to raise awareness of the heightened risk at this time when Koalas are more active.

2.9.3 Conclusion

Lower speed limits are expected to reduce the frequency and severity of road crashes. By giving drivers more time to react to sudden changes or obstacles, these measures aim to decrease the likelihood of collisions and enhance overall road safety for both humans and animals. Along with the safety benefits to road users from the lower speed limits, slower vehicle speeds may help reduce collisions between vehicles and wildlife, although detailed analysis of impacts are yet to be undertaken.

2.9.4 References

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3. Collecting Speed Data and Using Surveys

This section outlines the importance of good speed-related data to plan and monitor the implementation and effectiveness of speed management activities. It also covers how data collected from community attitude surveys can counter the 'status quo' bias and identify local support for change.

3.1 Speed monitoring and safety performance indicators

Key finding

Collecting and analysing speed monitoring data is essential for managing road safety outcomes. Safety performance indicators play a crucial role in this process by providing quantifiable metrics that help in assessing the effectiveness of interventions and in identifying areas for improvement.

3.1.1 Description of activity

Speed monitoring data is crucial for understanding and managing road safety. By collecting detailed data on vehicle speeds, authorities can identify trends and use this to plan appropriate strategies and interventions. Data is also used to monitor progress towards targets or, at more local level, to evaluate the effectiveness of speed management measures.

Various methods are used to collect speed monitoring data, including pneumatic tube counters (laid across roadways), automatic traffic counters (often installed in the road surface), radar and lidar devices and, more recently, GPS and vehicle telematics data. Some data has now been collected for several years, using the same locations each time. This regular monitoring is useful for identifying trends and changes in driver behaviour, including responses to policy changes. Therefore, speed-related data forms a very useful safety performance indicator (SPI).

SPIs are metrics used to assess the effectiveness of road safety strategies. Speed-related SPIs are part of a broader set of indicators that assess different road user behaviours, vehicle safety and road infrastructure quality. SPIs are strategically important for several reasons. They provide objective, quantifiable measures that can be used to monitor and evaluate the effectiveness of road safety interventions over time. This allows policymakers to make data-driven decisions and prioritise areas that need attention. SPIs facilitate comparisons and enable benchmarking of performance to learn from best practices. Lastly, SPIs help in setting and tracking progress towards road safety targets, including those from road safety or speed strategies.

Internationally, speed-related SPIs have been developed as part of the European Union's 'Baseline' project. This includes the percentage of vehicles travelling within the speed limit, regarded as the minimum requirement. Measurements may also be made of average speed (and variation in this) and 85th percentile speeds.

Figure 3.1: Minimum requirements for speed SPI – Baseline project

	Minimum requirement	Optional additions
KPI definition	• Percentage of vehicles within speed limit	• Average speed (+ Standard Deviation and Standard Error/Confidence Interval) • V85
Method	• Should allow for the observation of momentaneous speed in free flowing traffic[4]	
Conditions	• Free-flow traffic • Good weather conditions • In spring or autumn	• Non free flow traffic • Bad weather conditions • In summer or winter
Sample size	• Min 2000 observations • Min 500 observations / road type • Min 10 locations / road type • The proportion of observations at each of the three road types should be at least 20%	*If optional vehicles are included, the minimum sample requirements are per vehicle type in order to be considered in the national KPI tables*
Locations	• Random selection • Representative of entire national road network • Measurements should not take place near speed cameras, either fixed or mobile • A minimum traffic flow of at least 10 vehicles passing per hour is required	• Stratification by Regions

Source: Van den Broek et al. (2023).

3.1.2 Outcomes

Speed monitoring data has been used for many years in various jurisdictions in Australia and New Zealand. The following outlines some examples, including the collection and use of this data.

South Australia has a robust speed monitoring program that began in 2007 at 132 sites, covering various road types. The sites include local, collector and arterial roads in both metropolitan and rural areas. Speed and vehicle classification data are collected for one week each year, providing a comprehensive dataset for analysing speed trends and the effectiveness of speed management interventions.

The program aims to monitor changes in vehicle speeds over time to assess the impact of road safety initiatives. By comparing current data with historical data, authorities can evaluate the effectiveness of interventions such as the introduction of the 50 km/h default urban speed limit. The speed data collected includes date, time, direction of travel, speed, wheelbase, headway, gap, number of axles and vehicle class.

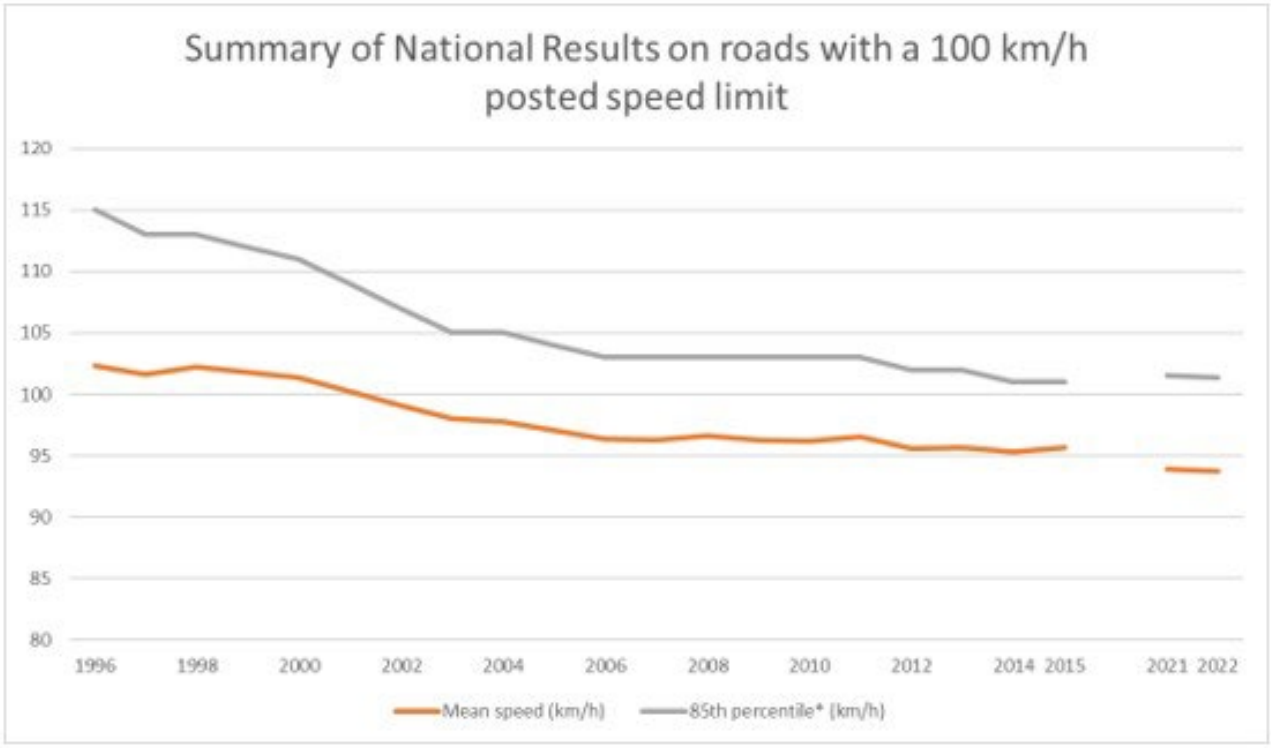
Results from the initial surveys in 2007 established baseline speeds for various road types. For example, the mean speed on Adelaide local roads (with a speed limit of 50 km/h) was 45.06 km/h, with 34.49% of vehicles exceeding the speed limit. In rural areas, the mean speed on 110 km/h roads was 102.12 km/h, with 25.82% exceeding the speed limit (Kloeden and Woolley 2009). These benchmarks help assess future changes and the effectiveness of speed management measures.

Until 2015, New Zealand employed a mix of speed monitoring technologies, including pneumatic tube counters, automatic traffic counters and radar devices as part of its annual speed surveys. The NZ Transport Agency Waka Kotahi and Ministry of Transport Te Manatū Waka conducted these surveys at randomly selected sites nationwide, covering both urban and rural areas. The annual speed surveys monitor free speeds of vehicles in 100 km/h and 50 km/h speed limit areas. Free speeds are measured when vehicles are unimpeded by other vehicles or environmental factors, providing a clear indication of driver speed choice. The surveys were conducted at about 65 open road and 65 urban sites each year, with a consistent methodology to ensure reliable trend analysis (Ministry of Transport 2015).

In 2015, the mean speed on open roads was 95.7 km/h, with 23% of vehicles exceeding the 100 km/h speed limit. In urban areas, the mean speed was 50.4 km/h, with 46% of vehicles exceeding the 50 km/h limit.

More recently, speed data has been compiled using TomTom data, matched to previous survey locations as much as possible. The 2021 and 2022 surveys included 61 sites with a 100 km/h speed limit, and 70 sites with a 50 km/h speed limit. The recent data provides very similar results, with mean speeds on 100 km/h roads of 93.7 km/h in 2022, and 44.1 on 50 km/h roads. These data points help in evaluating the effectiveness of speed management measures and identifying areas where further intervention is needed.

Figure 3.2: New Zealand speed monitoring data from 2022 (noting different methods compared to pre-2015)



Source: Provided by NZ Transport Agency Waka Kotahi.

Both Australia and New Zealand have developed and refined their use of SPIs to enhance road safety. In Australia, the *National Road Safety Strategy 2021–2030* highlights the importance of SPIs in achieving Vision Zero goals. The strategy includes targets for reducing speeding incidents and improving compliance with speed limits (Department of Infrastructure, Transport, Regional Development and Communications 2021). This includes the share of vehicles at or below the speed limit.

However, the Australian *National Road Safety Annual Progress Report* from 2023 (DITRDCA 2024) indicates that there are several definitional and data collection methodology issues regarding this SPI, and so a proxy measure has been agreed for reporting. This is based on enforcement data, and the proportion of vehicles photographed over the speed limit.

New Zealand's previous Road to Zero strategy also emphasised the use of SPIs to monitor progress towards its goal of reducing road deaths and serious injuries by 40% by 2030. Road to Zero included a comprehensive outcome monitoring framework that included program output indicators, safety performance indicators and final outcome indicators (Ministry of Transport 2019 and 2023). Indicators for speed included the following:

Output indicators:

- Kilometres of top 10% high-risk roads addressed through speed management.
- Percentage of rural schools with 60 km/h speed limits or lower.
- Percentage of urban schools with 30–40 km/h speed limits.

Safety performance Indicators:

- Percentage of road network where speed limits align with safe and appropriate speed.
- Percentage of traffic travelling within speed limits (by rural and urban areas and urban centres).
- Mean speed of vehicles (by rural and urban areas and urban centres).

Final outcome indicators:

- Number of deaths and serious injuries (DSIs) with speed being a contributing factor.
- Number of DSIs where the speed limit does not align with the safe and appropriate speed.

3.1.3 Conclusion

The collection and analysis of speed monitoring data are essential for managing road safety outcomes. By using various methods to collect this data, authorities can develop and implement effective road safety measures. SPIs play a crucial role in this process by providing quantifiable metrics that help in assessing the effectiveness of interventions and in identifying areas for improvement. Examples from Australia and New Zealand demonstrate the importance of speed monitoring and the development and use of SPIs in enhancing road safety.

3.1.4 References

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3.2 Community engagement – Annual surveys

Key finding

Annual community attitude surveys on traffic speed are essential tools for road safety management. They provide valuable data that informs policy decisions, including by documenting the level of support for different interventions. These surveys also help monitor progress against safety targets.

3.2.1 Description of activity

Surveys of community attitudes to traffic speed are a crucial tool to gauge public perception of and support for road safety measures. These surveys are typically conducted at both national and state levels. Their frequency varies depending on the specific aims and available resources. Many surveys are conducted on a regular basis (annually or biannually), often on a variety of road safety related issues, including questions on speed.

3.2.2 Outcomes

In Australia, the Community Attitudes to Road Safety Survey (CAS) has been conducted regularly since 1986, with the latest survey of attitudes to road safety done in 2017 (Department of Infrastructure, Regional Development and Cities 2018). The CAS aims to capture community perceptions on various aspects of road safety, including speeding, drink driving, mobile phone use while driving and seatbelt usage. This national survey has now been supplemented by an international survey, the E-Survey of Road Users' Attitudes (ESRA) (Holocher and Holte 2019).

In New Zealand, the Public Attitudes to Road Safety Survey is conducted by the NZ Transport Agency Waka Kotahi. This annual survey, which has been running since 1974, collects data on New Zealanders' attitudes towards various road safety issues, including speeding. The 2022 survey involved 1,640 participants and covered a range of topics such as the perceived risk of speeding and support for different road safety measures (NZTA 2022a).

In Australia, state-based surveys include the following:

- The Road Safety Monitor (RSM) survey conducted by the Transport Accident Commission (TAC) in Victoria, which serves as a pivotal tool in understanding community attitudes towards various road safety issues, including speeding. The RSM has been conducted since 2001 and reaches a broad and representative sample of the Victorian population.
- The Prevalence and Determinants of Speeding Survey (PDSS) conducted annually in Queensland since 2020. In 2023, the PDSS involved an online panel survey of 942 licensed motorists, focusing specifically on the prevalence and determinants of speeding in Queensland (TMR 2023).

Surveys on speed-related attitudes and issues are not only undertaken by government agencies. Motoring clubs conduct surveys of their members and the broader community on different road safety topics including speed. For example, the Royal Automobile Club (RAC) in Western Australia conducted a recent survey on this topic (RAC WA 2019).

Conducting surveys as a one-off exercise provides a useful benchmark of the current situation. However, surveys become an increasingly powerful tool when repeated over time, as it is possible to track changes in responses based on policy and other changes. As discussed below, this is a useful tool for the effective management of road safety, linking to the setting of targets and monitoring of safety performance indicators.

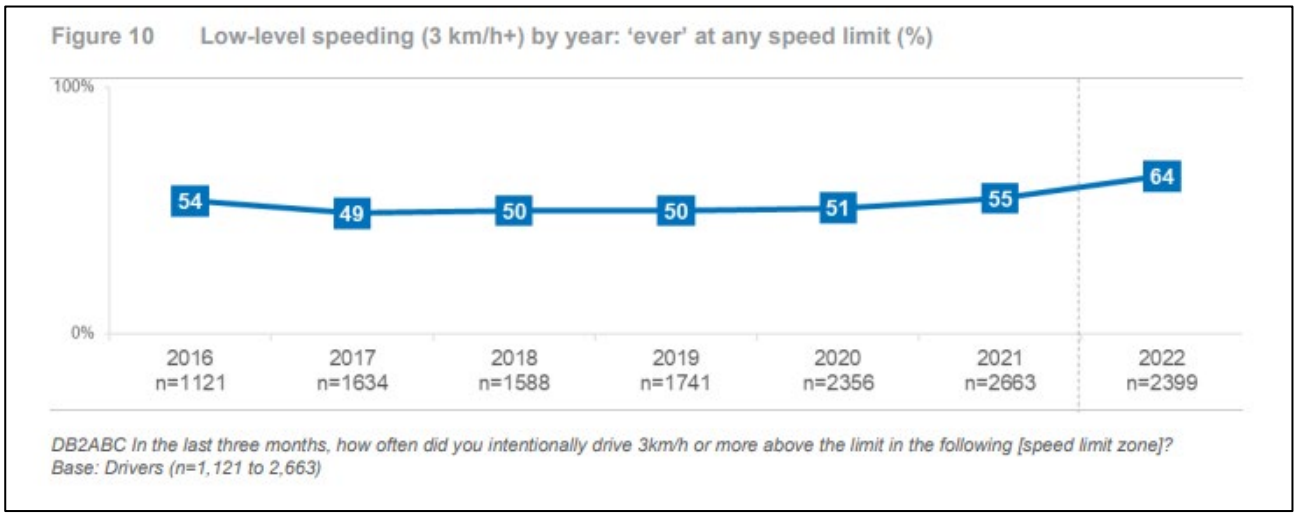
Example 1: RSM survey, Victoria

The RSM survey provides valuable data that informs the TAC's road safety campaigns and policies. By regularly tracking community attitudes and behaviours, the TAC can adapt its strategies to address emerging trends and improve the effectiveness of its road safety interventions.

The 2022 RSM survey involved 2,492 completed responses and highlighted several critical insights into speeding behaviour and attitudes in Victoria. Approximately 16% of drivers reported being caught speeding in the previous 12 months, an increase from 11% in 2021. This increase in speeding apprehensions coincides with the survey's findings on public perception of police presence, where only 15% of respondents felt there were more police on the roads compared to the previous year, down from 22% in 2021 (TAC 2023).

One interesting finding in the 2022 survey that may be related to the perceived reduction in police presence is the increase in low level speeding, with a jump from around 50% of those intentionally speeding 3 km/h or more pre-COVID to 64% in the most recent survey. This type of time series finding highlights the value of attitude surveys as an instrument to explain road safety outcomes.

Figure 3.3: Low level speeding, TAC, Victoria



Source: TAC (2023).

Example 2: Queensland Prevalence and Determinants of Speeding Survey

In 2020, the Safer Speeds team at the Department of Transport and Main Roads (TMR) redesigned the Road Safety Perceptions and Attitudes (RSPAT) survey, which had been conducted with Queensland motorists for almost 2 decades. This redesign led to the Prevalence and Determinants of Speeding Survey (PDSS), which had a specific focus on speeding as opposed to other high-risk driving behaviours and featured an enhanced focus on scientifically rigorous question wording and response formats.

This survey has since been conducted annually with a sample of approximately 900 Queensland motorists. The survey includes one of the most comprehensive self-reported speeding measures which captures not only the frequency of speeding behaviour but the excess speed over the limit, across a range of different speed zones and road types. This data is used to logically classify motorists into behavioural categories of 'compliant', 'low-level speeders' or 'moderate-excessive speeders'.

Additional items capture data on attitudes toward speeding, speed enforcement and speed limits, knowledge and awareness of speed enforcement policy and practice, and the determinants of speeding behaviour.

The 2024 survey marks a substantial milestone for the PDSS, which is now a great source of longitudinal data with several years' worth of data.

Example 3: E-Survey of Road Users' Attitudes (ESRA)

ESRA is an international initiative aimed at collecting and analysing comparable data on road safety performance. The survey focusing on road safety culture and the behaviour of road users and uses online panel methods to gather data from representative samples in each participating country, covering themes such as speeding, driving under the influence, distraction and support for road safety measures.

The Australian data from the second wave of data collection (ESRA2) provides a detailed look at the attitudes and behaviours related to speeding among Australian drivers[3]. The survey (Holocher and Holte 2019) revealed that many Australian drivers consider the likelihood of being checked by the police for speeding to be relatively low. This perception aligns with broader findings that show less than half of respondents globally believe they will be checked by the police for speeding on a typical journey. Enhancing the visibility and frequency of speed enforcement measures could be crucial in addressing this issue in Australia.

The survey included varying levels of support for different policy measures aimed at reducing speeding. A small majority (51.4%) supported stricter enforcement of traffic rules and there was reasonable support for the installation of intelligent speed assistance (ISA) systems in new cars, with 57.5% of respondents supporting this measure. This is despite limited information in Australia about the benefits of this new technology.

Given this is an international survey, the ESRA2 survey revealed interesting variations in speeding behaviours and attitudes among the participating countries, including Australia. Australian drivers' acceptance of speeding is relatively low compared to other countries. Only 6.1% of Australian respondents believe that driving faster than the speed limit outside built-up areas is acceptable. This rate of acceptance is among the lowest in the survey, reflecting a possible advantage for road safety authorities in Australia. Similarly, more than 80% of respondents believe that travelling faster than the speed limit can cause road crashes, a higher percentage than in many comparable OECD countries.

The survey data provides a valuable benchmark for assessing the effectiveness of current road safety strategies and identifying areas where further interventions are needed.

Safety performance indicators to monitor public perceptions

The data collected from these surveys is of significant value in shaping road safety policies and strategies. The information gathered provides insights into public attitudes and behaviours, which in turn can influence legislative changes, enforcement practices and public awareness campaigns.

Safety performance indicators (SPIs) are metrics used to evaluate different aspects of road safety measures. These indicators include factors such as average speeds, the prevalence of speeding and public attitudes towards speed limits and enforcement. Survey data is used to monitor the acceptability, understanding and effectiveness of road safety strategies and initiatives. For instance, state-based data on the prevalence of speeding provides a basis for targeted enforcement and education campaigns aimed at specific driver segments. At national level, the Australian CAS has shown a decline in the belief that speeding fines are mainly intended to raise revenue, suggesting a shift towards greater acceptance of speed enforcement as a safety measure. In addition, the survey showed strong increasing support over time for a change in the default urban speed limit from 60 km/h to 50 km/h (see Section 3.3 for more details).

The New Zealand Public Attitudes to Road Safety Survey includes several questions to monitor public perceptions, including levels of support for certain initiatives related to speed limits and speed enforcement. From a road safety outcome perspective, Road to Zero included the following SPIs to monitor public perceptions towards speed (NZTA 2022a):

[3] New Zealand is not part of the ESRA survey, but as identified above, conducts its own national survey every year.

- percentage of the general public who understand the risk associated with driving speed
- percentage of the general public who agree that they are likely to get caught when driving over the posted speed limit.

The New Zealand surveys reveal public support for various speed enforcement measures, including point-to-point cameras[4] and reduced speed limits in high pedestrian areas. In Australia, two-thirds of respondents in the CAS supported the use of point-to-point speed enforcement.

3.2.3 Conclusion

Regular community attitude surveys on traffic speed are essential tools for road safety management in Australia and New Zealand, including at national, state and local level. These surveys provide valuable data that inform policy decisions, shape enforcement strategies, and monitor progress against safety targets. By understanding public perceptions and behaviours, authorities can implement more effective road safety measures, ultimately reducing traffic crashes and saving lives.

3.2.4 References

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[4] Point-to-point cameras measure average speeds over a distance to ensure consistent speed compliance.

3.3 Attitude change over time and the status quo bias

Key finding

Regular surveys can indicate change in support for different measures over time. Initial reluctance for change is often overcome within a short time once a community appreciates the benefits and realises the changes have limited negative impact.

3.3.1 Description of activity

In the mid-1990s, urban areas across Australia had a default speed limit of 60 km/h. However, increasing road crashes and fatalities prompted road safety experts and community advocates to push for lower speed limits. Studies from around the world indicated that reducing the speed limit to 50 km/h could significantly enhance road safety by reducing the frequency and severity of crashes.

Several Australian states conducted pilot programs to test the impact of a 50 km/h speed limit. New South Wales was the first to officially adopt the 50 km/h limit in 1999, following positive results from these trials. The change aimed to improve pedestrian safety, reduce traffic crashes and enhance the overall liveability of urban areas.

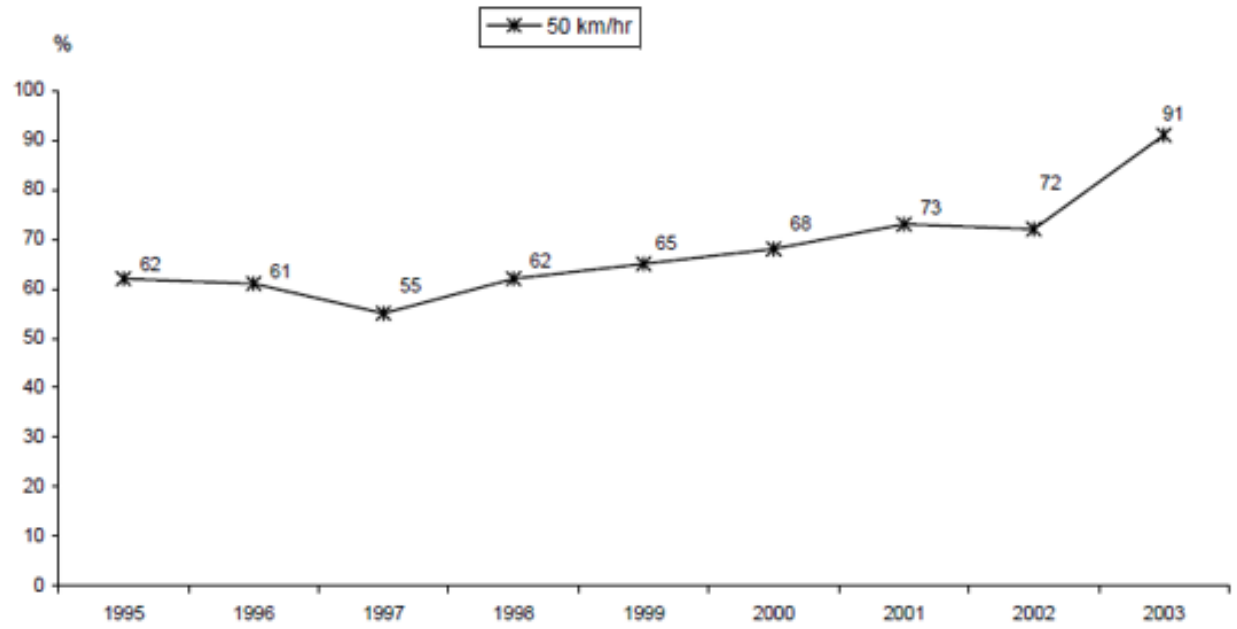
By the early 2000s, other states and territories followed the lead of New South Wales. Public awareness campaigns and community consultations played crucial roles in educating the public about the benefits of lower speed limits. By 2001, most Australian urban areas had adopted the 50 km/h speed limit.

Given the significance of this change, community surveys were undertaken at state and national level before, during and after the movement to a default 50 km/h speed limit. The results from these surveys are interesting, highlighting the change in levels of support that often accompanies speed limit change.

3.3.2 Outcomes

Initial reactions to the proposed changes in the default urban speed limit were mixed, with some resistance from drivers concerned about longer travel times and increased enforcement. This was reflected in the attitude surveys undertaken at the time (Department of Transport and Regional Development 1996). However, evidence from early adopters and international studies highlighted significant reductions in road crashes and fatalities, gradually swaying public opinion.

Figure 3.4: Community support for 50 km/h urban default speed limit, 1995–2003



Source: Adapted from Pennay (2004).

Surveys undertaken at the time by the federal government included questions on a broad range of road safety issues. From the mid-1990s, these surveys included a question on community support for the lowering of speeds to 50 km/h. The same question and the same method were used in subsequent surveys, giving a clear picture of the change over time.

Initial support dropped from 62% in 1995 to 55% in 1997 as the movement to 50 km/h became more prominent in the media and across the Australian community. However, as trials continued, the level of support started to increase from 65% in 1999 to 73% in 2001, around the time of the blanket change. This support then leapt to 91% in 2003, following the period of implementation. Interestingly, the level of support was stronger among women by more than 10% in some years during the rollout phase (68% by female respondents in 1998 compared to 56% of male respondents). Support from women continued to remain stronger following implementation. In 2003, 93% of female respondents were in favour of the lower speed limit compared to 89% of male respondents.

Public support has strengthened over the years, driven by visible improvements in road safety and the effectiveness of public education campaigns. The introduction of 50 km/h speed limits in urban areas led to a notable decrease in road crashes and fatalities. The initiative also contributed to broader urban planning goals, promoting safer and more liveable cities.

With careful engagement with the public and decision-makers, the benefits were made clear. Enough support was generated to facilitate the change, firstly through trials and then permanent change. Once road users were exposed to this change, they were able to appreciate the benefits and that negative outcomes were less than some had anticipated. This led to an increased level in support of this change.

3.3.3 Conclusion

This case study highlights the value of gathering data from the public on attitudes to speed and other road safety initiatives. In this case, it is notable that even from the outset, there was majority support for the change to a safer urban default speed limit. Reliance on feedback from the vocal minority who expressed strong negative opinions on this issue could have easily swayed policy. The survey data indicates that even at the peak of the debate in 1996, only 18% of respondents were strongly opposed to the change. Double that number (36%) were strongly supportive of the change.

This case study highlights that there is often initial reluctance to change but that public opinion can be swayed with good evidence and the right methods of engagement. It may also indicate a type of 'status quo' bias, with residents often satisfied with the current situation and some reluctance to change. Similar results have been identified in more recent surveys, with levels of support often increasing with time, especially following implementation (see for example, the case study from Mornington Peninsula Shire in Section 4.6).

3.3.4 References

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3.4 Innovative speed data collection methods

Key finding

There are new and emerging sources of traffic speed data that can be highly beneficial for those involved in research or managing roads.

3.4.1 Description of activity

Collecting accurate and comprehensive speed data is crucial for managing speed and improving road safety outcomes. Traditional methods such as pneumatic tubes, vehicle counters and manual methods such as radar and lidar have recently been supplemented by innovative methods, including probe speed data, connected vehicle data and event data recorders (EDRs). These methods offer a more detailed and comprehensive understanding of traffic behaviour and enable more effective analysis. This case study topic explores these innovative data collection methods, focusing on their usefulness, with a particular focus on examples from New Zealand and Australia.

Probe speed data

Probe speed data is collected from a variety of sources such as GPS devices, mobile phones and in-vehicle navigation systems. This method has been in use for over a decade, with significant advancements in the technology over the past few years. The primary advantage of probe speed data is its ability to provide real-time information on vehicle speeds across a wide area rather than being limited to fixed locations.

It helps identify congestion patterns, monitor traffic flow (including speeds) and evaluate the effectiveness of traffic management measures. For instance, probe speed data has been used to analyse travel time reliability and identify areas where traffic flow can be improved. It is particularly useful for monitoring segment speeds, and it has also been used to evaluate traffic calming measures.

Despite its benefits, probe speed data is still finding its place in broader speed monitoring and evaluation. One barrier to widespread uptake is the difficulty in comparing this new data collection type with more traditional sources such as pneumatic tubes. Pneumatic tubes, which measure traffic volume and speed by detecting pressure changes from vehicle tyres, provide a different type of data. Data is typically collected during a limited period and at a discrete location on the network. As a result, integrating probe data with historical data from pneumatic tubes or other traditional methods can be challenging due to differences in data collection techniques and metrics.

Traditional methods like pneumatic tubes or radar guns often capture free-flowing traffic speeds of vehicles. This is done by ensuring a gap between vehicles and collecting only data from the front, unimpeded vehicle, which helps avoid the impact of traffic congestion and collects better information on desired speeds. These traditional devices can also be used to categorise speeds for different vehicle types. Probe speed data is less able to collect free-flowing vehicle speeds. Various techniques are now used to counter this issue with probe speed data, including use of data from periods outside the peak period, although use of data from a specific period may introduce biases compared to travel at other times. Probe speed data is also less useful at determining speeds for different types of vehicles. Other issues include that probe data may not be representative of all vehicles using the road, with data from only small proportions of the vehicle fleet and types of vehicles collected. This may result in biases in the data.

Event data recorders (EDRs)

Event data recorders, often referred to as ‘black boxes’ for vehicles, capture detailed data about a vehicle's operation and performance immediately before and during a crash. This technology has been in use since the late 1990s but since then has seen significant improvements in the data that can be captured and analysed. EDRs provide critical insights into the circumstances surrounding traffic crashes, contributing to road safety analysis and vehicle design improvements. They capture data such as speed, acceleration, braking and seatbelt usage, which can be used to reconstruct crash events and identify contributing factors.

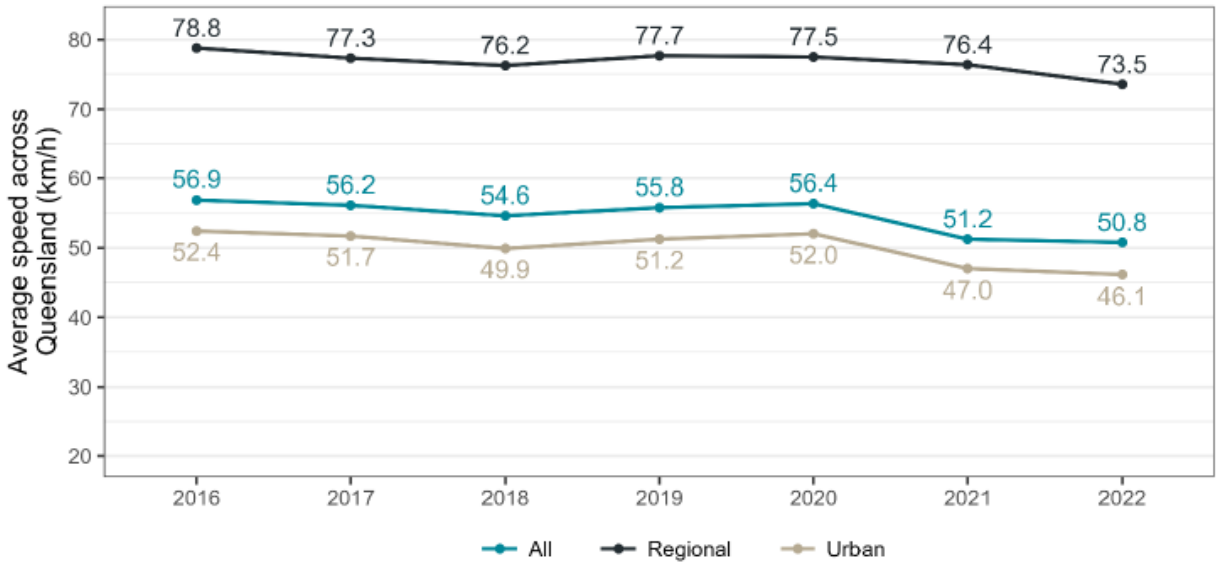
3.4.2 Outcomes

Probe speed data use case, Queensland

Since 2016, the Safer Speeds team at the Queensland Department of Transport and Main Roads (TMR) has procured an independent report of road network speed data across Queensland, using GPS speed probe data provided by HERE Technologies and sourced from vehicle telematics. The report provides an analysis of trends in average vehicle speeds, speed compliance, margin in excess of the speed limit, and percentage of the speed limit. This data is analysed across all of Queensland, with additional analyses by region and speed limit zone.

The most recent report (Soole et al. 2023) highlighted reductions in average network-wide vehicle speeds across Queensland in 2021 and 2022, as well as improved levels of compliance. However, there were also increases in the margin in excess of the speed limit among vehicles observed speeding. Ad hoc analyses in this report demonstrated that traffic flow data showed that working-from-home arrangements adopted during the COVID pandemic continued to impact traffic flow into 2022. In addition, an analysis of speed at road works and areas impacted by flooding showed that motorists typically reduce their speed in such instances.

Figure 3.5: Average speeds – Queensland 2016–2022



Source: Soole et al. (2023).

While this annual report produces invaluable information regarding network-wide speed trends, the encompassing nature of the data – which is impacted by congestion and road geometry – means it is less effective for analysing free-flow vehicle speeds. In addition, there are some limitations associated with the current state of the data that is sourced from vehicle telematics. This data is typically sourced from newer vehicles, which means there are issues of representativeness of the overall vehicle fleet in Queensland that are yet to be comprehensively quantified.

Vehicle data use case, Sunshine Coast Council

In Sunshine Coast Council, connected vehicle data from Compass IoT was used to evaluate the impact of retrofitting speed cushions at a pedestrian crossing. The council aimed to measure changes in vehicle speeds before and after Sunshine Coast Council installed speed cushions to create a safe route to a local primary school.

Before the installation, average speeds at the crossing were 46 km/h in each direction, with 85th percentile speeds of 59 km/h westbound and 55 km/h eastbound. After the installation, the average speed in both directions dropped to 22 km/h in each direction, and the 85th percentile speed reduced to 30 km/h westbound and 31 km/h eastbound. This significant reduction in speeds demonstrated the effectiveness of the speed cushions in enhancing pedestrian safety at the crossing (Compass IoT 2024).

Figure 3.6: Use of connected vehicle data, Queensland

When	Ave Speed at crossing km/h		85th % at crossing km/h	
Dates Collected	Westbound	Eastbound	Westbound	Eastbound
Before (1 Feb-1 May 2023)	46	46	59	55
After (1 Feb-1 May 2024)	22	22	30	31
Reduction	52%	52%	49%	44%

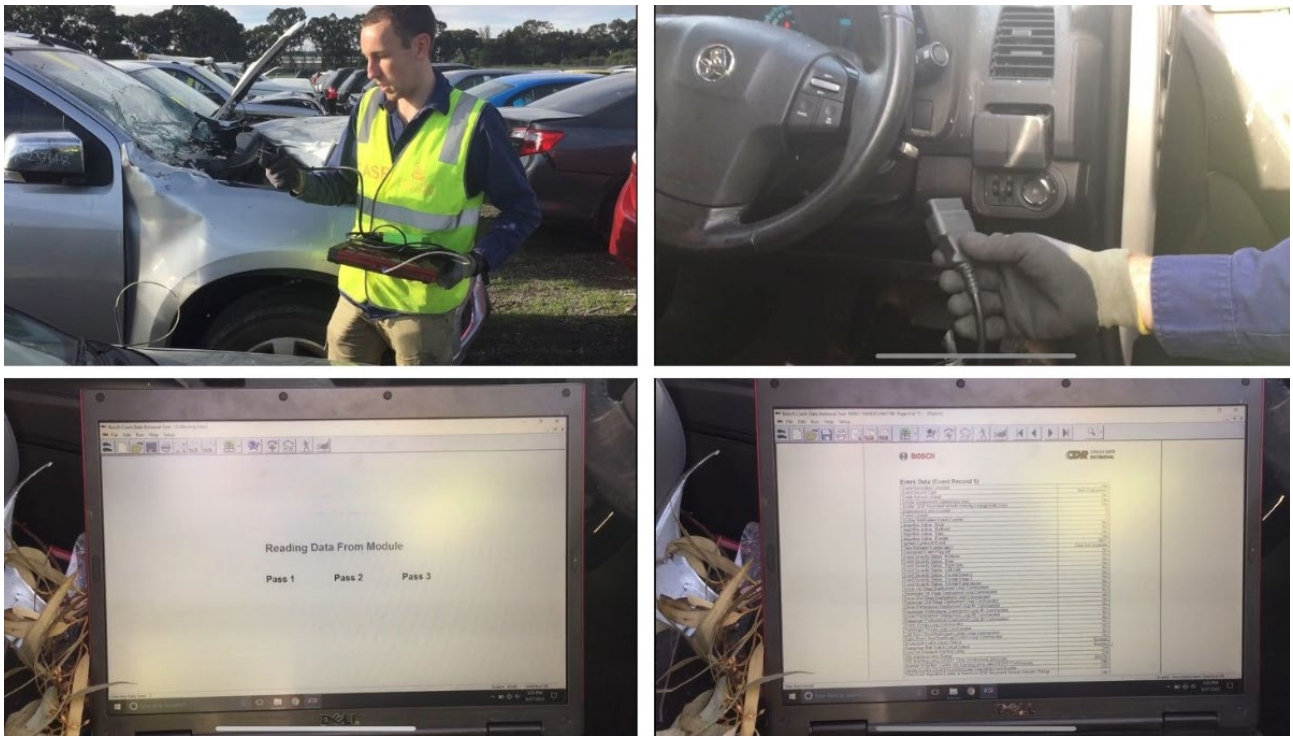
Source: Compass IoT (2024), based on a study conducted by Prue Oswin, Sidelines Traffic.

Event data recorders (EDRs) use case, South Australia

In South Australia, the Centre for Automotive Safety Research (CASR) has been a pioneer in utilising EDR data to enhance road safety. CASR began downloading EDR data from vehicles in 2014 as part of its in-depth crash investigation activities. The data collected from EDRs includes crash information on variables such as travel speed, impact speed, change in velocity (DeltaV), seatbelt usage and brake use (Doecke 2017).

EDR data provides a detailed account of crash dynamics and driver behaviour, which is crucial for understanding the causes and consequences of traffic crashes. For instance, EDR data has revealed that a significant percentage of vehicles involved in crashes were speeding at the time of the incident. This information has delivered useful perspectives in support of speed enforcement policies and public safety campaigns in South Australia (Elsegood et al. 2020). In 2017, CASR commenced a database that contains EDR data matched to police reports and hospital injury information, with 100 to 200 cases added each year. An additional database of EDR data for high-severity crashes has also been created for crashes in Victoria.

Figure 3.7: Extracting event data recorder data – South Australia



Source: Author's personal communication with the Centre for Automotive Research (CASR), University of Adelaide.

A detailed analysis conducted by CASR on 146 crashes between 2019 and 2020 found that 24.6% of the 171 bullet vehicles (vehicles that strike another vehicle) were speeding before the crash. This information, combined with police reports and hospital data, provided a comprehensive view of crash circumstances, enabling targeted interventions (Elsegood et al. 2020). One notable case involved a 2012 Toyota Corolla that crashed while traveling at 132 km/h in a 60 km/h zone. The EDR data showed that the driver was braking heavily before the crash, with the vehicle slowing considerably, debunking the driver's claim that the brakes had failed. This case highlighted the role of excessive speed in crashes and the ability of EDR data to provide accurate pre-crash information that traditional investigation methods might miss (Elsegood et al. 2020).

3.4.3 Conclusion

Speed data has traditionally been time consuming and sometimes costly to collect. New sources of data are available to help provide information on vehicle speeds for research and road management purposes.

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4. Use of Data to Engage and Convince

This section describes how information and evidence can be used to counter common myths and misperception about speed change, including about the impact on travel times and vehicle operating costs. It shows how open communication can help create community engagement and support from decision-makers.

4.1 Impact on travel time

Key finding

The impact of speed limit change on travel times is often vastly overestimated. Better knowledge of actual changes in travel times can help minimise one of the major barriers to acceptance of speed limit change.

4.1.1 Description of activity

It is often assumed that changes in speed limits have a significant impact on travel times. However, the relationship between speed limits and travel time is complex and can vary significantly based on factors including traffic density and road configuration.

Assumptions are often made about expected changes in journey time using basic calculations involving the speed limits before and after change. These calculations assume that the travel speed in each case is the same as the speed limit. For example, reduction of a speed limit from 100 km/h to 80 km/h over the distance of 10 km could be expected to increase journey time by 1 minute and 30 seconds if the speeds travelled were the same as the speed limit (6 minutes at 100 km/h compared with 7.5 minutes at 80 km/h). However, speed limits are often reduced at such locations due to adverse conditions (such as curvature, steep terrain or poor road surface conditions). The average vehicle speeds before the change may be less than the existing posted speed limit, meaning that the journey time benefits can easily be overestimated. Similarly, in urban areas, roads are often congested, and drivers need to slow or even stop at regular intervals due to intersections and traffic conditions. In addition, many journeys are made across different road types, including a mixture of local and arterial roads. If reductions in speeds are made only on local roads, the percent of journeys impacted by reduced speeds is often very small.

These and other factors often cause the public and decision-makers to overestimate the impact of speed limit change on journey time. But lower speed limits have produced demonstrated improvements in traffic flow and reduced travel time. When delays from traffic crashes are factored in, speed limit reductions typically do not have the negative impact on traffic flow that many assume. As the following examples show, evidence is building of the actual change in journey time from speed limit reductions on both urban and rural roads.

4.1.2 Outcomes

Urban areas

In urban areas, a number of towns and cities have reduced speed limits to enhance safety and manage traffic flow. Auckland conducted a high-level economic assessment based on 4 scenarios involving speed management around schools (Flow Transportation Specialists 2022). The assessment calculated the impact on safety outcomes and estimated the impact on travel times. Of the 4 scenarios, the most comprehensive and potentially disruptive involved:

- 30 km/h permanent speed limits on all non-arterial roads within 1,000 m of a school gate
- 30 km/h variable speed limits all arterial roads within 400 m of a school gate, plus
- permanent speed limits of 40 or 30 km/h on 30 selected high-risk arterial roads across Auckland.

Calculations were made on the likely impact on safety outcomes, with a significant number of deaths and serious injuries likely to be saved over a 10-year period, and with an estimated benefit-cost ratio (BCR) of 9.0.

Calculations were also made on likely impacts on traffic. The Auckland Macro Strategic Model (MSM) was used to model these changes during morning peak, off-peak and during afternoon peak. Based on average journeys of around 11 km, it was estimated that average trip times would increase by between 13.4 and 15.4 seconds on an average trip time of between 14 and 19 minutes. For this most comprehensive scenario, the impact on travel times was estimated to be less than a 2% increase over existing times.

A similar type of assessment was undertaken in the rural town or Orange, New South Wales. Traffic counters were placed at strategic locations before speed limits were changed while the existing speed limit was 50 km/h. The traffic counters found that the average speed of vehicles rarely reached 50 km/h. The highest 85th percentile speed (85% of motorists were within this speed) was on Sale Street, between Kite Street and Summer Street, where vehicles travelled 47.5 km/h. The speeds on other streets in the area of proposed change were between 39.6 and 44.4 km/h.

Using this data, engineers calculated the difference in travel time to drive from one end of the CBD to the other based on the reduction in speed limit from 50 to 40 km/h. This information was used as part of the community engagement process. The biggest increase was on Summer Street from Hill Street to Peisley Street, a section 930 m in length. The change was estimated to increase travel times by 7.87 seconds in one direction and 12.36 seconds in the other. Travel times on other parts of the CBD subject to change were likely to range from no change to a maximum of 5.46 seconds additional travel time (Orange City Council 2020).

Rural areas

In the Mornington Peninsula, a trial to reduce speed limits from 100 km/h or 90 km/h to 80 km/h in rural areas, and from 50 km/h to 40 km/h in urban residential areas identified no significant differences in travel times in either environment following the change. The study (Pyta and Pratt 2013) evaluated 6 rural sites where speed limits were reduced, and 4 ‘control’ sites where speed limits remained unchanged. The study adopted a floating car method over multiple journeys at each site. Although there were increased journey times at all locations, there were also increases at the control sites during the same period. The changes in journey times for treated sites were often minimal (just a few seconds), with the greatest increase being a 36 second increase (from 14:41 minutes to 15:17 minutes). The changes for the 3 urban roads also showed minimal changes in journey time, ranging from 1 second (from 3:15 to 3:16 minutes) to 18 seconds (from 2:12 to 2:30 minutes) (Mornington Peninsula Shire 2022).

In New Zealand, several assessments have been made of changes in speed limits on rural roads. On State Highway 75 (SH75) between Christchurch and Akaroa, a series of speed limit changes were made over the 80 km corridor. Some of these involved reductions from 100 to 80 km/h or even 60 km/h. The increase in journey time was around 5.7 minutes, from a total of 69.9 minutes to 75.6 minutes. This represents an increase of just over 4 seconds per km. For one substantive section, speed limits were reduced from 100 km/h to 60 km/h. However, due to the curvature of this section, journey times increased only marginally, from 18.4 minutes to 19 minutes, or just 2 seconds extra per km of travel (Koorey 2023).

On State Highway 6 (SH6) between Blenheim and Nelson, speed limits were reduced from 100 km/h to 90 km/h and 80 km/h on certain sections. The safety benefits from this initiative were significant, with around an 80% reduction in deaths and serious injuries in the two-year period following the reduction. The change resulted in a very modest increase in travel time by about 4 minutes over the 110 km length, or around 2 seconds per km (NZTA 2023b).

Figure 4.1: Travel time change, New Zealand

Source: NZ Transport Agency (2023b).

On State Highway 5 between Rangitāiki and Esk Valley, speed limits were reduced from 100 km/h to 80 km/h. The safety benefits were approximately 34 fewer crashes in the year following introduction of the speed limit change and reductions in the severity of crashes that did occur. Travel time increases of between 0.5 to 2.8 seconds per km travelled were calculated, equivalent to increased journey times of between 36 seconds and 3.6 minutes across a single journey on the 76 km section of highway (NZTA 2025a).

A recent study undertaken in Western Australia estimated the likely impact of changing the current rural default speed limit from 110 km/h to 100 km/h (Moyses et al. 2024). Western Australia is one of the few states that 'rounded up' its speed limit when metrification came into effect in Australia in 1974. Before metrification, the speed limit was 65 mph (104 km/h). Most other states reduced their speed limits to 100 km/h. There are a high number of severe injuries on rural roads in Western Australia, and estimates indicate that 160 fatal and serious injuries could be avoided between now and 2030 through simple regulatory change. However, one barrier to change is the perception that journey times will increase with a reduction in speed limits.

The study was undertaken to determine the likely impact on journey times and the analysis included every town in Western Australia with a population over 1,000. This involved 52 towns that make up 91% of Western Australia's total population. Google was used to map the most direct routes between these towns, and the change in journey times was calculated based on the new speed limit. The study identified that 98% of these journeys would not change, and for the remaining 2%, the change would be an increase of between only 30 seconds to 2 minutes for most. This is because most of the journeys would occur on roads where the speed limit is already signposted, and this would not change. It was also noted that disruption to journey time would likely be even less than this estimate, and that trips are often disrupted because of traffic congestion.

4.1.3 Conclusion

The evidence from Australia and New Zealand suggests that reduced speed limits do not necessarily lead to significant delays in traffic or increases in journey time. While the increase in travel time is generally minimal, the overall benefits to road safety are substantial. An assessment of a change in journey time should be based on actual change in speed and not on a simplistic analysis of speed limits before and after the change, especially in locations where actual speeds are likely to be less than the posted speed limit. The full extent of typical journeys also needs to be taken into account when measuring changes in journey time. Journeys may include roads where no change in speed limit has been made (for example, the arterial road portion of a journey) as well as roads where speed limits have been reduced. The total change in journey time will depend on the proportion of travel that is undertaken on roads with and without speed limit changes.

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4.2 Optimal costs from speed change across different societal objectives

Key finding

Contrary to popular belief, reducing speeds can produce substantive economic benefits. Speeds should be lowered to reduce costs to society, especially on lower quality rural roads.

4.2.1 Description of activity

Speed limits are a critical aspect of road management, influencing not only road safety, but also journey times, vehicle operating costs and emissions. Although the Safe System approach identifies that road safety outcomes should not be compromised, it is often the case that transport decisions are made on a wider set of criteria than just safety outcomes. The concept of 'optimal speed limits' aims to balance various factors to minimise the overall societal cost. This approach considers the economic, environmental and social impacts of speed limits, advocating for settings that achieve the lowest total cost rather than merely focusing on individual aspects like safety or travel time.

The rationale behind setting speed limits based on the lowest cost to society stems from the need to optimise multiple outcomes. High speeds can reduce journey times but often increase crash rates and vehicle operating costs, including fuel consumption and emissions, especially in higher speed environments. Conversely, lower speeds can enhance safety and reduce emissions but may lead to longer travel times. An optimal speed limit aims to find a balance where the aggregate cost, including journey time, safety and environmental impact, is minimised.

The method for determining optimal speed limits involves a comprehensive analysis of various cost components, including:

- journey time costs (the economic value of time saved or lost due to travel speed, a factor that is often overestimated as discussed in Section 4.1)
- road safety costs (calculated in different ways, but recommended to include the 'willingness to pay' approach, or how much people are prepared to spend to avoid being involved in a crash)
- vehicle operating costs (related to fuel consumption, wear and tear)
- emissions.

Economic models often use data from traffic studies, accident reports and environmental impact assessments to calculate these costs at different speeds. The optimal speed is identified where the combined cost is at its lowest.

The concept of optimal speed has been used in several countries to help develop speed limit policies, including in Sweden, Norway and Iran (Hosseinlou et al. 2015). It can be used to justify changes in speed limits, aiming to achieve a balance between efficiency and safety. In both Australia and New Zealand, this research has been led by Professor Max Cameron from the Monash University Accident Research Centre (MUARC).

4.2.2 Outcomes

In Australia, studies have shown that optimal speed limits can significantly reduce the overall cost to society. For instance, Cameron's research in Australia identified that the optimal speeds for rural roads varied based on the road type and traffic conditions (Cameron 2012). The study considered travel time, vehicle operating costs (including pollution) and road trauma costs. Key findings include the following optimal speeds:

- Freeway standard rural roads: Optimal speed around 100–110 km/h.
- Other divided rural roads: Optimal speed about 90–100 km/h.
- Two-lane undivided rural roads: Optimal speed approximately 80–90 km/h.

These optimal speeds are lower than current speed limits, suggesting significant potential for reducing societal costs by lowering speed limits. The results also contradict the claim by those opposing speed limit reductions that reductions will lead to increased costs to society.

New Zealand has also explored the concept of optimal speed limits, particularly in rural settings (Cameron 2022). Recently updated research conducted on rural state highways found that optimal speeds varied significantly depending on road quality and traffic conditions (Cameron 2024). Key findings include:

- Motorways/expressways (divided four-lane roads): Optimal speed of 95–100 km/h for cars and light commercial vehicles, and 80 km/h for trucks.
- Undivided rural highways: Optimal speeds ranged from 70–75 km/h for different types of straight, undivided national roads, and 60–70 km/h for different classes of winding roads (and around 5 km/h slower in each case for trucks).

Further, calculations can be made on the expected cost savings if all vehicles adopted the optimum speeds. Based on older values (Cameron 2012), it was estimated that the savings for rural national strategic roads would result in a 1.8% reduction in total costs, as shown in Table 4.1. Given that the cost of individual crashes has substantially increased in New Zealand in recent years, the savings could now be expected to be much greater.

Figure 4.2: Economic impacts from speed change, New Zealand

$'000/year	Before	After	Change	
Vehicle operating costs	730,208	688,927	-41281	-5.7 %
Time costs	521,547	585,799	64252	12.3 %
Crash costs	149,140	103,389	-45,752	-30.7%
Air pollution costs	37,015	34,540	-2,475	-6.7 %
Total	**1,437,910**	**1,412,655**		
Change			**-25,256**	**-1.8 %**

Source: Cameron (2012).

The above findings indicate that current speed limits in New Zealand could be adjusted to reflect these optimal speeds, potentially reducing crash rates and vehicle operating costs.

4.2.3 Conclusion

Setting speed limits based on the minimisation of societal costs is an effective approach to road management. Studies have been undertaken in Australia and New Zealand that have each demonstrated that current speed limits, especially for lower quality rural roads, are set too high to be economically optimal. In addition, this research demonstrates that narratives about speed limit reduction having a negative impact on economic outcomes are false.

4.2.4 References

Cameron MH (2012) ‘Optimum speeds on rural roads based on ‘willingness to pay’ values of road trauma’, *Journal of Road Safety*, 23(3):67–74.

Cameron MH (2022) *Economic analysis of optimum speeds on rural state highways in New Zealand*, NZ Transport Agency website, accessed 17 February 2025.

Cameron MH (30 September–3 October 2024) ‘Optimum speeds on New Zealand rural state highways: An update’ [conference presentation extended abstract], *Australasian Road Safety Conference*, Hobart, Tasmania.

Hosseinlou MH, Kheyrabadi SA and Zolfaghari A (2015) ‘Determining optimal speed limits in traffic networks’, *IATSS Research*, 39(1):36–41, doi:10.1016/j.iatssr.2014.08.003.

4.3 Using evidence to counter opposition and myths: The value of FAQs

Key finding

Objections to speed limit change can be overcome with good evidence. Frequently asked questions (FAQs) can be used to counter key barriers to change.

4.3.1 Description of activity

Reducing speed limits is a critical strategy for reducing traffic crashes, but speed reduction and supporting measures often face significant opposition from the public, who may view lower speed limits as inconvenient or unnecessary. To counter this opposition, various forms of evidence can be employed to demonstrate the benefits. This evidence includes statistical data, research studies, pilot programs, case studies and testimonials from affected communities. By presenting a robust body of evidence as well as personal stories about the impacts of speed, authorities can effectively communicate the advantages of speed limit reductions and encourage greater public acceptance.

4.3.2 Outcomes

One method that has been employed by several jurisdictions is the use of frequently asked questions (FAQs) to counter the most common myths about speed limit change. Given that misconceptions are generally similar across different situations and locations, a small set of FAQs can be produced in advance of any public engagement drawing upon the extensive evidence base that exists on this topic. Many jurisdictions produce speed-related evidence and make this available on their websites, including key statistics and infographics. Some even produce FAQs to directly address the speed issue.

Examples of New Zealand and Australian jurisdictional FAQs are:

- Auckland Transport Safe Speed FAQs (Auckland Transport 2022)
- Waikato Regional Council Myths and frequently asked questions about speed (Waikato Regional Council 2025)
- Victorian Government FAQs on road safety cameras (Victoria State Government 2023)
- Transport for NSW Speed – Fact sheet (Transport for NSW 2023d)

The Austroads *Guide to Road Safety Part 3: Safe Speed* (Austroads 2024) includes content on common speed myths.

Tasman District Council, New Zealand: Speed review FAQs

As part of their speed review, Tasman District Council in New Zealand included FAQs, infographics and informative videos on their website. The FAQs included summaries of such issues as impacts of speed change on safety outcomes, revenue raising from fines and travel times.

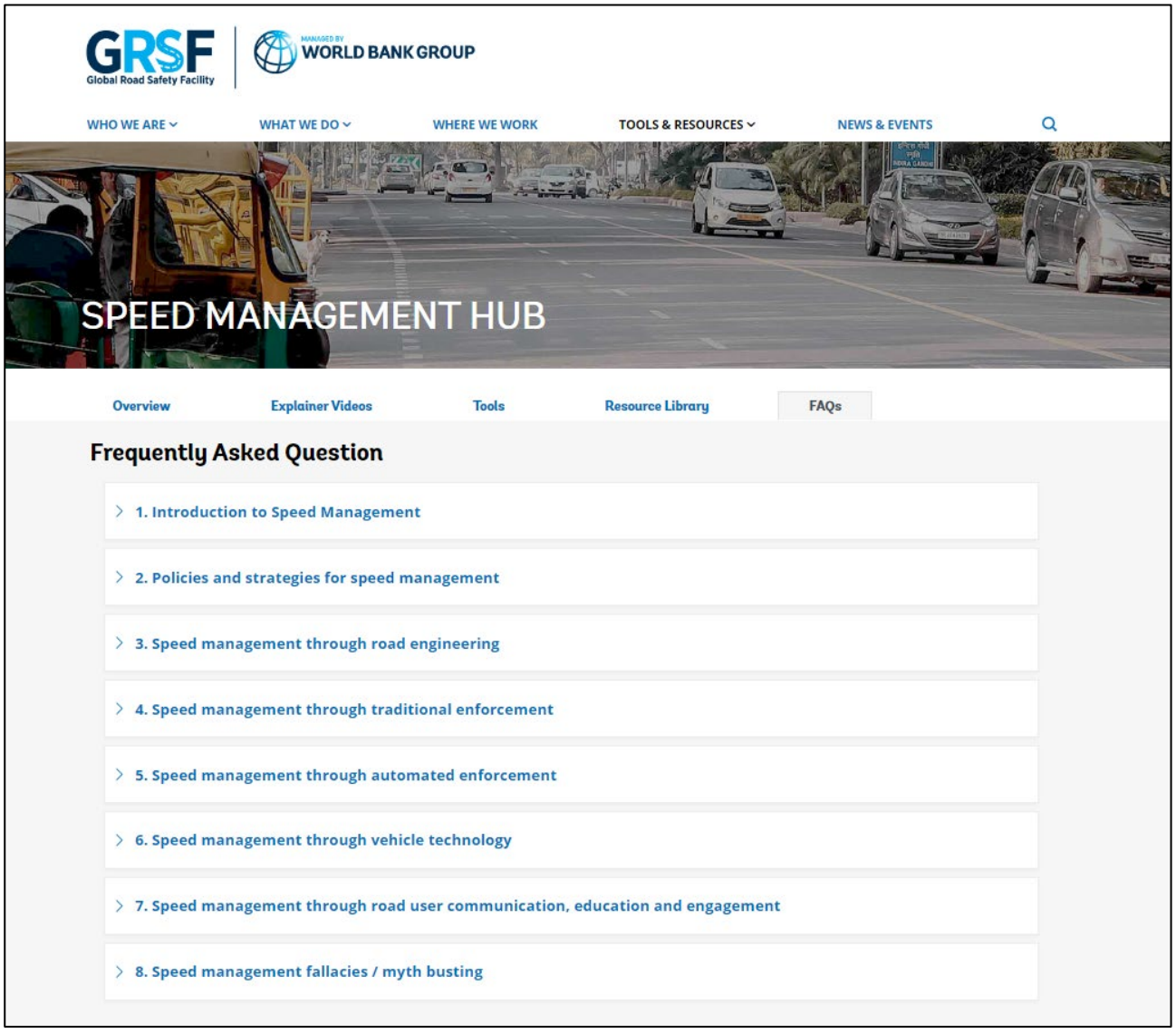
Figure 4.3: Frequently asked questions, New Zealand

Source: Tasman District Council (2025.

Launceston, Tasmania: FAQs as part of public consultation

In Launceston, Tasmania, FAQs were used to counter myths and misinformation about speed limit changes as part of the public consultation process. This approach not only provided clear and concise information but also addressed common concerns and objections raised by the public and decision-makers. An external source of information helps recognition that appropriate speed limit setting is not just a local issue but follows good practice worldwide. The evidence to address public concerns was sourced from the World Bank's Global Road Safety Facility (GRSF). The GRSF has a dedicated website that helps address speed-related myths (GRSF 2024a). In submitting their successful proposal to the Tasmanian State Government for approval, the City of Launceston highlighted that 'the arguments provided by the community against the proposal are countered by robust international research and engineering advice' (City of Launceston 2023).

Figure 4.4: Frequently asked questions, Global Road Safety Facility



Source: Global Road Safety Facility (2024a).

4.3.3 Conclusion

There are barriers to lowering speed limits, even when these changes produce substantive societal benefits. Many of these barriers are based on myths, but good evidence is available to counter these myths. There is a need to be prepared with robust evidence when engaging in discussions on these issues. FAQs are also an effective way to communicate the advantages of speed limit reductions and a useful source of information to address common myths.

4.3.4 References

Auckland Transport (2022) *Safe Speed FAQ*, Auckland Transport website, accessed 17 February 2025.

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City of Launceston (2023) Council Meeting Agenda Thursday 1 June 2023, City of Launceston website, accessed 10 March 2025.

Global Road Safety Facility (GRSF) (2024a) *Speed management hub – FAQs*, World Bank Group, GRFS website, accessed 18 February 2025.

Tasman District Council (2025) *Myths and misconceptions*, TDC website, accessed 13 March 2025.

Transport for NSW (2023d) *Speed – Fact sheet*, TfNSW website, accessed 18 February 2025.

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4.4 Benchmarking to help generate interest in change

Key finding

Benchmarking is a useful tool to help generate interest in speed limit change within the community. As well as raising awareness about relative performance on speed and safety outcomes, it can introduce an element of 'competition' to help drive change.

4.4.1 Description of activity

Healthy Auckland Together is a coalition of 25 organisations working to make the region a healthier place. The partnership includes local government, mana whenua, health agencies, NGOs, academics, community representatives and consumer interest groups. They believe that all children should have a safe route to school for walking, cycling and scootering, regardless of where they live, and that safety can be improved around schools by calming the roads with safe speeds. This can reduce the risk of serious injury and death from vehicle crashes and help children live more active and healthier lives.

However, the proposals for speed limit change varied across different local boards in Auckland, with schools in different areas proposed to receive different levels of protection. This would have meant that the amount of safety offered could vary significantly depending on where people lived and which school children attended.

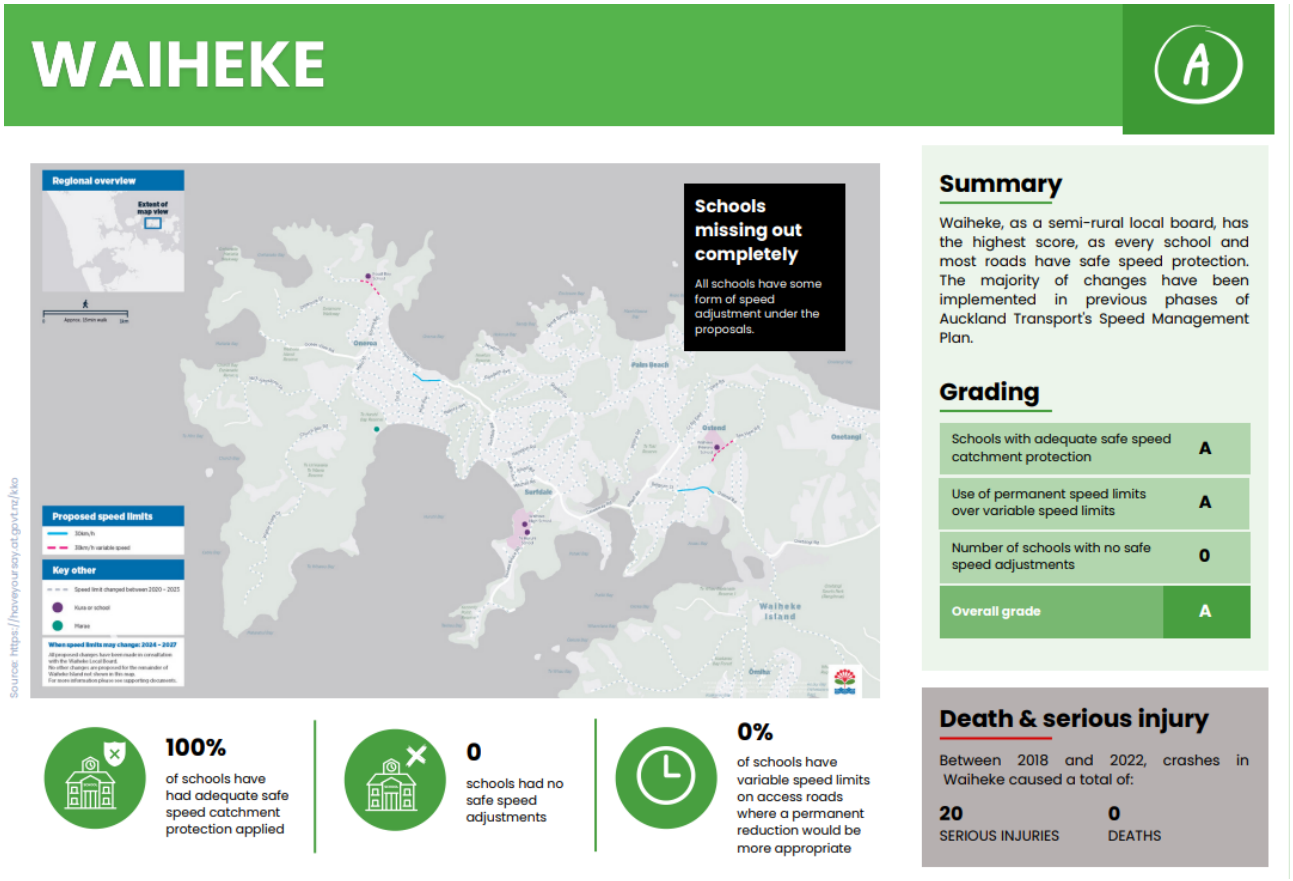
Healthy Auckland Together created a scorecard report to analyse the speed proposals by each local board (Healthy Auckland Together 2023). The report compared what levels of protection were being proposed in each area, based on 3 key criteria:

1. **Do the proposed safe speed restrictions cover a suitable catchment area around the school?** This reflects the issue that children use a variety of routes to reach school, not just a single roadway. It also reflects that children and families play in surrounding streets along with other activities. This was assessed by identifying permanent adjustments made to safe speeds within a 500 m catchment of residential roads around the school. It formed the largest part of the rating (70% of the score).
2. **Are the proposed speed restrictions on non-arterial access roads permanent or variable?** Permanent speed limits are more effective than temporary time-based speed limits, and schools are used at different times of the day and at weekends. This element was assessed by identifying the proportion of schools in each area with proposed variable limits on non-arterial access roads where a permanent limit would be more appropriate.
3. **Are any schools within a local board area proposed to have no form of speed reduction?** This element reflects schools that will see no adjustments made to roads around schools to make them safer.

Speed adjustments implemented as part of previous speed reduction phases were included in the analysis. The total number of schools in the area with no protection was also used to modify the score.

Based on these elements, individual scores were calculated along with an overall score from 'A' (excellent) to 'F' (poor). Out of 21 local board areas, 3 (14%) scored an A, while 4 (19%) scored an F. In addition, detailed scorecards were provided for each area. Each scorecard includes details of the grading, including percentage of schools that have had adequate safe speed catchment protection applied; number of schools that have no speed adjustments made; and percentage of schools that have variable speed limits on access roads where permanent reductions would be more appropriate. Details are also provided on the number of deaths and serious injuries occurring in the area, as well as a summary of the area. Lastly, a map is included for each local board area, showing the location of schools and the current and proposed speed limits. An example for Waiheke, which achieved the highest safety rating, is provided below.

Figure 4.5: School benchmarking, Waiheke, New Zealand



Source: Healthy Auckland Together (2023).

4.4.2 Outcomes

The Healthy Auckland Together scorecards had a significant impact on raising awareness about the need for speed change around schools and the broader community. They increased engagement by stakeholders in discussions on this topic and raised support for speed limit change. The release of the scorecards coincided with a substantial increase in public interest and feedback to a public consultation on speed limit change around schools. There was a jump in numbers of people visiting the consultation page and completing the survey immediately following the launch. The scorecards enhanced the local board support for safety improvements through speed limit changes, with 16 out of 21 boards in support of the change, 4 with mixed views or requiring further information, and only one opposed. The board opposing the proposed speed limit changes was in favour of variable speed limits outside local schools but opposed 30 km/h neighbourhood zones.

4.4.3 Conclusion

Benchmarking can be a useful approach to help generate interest in speed change within the community.

4.4.4 Reference

Healthy Auckland Together (2023) *Safe speeds scorecard report: Analysis of Auckland Transport's Katoa, Ka Ora proposals by local board*, Healthy Auckland Together website, accessed 18 February 2025.

4.5 Other use of data to support change – ANRAM

Key finding

Using evidence including comprehensive data on safety performance can help generate interest in the need for speed limit change.

4.5.1 Description of activity

The Mildura Rural City Council used the Australian National Risk Assessment Model (ANRAM) to persuade decision-makers to implement lower speed limits. This case study topic examines how ANRAM was used to present evidence-based arguments that resulted in road safety improvements in Mildura, including the allocation of funding and implementation of new speed limits across residential and commercial areas.

With high rates of fatal and serious injury (FSI) crashes, Mildura faced significant road safety challenges. The council aimed to address these issues through targeted speed management interventions. However, gathering support from local decision-makers required robust evidence of the need for change. This is where ANRAM played an important role.

ANRAM provides a systematic approach to assess road safety risks by analysing crash data, road attributes and traffic volumes. The tool offers a detailed risk assessment that includes both individual and collective risk measures, allowing for a comprehensive understanding of the factors contributing to road safety issues. More information and guidance for implementation of ANRAM can be found in Austroads' *Australian National Risk Assessment Model* (Austroads 2014).

The Mildura Rural City Council faced initial resistance from decision-makers, particularly regarding the proposed area-wide 30 km/h speed limit reduction in the CBD. The council initiated a detailed analysis using ANRAM, which involved coding the latest available road attribute data and FSI crash data for the Mildura network. The assessment followed a structured process, including the collection and coding of data on road attributes and traffic volumes; crash data assignment using FSI crash data from the most recent five-year period; and development of a baseline and treatment scenarios. The analysis compared the baseline scenario (existing conditions) with 2 proposed speed management scenarios. Treatment scenario 1 involved applying 40 km/h speed limits in built-up areas and 80 km/h limits in rural areas. Treatment scenario 2 included additional modifications, such as further raising or lowering speed limits on specific roads.

The ANRAM analysis provided significant findings. It showed that, in the baseline scenario, 70% of Mildura's roads had a 1- or 2-star (or poor quality) rating according to the Australian Road Assessment Program (AusRAP) star rating system, indicating high individual risk. For implementing treatment scenario 1 with speed limits of 40 and 80 km/h, it was predicted that 11% of the network would achieve a 5-star rating, with a 45% reduction in FSI crashes. In treatment scenario 2, 4% of the road network would achieve a 5-star rating, with a 34% reduction in FSI crashes.

Figure 4.6: AusRAP star rating assessment, Mildura city centre and surrounds

Source: Australian Road Research Board (unpublished).

Figure 4.7: ANRAM results, Mildura

	Baseline scenario (before)	Treatment scenario 1	Treatment scenario 2
Total estimated FSI crashes	78.3 FSI crashes	42.7 FSI crashes (45% reduction)	51.7 FSI crashes (34% reduction)
Run-off-road estimated FSI crashes	21.9 FSI crashes	13.3 FSI crashes (39% reduction)	14.1 FSI crashes (36% reduction)
Intersection estimated FSI crashes	33.8 FSI crashes	17.9 FSI crashes (47% reduction)	22.7 FSI crashes (33% reduction)

Notes:

- Treatment scenario 1 involves application of the 40 & 80 km/h regions (only)
- Treatment scenario 2 involves application of the 40 & 80 km/h regions along with additional changes (raising and lowering of speed limits on some roads)

Source: Australian Road Research Board (unpublished).

These findings highlighted the potential safety benefits of the proposed speed limit changes, providing a compelling case for action. The visual representations of risk before and after implementation, as shown in Figure 4.5, allows for easy interpretation of data, including the likely benefits, which makes technical information more accessible to decision-makers.

4.5.2 Outcomes

The comprehensive analysis and clear presentation of expected safety improvements helped gain a $2.3 million state government grant from the Safe System Road Infrastructure Program (SSRIP) in 2018. This funding enabled the council to implement extensive speed management treatments, including:

- reducing speed limits to 40 km/h on all residential streets
- implementing 10 km/h and 20 km/h limits in CBD laneways
- introducing 40 km/h zones and zebra crossings in the medical precinct.

The implementation of the new speed limits and associated treatments led to safety improvements in Mildura. Community engagement and public education were also important components of the process, ensuring residents understood the benefits of the changes.

4.5.3 Conclusion

The use of ANRAM by the Mildura Rural City Council demonstrates the power of evidence-based risk assessments in influencing road safety policy decisions. The detailed analysis provided by ANRAM was useful in securing funding and gaining the necessary support from decision-makers. The resulting safety improvements underscore the importance of data-driven approaches in road safety management.

4.5.4 References

Australian Road Research Board (unpublished) *ANRAM analysis for Mildura*, ARRB Group Ltd, Melbourne.

Austroads (2014) *Australian National Risk Assessment Model*, AP-R451-14, Austroads, Sydney, NSW.

4.6 Using evidence of community support to generate change

Key finding

Having evidence of community support for change can be a critical part in convincing decision-makers about the need for change. This information can assist with the initial implementation of the changes as well as ongoing improvements.

4.6.1 Description of activity

Public attitude surveys are a useful tool in policymaking, particularly in relation to speed limit change. Such surveys provide decision-makers with insight into the community's perceptions, concerns and support levels regarding proposed changes. Understanding public opinion is essential in creating policies that are both effective and publicly acceptable. This case study topic explores the use of public attitude surveys in Australia and New Zealand to inform decisions about lowering speed limits and to understand attitudes after a change has been implemented. The focus is on project-specific surveys, which are sometimes undertaken before speed limit changes are made to specific sections of roadway. Information on community-wide attitude surveys can be found in Section 3.2.

Attitude surveys are a useful way to assess public acceptance for policy changes, especially those that impact daily life and require public buy-in to be successful. Surveys gauge public acceptance but also help identify specific concerns and perceived benefits among the public, allowing for targeted communication strategies. They can also be used to measure the impact of policy changes over time, providing feedback for continuous improvement.

Surveys should follow a structured, robust methodology to ensure accuracy and reliability. It is important to select an adequate random sample of respondents that is representative of the population. This includes stratified sampling to cover different demographics such as age, gender, and location. Data collection methods vary, including online surveys, telephone interviews and face-to-face surveys. Each method has its strengths and weaknesses regarding reach and response rate. Statistical analysis may also be used to interpret the data. This involves identifying trends or differences, and the statistical significance of these.

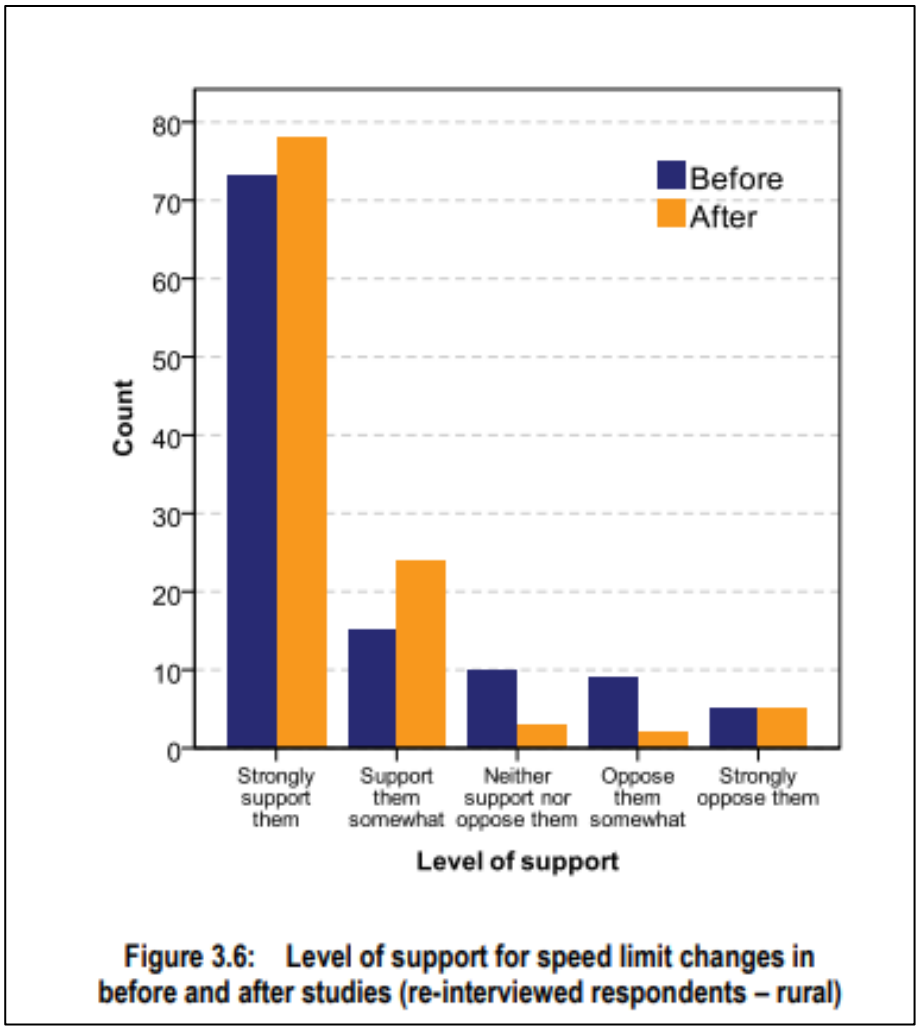
4.6.2 Outcomes

Mornington Peninsula Shire in Victoria embarked on an ambitious road safety improvement program spanning many years. During this time, speed limits were reduced on higher risk roads in urban and rural areas. The outcomes from these speed limit reductions were assessed and showed substantial road safety improvements. However, at the outset of the speed reduction initiative, there was some reluctance to change, in part due to concerns about negative feedback from road users.

To provide evidence for the levels of community support for speed limit change, a telephone survey was undertaken. From the residential area, 150 residents were interviewed in February and March 2012, and a further 150 residents from the rural catchment area. Follow-up interviews were conducted in April 2013 after the changes to speed limits were made in 2012. The speed limit in one urban area was reduced from 50 to 40 km/h, while more substantial changes occurred for rural roads, with 15 sections of high-risk roads reducing from 100 km/h to either 80 or 90 km/h.

The evaluation indicated a high level of initial support (79% for residential and 80% for rural areas), which increased to 81% and 91% respectively after implementation (Pyta et al. 2014).

Figure 4.8: Support for speed limit change



Source: Pyta and Pratt (2013).

In 2019, the Mornington Peninsula Shire launched a new phase of road safety improvements, with the Safer Speeds on Rural Roads project. This involved lowering speed limits on 33 high-risk rural roads from 90 km/h and 100 km/h to 80 km/h, initially as a two-year trial (Mornington Peninsula Shire 2025).

Figure 4.9: Locations for speed limit change

Source: Mornington Peninsula Shire (2022).

This initiative aimed to reduce road trauma by matching speed limits with the road environment and characteristics of high-risk rural roads. The project included a comprehensive evaluation, including surveys with a random sample of residents. The sample size was robust, with 1,059 respondents providing feedback through online and telephone surveys. In addition, 15 in-depth qualitative interviews were conducted with local community members. The survey was undertaken 12 months after the implementation of the 80 km/h speed limits, a period that allowed respondents to form their opinion based on their experience of the new limits. This approach helped avoid biases about perceived impacts, which were noted as potentially emotive and negative and based on an imagined scenario quite different from real-world outcomes.

Community support for the 80 km/h speed limits was 59%, with a further 20% taking a neutral stance. Only 22% opposed the change. Interestingly, when asked about what other people thought about the changes, only a third (34%) agreed that ‘most people I know are supportive of the trial’, far less than the 59% of respondents who actually supported the trial. The surveys also helped indicate reasons for support or opposition to change. As an example, only 7% of those opposed to the speed limit reductions agreed to the statement that ‘the reduced speed limits will help reduce the level of road trauma in the Peninsula’. Given the strong safety benefits obtained through the speed limit changes, strong evidence is available to counter this misperception.

With this strong support (almost 3 times as many people supporting the initiative as opposing it), the survey was a useful way to demonstrate the positive community sentiment towards the trial. These results run counter to the common myth that appropriate speed limits that match the road environment would be viewed negatively by the broader community. The project's success has led to the permanent adoption of the lower speed limits on the trial roads in Mornington Peninsula Shire.

The result regarding increased level of support after the speed limit change from the 2012/13 survey is also interesting, and this outcome has been repeated in other surveys following speed limit changes in New Zealand and Australia (also see Section 3.3).

4.6.3 Conclusion

Evidence of community support for change is useful when convincing decision-makers about the need for change. This information can assist with the initial implementation of the changes as well as ongoing improvements. Survey results also provide useful information on reasons for support or opposition to change, and this can help to more effectively target information to address misperceptions.

4.6.4 References

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Pyta V and Pratt K (2013) *Peninsula SaferSpeeds project: Final analysis*, ARRB Group Ltd, Vermont South, Victoria, accessed 18 February 2025.

Pyta V, Pratt K and Bradbrook D (19–22 October 2014) 'Evaluation of Peninsula SaferSpeeds – Speed limit reduction and community perceptions' [conference presentation], *26th ARRB Conference*, Sydney, NSW.

5. Other Supporting Activities and Measures

This section provides examples of the growing community demand for speed limit change and how this 'bottom-up' support can be harnessed to present a compelling case for change to decision-makers. The section also outlines other measures to support speed change, including mitigation measures for emergency services, low-cost infrastructure interventions, additional signage with reasons for speed change and tools to simplify speed limit setting.

5.1 Community-led action for change

Key finding

There is growing demand from the community for safer speeds. It is important to harness community sentiment through active engagement with community groups to help shape speed limit policy and change.

5.1.1 Description of activity

Historically, speed limit changes have been predominantly a top-down process managed by government authorities and traffic management professionals. However, in recent years there has been a significant shift towards community engagement and grassroots movements advocating for safer, more liveable streets. This shift is particularly evident in urban areas where the impact of high-speed traffic on safety and overall quality of life is of increasing interest.

Community-led initiatives have increased globally, with notable examples from Europe, North America and Latin American cities. Cities like London and Paris have seen substantial community involvement in advocating for lower speed limits. The '20's Plenty for Us' campaign in the United Kingdom (20's Plenty for Us n.d.), which promotes a speed limit of 20 mph (30 km/h) in residential areas, is a good example of a grassroots movement successfully influencing policy changes. This initiative has been widely adopted, with over 20 million people in the United Kingdom now living in areas with 20 mph limits. In the United States, New York City's Vision Zero initiative, which aims to eliminate traffic fatalities and severe injuries, has been strongly supported by local community groups. Organisations like Transportation Alternatives and Families for Safe Streets have been instrumental in pushing for lower speed limits and increased traffic calming measures in New York City, resulting in the city's default speed limit being reduced to 25 mph in 2014 (NYC DOT 2019).

In Bogotá, Colombia, and other Latin American cities, the concept of 'Ciclovía' has transformed Sundays and holidays into car-free days, allowing citizens to reclaim streets for walking, cycling and social activities. This community-driven initiative highlights the potential for grassroots efforts to influence urban mobility policies (Sarmiento et al. 2017).

In Australia and New Zealand, community groups and individuals are increasingly advocating for lower speed limits, mirroring trends seen internationally. The push for change is often driven by concerns over road safety, environmental impacts and the desire for more liveable urban environments.

5.1.2 Outcomes

Mullalyup, Western Australia

One specific example of community-led change comes from the small town of Mullalyup in the South West region of Western Australia. The town faced issues with high-speed traffic, including logging trucks. This raised significant safety concerns among residents, particularly in the town centre where people walk, shop and socialise. The key player in the community's push for safer speeds has been Erwin Gerritsen-Kieft, a local business owner. Erwin mobilised the community to workshop ideas to reduce speeding and improve safety in Mullalyup. This initiative has received support from the WA Road Safety Commission, the WA Royal Automobile Club (RAC) and the Shire of Donnybrook-Balingup (Town Team Movement 2024).

The primary concern in Mullalyup was the danger posed by high-speed traffic through the town centre. Residents felt unsafe while walking or cycling, and the presence of heavy vehicles increased these fears. The community believed that reducing vehicle speeds would not only enhance safety but also make the town a more pleasant place to live, work and visit.

Erwin Gerritsen-Kieft led the community engagement efforts. He organised workshops and discussions to gather ideas and build consensus on the need for speed reduction. The *Safer Speeds & Better Places Community Toolkit* provided a structured approach, offering insights into the impact of speed and the benefits of community-led actions (Town Team Movement 2024).

The community decided to implement a series of placemaking interventions aimed at slowing down traffic and enhancing the town's appeal. These included:

- Asphalt murals, inspired by the successful implementation elsewhere in Western Australia, which create visually striking road murals. Studies have shown that such murals can reduce speeding.
- Beautification projects, including adding trees, parklets, playgrounds, art installations, gardens and improved lighting. These measures aim to create a more attractive environment that naturally encourages slower driving speeds.
- Creation of ‘inglenooks’, or small, landscaped seating areas that provide spaces for social interaction and increase the visibility of pedestrians (Town Team Movement 2024).

The initial phase of the project has shown promising results. Traffic speeds through the town centre have decreased, and the community feels safer and more connected. The beautification efforts have also attracted more visitors, benefiting local businesses. The project is ongoing, with further interventions planned to sustain and build on these improvements. Mullalyup's experience will be closely monitored and documented to provide a model for other small towns facing similar challenges. The community plans to continue its engagement with local and state authorities to ensure ongoing support and funding for the project.

The *Safer Speeds & Better Places Community Toolkit* is a resource developed by the Town Team Movement in collaboration with the Road Safety Commission of Western Australia. Launched as part of a three-year program (2023–2025), the toolkit aims to educate and empower communities to take proactive steps in reducing vehicle speeds and enhancing the liveability of their local streets. The initiative focuses on building community knowledge about the impact of speed on road safety and providing practical guidance for community-led actions.

The toolkit provides guidance on several key issues, including the impact of speed on road safety in Western Australia, and the benefits of speed reduction in relation to health, safety, the environment, community wellbeing, economic factors and others.

The toolkit features various case studies showcasing successful community-led initiatives. These examples provide inspiration and practical insights for other communities looking to implement similar projects (Town Team Movement 2024).

Students Against Dangerous Driving, New Zealand

Students Against Dangerous Driving (SADD) is a New Zealand youth-led organisation that has been influential in advocating for lower speed limits around schools and residential areas. In December 2023, national leaders presented their concerns about speeds around schools at an Auckland Council Transport and Infrastructure Committee meeting (SADD 2023). Their advocacy included well-researched information on safety related issues to raise awareness of the dangers of high speeds near schools. The involvement of SADD contributed to a significant decision for change in Auckland. Auckland Council endorsed a new speed management plan, proposing a reduction in speed limits to 30 km/h around 40% of the city's schools. Furthermore, the initiative has fostered a culture of road safety awareness among young people, potentially encouraging more students to walk and cycle safely to school.

Bike Point Chev, Auckland

Also in Auckland, the Bike Point Chev group has been prominent in advocating for reduced speed limits in the Point Chevalier ('Pt Chev') area. Bike Point Chev is a community organisation dedicated to promoting safer, more active transportation options. The Pt Chev community was concerned about traffic safety, especially for children travelling to and from school. Their concerns focused on the 'bird streets' – streets named after New Zealand birds that include Huia Road, Kiwi Road and Tui Road. The bird streets in Pt Chev are heavily used by children walking and cycling to school. However, these streets had become dangerous due to their use as 'rat runs' by commuters seeking shortcuts, leading to high traffic speeds and volumes. Bike Point Check collaborated with local schools and parents to advocate to Auckland Transport (AT) for speed calming measures in the area. The group reported that, in 2019, 6 young children coming out of driveways were hit by cars, highlighting the urgent need for traffic calming.

Bike Point Chev conducted extensive community engagement to gather support for their cause. A rapid survey conducted over 48 hours received responses from 120 households, representing 550 individuals. The survey highlighted widespread concern over traffic speeds and safety in the bird streets. The feedback revealed numerous accounts of dangerous driving, near misses and actual crashes, reinforcing the need for action.

The group presented their findings and demands at public hearings for the proposed AT speed limits bylaw changes in 2022. They advocated for including the bird streets in upcoming speed limit changes (Bike Point Chev 2022). The group emphasised that, without intervention, there was an elevated chance of death or serious injury (DSI) for vulnerable road users due to speed.

Following the advocacy efforts, AT included the bird streets in their consultation on 30 km/h speed reductions, and this change was ultimately supported by their local board.

5.1.3 Conclusion

This case study topic has outlined the evolving role of community groups in advocating for lower speed limits, highlighting international trends and providing examples from Australia and New Zealand. The positive outcomes from these case studies underscore the importance of community engagement in shaping traffic policies that enhance road safety and urban liveability.

5.1.4 References

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5.2 Engagement with emergency services

Key finding

There is sometimes reluctance to lower speeds in urban areas due to a perceived impact on emergency vehicle response times. This impact is most likely overstated, and there are measures that can be taken to minimise impacts.

5.2.1 Description of activity

This case study topic explores the perceived and actual impacts of reduced speed limits on emergency response times in Australia and New Zealand. The perception is that lower speed limits negatively impact response times for emergency services such as ambulances, fire trucks and police vehicles. However, evidence suggests that, with careful planning and strategic interventions, these negative impacts can be mitigated, especially when road agencies work together and engage with emergency providers. This case study topic examines how reduced speed limits might influence response times and then provides case studies and results from New Zealand.

Emergency response times are critical in life-threatening situations. The response time is the period between receiving a call and arriving at the scene. Various factors influence response times, including road conditions, traffic congestion and speed limits. Lower speed limits are often perceived to increase travel time for emergency vehicles, potentially delaying critical interventions.

Many cities have implemented traffic signal pre-emption systems, which allow emergency vehicles to control traffic signals and reduce delays at intersections. This technology has proven effective in maintaining quick response times despite lower speed limits. It is also notable that emergency vehicles typically slow at intersections, as these are conflict points during emergency responses. Drivers slow at these locations to ensure that other vehicles have seen them before proceeding. This means that traffic calming measures at intersections have more limited impact on response times than is often assumed. Another way to ensure emergency vehicles can bypass traffic is to create dedicated lanes for them in congested areas. Real-time traffic monitoring systems enable emergency services to choose the fastest routes for the traffic conditions at the time.

5.2.2 Outcomes

In Auckland, a reduction of speed limits in the central business district was initiated to enhance pedestrian safety. As part of its Speed Management Plan, Auckland Transport (AT) worked closely with emergency services. This collaboration included establishing shared principles for community safety and involving emergency services in discussions about speed limit changes and broader strategic network planning.

Additionally, AT has integrated emergency service considerations into design documents for raised safety platforms. These platforms are designed to reduce vehicle speeds while maintaining safe and efficient routes for emergency services. AT also worked with emergency services to implement a system for a ‘green wave’, or coordination of traffic signals near the central fire station to give priority to fire appliances, assisting with faster travel times.

A study prepared for Fire and Emergency New Zealand found that, while traffic calming measures like speed tables could theoretically slow emergency response times, actual impacts were minimal. The study highlighted that overall emergency response speeds in Auckland have gradually decreased due to various factors, but specific traffic calming interventions did not significantly contribute to these changes (MRCagney Ltd 2023).

5.2.3 Conclusion

There is sometimes a perception that reduced speed limits significantly hinder emergency response times, but this is not supported by evidence from New Zealand. While lower speed limits may marginally increase travel times, strategic planning and the implementation of various mitigation measures can effectively address these challenges. Traffic signal pre-emption, dedicated lanes, real-time traffic monitoring and careful consultation help ensure that emergency response services remain efficient and effective despite reduced speed limits. These findings highlight the importance of a holistic approach to road safety and emergency service planning, demonstrating that lower speed limits can coexist with efficient emergency response systems. However, it is important that road agencies and emergency services continually work together to better understand each other's objectives and concerns.

5.2.4 References

MRCagney (NZ) Ltd (2023) *Traffic calming and effective response speeds*, Fire and Emergency New Zealand Research Report Number #201, FENZ website, accessed 17 February 2025.

5.3 Low-cost speed infrastructure treatments to support speed change

Key finding

In some cases, there is a need to support reduced speed limits with infrastructure measures to help with road user compliance. Cost of this infrastructure can be a barrier to change, but there are emerging low-cost interventions that can be used.

5.3.1 Description of activity

Infrastructure can be a key supporting measure to help support speed compliance and provide broader road safety improvements. Effective infrastructure measures can significantly reduce vehicle speeds, reduce traffic crashes and enhance the overall safety of road users. Recent advancements have led to the development of various low-cost infrastructure measures aimed at supporting lower speed limits. These innovations are useful given limited budgets. This case study topic covers examples from urban and rural settings. Information is provided on compact roundabouts, vehicle-activated speed limits and low-cost traffic calming measures.

5.3.2 Outcomes

Compact roundabouts in Victoria

In Victoria, compact roundabouts have been installed in various urban and rural locations, including Mildura and Mornington Peninsula Shire. These roundabouts are designed to fit into smaller spaces and are constructed at a lower cost compared to traditional roundabouts. Compact roundabouts also have other potential benefits, including less environmental impact, avoiding or minimising land acquisition, reduced need for utility service relocation and shorter delivery timeframes.

Typical rural roundabouts provide safety benefits because they reduce conflict points, decrease angles of impact and reduce speeds. This speed reduction is from the introduction of ‘deflection’ (a ‘reverse’ curve in the road) on the approach to the roundabout, and while travelling through the roundabout (a large central island that forces motorists to slow).

Compact roundabouts produce the required speed reduction differently. Vertical deflection, including raised platforms and humps in advance, are used to create the required speed reduction. Because these roundabouts need less space, they can be installed at much lower cost.

As part of the Australian Government’s Roads to Recovery Program, Mornington Peninsula Shire installed a compact roundabout at the intersection of Merricks Road and Stanleys Road in Merricks. The intersection had been identified as high risk, with 5 crashes over a 10-year period. Improvements included installation of a compact roundabout, with 2 raised safety platforms on each approach to slow vehicles, as well as advance warning signage and additional street lighting. Based on community concerns and consultation, ramp grades and positions were adjusted, and amendments were made to the roundabout apron and central island. The estimated cost was $1.4 million. This is considerably less than a traditional rural roundabout at this location, which would have been around double the cost. Recently constructed, the site is now being monitored to determine impacts.

Figure 5.1: Compact roundabout, Victoria

Source: Author.

Source: Mornington Peninsula Shire.

Evaluations of compact roundabouts have identified the significant benefits from these treatments. They have effectively reduced vehicle speeds at intersections, leading to reduced likelihood of high-speed collisions and reduced severity of injury outcomes when things do go wrong. Evaluations have shown a significant decrease in the number of crashes at intersections where compact roundabouts have been implemented. For example, in Mildura, the introduction of compact roundabouts has led to a 30% reduction in intersection crashes.

Significant benefits were also identified at Lance Creek in Victoria. At this location, 4 casualty crashes were recorded in the five-year period before installation, with 3 of these resulting in serious injuries. In the three-year period after construction, there were no reported crashes. On the main through route, the 85th percentile speed reduced from 76 km/h to 34 km/h, well below the speed threshold where severe injury to car occupants typically occurs if things go wrong and vehicles collide (Regional Roads Victoria 2020 and Department of Transport 2021).

Vehicle-activated speed limits at intersections in South Australia

High-speed rural intersections pose significant safety risks due to the potential for severe collisions between vehicles. Traditional static signs are often insufficient in mitigating these risks. Vehicle-activated speed limits are a type of variable speed limit (VSL) signs that have been used in New Zealand and Australia for many years. They are electronic signs that alert drivers on the main road in rural areas to vehicles approaching on a side road. The systems aim to reduce vehicle speeds when there is a high potential for collisions, thus enhancing safety at an intersection. In situations where vehicles are approaching, the electronic speed signs display a lower speed limit on the main road. This intervention has proven highly effective. For example, New Zealand evaluated these signs at 21 intersections and found that they resulted in a mean speed reduction of 3 to 10 km/h when the VSL signs were activated. There was a 69% reduction in fatal and serious injury crashes at the sites, compared to an increase at control sites without the system (Thorne and Mackie 2020). However, the requirement for different sensors and signage can also make VSLs costly and because of this, they are used sparingly.

South Australia has implemented a low-cost variant of vehicle-activated speed limits at several intersections, termed the ‘Rural Junction Active Warning System’ (RJAWS Lite). When the system detects vehicles approaching from the side road, it activates flashing lights (or ‘wig wags’) and indicates that a lower speed of 50 km/h is advised while these lights are flashing. This system retains the core functionality of full VSL installations but uses simpler and more cost-effective technologies, such as off-grid solar power and wireless communication. An added advantage of the system is the secondary warning on the minor road that flashes the border of a Stop or Give Way sign if it detects that a vehicle is not sufficiently decelerating on approach to the intersection. The system is also able to be moved.

Evaluations at the sites indicated that the mean speed reduction ranged from 11.3 to 22.1 km/h when the signs were activated, resulting in a 42% to 65% reduction in the risk of casualty crashes when the system was active (Mongiardini et al. 2021; Stokes and Mongiardini 2022, unpublished). The cost for the system was $70,000 for three-leg intersections and $100,000 for four-leg intersections, significantly lower than the $350,000 to $420,000 cost of full installations.

Figure 5.2: RJAWS Lite, South Australia

Source: Brett Williams, City of Onkaparinga.

Traffic cushions instead of raised pedestrian 'wombat' crossings, Queensland

Raised pedestrian crossings are a highly successful intervention for addressing pedestrian safety. Termed 'wombat crossings' in Australia, these utilise raised sections of road and provide priority to pedestrians as they are combined with zebra crossing markings. They have the benefit of slowing the traffic at the crossing location so that, if a collision does occur, it will be at low speed and typically result in minor injury only. The crossings also improve safety as they provide a more visible crossing location, easier access from the footpath (crossings are typically at the same level as the path) and a narrower crossing distance when coupled with kerb extensions. Although highly effective, they are also used sparingly due to the cost.

As a lower cost alternative, traffic cushions have been installed in Queensland to slow down vehicles in advance of zebra crossings. These cushions are placed to ensure vehicles reduce their speed before reaching pedestrian crossing areas.

Sunshine Coast Council installed traffic cushions at a pedestrian crossing on a route to a school. Before the installation, average speeds at the crossing were 46 km/h in each direction, with 85th percentile speeds of 59 km/h westbound and 55 km/h eastbound. After the installation, the average speed dropped to 22 km/h in each direction, and the 85th percentile speed reduced to 30 km/h westbound and 31 km/h eastbound. This significant reduction in speeds demonstrated the effectiveness of the speed cushions in enhancing pedestrian safety at the crossing (also see Section 3.4). The cost to retrofit speed cushions at the site was less than $20,000, considerably less than a raised crossing.

Figure 5.3: Traffic cushions, Queensland

Source: Compass IoT (n.d.), from study conducted by Prue Oswin, Sidelines Traffic.

5.3.3 Conclusion

In some cases, lower speed limits need to be supported with infrastructure measures to improve road user compliance. New low-cost interventions can be used to help reduce the cost of these interventions.

5.3.4 References

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Stokes C and Mongiardini M (unpublished) ‘Evaluation of a low-cost vehicle-activated system to reduce the risk of casualty crashes at rural intersections in South Australia’, Centre for Automotive Safety Research, University of Adelaide, Adelaide, South Australia.

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5.4 Measures to support acceptability of speed cameras

Key finding

Speed cameras are highly effective but not always supported by the community. Steps can be taken to help the community understand the benefits of speed cameras and increase the level of support for this intervention.

5.4.1 Description of activity

Speed cameras are a useful intervention in addressing speed-related safety issues. Their primary purpose is to reduce speeding by acting as a deterrent, encouraging drivers to adhere to speed limits and promoting safer driving behaviours. Research consistently shows that speed enforcement through cameras reduces crashes, ultimately saving lives and reducing severe injuries.

Despite their proven benefits, speed cameras often face public resistance. Concerns about revenue-raising motives, privacy and fairness can undermine their acceptability. Therefore, it is essential to implement measures that address these concerns and enhance public support for speed cameras.

Different states and territories in Australia, as well as New Zealand, have adopted various strategies to improve the acceptability of speed cameras. These measures aim to address public concerns, increase transparency and demonstrate the safety benefits of speed cameras.

5.4.2 Outcomes

Responsiveness to public demands

The news is not all negative about the use of speed cameras. Indeed, in South Australia, speed cameras were reinstated at a specific location due to public demand. The cameras were removed because of public perceptions of revenue raising, but they were reinstalled after community members recognised their effectiveness in reducing speeding and crashes. In Clunes, New South Wales, the local community lobbied for several years for the installation of a speed camera. Feedback from local residents indicates that the speed camera has made a ‘world of difference’ and that it would have saved many lives. These examples underscore the importance of community engagement and responsiveness to public concerns in the deployment of speed cameras.

Figure 5.4 Residents fight for speed camera – Sydney Morning Herald article


Residents rally against removal of hard-won speed camera

Source: Smith (2011).

‘Period of grace’, Victoria

One example of a measure to increase the acceptability of speed cameras is to implement a 'period of grace' for new speed camera sites. In Victoria, this approach involves installing speed cameras but not activating them immediately. During this period, warning signs are placed and information campaigns are conducted to inform the public about the upcoming enforcement. This strategy allows drivers to adjust their behaviour without immediate penalties, fostering a sense of fairness and giving the public time to understand the rationale behind the camera installation.

Addressing concerns about ‘revenue raising’

Other methods provide greater transparency about the collection and use of revenue from speed camera fines. Western Australia employs a policy of hypothecation, which reinvests all revenue collected from speed camera fines into road safety initiatives. This transparent use of funds helps counter the perception that speed cameras are merely revenue-raising tools. By clearly linking fines to tangible road safety benefits such as road improvements, education campaigns and enforcement activities, the state demonstrates its commitment to enhancing road safety. Similarly, Queensland provides details on costs and revenue from their Camera Detected Offence Program. This information is included in the Transport and Main Roads Annual Report, and highlights that revenue is hypothecated (or dedicated) to road safety related activities.

Most states conduct audits of speed camera operation and outcomes in an attempt at transparency and to ensure fairness. For example, in South Australia, speed cameras were subject to an extensive audit and community consultation process to ensure their effectiveness and address public concerns about revenue raising. In 2018, the newly elected state government committed to conducting an audit of traffic cameras within the first 100 days of gaining office. The audit aimed to verify that speed cameras were operating for safety purposes rather than as revenue-raising tools. Community consultation was a significant component of the audit. Conducted via the YourSAy website (DPC n.d.), the consultation invited public opinions on speed cameras and their placement. A total of 342 people logged onto the online survey, with 240 answering specific questions. The consultation revealed a divided public opinion: 33% were supportive of speed cameras, while 28% were non-supportive. A notable concern was the placement of cameras on downhill slopes, which many viewed as a revenue-raising rather than a safety measure.

The audit report indicated that speed cameras generally reduced speeding and crashes at their locations. However, it identified 2 cameras at locations with no significant crash history that the community perceived as primarily revenue-raising. These cameras were switched off in January 2019 for a trial period. Subsequent speed monitoring revealed a significant increase in speeding at one of the decommissioned sites, leading to the reinstatement of that camera in 2021.

Following the audit, South Australia established a dedicated website to provide transparent information about speed cameras. This site includes details on the purpose of cameras, their locations and the criteria for their placement. By making this information publicly accessible, the government aims to build trust and demonstrate the safety-oriented rationale behind speed camera use.

Reviews to ensure effectiveness and fairness

The NSW Government conducts annual reviews of its speed camera program to ensure the system's effectiveness and fairness. The results from the NSW reviews are published in comprehensive reports, which include detailed statistics and analyses. By making these reports publicly available, the NSW Government enhances transparency and accountability. The documented improvements in road safety and clear evidence of the cameras' effectiveness bolster public confidence in the system (Transport for NSW 2023c). Prepared by the NSW Centre for Road Safety, the annual review is a comprehensive assessment of various speed camera programs, including fixed, red-light, average and mobile speed cameras.

The annual reviews are undertaken for several key reasons, including to:

- improve accountability and integrity (verifying that speed cameras are functioning correctly and enforcing speed limits fairly)
- evaluate performance (to assess the impact on speeding behaviour),
- demonstrate transparency (providing the public with clear, accessible information about the effectiveness of speed cameras), and
- ensure continuous improvement (to identify areas for improvement and implement necessary changes based on data-driven insights).

The outcomes from the 2021 review included detailed findings across different types of speed camera programs in New South Wales (Transport for NSW 2023c). The review identified that for fixed cameras, there was a 62% reduction in fatalities, a 48% reduction in injuries, and a 43% reduction in casualty crashes compared to the five-year period before installation. The reduction in road trauma represented a saving of $579 million to the NSW community over the five-year period from 2016 to 2020. Over 99% of vehicles passing fixed speed cameras complied with the posted speed limit in 2020. Red-light speed camera locations experienced a 79% reduction in fatalities, a 39% reduction in serious injuries and a 50% reduction in overall injuries. Pedestrian casualties were also significantly reduced by 66%. The reductions in road trauma at these locations saved $339 million over the same period.

Average speed camera locations, used primarily for heavy vehicles, showed a 53% reduction in fatalities, a 14% reduction in serious injuries and a 26% reduction in injuries. The financial savings from reduced road trauma at these locations amounted to $175 million. Compliance rates for heavy vehicles passing these cameras remained high, with over 99% adhering to the speed limits.

The mobile speed camera program also contributed to a reduction in road trauma across the NSW road network. Annual speed surveys showed a general decrease in the proportion of vehicles exceeding the speed limit since the program's reintroduction in 2010. In 2020, the offence rate per vehicle checked was 0.19%, indicating high compliance.

Annual reviews of speed camera programs in New South Wales play a crucial role in maintaining their effectiveness and public trust. The 2021 review highlighted substantial reductions in road trauma and demonstrated significant financial savings to the community. By providing transparent, data-driven insights, the NSW Government ensures ongoing support for speed camera enforcement as a vital component of road safety strategy.

In Queensland, annual reviews of speed cameras are conducted to ensure the proper functioning of the cameras, assess their impact on speeding and crash rates and provide data-driven insights to guide future road safety initiatives. As part of this assessment, the Department of Transport and Main Roads (TMR) procures an independent evaluation of the Camera Detected Offence Program (CDOP). The latest evaluation (examining data from 2020–2021) demonstrated that the CDOP is associated with sustained crash reductions, with correspondingly large economic benefits to the community (Newstead et al. 2023). Both fixed and mobile elements of the program produced significant crash reductions, while crash effects associated with red-light cameras, combined speed and red-light cameras, point-to-point speed cameras, tunnel cameras and road safety camera trailers were robust. In contrast, the evidence of effectiveness for some fixed camera types, including fixed mid-block spot speed cameras and recently installed intersection speed and red-light cameras, remains weaker due to insufficient post-implementation history and small number of camera installations.

Despite the expansion of the number of fixed cameras in use under the CDOP, the mobile camera program continues to produce around 91–93% of the measured benefits (in terms of casualty crashes) associated with the program, reflecting the high proportion of the crash population it covers. Overall, crash reductions in Queensland associated with the CDOP were 7.1% for serious casualty crashes and 6.9% for all casualty crashes in 2020, and 8.7% for serious casualty crashes and 8.2% for all casualty crashes in 2021. It was estimated that CDOP was associated with absolute casualty crash savings of 897 in 2020, of which 457 were fatal or serious injury crashes, and 1,191 casualty crashes saved in 2021, of which 621 were fatal or serious injury crashes. These estimated crash savings correspond to community cost savings of around $503 million in 2020 and $678 million in 2021, valued using willingness-to-pay crash costs in 2021 dollars.

Transparent reasons and methodology

Other Australian states and New Zealand provide comprehensive information on their websites about the reasons for using speed cameras and the robust processes for site selection. These processes are typically based on crash risk, ensuring that cameras are placed in locations with a demonstrated need for speed enforcement. By transparently communicating the criteria for site selection and the expected safety benefits, these jurisdictions build public trust and support for speed camera programs.

For example, the Queensland Government outlines a detailed methodology for selecting speed camera sites, including crash history analysis, speed surveys and community feedback. Similarly, the New South Wales Government provides extensive information on the purpose of speed cameras, their operational guidelines, and the process for public reporting and review (NSW Government 2025).

Victoria has a website dedicated to their road safety camera program, including for frequently asked questions about speed cameras (Victorian State Government 2023).

5.4.3 Conclusion

The acceptability of speed cameras is crucial for their effectiveness in improving road safety. Measures such as periods of grace before operation, hypothecation of collected funds, responsiveness to public demand, and transparency in site selection processes play vital roles in addressing public concerns and enhancing support for speed cameras.

5.4.4 References

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Victoria State Government (2023) *Frequently asked questions about road safety cameras*, Victorian Government website, accessed 18 February 2025.

5.5 Simplifying the speed limit setting process

Key finding

The speed limit setting process can be a barrier to change, especially for local government. Simpler speed limit setting methods can help address this issue.

5.5.1 Description of activity

The setting of speed limits plays a crucial role in ensuring improved road safety. The process of setting speed limits can be cumbersome, especially for local government, as it often involves collection of multiple sources of data and navigating different processes for approval from state road agencies. This can make it challenging to respond promptly to community demands for safer speeds.

Local governments in Australia and New Zealand are required to balance multiple tasks when addressing community needs, including road safety. The process of setting speed limits varies between states and in New Zealand, but it usually requires approvals from state or territory agencies. The regulatory power to set speed limits on local roads sits with local councils in New Zealand and is delegated to an extent in Queensland. Regardless of the process, meeting the requirements for change may involve extensive consultation, technical assessments and approvals from various stakeholders, including state or national road authorities. This complexity can delay the implementation of necessary changes, frustrating communities that demand safer speeds.

Simplifying the speed limit setting process can improve responsiveness to community needs, improve efficiency and resource management (especially given these resources are often very limited), improve road safety outcomes and improve community trust and engagement.

State, territory and national agencies (in New Zealand) have made various attempts at simplifying the speed limit setting process to address this issue.

5.5.2 Outcomes

New South Wales updated guidance on 30 km/h speed limits

In New South Wales, the Centre for Road Safety under Transport for NSW has implemented measures to simplify the speed limit review process (Centre for Road Safety 2025). The introduction of the NSW Speed Zoning Standard has simplified the process for local governments to implement 30 km/h speed limits in high pedestrian activity areas. This change was driven by the need to create safer environments for pedestrians in areas with significant foot traffic, such as shopping precincts, town centres and school zones.

The new standard specifies that 30 km/h speed limits should be applied in areas with high pedestrian activity and low traffic movement, avoiding major arterial routes. The criteria for setting these limits include ensuring that there is only a single lane of travel in each direction and that pedestrian crossing distances are minimised. Additionally, the standard recommends using traffic calming measures such as gateway treatments, vertical and horizontal deflections and enhanced pedestrian crossing facilities to ensure compliance with the reduced speed limit. The simplification of the process in New South Wales has led to several successful implementations of 30 km/h zones.

South Australia revised guidance on consultation

In August 2017, South Australia's Department for Infrastructure and Transport released the Speed Limit Guideline for South Australia (Department for Infrastructure and Transport 2023). This document removed the previous requirement for councils to achieve a 30% response rate to public consultation with two-thirds of respondents supporting a speed limit change on local roads. This requirement was first specified in April 2000 based on the experience gained from the implementation of 40 km/h areas since 1991.

Feedback from councils indicated that the requirement for community response and support rates was onerous and costly to meet, and that councils wished to be empowered to conduct their own assessment of community support for such proposals. The new guideline simplified the process for councils and gave them more flexibility to conduct their own assessment of the suitability of the speed limit on their streets while still emphasising the importance of community support for successful implementation.

The outcome from this change is that councils now see the speed limit setting process as less onerous and costly. Councils also feel they have more freedom and greater flexibility to set local speed limits.

5.5.3 Conclusion

Simplifying the speed limit setting process is essential for local governments to effectively respond to community demands for safer speeds. The experiences of New South Wales and South Australia demonstrate that streamlined processes can lead to quicker implementation of speed limit changes, resulting in improved road safety outcomes. By reducing administrative burdens and focusing on rapid assessment and approval, local governments can enhance their ability to protect road users and foster community trust.

5.5.4 Reference

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Department for Infrastructure and Transport (2023) *Speed limit guideline for South Australia*, Government of South Australia, Department for Infrastructure and Transport website, accessed 18 February 2025.

5.6 Speed limit setting tools

Key finding

Various tools exist to help in the setting of speed limits. These tools provide data driven, efficient and consistent methods for determining appropriate speed limits and improve the reliability and confidence in the speed limit setting process.

5.6.1 Description of activity

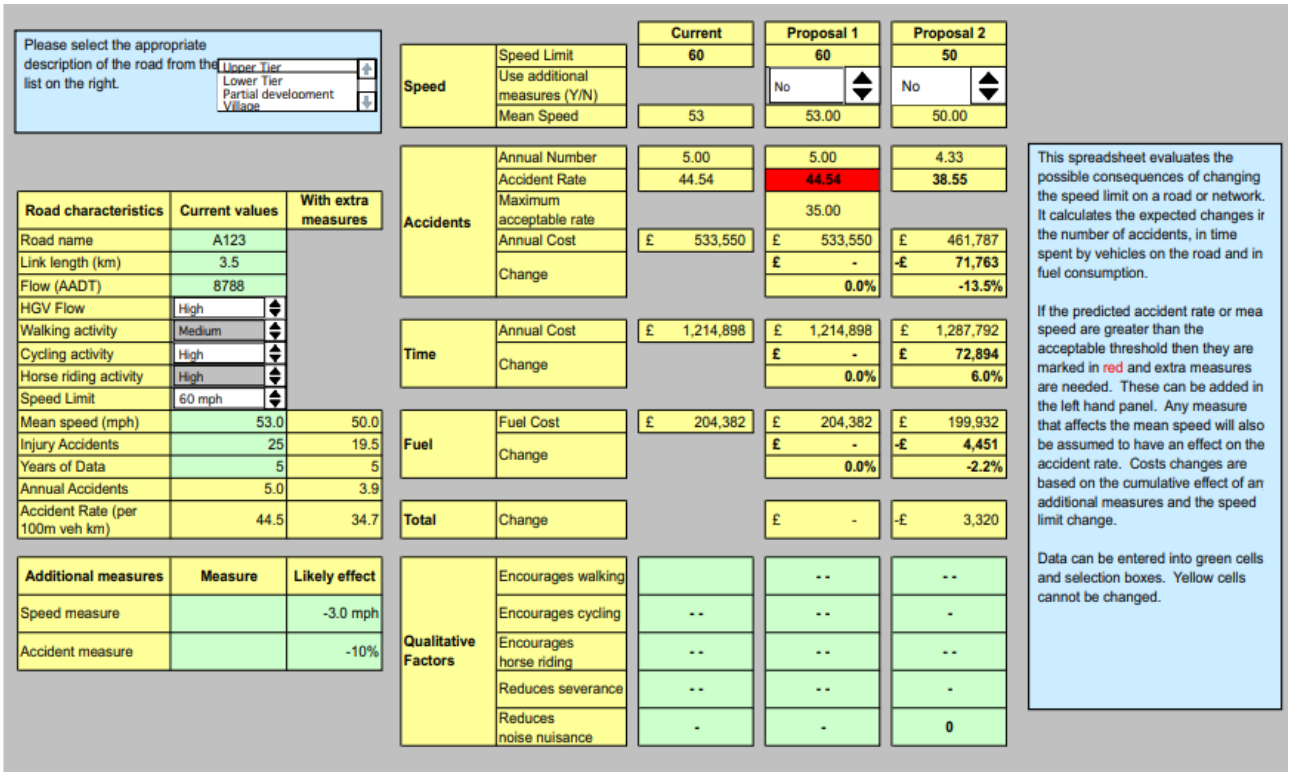
Setting safe speed limits is a critical component of road safety strategies worldwide. Various tools have been developed to assist authorities in determining the most suitable speed limits for different road segments. These tools utilise data analytics to provide evidence-based recommendations. This case study topic explores the use of these tools and provides examples from New Zealand and Australia.

The process of setting speed limits involves several factors, including road characteristics, surrounding land use and safety. Traditional methods for setting speed limits often rely on manual surveys and historical data. This can be time-consuming and may not provide a comprehensive view or may produce inconsistent results. Modern tools offer several advantages, including that they are data-driven, can be more efficient, provide consistency and may even help in providing predictive ability (such as for crash reduction). They may also help provide better linkage to other road management activity.

Several countries have adopted advanced tools to set speed limits, which has led to improved road safety outcomes. In the United States, for example, the Federal Highway Administration (FHWA) provides USLIMITS2, which gives speed limit recommendations based on road characteristics and crash data. This tool was adapted for use in the United States from earlier work in Australia (the xLIMITS tools). Essentially, these tools were applications that mimic the decision process used in jurisdictions based on policy (a decision tree approach to speed limit setting).

In the United Kingdom, the Speed Limit Assessment Framework was developed to help local authorities determine appropriate speed limits by considering road safety related factors (Department for Transport 2006). This tool also used a decision tree approach to capture key policy elements. The tool calculated the expected reduction in crashes from the change in speed and monetarised this. In addition, impacts on journey time, fuel use and emissions were also calculated, and change in costs calculated based on each.

Figure 5.5: UK speed assessment framework



Please select the appropriate description of the road from the list on the right. Upper Tier / Lower Tier / Partial development / Village

Road characteristics	Current values	With extra measures
Road name	A123	
Link length (km)	3.5	
Flow (AADT)	8788	
HGV Flow	High	
Walking activity	Medium	
Cycling activity	High	
Horse riding activity	High	
Speed Limit	60 mph	
Mean speed (mph)	53.0	50.0
Injury Accidents	25	19.5
Years of Data	5	5
Annual Accidents	5.0	3.9
Accident Rate (per 100m veh km)	44.5	34.7

Additional measures	Measure	Likely effect
Speed measure		-3.0 mph
Accident measure		-10%

		Current	Proposal 1	Proposal 2
Speed	Speed Limit	60	60	50
	Use additional measures (Y/N)		No	No
	Mean Speed	53	53.00	50.00
Accidents	Annual Number	5.00	5.00	4.33
	Accident Rate	44.54	44.54	38.55
	Maximum acceptable rate		35.00	
	Annual Cost	£ 533,550	£ 533,550	£ 461,787
	Change		£ -	-£ 71,763
			0.0%	-13.5%
Time	Annual Cost	£ 1,214,898	£ 1,214,898	£ 1,287,792
	Change		£ -	£ 72,894
			0.0%	6.0%
Fuel	Fuel Cost	£ 204,382	£ 204,382	£ 199,932
	Change		£ -	-£ 4,451
			0.0%	-2.2%
Total	Change		£ -	-£ 3,320
Qualitative Factors	Encourages walking		--	--
	Encourages cycling	--	--	-
	Encourages horse riding	--	--	--
	Reduces severance	--	--	-
	Reduces noise nuisance	-	-	0

This spreadsheet evaluates the possible consequences of changing the speed limit on a road or network. It calculates the expected changes ir the number of accidents, in time spent by vehicles on the road and in fuel consumption.

If the predicted accident rate or mea speed are greater than the acceptable threshold then they are marked in red and extra measures are needed. These can be added in the left hand panel. Any measure that affects the mean speed will also be assumed to have an effect on the accident rate. Costs changes are based on the cumulative effect of an additional measures and the speed limit change.

Data can be entered into green cells and selection boxes. Yellow cells cannot be changed.

Source: Department for Transport (2006).

5.6.2 Outcome

Speed management tool in Queensland and Northern Territory

Closer to home, the Department of Transport and Main Roads (TMR) in Queensland uses a spreadsheet-based tool to assist the setting of speed limits. It facilitates components of the nine-stage speed limit review process, as defined in the *Queensland Road Safety Technical User Volumes* (QRSTUV): *Guide to Speed Management* (TMR 2024).

This process requires a registered professional engineer to assess the real-world characteristics of the road section (for example, historical crashes, infrastructure attributes, observed vehicle speed), to code these attributes according to the literature and then use this data for inputs into the tool.

The tool itself represents a uniform approach to the objective risk assessment components of the review and combines several functionalities, including:

- providing decision logic for consideration of criteria-based speed limits
- data capture for road attributes such as infrastructure features, adjacent land use, crash and surveyed vehicle speed data
- calculation of risk metrics based for the road section
- providing the engineer with recommended speed limits for typical roads of that function and for that environment
- providing additional prompts for the engineer to consider speed limits suitable for the context of the road section.

Overall, the tool aims to assist the subjective and objective elements of the speed limit review process, with the goal of implementing consistent speed limits that are relevant in the diverse contexts across Queensland. The tool also assists with explaining the speed limit review outcomes to decision-makers who endorse or approve speed limit review recommendations.

A version of this tool has been adopted for use in the Northern Territory. Benefits of the tool are that it provides a consistent mechanism for the setting of speed limits using a standardised approach. This removes the perception of an occasionally subjective approach when setting speed limits, and so the results carry greater credibility.

MegaMaps, New Zealand

MegaMaps is a GIS-based tool developed by the NZ Transport Agency Waka Kotahi (NZTA 2025b). It provides a comprehensive assessment of road safety risks by integrating various data sources, including crash statistics, proactive risk rating score (infrastructure risk rating or IRR), traffic volumes, posted speed limits and advisory speed limits, average free-flow vehicle speeds (from TomTom data) and road geometry. Key features of MegaMaps include:

- Risk mapping: Identifies high-risk road segments based on historical crash data.
- Speed management: Recommends appropriate speed limits for different road segments to enhance safety.
- Scenario analysis: Allows authorities to model the impact of different speed limits on road safety outcomes.

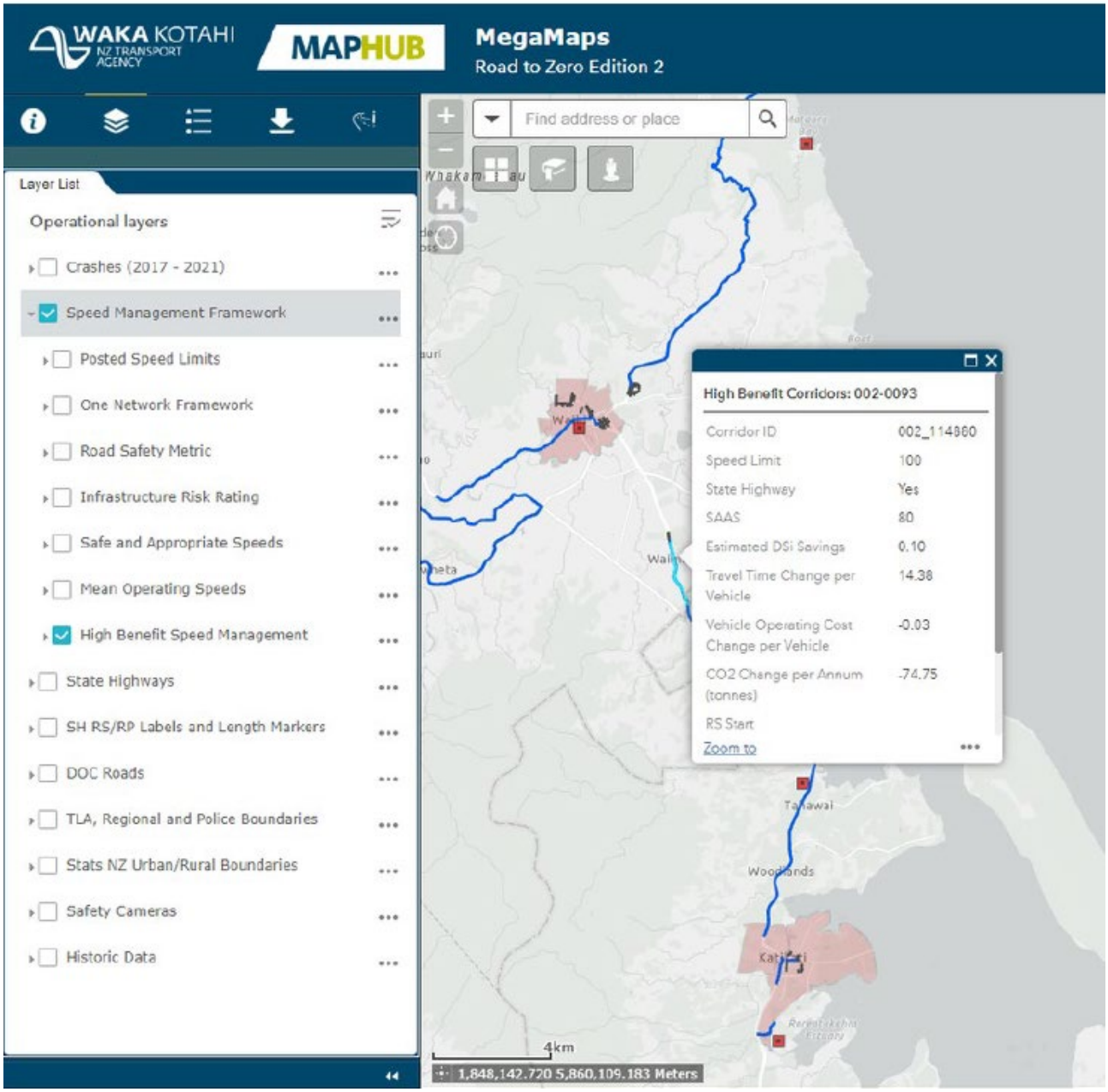
Another key feature of the tool has been its ability to generate the ‘safe and appropriate speed’ (SAAS) for a road segment based on the criteria specified in the *Speed Management Guide* (NZTA 2022b), using the data already within the system[5]. In addition, the tool can calculate the change in safety performance, travel time, vehicle operating costs (such as fuel use) and CO_2 emissions. These estimates are based on the expected change in travel speed resulting from a change in speed limit, using the existing mean free-flow travel speeds from TomTom data.

MegaMaps has been useful in providing data-driven decisions for speed management. It has been particularly effective in rural areas, where high-speed limits were previously a significant risk factor. The tool's data integration allows for precise identification of high-risk areas and appropriate speed limits, leading to significant improvements in road safety.

By using real-time data and analytics, MegaMaps produces more accurate and reliable recommendations compared to traditional methods. It also provides an automated data processing and analysis approach that significantly reduces the time and resources required for speed limit assessments.

[5] MegaMaps is due to be updated to reflect the Land Transport Rule: Setting of Speed Limits 2024. As part of this update, some of these features will be removed to reflect the new rule.

Figure 5.6: MegaMaps, New Zealand



Source: NZ Transport Agency (2025b).

5.6.3 Conclusion

Tools for setting speed limits are useful for enhancing road safety. These tools provide data-driven, efficient and consistent methods for determining appropriate speed limits, ultimately improving the reliability and confidence in the speed limit setting process. The examples from New Zealand and Australia demonstrate the effectiveness of using a data-driven approach.

5.6.4 References

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5.7 Vehicle speed monitoring systems

Key finding

In-vehicle speed monitoring systems can help with speed compliance and help improve safety outcomes. Greater use would improve safety, including for fleets and heavy vehicles.

5.7.1 Description of activity

Telematics systems use GPS technology and onboard diagnostics to monitor and transmit data on vehicle location, speed and other operational characteristics. These systems are installed in vehicles or mobile phones and monitor driver behaviours including speed, often in real-time.

Telematics systems are widely adopted across various industries to enhance safety, improve efficiency and reduce operational costs. Companies use telematics to monitor fleet performance, ensure compliance with safety regulations and optimise route planning. The technology is used by trucking companies to help ensure the safe and efficient movement of freight, and businesses and organisations with large vehicle fleets to help monitor employee safety.

Vehicle monitoring, including driver speed, can potentially improve safety outcomes. This can occur through self-regulation of driver behaviour, on the assumption that drivers who know they are being monitored will improve their levels of compliance. Alternatively, it can be used to identify drivers who are unsafe and allow opportunities for training, or to apply penalties if the adverse behaviour continues.

Although crash savings are a key benefit from the use of monitoring systems, there may also be other benefits. Reducing speeds, or less acceleration and deceleration can lead to lower fuel consumption, reduced wear and tear on vehicles and decreased maintenance costs (see Section 2.3). It may also result in less damage to freight (for instance, for fragile items) and improve organisational reputation.

5.7.2 Outcomes

Safer Together IVMS standard, Queensland

This is an area where industry is already self-regulating, with companies seeing the commercial and broader benefits from such systems. For example, the Queensland Natural Gas Exploration and Production Industry Forum (partnering as the ‘Safer Together’ organisation) have produced guidelines for the use of in-vehicle monitoring systems (IVMSs). For Safer Together members and their contractors, IVMSs are required for both heavy and light vehicles operating in rural or remote areas. A high-level minimum standard of IVMS requirements has been developed (Safer Together 2020). This includes that the IVMS unit must be securely and permanently fixed into the vehicle; that exceeding the speed limit by 5 km/h or more be recorded as an ‘event’, and that 5 km/h or greater over the speed limit for 5 or more seconds should be a ‘reportable event’. In both cases, the unit must record the maximum speed.

NSW Government fleet telematics policy

The NSW Government implemented telematics across its public service vehicle fleet to enhance safety and compliance. The comprehensive Travel and Transport Policy, updated in 2021, provides a framework for official travel, emphasising safety, risk mitigation and cost-effectiveness (NSW Government 2021). The NSW Government Fleet Telematics Policy mandates the use of telematics to gather data on vehicle location, driver behaviour and vehicle activity, aiming to improve workplace health and safety, asset management, and driver behaviour (NSW Government 2021:Appendix 2).

Implementation involved the installation of telematics devices in over 5,000 government vehicles and integration with a central monitoring system to track speed, location and other driver behaviour. The telematics data is used to ensure compliance with speed limits and other regulations.

GPS speed data for NZ Transport Agency fleet

The NZ Transport Agency Waka Kotahi implemented a telematics system in its corporate fleet vehicles to promote safe driving practices and demonstrate transparency in road safety leadership. This included installation of GPS units in all corporate fleet vehicles with continuous recording of speed data and data reported for every 500 meters travelled. The Transport Agency reported speeding instances publicly to encourage safe driving among staff and maintain transparency (NZTA 2021).

Monthly data shows a consistent number of speeding instances being recorded, with efforts to reduce these occurrences over time. For example, in October 2020, there were only 7 instances of speeding in over 220,000 km travelled. It appears that public reporting of speeding data has increased accountability and awareness among drivers, promoting safer driving behaviour. Regular monitoring and reporting have contributed to a safer driving environment within the agency's fleet.

Young drivers telematics trial, New South Wales

The NSW Young Drivers Telematics Trial was launched by the NSW State Insurance Regulatory Authority (SIRA) in collaboration with the NSW Data Analytics Centre (DAC) and the NSW Centre for Road Safety. The trial aimed to investigate the effectiveness of telematics in improving young driver behaviour and reducing road casualties. A randomised controlled trial with 717 participants aged 17–24 years old was divided into control and treatment groups. Telematics systems were installed in participants' vehicles, providing real-time feedback on driving behaviours such as speeding, harsh braking, rapid acceleration and harsh cornering. Data was collected over 6 months, covering 1.8 million km of driving.

The trial demonstrated significant positive changes in young driver behaviour:

- 10.9% reduction in medium-range speeding (10-20 km/h over the limit)
- 38.9% reduction in high-range speeding (over 20 km/h above the limit)
- 1.56 km/h reduction in mean speeds in 50 km/h zones
- 42% reduction in extreme harsh braking events
- 24.9% reduction in very rapid acceleration events
- 24.1% reduction in harsh turning events (SIRA 2019).

Applying the power model (see Section 2.1) to the trial data suggested that telematics could potentially prevent 159 casualty crashes involving young drivers each year, including 2 fatal crashes and 59 serious injury crashes. This could result in annual community savings of $38.2 million to $59.9 million (SIRA 2019).

Most participants (75%) reported that the telematics device positively impacted their driving, with 74% indicating reduced risk-taking and 67% acknowledging safer driving practices during the trial period. The broader use of telematics was supported by 70% of participants, and 75% believed it should be mandatory for all drivers. Additionally, 89% believed that more telematics use would reduce crashes on the roads.

5.7.3 Conclusion

In-vehicle speed monitoring is an emerging technology that can help fleet managers monitor speed compliance, thereby improving safety outcomes for road users.

5.7.4 References

NSW Government (2021) *Travel and transport policy*, NSW Government website, accessed 25 February 2025. < >.

NZTA (NZ Transport Agency Waka Kotahi) (2021) *GPS speed data for Waka Kotahi Transport Agency fleet vehicles*, NZTA website, accessed 18 February 2025.

Safer Together (2020) *IVMS specification*, Safer Together website, accessed 18 February 2025.

SIRA (State Insurance Regulatory Authority) (2019) *NSW young drivers telematics trial: Findings, implications and lessons learnt*, NSW Government website, accessed 18 February 2025.

5.8 Supplementary plates with reason for speed limit change

Key finding

Explaining the reason for speed limit change with subplates can help improve understanding of the reason for change, leading to improved compliance.

5.8.1 Description of activity

Often the reasons for changes in speed limits are clear to motorists, as these occur at locations where the road environment changes, for example, when entering or exiting a town. However, in many situations the reasons for a change may be unclear to motorists, and this can lead to lower acceptance by road users and reduced levels of compliance.

In Australia and New Zealand, there are some limited situations where supplementary information is provided in association with a regulatory speed limit sign to indicate the reason for the lower speed limit. This includes school zones, where additional information may be needed for part-time speed limits to inform motorists of the start and end times for the lower limit. In New South Wales, the R4-201-3n Winding Road (Supplementary Plate) is used with the R4-1 Speed Limit sign. Similar provision is available for supplementary plates for narrow bridges and complex intersections. The Tasmanian *Manual of uniform traffic control devices* (MUTCD) mentions use of supplementary signs at shopping zones, while the Queensland Department of Transport and Main Roads (TMR) provides provision for supplementary plates for hospital zones.

In many other situations, non-mandatory advisory speed signs are installed as guidance on the safe speed but also the reason for the change, for example at curves and, in some Australian states, in advance of roundabouts. This also includes rough road surfaces and the presence of animals, which more commonly have advisory speed limit signs.

Figure 5.7: Supplementary plates for rough surface

'Rough surface' subplate on a regulatory speed limit sign. Source: Stawell Times.

More traditional 'rough surface' sign on an advisory speed sign. Source: Canberra Times.

The case study below presents an example from NSW on the use of subplates to alert motorists to the reason for speed limit change. Practitioners are advised to check their local regulations regarding the installation of subplates on speed limit signs**.**

5.8.2 Outcomes

A new approach has been used in New South Wales on the Great Western Highway through the Blue Mountains near Leura. A lower speed limit of 70 km/h now applies along a one-kilometre section of road due to its crash history. Over a five-year period, there were 24 crashes along this section, one of which involved a fatality. Crashes were predominantly intersection, run-off road or head-on crashes (Transport for NSW 2023e).

Supplementary signs have been added to the new speed limit signs to indicate that the speed limit has been reduced due to 'intersections', 'road alignment' and 'slippery' conditions. It is hoped that the new signs with subplates will alert drivers to these identified risks as they enter the new speed zone area, leading to greater acceptance and improved compliance.

Figure 5.8: Supplementary plates, New South Wales

Source: Transport for NSW.

The signs on the Great Western Highway were installed in December 2023 and followed the temporary provision of variable message signs that indicated 'Slow Down'. Speed data has been collected at this site, with some significant reductions in speeds detected. Table 5.1 below indicates the 85th percentile speeds (the speed at which 85% of vehicles were travelling, with only 15% of vehicles exceeding this speed) before the installation of new speed limit signs (and before variable message signs were used).

Table 5.1: Speed change following new signage

Site	Before change (km/h)	After change (km/h)	Reduction (km/h)
Intersections - Westbound	86.2	79.9	6.3
Intersections - Eastbound	88.5	80.3	8.2
Kitchener Corner - Westbound	84.0	74.0	10
Kitchener Corner - Eastbound	86.8	77.0	9.8

Source: Author's personal communication with Transport for NSW, 27 August 2024.

The data above does not include information from comparison sites, and so it is difficult to tell whether speeds changed only at this location due to the new signage, or whether speeds here and elsewhere were influenced by other activity. However, given the short elapsed time, and the significant reductions in speed at these locations, it is likely that the speed limit change has had a significant impact.

Transport for NSW report that overall feedback from the public has been positive. Comments on social media and direct feedback indicate the signposting was clear, with gateway and repeater signage to ensure driver awareness. The supplementary plates for the 2 defined risk areas also informed road users of why the speed zone was in place. While Transport for NSW worked with NSW Police to have a 'grace period' of around 6 weeks post-implementation, anecdotally, NSW Police have indicated that they had a greater presence at this location compared to other areas of the Great Western Highway due to the crash history, and this may have also influenced strong compliance with the speed zone.

5.8.3 Conclusion

Using supplementary signs to provide more direct information about the reasons for a speed limit change may assist with improved compliance. However, due to the recent implementation of this type of intervention, crash data is not yet available to provide a full indication of safety benefits.

5.8.4 References

Transport for NSW (2023e) *Reduced speed limit for improved safety through Leura*, TfNSW website, accessed 18 February 2025.

5.9 Speed change without speed limits

Key finding

Vehicle speeds can be reduced without the need for changed speed limits but instead using infrastructure measures to reinforce road types and slow traffic where needed. This may be more acceptable to communities in some circumstances.

5.9.1 Description of activity

The concept of 'self-explaining roads' was developed in the Netherlands as part of the Sustainable Safety vision, which aimed to reduce traffic injuries by designing roads that naturally encourage safe driving behaviour. Self-explaining roads emphasise that the design and layout of the road environment should elicit safe behaviour by being intuitive to road users. This approach helps in significantly reducing errors and promoting safer road use. It is not always necessary to provide infrastructure to support reduced speed limits (see, for example, the case studies in Section 2.1). Safety improvements may occur from speed limit change alone, and there may be no need to invest in infrastructure to support this change. However, in some circumstances, infrastructure change may be needed to support the change or as part of a wider improvement project.

In New Zealand, the self-explaining roads approach was trialled in Auckland, where it led to substantial improvements in road safety and user behaviour.

5.9.2 Outcomes

Point England, an established neighbourhood in Auckland, New Zealand, was selected for road safety improvements using the self-explaining roads approach. The area comprises houses, shops, schools and churches, and it had a history of traffic crashes that necessitated intervention (Mackie et al. 2013). The aim was to reinforce road types and create low-speed environments, particularly on local streets. This was achieved through infrastructure changes alone, without altering the existing speed limit of 50 km/h. Key interventions included:

- Planting trees in the centre of roads and creating landscaped community islands to limit forward visibility.
- Installing mountable central islands and removing road markings to create a less formal environment on local streets, while enhancing road markings on collector roads.
- Creating a design speed of 30 km/h for local roads using these infrastructure changes.

The interventions led to significant reductions in vehicle speeds and crashes. Mean speeds on local roads dropped from 44.4 km/h to 29.6 km/h. Preliminary analysis indicated a 30% annual reduction in crashes and an 86% annual decrease in crash costs, suggesting reduced crash severity. Increased pedestrian activity and decreased vehicle activity were observed on local roads, indicating a shift towards a more pedestrian-friendly environment. Public perception surveys conducted before and after the intervention showed increased satisfaction with the appearance and functionality of the roads. However, some residents initially expressed concerns about the reduction in on-street parking and the presence of speeding motorists (Charlton et al. 2010).

There have been some maintenance issues over time and some modifications to the streets. However, the area continues to provide a safe environment, particularly for vulnerable road users.

Figure 5.9: Point England, New Zealand

Source: Author.

5.9.3 Conclusion

The Point England case study demonstrates the effectiveness of self-explaining roads for creating safer, lower-speed environments through infrastructure changes alone. The success of creating perceptually obvious street types, reducing vehicle speeds and crashes and improving the overall road environment highlights its potential for wider application in urban areas (Mackie et al. 2013). Further development of this concept has now been implemented and evaluated in another part of Auckland. For more information see Future Streets – Te Ara Mua (www.futurestreets.org.nz).

5.9.4 References

Charlton SG, Mackie HW, Baas PH, Hay K, Menezes M and Dixon C (2010) 'Using endemic road features to create self-explaining roads and reduce vehicle speeds', *Accident Analysis and Prevention*, 42(6):1989–1998, doi:10.1016/j.aap.2010.06.006.

Mackie H, Charlton S, Baas P and Villasenor PC (2013) 'Road user behaviour changes following a self-explaining roads intervention', *Accident Analysis & Prevention*, 50:742–750, doi:10.1016/j.aap.2012.06.026.

6. Key Lessons from Case Studies

This section provides a summary of key lessons from the speed management implementations described in the case studies in this report. It also includes conclusions from an activity not included in the case studies but presented in feedback during the consultation phase.

6.1 Benefits of speed limit change

6.1.1 Safety benefits

There are very clear benefits from speed change across several different policy areas. This includes significant road safety improvements from reduced speeds in both rural and urban areas. The benefits from change were generally in alignment with overseas research on this topic. It was noted from surveys in one case study that individuals not supportive of speed reductions were more likely to believe that the change would have no impact on safety. Better knowledge and engagement with communities and decision-makers on the safety benefits from speed reduction is needed to help improve understanding and acceptability of change.

Safety benefits from speed limit change were often substantial. In many cases these benefits were achieved without the need for infrastructure supporting measures. Although it is desirable to have 'self-explaining' roads, where the speed limit matches the design and road user expectations, investment in supporting infrastructure is not essential in all cases. Improved safety is the main objective from speed change, and not improved compliance.

6.1.2 Co-benefits

Other examples of benefits from lower speeds include reduced emissions (including CO_2), and lower vehicle costs, especially through reduced fuel use. There is significant evidence of this from rural environments, but also emerging evidence that there are likely to be benefits in urban areas, especially when speeds are low and steady and result from model shift.

There were examples of local businesses benefiting from reduced speeds, including one case where the increase in economic activity has been quantified. In other examples, the changes in speed limits are made to help encourage economic activity.

Speed limits are being reduced in some locations to reduce the impact on local wildlife. This is included as a valid consideration in at least one state's guidance on setting speed limits.

There are examples where speed limit reductions have led to improved traffic flow. When combined with other information presented on the impact on travel times, there is a significant over-estimation of the detrimental impact of speed change on travel times. Given this is a major barrier to change, clearer guidance on this issue is needed. Local case studies using actual change in journey time should be presented to the public and decision-makers to help counter false beliefs.

Freight and other commercial operators understand the benefits of speed change on safety and other outcomes. Several companies have mandated lower speed limits for their light and heavy vehicle fleets, recognising the significant benefits that can be achieved. This runs counter to the misperception that lower speeds bring negative economic impacts or are bad for business.

The case studies clearly show that speed limit reductions can produce a range of benefits. Although safety outcomes are likely to improve, there may well be other benefits as well. It is important to ensure that the public and decision-makers are aware of these co-benefits and the reasons why speed change matters. Clearer communication to these target audiences is needed.

When engaging on this issue, it is important to understand stakeholder interest and context. On an individual basis, some of these benefits may be of little interest, while others might be far more salient and better able to produce support for change. As highlighted in one interview, there is a need to 'deeply understand your audience'. There is no point in highlighting the road safety benefits if this is not what drives decision-making.

6.2 Speed data and surveys

6.2.1 Speed data collection and safety performance indicators

Good speed-related data is needed to identify safety-related risk factors and locations, to plan effective strategies and set targets, and to monitor implementation and progress. One case study identified the importance of safety performance indicators (SPIs) to help manage safety outcomes.

Several examples of new sources of speed data were identified. This includes 'big data' sources as well as event data recorder information. These can potentially bring significant benefits in managing speed, but in some cases, better guidance is needed on data collection and use.

6.2.2 Community attitude surveys

Information on community attitudes to speed is important to monitor public knowledge of speed as an issue as well as driver speed behaviours. Surveys of community attitudes can also provide useful information on interest in and acceptance of speed-related policy (for example, 80 km/h speed limits on poor quality rural roads) and on speed-related interventions. One example highlighted a 'status quo' bias in community attitudes in relation to speed policy. There are often high levels of support for the status quo and reluctance to change. This may be heightened near the time of policy implementation, presenting a significant impediment to change. However, there is clear evidence that, following change, the public very quickly become familiar with the new situation and realise the benefits (or that the disbenefits are not nearly as great as anticipated). Awareness of this bias is important to assist with policy change.

At local project level, when changes are explained properly, there is often strong community support for change. This shows the importance of conducting local surveys and providing the outcomes to decision-makers to counter the vocal minority who sometimes dominate the conversations on speed change.

6.3 Using data for persuasion and engagement

6.3.1 Countering perceptions of travel time increases

Case studies were provided on ways that information and data can be used to help convince the public and policy makers about the importance and benefits of speed change. As highlighted above, increases in travel time from speed limit reduction are often vastly overestimated. Specific local case studies can be generated to help provide information on actual impacts.

6.3.2 Using evidence to gain support

The costs and benefits across different policy objectives such as safety, vehicle operating costs (especially fuel use), emissions and journey time can be calculated. Even in situations where there are increases in costs due to increased journey times, these tend to be far outweighed by other benefits. The evidence on this issue needs to be presented more clearly to the public and decision-makers.

Other forms of data can be used to help convince decision-makers by providing information on current risk and the likely benefits from change. The Australian National Risk Assessment Model (ANRAM) was used as an example of a proactive tool to assist in this task.

Benchmarking provides a powerful tool, raising awareness about relative safety performance and progress, but also introducing an element of competition to drive change. One case study highlighted the benefits of benchmarking, with comparisons of speed activity around schools.

6.3.3 Early engagement and open communication

There is a need to be transparent and communicate publicly about speed-related activity, a point raised by one road agency during the interview process. This includes presenting both the positive and negative sides to ensure real consultation and consideration of all views. Ensuring that all relevant information is included in the public domain is good engagement practice.

Similarly, it is important to acknowledge and address concerns related to speed change, such as changes in journey time. When discussed openly and with objective data, the public will often understand the evidence and be more accepting of the need for change.

Engagement with elected members, stakeholders and community needs to occur early and it needs to be ongoing to be successful.

Most of the potential barriers to speed change have been documented across various publications. It should be possible to anticipate these issues and prepare evidence-based responses. The case study on frequently asked questions (FAQs) highlights one example of an approach that can be taken to address barriers and concerns.

6.4 Other supporting activities and measures

6.4.1 Community action for change and the importance of stories

There appears to be growing community support for speed limit change. Various examples from across Australia and New Zealand identified a ‘bottom-up’ approach to this issue. There is strong demand for change in many locations, with community members seeing the benefits achieved in neighbouring communities and demanding similar change. In some cases, state speed policy is not keeping pace with this community sentiment for change.

Community voices can be compelling when convincing decision-makers about the need for change. One of the case studies highlighted the role of high school students (through the New Zealand Students Against Dangerous Driving coalition) in presenting the argument for change. Although the science (the facts and figures) on benefits from speed change is robust, this is often not enough to generate change. The individual stories about impacts of high speeds can be equally or even more important. Ideally, both the science and stories should be presented to decision-makers.

6.4.2 Mitigating impacts on emergency services

There is value in good communications and research to help bridge a gap in understanding and acceptance, an issue that was demonstrated in the case study on engagement with emergency services. As identified elsewhere in the world, there is a perception that lower speeds and particularly traffic calming can be seen as an impediment to emergency services, and this may form a barrier to change. However, there are often easy solutions to address likely negative impacts, and working closely with important stakeholders like emergency service providers can lead to mutually beneficial outcomes.

6.4.3 Infrastructure to support change

Examples of low-cost infrastructure to support safe speed limits were identified. In some cases, the safe speed limit will need supporting measures to ensure reasonable compliance, and this typically means road infrastructure and/or enforcement. There is often a high cost to the infrastructure support needed to ensure compliance. Low-cost measures can be effective, and it would be useful for additional low-cost measures to be developed. There was also an example presented where the debate about speed limits was completely avoided because infrastructure changes supported low speeds through design and there was no need for reduced speed limits.

6.4.4 Increasing acceptability of speed cameras

Public confidence in the use of speed cameras can be increased. Activities to support this are needed to counter the often negative public perceptions regarding these safety devices. Confidence can be increased through greater transparency on issues such as the site selection processes, accuracy of equipment and use of generated revenue.

Speed cameras were not always seen as negative by the public. In one example, speed cameras were reinstated due to public demand after they were removed, while public demand led to their initial installation at other locations.

6.4.5 Simplifying speed limit setting

Speed limit setting tools can increase the level of confidence in speed limit setting processes, especially among internal stakeholders. Several tools were identified that help with the speed limit setting process. One of these tools also helped identify the broader benefits from the speed limit change. As well as increasing the credibility of the speed limit setting process, these tools help improve consistency in speed limit setting.

Another example suggests that simplifying the speed limit setting process, especially for those in local government, can bring benefits.

6.4.6 Providing reasons and feedback to drivers

Providing information on the reason for a reduced speed limit may be a useful approach, as often road users are unaware of the risks that are present and therefore do not understand the reason for change. Providing this information can help increase public understanding and acceptability for speed limit reductions. The use of subplates on the speed limit sign can indicate the reason for change to motorists, with flow-on benefits for compliance.

There are several trials underway on the use of in-vehicle speed monitoring systems, which are showing some benefits. Such systems can be used by fleet managers or even insurance companies to help manage risks. For companies, drivers who continually exceed the speed limit or exhibit other risky behaviours can be retrained or suffer penalties. Emerging results indicate that this technology may bring useful safety benefits.

6.4.7 Additional measure: Use of champions

One approach identified in several interviews, but not documented in case studies, is the use of champions to help convince decision-makers. These could be international experts, health experts (including first responders or surgeons) or prominent members of the community. One agency indicated the importance of letting partners and trusted voices lead the conversations. An approach drawing upon broader stakeholders is likely to be more successful in generating change than if the conversations are led by internal technical staff.

7. Conclusions

Progress has been slow in managing traffic speeds due to various barriers, many relating to our engagement and communications on this issue. Information exists to address the most significant barriers, and this needs to be used when engaging with the community and decision-makers.

Speed plays a significant role in crash causation and severity, and substantive reductions in road trauma will not be achieved unless the speed issue is addressed. The case studies in this report identified clear evidence of the benefits of lower speed, with substantial reductions in road trauma possible even from small reductions in speed. There are also broader benefits from speed reduction that are often not recognised.

Despite these clear benefits, reductions in speed have been slow. This is likely due to a variety of reasons. Barriers to change represent an implementation issue rather than a technical one, as many of the solutions on how to reduce speeds are already well established. Some of these barriers are based on myths and disinformation. For example, it is often believed that journey times will increase substantially when speed limits are reduced, when they typically do not.

The key myths and barriers are well known. It is possible to anticipate them when engaging with communities and decision-makers and to prepare compelling responses based on evidence. Extensive knowledge of the benefits of speed management already exists. This report provides additional examples of ways that communities and decision-makers can be better informed about these benefits. The examples and the broader evidence base can be used when engaging on this issue.

This report collects only a small number of examples when compared to the extensive speed-related activities undertaken throughout Australia and New Zealand. Continuing to collect examples and presenting them to stakeholders in an accessible way will help ensure that decision-making on speed change is based on evidence, including the full range of benefits.

The examples in this report show that community support is generally strong for speed change when the benefits and likely outcomes are presented more clearly. Greater change is likely if this increasing public support can be harnessed more effectively.

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Appendix A Full List of Case Studies

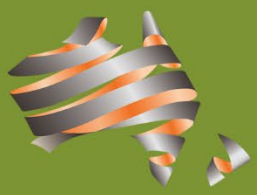
This table shows the list of topics and case studies submitted as part of this study. It illustrates that a considerable amount of speed management work is being undertaken in Australia and New Zealand.

Table A.1: Topics considered by Austroads Speed Technical Reference Group

No	Topic	Notes
1	Using evidence to counter opposition	Launceston used international evidence; Use of crash reduction data; NZ use of position papers; New NSW guidance on engagement; Mildura – preparation by media team
2	Community engagement - annual surveys	Annual attitude surveys (Qld, WA, SA, Federal)
3	Benchmarking to help generate interest in change	NZ Safe speed scorecard
4	Research to develop comms strategies	Qld (research on speed and driver attitudes)
5	Other use of data to support change	ANRAM (Mildura)
6	Enforcement interventions	Lane Use Management System on motorways (Vic; NSW)
7	Using evidence of community support to generate change	MPS survey data; Mildura focus groups; SA (options for beach speed limits), NT
8	How to support the innovation process	How to get this moving – Trials e.g. low-cost roundabouts in Victoria (Mildura, MPS) – Production of material to counter issues like rollover (Vic); 40 km/h in Unley (SA); The role of champions to push trials (MPS)
9	Co-benefits – Economic impact on local business	Countering the myth that there will be a negative impact on business – Cairns; Mildura (negative); Hospitality take increase Fort St (Auckland)
10	Co-benefits – Economic impact on freight business	Speed limits for trucks to save fuel – Tasmania
11	Co-benefits – health and walkability	Speed change being led by walkability agenda (Mildura); High Pedestrian Activity Areas (NSW); Healthy Auckland Together (NZ) – position paper on speed; Business case for walking (Fort St, Auckland)
12	Impact on travel time	Phillip Island, WA (South-West Safer Speeds Trial – theoretical plus actual); SA (Adelaide Hills – CASR simulation model, City of Onkaparinga 80 km/h); NZ (including Auckland schools); Orange City (urban)
13	Community engagement tools and methods	Use of focus groups and community surveys – NZ, Mildura; Testing of messaging (TAC; Qld); Pop up stands (NT)
14	Public engagement materials/ access	Public engagement materials (SA)
15	Indigenous community engagement	NT – Town camp; NZ several examples, including integral role of hapū in the speed planning and consultation
16	Safety impact of speed change – rural	Vic (MPS); SA (Adelaide Hills), NZ
17	Safety impact of speed change – urban	Vic (City of Yarra, Footscray), Tas (Hobart),
18		Fixed and Mobile speed camera (Tas); switched-off speed cameras but reinstated due to public demand (SA)

No	Topic	Notes
19	Speed limit setting change	Change to a simpler speed limit setting process led to a better approach for local government: SA; NSW
20	Speed limit setting tools	Qld and NT – spreadsheet and online tools; NZ – MegaMaps (also Vic to a limited extent)
21	Optimal speed assessments across different societal objectives	NZ (optimal speed); Vic
22	Sharing knowledge – networks	ACRS Local Government Network as a mechanism to share good practice across local government; NSW internal share point and new local government hub
23	Development of a speed strategy	Developed process for a speed management strategy in NT, NZ, new strategy in Tas; updated strategy in NSW
24	Role of strategy	How strategy gives focus and direction over the long term. No longer question as it meets strategy objectives. Vic (MPS)
25	Coordination of speed strategy development and delivery	NZ (Regional Navigators and Waikato pilot of reginal transport committee; Waikato Mayor example); Qld (New Road Safety groups, including one on enforcement); NSW traffic committees
26	Co-benefits – noise	Tasmania speed limit reduction at locations to reduce noise for local residents
27	Stakeholder engagement	Bringing stakeholder groups together (Auckland city)
28	Engagement with emergency services	Examples from SA, Tas, NZ, NSW; Production of technical guidance – Auckland
29	Speed monitoring and link to SPIs	Annual speed surveys to help monitor impacts (NZ, SA, Tas); SPIs (NZ, Tas, NSW)
30	Measures to support acceptability of speed cameras	Vic (period of grace before operation); hypothecation (various); issue of warnings (WA); feedback signs (WA)
31	Using data – Annual evaluation of speed camera program	Qld (evidence on effectiveness and deployment); NSW
32	Innovative speed data	Probe speed data (Qld, NZ, Vic, NSW; Transurban); Vehicle event data recorder (SA); Study in NSW on validation;
33	Speed limit change through infrastructure (not speed limits)	Pt England trial (NZ)
34	Low-cost speed infrastructure treatments	Roundabouts (Mildura, MPS, Victoria)
35	Low-cost speed infrastructure treatments	Side road speed limits (South Australia)
36	Other infrastructure interventions	Gateway treatments (NZ, Vic, Qld)
37		Normal side road speed limits (Vic, NZ, SA)
38		Beach road speed limits – consultation process (SA)
39		80 km/h default speed (Tas)
40		Speed reduction at roadhouses (NT)
41		Sub plate highlighting reason for speed change (NSW)
42	Vehicle speed monitoring systems	WA (Shire of Manjimup; insurance premium reduction), NT, NZ (Fonterra); NZTA monitoring of government vehicles; NSW – government fleet vehicle trial; insurance-based system for young drivers
43	OH&S leading to lower speed limit on unsealed roads	80 km/h speed limit for council vehicles when using unsealed roads (Vic); 40 km/h for Santos
44	Use of mass media to bring speed change	Only weak effect from reliance on this (research CASR)
45	Champions in speed change	Includes LG (e.g. MPS with technical officers plus councillors) and State (e.g. WA with local MPs leading the change); knowledge champions (e.g. international experts NZ)

No	Topic	Notes
46	Community-led action for change	WA (Bussell Hwy; Albany Hwy; Town Team – Safer Speeds); Student (SADD) led engagement (Auckland City); BRAKE
47	Attitude change over time, and the status quo bias	There is often vocal opposition prior to change, but this quickly turns once change is in place. Includes change in Australian urban default speed limit from 60 to 50 km/h; change in compliance over time; SA (Adelaide Hills)
48	Co-benefits – emissions	Impact of speed limit change on emissions: NT (work on this issue from Darwin / Palmerston); optimisation approach in NZ; data from NZ on emissions impact – Auckland
49	Moving from innovation to implementation, and the need for scale	Need to scale up – one location is not enough to create evidence and momentum. Story of raised platforms in NZ (226 now but a slow start); in Victoria. Gateway treatments
50	Funding for implementation	WA (Town Team Movement, seed funding followed by scale up); NSW program guide and Towards Zero Safer Roads (linking infrastructure and speed)
51	Using data for speed enforcement location	Metrocount data (WA)
52	Requirements for infrastructure support	Self-explaining roads as a barrier to change and a process to address this (NZ)
53	Low-cost speed infrastructure treatments	Speed cushions in advance of pedestrian crossings (Mildura; Qld)
54		Road works speed cameras (Qld)



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