Australian Government

**Department of Infrastructure, Transport,
Regional Development, Communications, Sport and the Arts**

Consultation Regulatory Impact Analysis

Reducing default speed limits outside of built-up areas

September 2025

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Executive summary

Speed limits in Australia are primarily set by state and territory governments, with the [Australian Road Rules](#) (ARR) serving as the foundational model legislation that provides national consistency across jurisdictions. The ARR establish a uniform system of default speed limits that apply on roads where there is no sign-posted speed limit. The default speed limits under the ARR include 50 km/h in built-up areas, 100 km/h outside built-up areas.

Built-up area, *Australian Road Rules* definition:

Built-up area, *in relation to a length of road, means an area in which either of the following is present for a distance of at least 500 metres or, if the length of road is shorter than 500 metres, for the whole road:*
(a) buildings, not over 100 metres apart, on land next to the road;
(b) street lights not over 100 metres apart.

This RIA assesses proposed changes to default speed limits on roads without a sign-posted speed limit. It does not propose, nor consider, changes to any current sign-posted speed limits.

In May 2021, the Australian Government and all state and territory governments agreed to the National Road Safety Strategy 2021-30 (the Strategy), which sets out the collective ambition of governments to improve road safety. Notably, this includes a reduction in road fatalities serious injuries by 50% and 30% (respectively) by 2030, with a long-term goal of zero by 2050.

To that end, the Infrastructure and Transport Ministers launched the National Road Safety Action Plan 2023-25 (the Action Plan) which detailed the actions each government would take to contribute to the 2030 goal. This included a commitment by the Australian Government, through the Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts (the Department) to:

> **Co-ordinate a review of the Australian Road Rules and development of a Regulatory Impact Statement (RIS) on reducing the open road default speed limit in consultation with state and territory governments, including police, and local government.**
>
> **Page 14, National Road Safety Action Plan 2023–25**

As part of this process, the Department engaged ACIL Allen and the Monash University Accident Research Centre (MUARC) to develop a Regulatory Impact Analysis (RIA) for proposed reductions in default speed limits for roads outside built-up areas. This is that RIA.

The RIA is developed in 2 stages:

1.   a Consultation RIA (CRIA) for the purpose of consulting with interested stakeholders (this report)
2.   a Decision RIA (DRIA) incorporating relevant information and data gathered through the consultation process with interested stakeholders. The DRIA is used by decision makers as an input into its decision on the matter that is the subject of the RIA.

Statement of the problem

Australia is a very large country with an extensive road network that serves a relatively small population. In 2023 it was estimated that Australia has over 460,000km of sealed roads and nearly 860,000km of unsealed roads, for a total of over 1.3 million km.[1]

Between 2000 and 2020, Australia recorded a significant decline in road fatalities (see Figure 1). This positive trend has been attributed to factors such as improved vehicle safety features (such as adoption of seatbelts and airbags), investments in road infrastructure and design, and shifts in driver behaviour.[2] However this trend has reversed in recent years. In 2024 there were 1,291 recorded road deaths, the highest annual toll in 12 years and an increase of 18.6% compared with 2020.[3] Other measures also tell a similar story, with the fatalities rate per 100,000 people, billion vehicle kilometre travelled (VKT) and fatalities rate per number of registered vehicles following similar trends.[4]

Figure 1   National annual road fatalities, 1989 to 2024
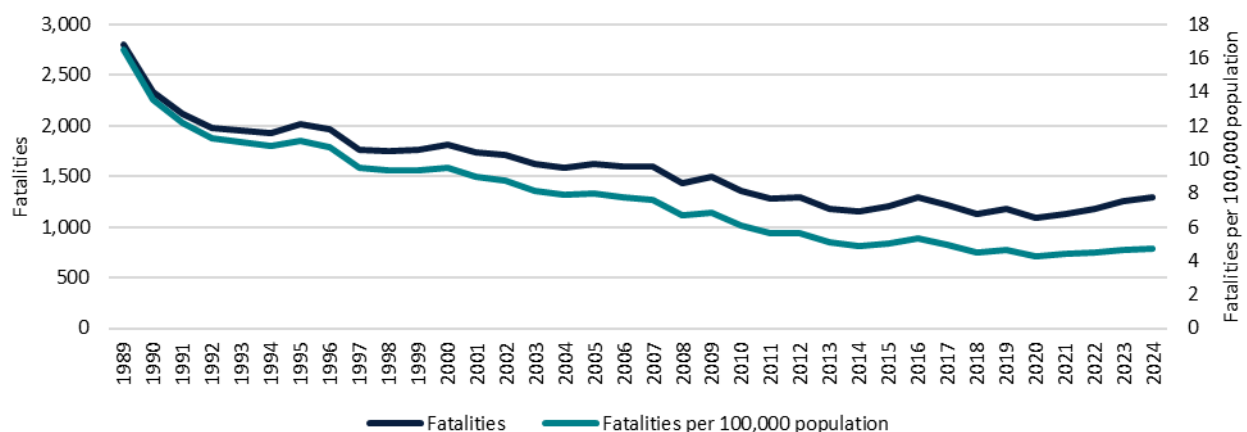
Source: ACIL Allen analysis, based on DITRDCSA and ABS

However, evidence of harm alone is insufficient to justify government intervention, as the problem itself must be amenable to such intervention. Typically, such interventions can be justified where markets fail to provide the most efficient and effective solution to a problem. This is typically described as a market failure. While the road network is not a typical market, these types of failures still apply. Some of the failures identified with road safety include:

- negative externalities and moral hazard
- imperfect information.

In responding to these failures, governments have introduced a number of measures, which can broadly be categorised under the Safe Systems approach as interventions to achieve safe roads, safe speeds, safe vehicles, safe road users, or post-crash care. The ARR addresses the need for safe speeds, among other things, through its provisions on default speed limits, which set the default speed limits in built up areas at 50 km/h and those outside of built-up areas at 100 km/h and have been adopted by most jurisdictions.[5]

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[1]   ACIL Allen estimates, based on BITRE, *Australian Infrastructure and Transport Statistics Yearbook 2024, Roads*. Tables 6.2a and 6.2c.

[2]   ABC News 2024, *After decades of decline, road fatalities are on rise in Australia and around the world — why and what can be done?* Accessed 27 August 2025, https://www.abc.net.au/religion/road-fatalities-on-the-rise-australia-what-can-be-done/103532970

[3]   The Guardian January 2025, *Australia's road toll hits 12-year high as pedestrian and cyclist fatalities rise*. Accessed 25 August 2025, https://www.theguardian.com/australia-news/2025/jan/27/australia-road-toll-2024-1300-deaths-highest-in-more-than-a-decade

[4]   ACIL Allen analysis based on DITRDCSA and BITRE

[5] Western Australia and the Northern Territory

As discussed above, governments have agreed to ambitious road safety targets through the Strategy, including a 50% reduction in road fatalities and a 30% reduction in serious injuries by 2030, progressing toward the ultimate goal of zero deaths and serious injuries by 2050. Without action to reverse road safety trends, these goals are unlikely to be met.

- As such, to meet governments' objectives, additional regulatory action is warranted.

Objectives and options

The objectives of further government action in managing default speed limits outside built-up areas can be summarised to:

- improve the safety of default roads outside built-up areas
- reduce road deaths and serious injuries on default roads outside built-up areas
- contribute towards reaching the trauma reduction targets set by the Strategy.

To achieve these objectives, we consider 3 options for reform on sealed roads outside of built-up areas and 2 options for unsealed roads outside of built-up areas, all of which are compared against the base case of the status quo. These options are shown in detail in Table 1.

Table 1   Proposed options for sealed and unsealed roads

	Options
Options considered for sealed roads	1. 90 km/h
	2. 80 km/h
	3. 70 km/h
Options considered for unsealed roads	1. 80 km/h
	2. 70 km/h

Source: ACIL Allen

While there may be other options to achieve road safety outcomes, these are not considered in this RIA – noting that they are addressed by other elements of the Action Plan and Strategy.

Methodology

In line with best practice, the impact analysis for this RIA has been prepared using a cost benefit analysis (CBA) framework. CBA is an economic analytical tool used to assess the costs and benefits of regulatory proposals. Costs and benefits are examined from the perspective of the community as a whole to identify the proposal with the highest net benefit. Table 2 summarises the costs and benefits that will be modelled.

Table 2   Costs and benefits framework

High level impact	Detailed benefits	Price	Quantity
Benefits			
Avoided costs of fatalities and serious injuries	Avoided fatalities	Office of Impact Assessment (OIA) value of a statistical life	MUARC scenario modelling
	Avoided serious injuries	Based on Australian Transport Assessment and Planning (ATAP) Guidelines	MUARC scenario modelling
	Avoided minor injuries	Based on Australian Transport Assessment and Planning (ATAP) Guidelines	Proportional to serious injuries
	Cost of fuel		

High level impact	Detailed benefits	Price	Quantity
Avoided fuel consumption	Emissions benefits	Estimates from ACIL Allen's previous New Vehicle Efficiency Standards (NVES) work	Estimated share of VKT on default roads, adjusted by speed change estimates output by MUARC's modelling
Other intangible benefits	Improved community amenity, reduced noise, reduced road maintenance, and enhanced perceptions of safety	Qualitative discussion	Qualitative discussion
Costs			
Travel time	Private travel time Business travel time Logistics travel time	Austroads estimates of value of travel time Logistics company estimates of cost of travel time	Estimated share of VKT on default roads, adjusted by speed change estimates
Government costs	Administrative costs	Departmental estimates	
Other intangible costs	Social acceptance and public opinion	Qualitative discussion	Qualitative discussion

Source: ACIL Allen

CBAs typically make a central estimate of the costs and benefits on the basis of relatively certain estimates of quantity and price, allowing for any deviations from these to be handled in sensitivity analysis. However, in attempting to estimate the costs and benefits of a default speed reductions, there are too many uncertainties to be able to make a firm estimate. As will be discussed further in sections 4.2 and 4.3, the vehicle-kilometres travelled (VKT) (that is to say, the amount of driving) and the share of fatal and serious injury (FSI) crashes that occur on default roads are unknown across jurisdictions. While the VKT and FSI on default roads cannot exceed the VKT and FSI on all roads, there is very limited information on what their true values might be.

As such, there is no way to develop a robust central estimate for each option. To ameliorate these risks, a scenario-based approach has been taken.

By modelling several scenarios, it can be identified whether an option would have a positive (or negative) result under any set of reasonable assumptions. This approach incorporates the uncertainty around the share of FSI and VKT into a range of final results.

In using these scenarios, both the plausible best- and plausible worst-case scenarios are modelled. In this way, it can be determined if there are any reasonable scenarios under which the reforms would or would not lead to a positive net benefit. As such, instead of one set of results, a range would be presented.

Impacts of the regulation

Sealed roads

As noted above, available data does not allow for an understanding of the exact proportion of FSI that occur on sealed default speed-limited roads outside of built-up areas across Australia. The table below presents the reduction in fatalities in Australia between 2026 and 2036 by speed reduction scenario, with difference scenarios based on the percentage of FSI that occurs on default sealed roads outside of built-up areas.

Table 3   Avoided FSI by option by scenario

Speed reduction scenario	% of FSI on default-speed limited roads sealed roads outside of built-up areas		
	10%	**20%**	**38%**
Fatalities avoided			
Low (100 km/h to 90 km/h)	95	190	361
Medium (100 km/h to 80 km/h)	201	401	763
High (100 km/h to 70 km/h)	286	572	1,087
Serious injuries avoided			
Low (100 km/h to 90 km/h)	1,444	2,888	5,487
Medium (100 km/h to 80 km/h)	3,156	6,312	11,992
High (100 km/h to 70 km/h)	4,644	9,287	17,646

Given the relationship between speed and FSI, it is unsurprising that modelling shows a reduction in FSI after the introduction of lowered speed limits. As the default speed is reduced further (from 100 to 90, to 80, to 70), the number of avoided fatalities and serious injuries increases across all the scenarios shown.

The results in Table 4 represent the lower, middle and upper assumption groupings shown in the NPV and sensitivity tables (shown in Section 5.1). These sets of assumptions are called the central VKT-FSI assumption groupings. Central estimates BCRs:

Table 4   Central estimate NPVs and BCRs

Speed reduction scenario	Lower estimate	Middle estimate	Upper estimate
Low (100 km/h to 90 km/h)	$678.7	$1,368.7	$1859.6
	2.4	2.4	1.7
Medium (100 km/h to 80 km/h)	$1,348.7	$2,697.4	$3,210.3
	2.2	2.2	1.5
High (100 km/h to 70 km/h)	$1,759.7	$3,527.4	$3,505.5
	1.9	1.9	1.3

Unsealed roads

Government databases record whether an FSI crash occurs on an unsealed road. As such multiple FSI scenarios do not need to be modelled (as was done above). Based on the records of FSI on unsealed roads, the estimates of FSI reduction are shown in Table 5. As with sealed roads, there are greater reductions in fatalities and serious injuries on unsealed roads as speed limits are reduced.

Table 5   Modelled reductions in fatalities and serious injuries on unsealed roads by option

Speed reduction scenario	Reduction in FSI
Fatalities	
100 km/h to 80 km/h	123
100 km/h to 70 km/h	248
Serious injuries	
100 km/h to 80 km/h	4,182
100 km/h to 70 km/h	8,847

Table 6 below shows the BCRs for each VKT bound assumption. Bar one exception, both speed reduction scenarios for all VKT assumptions produce positive BCRs. When a large proportion of driving is assumed on unsealed roads (i.e. upper bound for VKT), a speed limit reduction form 100 km/h to 70 km/h produces a negative BCR (given the fixed level of FSI that occurs on these roads).

Table 6   Unsealed roads BCR by option by VKT scenario

VKT on unsealed roads	100 km/h to 80 km/h	100 km/h to 70 km/h
Lower bound VKT estimate	$1,964.4	$3,948.6
	5.4	4.6
Middle VKT estimate	$1,340.4	$2,367.5
	2.2	1.9
Upper bound VKT estimate	$320.3	-$214.8
	1.1	0.96

Implementation and review

The Australian Road Rules (ARR) is a model law that is adopted by states and territories to ensure nationally consistent road rules. As model a law, the ARR does not have legal effect until adopted by individual jurisdictions. The National Transport Commission (NTC) is responsible for maintaining and reviewing the ARR.[6]

Once relevant Ministers have agreed to the policy, the NTC works with Parliamentary Counsel to prepare legally robust amendments. Draft amendments are then released for public consultation, allowing stakeholders to provide feedback to inform any necessary refinements.

Following consultation, amendments are finalised and submitted to the Infrastructure and Transport Ministers' Meeting for approval. Jurisdictions then adopt the amendments according to their legislative processes. Jurisdictions may adopt the amendments as drafted or with variations to suit local requirements.

The process including drafting, consultation and approval typically takes about 18 months. Actual timing may vary depending on the complexity of the amendments, the volume of consultation feedback, and jurisdictional legislative schedules.

Conclusion

The impacts of reducing default speed limits on default roads outside of built-up areas are complex to assess due to limitations in existing road safety datasets. In particular, there is no comprehensive data on vehicle-kilometres travelled or the proportion of fatal and serious injury crashes that occur on roads outside of built-up areas with default speed limits. Recognising this uncertainty, a scenario-based modelling approach was adopted for the analysis, supported by the best available evidence. While this scenario analysis provides a structured way of understanding the potential impacts of the proposed policy options on the Australian economy, it does not provide a definitive conclusion about its overall impacts.

Figure 15 summarises the estimated NPVs and BCRs of the range of scenarios considered to be the most likely (the central case scenarios)[7]. Overall, the modelling indicates that reductions in default speed limits are likely to deliver a net societal benefit under all central case scenarios examined. This conclusion holds across both sealed and unsealed roads, though the scale of benefits varies depending on the extent of the reduction.

Typically, the decision rule to identify a preferred policy option in regulatory analysis is to select the option with the highest net benefit to society. However, given the uncertainty associated with the NPVs in Figure 2, it is reasonable to also consider the efficiency with which outcomes would be achieved under each option.

* A **reduction to 70 km/h** generates the largest net benefits in absolute terms under the central assumptions. However, marginal costs rise more steeply than marginal benefits. For example, on sealed roads, compared to a reduction to 80 km/hr, decreasing the speed limit to 70 km/hr doubles the estimated benefits but triples the estimated costs.
* A **reduction to 80 km/h** provides a more efficient outcome. Each dollar of cost is associated with an estimated $2.20 in benefits, compared with $1.50 under the 70 km/h scenario (on sealed roads). The scale of benefits is lower, but they are achieved at proportionately lower cost.
* This highlights a trade-off between maximising absolute benefits (with 70 km/h) and achieving a more efficient balance of benefits and costs (with 80 km/h).

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[6] The information in this section relating to the implementation, review and evaluation of the proposed policy was provided by the NTC.

[7] The impacts of the full range of scenarios analysed are included in Chapter 5.

Figure 2   Potential impact of the proposed policy options under different scenarios
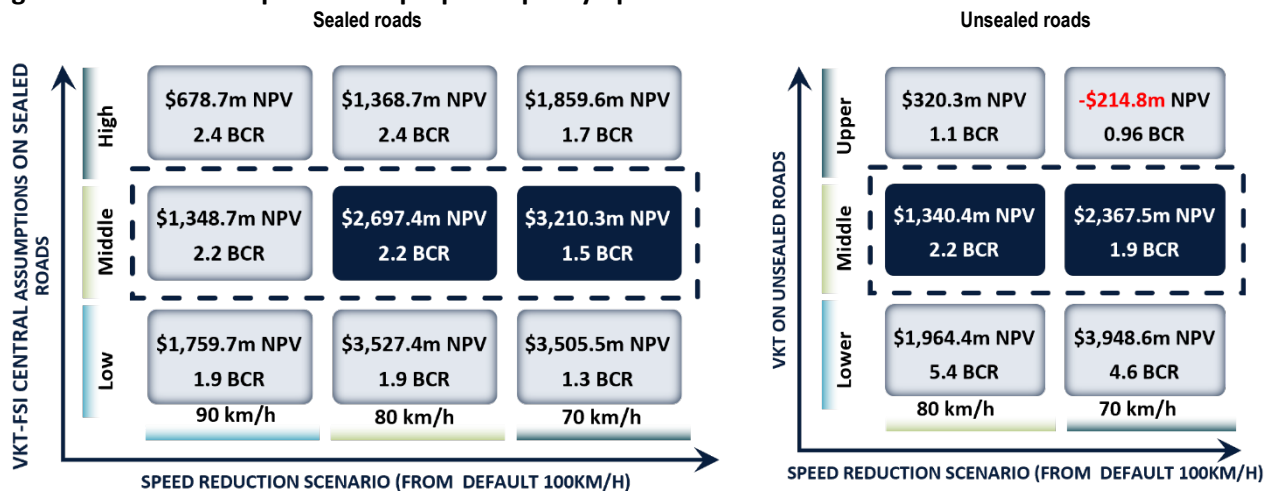
Notably, there are other considerations that are important when making a decision about the proposed speed limit reductions, including:

- Compliance and behavioural responses – evidence suggests that not all drivers comply fully with default speed limits or adjust their speed proportionally to speed limit changes. This reduces the certainty of achieving modelled outcomes, particularly under larger reductions (to address this, we have used relatively conservative assumptions on speed change).
- Stakeholder views – larger reductions are likely to face stronger community resistance. A large reduction to 70 km/h has few precedents.
- Implementation risks – lower speed limits impose additional travel time costs and may generate equity concerns for regional and remote communities with fewer transport alternatives.
- Staged implementation – introducing an initial reduction to 80 km/h provides an opportunity to assess impacts and compliance before considering further reductions.
- The analysis above shows that there is a trade-off in considering a preferred option. Ultimately, decision-makers are best placed to weigh these factors, considering their potential impacts on different communities.

Following consultation, the Decision RIA will recommend a preferred option to amend the Australian Road Rules. State and territory governments may consider alternate options that will deliver net benefits, as well as other jurisdictional considerations, when amending their road rules.

The figures in this report are estimates based on the best information available at the time of the analysis, and assumptions have been used where data was not available. The purpose of this Consultation RIA is to seek stakeholder feedback on a number of important questions to inform a future review of default speed limits outside of built-up areas in the Australian Road Rules. Some of these questions seek to gain more information that could be used in the Decision RIA to improve the estimates provided above.

Questions for stakeholders

- Does the RIA adequately identify and define the problem?
- Are there any other problems not considered by this RIA?
- Does the RIA establish a case for amending the default speed limits in the ARR?
- Does the RIA present clear, well differentiated options that can achieve the stated policy objective?
- Which of the options analysed have the ability to meet the stated objectives? How could these be enhanced?
- Are there any other feasible options to address the problems identified in the previous chapter that have not been assessed in the RIA and should be considered?
- Of the options discussed in this chapter which would be the most effective at achieving the stated objectives and why?
- Which is your preferred option and why?

- Are the objectives as expressed above appropriate?
- Are the lists of costs and benefits considered in this methodology sufficient to capture the costs and benefits of the proposed change?
- Do the scenarios considered capture the full range of uncertainty about the costs and benefits of the policy?
- Are there any additional data that ought to have been considered when constructing the baseline FSI, VKT, efficiency and fuel costs?
- Is the approach to measuring the impact of policy change appropriate? Where assumptions have been made, do you have any specific alternative assumptions that ought to have been considered?
- Are there any additional regulatory burdens that have not been considered?
- Are there any additional impacts on competition that have not been considered?

1.   Introduction

1.1   Scope of this report

Speed limits in Australia are primarily set by state and territory governments, with the Australian Road Rules (ARR) serving as the foundational model legislation that provides national consistency across jurisdictions. The ARR establish a uniform system of default speed limits that apply on roads where there is no sign-posted speed limit. In particular, Rule 25 of the ARR sets out the "speed-limit elsewhere" provisions, which establish default speed limits when no speed limit signs are present. The default speed limits under the ARR include 50 km/h in built-up areas, 100 km/h outside built-up areas, and various limits for specific zones like school areas (40 km/h) and shared zones (10-30 km/h).

Built-up area, *Australian Road Rules* definition:

Built-up area, *in relation to a length of road, means an area in which either of the following is present for a distance of at least 500 metres or, if the length of road is shorter than 500 metres, for the whole road:*
(a) buildings, not over 100 metres apart, on land next to the road;
(b) street lights not over 100 metres apart.

This RIA assesses proposed changes to default speed limits on roads without a sign-posted speed limit. It does not propose, nor consider, changes to any current sign-posted speed limits.

This Regulatory Impact Analysis (RIA) assesses proposed changes to the model road rules regarding default speed limits (referred to throughout as the default) outside built-up areas. It does not propose, nor consider, changes to any current sign-posted speed limits, such as those on main roads, highways or freeways. Typically, default roads carry far less traffic than signed roads and have fewer safety features. Examples of these roads are shown in Figure 3.

Figure 3   Examples of default speed-limited roads outside of built-up areas

| Drummond-Vaughan Rd Glenluce, Victoria | Wynyangoo/Wondinong Rd, Mount Magnet, WA |

Source: Maps data: Google, ©2025

1.2   Background

In May 2021, the Australian Government and all state and territory governments agreed to the National Road Safety Strategy 2021-30 (the Strategy). The Strategy was developed by the Office of Road Safety in collaboration with state and territory road and transport agencies, and the Australian Local Government Association (ALGA), along with the Australia New Zealand Policing Advisory Agency (ANZPAA), the National Heavy Vehicle Regulator (NHVR), the National Transport Commission (NTC) and Austroads.

The Strategy sets out the collective ambition of governments to improve road safety through key priorities for action, in pursuit of road trauma reduction targets. Notably, this includes a reduction in road fatalities of 50% and a reduction of serious injuries by 30% by 2030, with a long-term goal of zero by 2050 (Figure 4).

The Strategy identified speed management as a critical factor in managing the risk of road death and injuries.

Figure 4   National Road Safety Strategy 2021-30, Targets for 2030

Source: Infrastructure and transport ministers (2021) Page 9, National Road Safety Strategy 2021-30

To support their outcomes under the Strategy, the Infrastructure and Transport Ministers launched the National Road Safety Action Plan 2023–25 (the Action Plan) which detailed the actions each government would take to contribute to the 2030 goal. Among them, was a commitment by the Australian Government, through the Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts (the Department) to:

> **Co-ordinate a review of the Australian Road Rules and development of a Regulatory Impact Statement (RIS) on reducing the open road default speed limit in consultation with state and territory governments, including police, and local government.**
>
> **Page 14, National Road Safety Action Plan 2023–25**

As part of this process, the Department engaged ACIL Allen and the Monash University Accident Research Centre (MUARC) to develop a Regulatory Impact Analysis (RIA) for proposed reductions in default speed limits for roads outside built-up areas.

1.3   RIA requirements

This RIA has been developed in accordance with the best practice regulatory principles administered by the Office of Impact Analysis (OIA) and set out in the *Regulatory Impact Analysis Guide For Ministers' Meetings and National Standard Setting Bodies* (referred to as the RIA Guidelines or OIA Guidelines).[8]

The RIA is developed in 2 stages:

1.   a Consultation RIA (CRIA) for the purpose of consulting with interested stakeholders (this report)
2.   a Decision RIA (DRIA) incorporating relevant information and data gathered through the consultation process with interested stakeholders. The DRIA is used by decision makers as an input into its decision on the matter that is the subject of the RIA.

The RIA guidelines state that there are 7 RIA questions that must be answered in each RIA:

1.   What is the problem? (addressed in Chapter 2)
2.   Why is government action needed? (addressed in Chapter 2)
3.   What policy options are to be considered? (addressed in Chapter 3)
4.   What is the likely net benefit of each option? (addressed in Chapter 5)
5.   Who was consulted and how was their feedback incorporated? (Stakeholder consultation incorporated throughout the report, with a description of who was consulted in Section 4.1.1)
6.   What is the best option from those considered? (addressed in Chapter 8)
7.   How will the chosen option be implemented and evaluated? (addressed in Chapter 7)

1.4   Structure of this report

The rest of this report is structured as follows:

- Chapter 2 discusses the nature and extent of the problem that the proposed changes are seeking to address
- Chapter 3 specifies the objectives of government action and the options to address the identified problem
- Chapter **Error! Reference source not found.** outlines the framework used to analyse the impacts of the proposed change
- Chapter 5 assesses the impacts of the proposed change
- Chapter 6 identifies the other impacts of the regulation
- Chapter 7 discusses the implementation, review and evaluation of the proposed regulation
- Chapter 8 sets out the conclusions of the analysis.

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[8]   Commonwealth of Australia, Department of the Prime Minister and Cabinet 2021, *Regulatory Impact Analysis Guide for Ministers' Meetings and National Standard Setting Bodies*, May.

2.   Statement of the problem

What is the policy problem you are trying to solve? Why is government action needed?

2.1   Identifying the problem

Australia is a very large country with an extensive road network that serves a relatively small population. In 2023 it was estimated that Australia has over 460,000km of sealed roads and nearly 860,000km of unsealed roads, for a total of over 1.3 million km.[9]

As of January 2024, the total registered vehicle fleet was nearly 22 million vehicles,[10] equivalent to 0.8 vehicle per capita.[11] Around 73% of the population have active drivers' licences [12] and 87% of people who travel to work use a vehicle.[13]

Besides moving people and enabling services, the road network serves an important role in our economy by moving goods; in 2023-24, road freight reached 249 billion tonne-kilometre (tkm)[14], accounting for 32% of all domestic freight travel. Road is also the second most prevalent freight transport mode, second only to rail at 57%.[15]

These statistics highlight that road transport is a vital part of Australian society and the economy. It is the primary way people commute and travel, and it delivers around a third of all goods to consumers.

2.1.1   Road safety trends

Fatal crashes

Between 2000 and 2020, Australia recorded a significant decline in road fatalities (see Figure 5). This positive trend has been attributed to factors such as improved vehicle safety features (such as adoption of seatbelts and airbags), investments in road infrastructure and design, and shifts in driver behaviour.[16]

However, in recent years this trend has reversed. Fatalities and associated costs have been rising, with 1,291 road deaths recorded in 2024, the highest annual toll in 12 years and an increase of 18.6% compared with 2020.[17] This increase is still evident, albeit to a lesser extent, when analysed on the per capita basis. During the same period, the number of fatalities per 100,000 population had increased from 4.28 to 4.72, equivalent to increase of 10%.[18] Other measures also tell a similar story, the fatalities rate per billion vehicle kilometre travelled (VKT) and fatalities rate per number of registered vehicles also follow a similar trend.[19]

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9   ACIL Allen estimates, based on BITRE, *Australian Infrastructure and Transport Statistics Yearbook 2024, Roads*. Tables 6.2a and 6.2c.
10   BITRE 2025, *Australian Infrastructure and Transport Statistics Yearbook 2024, Roads.* Tables 6.8.
11   ACIL Allen analysis, based on ibid and ABS 2025, *Release 3101.0 National, state and territory population 2024*. Table 1.
12   BITRE 2025, *Australian Infrastructure and Transport Statistics Yearbook 2024, Roads.* Tables 6.13i.
13   ABS (2022), *Australia's journey to work, How people travelled(a) to work on Tuesday 10 August 2021*
14   A tonne-kilometre (tkm) is a unit of measurement used to quantify the volume of freight transport, representing the transport of one metric tonne of goods over a distance of one kilometre
15   ACIL Allen analysis, based on BITRE 2025, *Australian Infrastructure and Transport Statistics Yearbook 2024, Freights.* Table 4.1c.
16   ABC News 2024, *After decades of decline, road fatalities are on rise in Australia and around the world — why and what can be done?* Accessed 27 August 2025, https://www.abc.net.au/religion/road-fatalities-on-the-rise-australia-what-can-be-done/103532970
17   The Guardian January 2025, *Australia's road toll hits 12-year high as pedestrian and cyclist fatalities rise*. Accessed 25 August 2025, https://www.theguardian.com/australia-news/2025/jan/27/australia-road-toll-2024-1300-deaths-highest-in-more-than-a-decade
18   ACIL Allen analysis based on DITRDCSA 2025 and ABS 2025.
19   ACIL Allen analysis based on DITRDCSA and BITRE

Figure 5   National annual road fatalities, 2000 to 2024
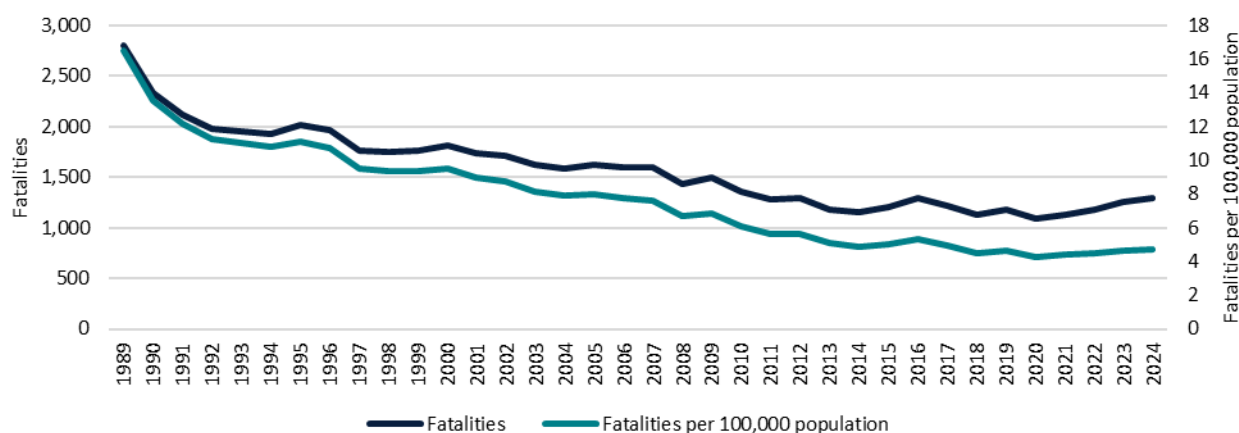
Source: ACIL Allen analysis, based on DITRDCSA and ABS

No consistent international trend in road fatality rates is evident. In New Zealand, fatalities rose after the COVID-19 pandemic, peaking in 2022 with 371 deaths (7.25 per 100,000 population), but fell to 292 deaths in 2024 (5.5 per 100,000 population)—the lowest since 2014.[20] Great Britain also saw an increase in road fatalities from 2020 to 2022 (1,460 to 1,711 deaths, or 2.25 to 2.60 per 100,000 population), before declining by 6% in 2023 (to 1,624 deaths, 2.45 per 100,000 population).[21] The United States recorded a reduction since 2022, from 42,514 to 40,990 deaths (12.76 to 12.06 per 100,000 population).[22] By contrast, Canada's fatalities rose from 2020 to 2023, increasing from 38,824 to 40,990 deaths (4.59 to 4.90 per 100,000 population).[23]

Table 7 below shows the change in fatality rate per 100,000 population between 2020 and 2023 for these countries, with Australia recording the second largest increase of 8.44% between these 2 years.

Table 7   Fatalities per 100,000 population in 2020 and 2023 by country

Country	2020	2023	Change from 2020 to 2023
New Zealand	6.26	6.50	3.83%
United Kingdom (Great Britain only)	2.25	2.45	8.72%
United States	11.67	12.76	3.34%
Canada	4.59	4.90	6.72%
Australia	**4.28**	**4.64**	**8.44%**

Source: ACIL Allen analysis, based on various sources

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[20] ACIL Allen analysis, based on New Zealand Ministry of Transport | Te Manatū Waka. (2025*). Safety – Road Deaths.* Retrieved from: https://www.transport.govt.nz/statistics-and-insights/safety-road-deaths/sheet/death-on-nz-roads-since-1921 and StatsNZ | Tatauranga Aotearoa, *Population*. Retrieved from: https://www.stats.govt.nz/topics/population/

[21] ACIL Allen analysis, based on United Kingdom Government (2024). *Road safety statistics: data tables*. Retrieved from: https://www.gov.uk/government/statistical-data-sets/reported-road-accidents-vehicles-and-casualties-tables-for-great-britain#road-user-type-ras02.

[22] ACIL Allen analysis, based on U.S. Department of Transportation National Highway Traffic Safety Administration (2025). *NHTSA Estimates 39,345 Traffic Fatalities in 2024.* Retrieved from: https://www.nhtsa.gov/press-releases/nhtsa-2023-traffic-fatalities-2024-estimates#:~:text=The%20U,of%20fatalities%20fell%20below%2040%2C000.

[23] ACIL Allen analysis, based on Government of Canada. (2025). *Canadian Motor Vehicle Traffic Collision Statistics: 2023*. Retrieved from: https://tc.canada.ca/en/road-transportation/statistics-data/canadian-motor-vehicle-traffic-collision-statistics/2023/canadian-motor-vehicle-traffic-collision-statistics-2023 and Statistics Canada (2025). *Population estimates on July 1, by age and gender.* Retrieved from: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501

Australia's fatality rate also has been found to be high amongst the OECD countries. Figure 6 shows a comparison of fatality rate per 100,000 population in 32 OECD countries in 2023.[24] In Australia, it was found that 4.69 people died due to road trauma for every 100,000 population, higher than the OECD median than 4.33.

Figure 6   Comparison of fatality rate per 100,000 population in 32 OECD countries, 2023
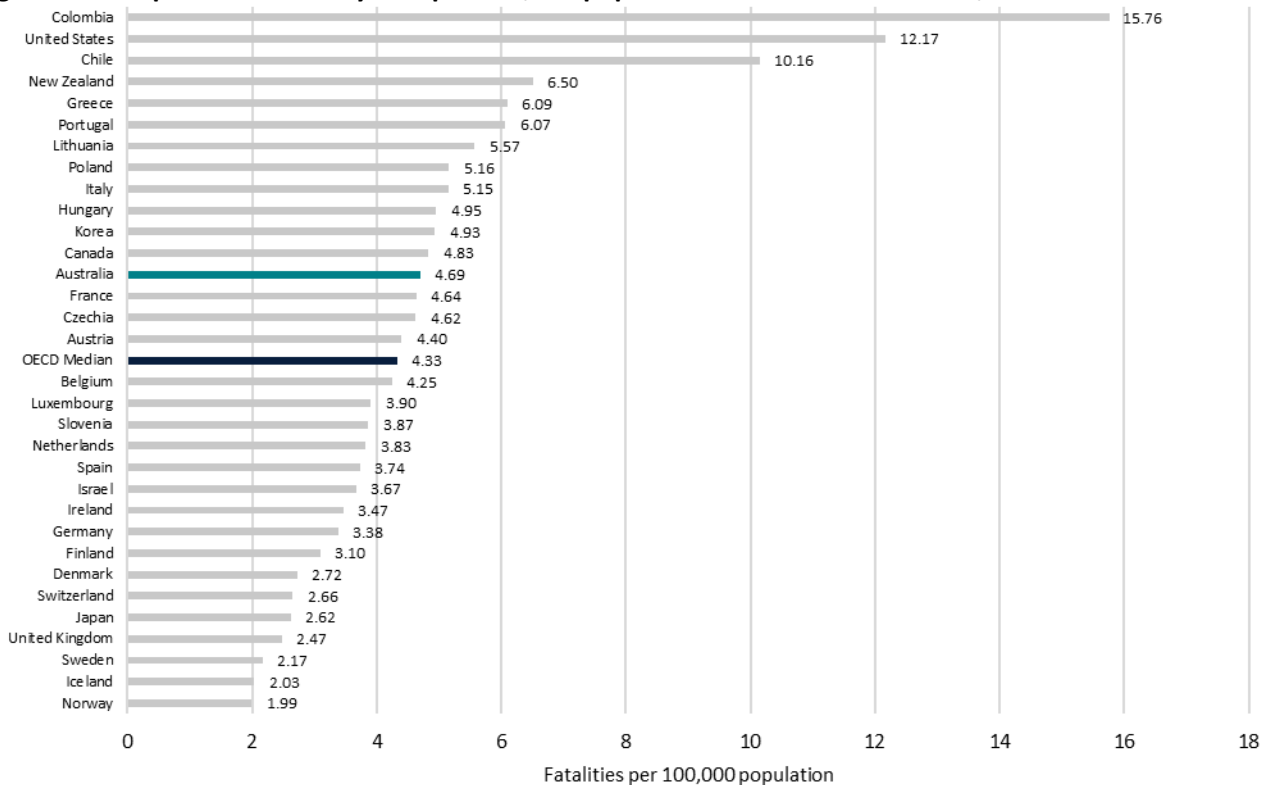
Source: ACIL Allen, based on DITRDCSA, International Transport Forum 2024, Road Safety Annual Report 2024, and the World Bank

NOTE: figures differ slightly from the table above due to inconsistencies with national and World Bank reporting.

While data is not available to determine how many fatalities happen on roads outside built-up areas with default speed limit, statistics on fatalities and injuries by remoteness region is a good proxy as roads in more remote regions are more likely to be defined as outside built-up areas. Between 2014 and July 2025:

- nearly two-thirds of Australia's road fatalities (65%) occurred outside of major cities[25]
- the majority (85%) of road deaths outside of major cities occurred on roads with speed limits over 80 km/h, with over half (53%) occurring on roads with 100 km/h and 110 km/h speed limits.[26]

This distribution of road fatalities is highly disproportionate, given that regional and remote areas account only for a quarter of Australia's population. As shown in Figure 7 these areas consistently record significantly higher fatalities per 100,000 people.

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[24]   Latest year with sufficient data for comparison.

[25]   ACIL Allen analysis based on BITRE 2025, Australian Road Deaths Database: Fatalities. Outside of major cities include Inner Regional Australia, Outer Regional Australia, Remote Australia, Very Remote Australia per AGSG Edition 3 (2021). Data prior to 2014 does not allow for remoteness region comparison. Another 1,843 fatalities were recorded with location unknown.

[26]   Ibid.

Figure 7   Road fatalities per 100,000 population by remoteness region, 2014 to 2024
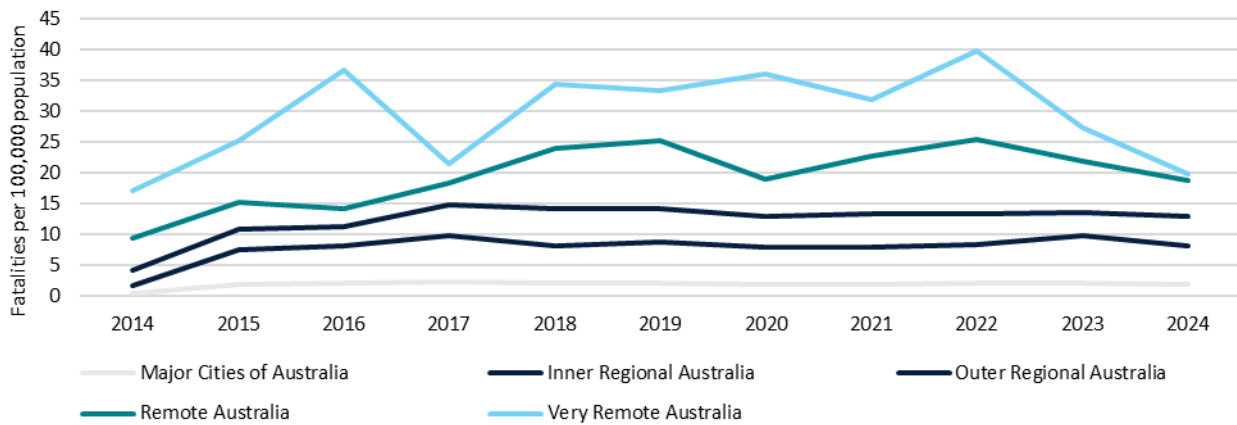
Source: ACIL Allen analysis, based on BITRE and ABS

Injury crashes

Beyond fatalities, road crashes also often result in injuries. The severity of injuries ranges from minor to serious. There is limited data available on minor injuries from crashes as they often go unreported. Data on more serious injuries also face constraints since they need to be reported by hospitals across the country, analysed and collated, requiring larger administrative efforts. As a result, there is often a large gap in recent data availability. The latest hospitalised injuries data available is for 2021 (see Figure 8), in which there were 39,505 hospitalisations due to injuries from road crashes, with an average number of 5 bed days per hospitalisation.[27] This data availability limits the understanding of whether or not hospitalised injuries figures has followed a similar increasing trend since 2010 as observed in fatalities figures.

In contrast with fatalities, most hospitalisations occurred in major cities (67%), followed by regional areas (29%) and remote areas (3%). While the true factors determining this difference is not known, it is possible that crashes in regional and remote areas often occur at higher speed and of higher severity, resulting in a higher ratio of fatalities to hospitalisations. This is supported by statistics showing that hospitalised injuries in regional and remote areas have an average duration of 6 bed days compared to 5 bed days for major cities.

Figure 8   Hospitalised injuries per 100,000 population, 2011-2021
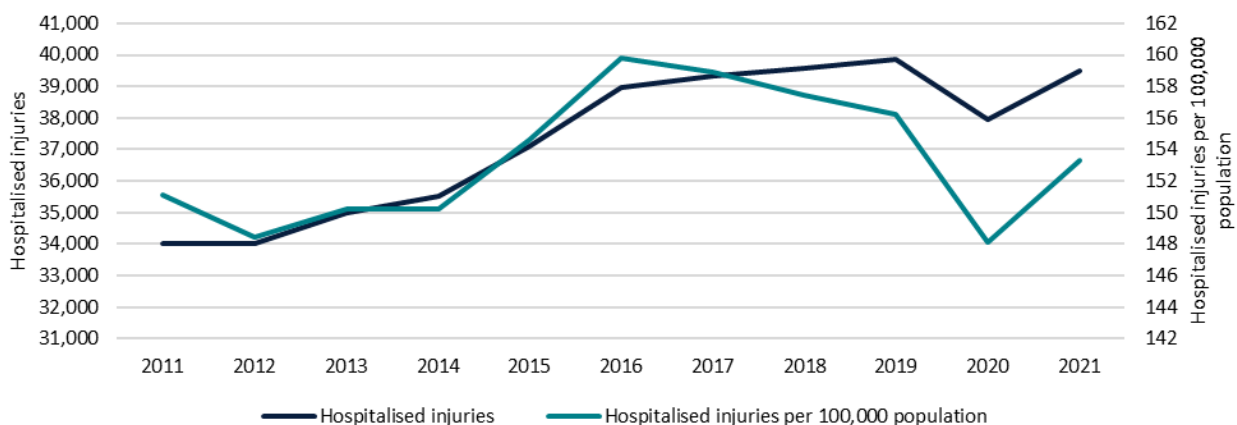
Source: ACIL Allen, based on DITRDCSA, Hospitalised injuries from road crashes – Australia 2011-2011

2.1.2   Cost of road trauma

Road trauma carries significant economic and social consequences. At the societal level, motor vehicle crashes result in substantial costs, including lost productivity, expenses related to vehicle and property repairs, and

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27   Australian Institute of Health and Welfare. (2023). Hospitalised injuries 2011 to 2021. Retrieved from:
      https://datahub.roadsafety.gov.au/progress-reporting/hospitalised-injuries

increased demands on healthcare systems. For individuals and families, the impacts are often profound, encompassing physical and emotional suffering, medical expenses, loss of income, elevated insurance premiums, and the financial burden of vehicle repairs.

Nationally the annual cost of road trauma has been estimated at more than $30 billion, reflecting the value of life, health and wellbeing, as well as other financial costs of vehicle damage, hospital care and insurance.[28]

Given the above mentioned trend in road deaths, Australia is not expected to meet either of the Strategy's 2030 or 2050 targets.[29,30] Without further interventions, researchers estimate that compared to the 2020 baseline, the number of fatalities will reduce by ~10% to 930 deaths by 2030, and by ~50% to 525 deaths by 2050.[31] This would not meet the target of reducing road fatalities by 50% by 2030, or the Vision Zero target by 2050.

Road trauma definitions

When referring to the impact of road trauma, there are a number of terms used in official reporting, the definitions of which can vary from source to source.

- **Fatality**: A road death or fatality is a person who dies within 30 days of a road crash as a result of injuries received in that crash, excluding deaths from deliberate acts and natural causes[32]

- **Casualty**: a casualty refers to any injury or death incurred, serious or otherwise.

- **Serious injury**: in the national definition, a serious injury refers to an injury sustained in a crash which resulted in a person being admitted to hospital (distinct from presenting to hospital). There are some differences in definitions between Australian jurisdictions. For example Victoria defines it as injuries requiring admission to hospital within 7 days,[33] while NSW is the same, but sets 30 days as the limit.[34] Notably, Victoria's definition used in reporting differs from the definition of Serious Injury used in the *Transport Accident Act 1986* (used by the Transport Accident Commission for the purpose of compensation) which makes no reference to hospitalisation, rather categorising on the basis of the harm suffered.[35]

- **Non-serious, moderate or minor injuries**: There are also different terminology for injuries that are not classified as serious. These are sometimes described as 'moderate' and 'minor injuries', other, 'slight' or simply 'non-serious', with some distinctions between the definitions.

2.1.3   Primary causes of road crashes

The reasons for the reversal in the macro trend identified above are difficult to identify, as they appear to be Australia specific, and not associated with any overall policy or behavioural shift but for the outbreak of the COVID-19 pandemic. While some have speculated as to the cause (including suggestions that the road

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[28] Australian Automobile Association September 2017, *Cost of Road Trauma in Australia.*

[29] Soltani, A., Afshari, S., & Amiri, M. A. (2025). Time-series projecting road traffic fatalities in Australia: Insights for targeted safety interventions. *Injury*, *56*(3), 112166.

[30] Soltani, A., Afshari, S., & Amiri, M. A. (2025). Human cost, machine insight: A data-driven analysis of Australian road crashes. *Case Studies on Transport Policy*, *20*, 101440.

[31] Ibid 16.

[32] Australian Department of Infrastructure and Regional Development (n.d.) Page 3, *Developing national road safety indicators for injury*. Accessed at: https://www.bitre.gov.au/sites/default/files/is_076.pdf

[33] Victorian Government (2024) *Victorian road trauma statistics*. Accessed at: https://www.vic.gov.au/victorian-road-trauma-statistics

[34] Transport for NSW (2025) *Serious injuries*. Accessed at: https://www.transport.nsw.gov.au/roadsafety/statistics/serious-injuries

[35] Transport Accident Commission (n.d.) *Serious injury*. Accessed at: https://www.tac.vic.gov.au/clients/how-we-can-help/compensation/common-law-compensation/common-law-fact-sheets/what-is-serious-injury

network is deteriorating, poor habits, and the rise in ownership in large cars), there has been little causal literature describing what the cause of the change is.[36]

This uncertainty is reflective of a broader challenge of attribution regarding road safety: in any given crash there are often several contributing factors, making it difficult to identify any particular factor as *the* cause. Nevertheless, some research has been undertaken to rank the relative impact of each different factor in crashes as a whole.[37] One estimate published in *The Open Transportation Journal* estimated that speed was the largest individual factor, with alcohol and fatigue the second and third contributing factors respectively (Figure 9). It is important to stress that this is only one study, and additional research – such as 'no blame investigations' as proposed by the Australian Automobile Association may reveal different trends.[38]

The factors identified in Figure 9 are discussed further below.

Figure 9   Causes of road fatalities in Australia in 2017
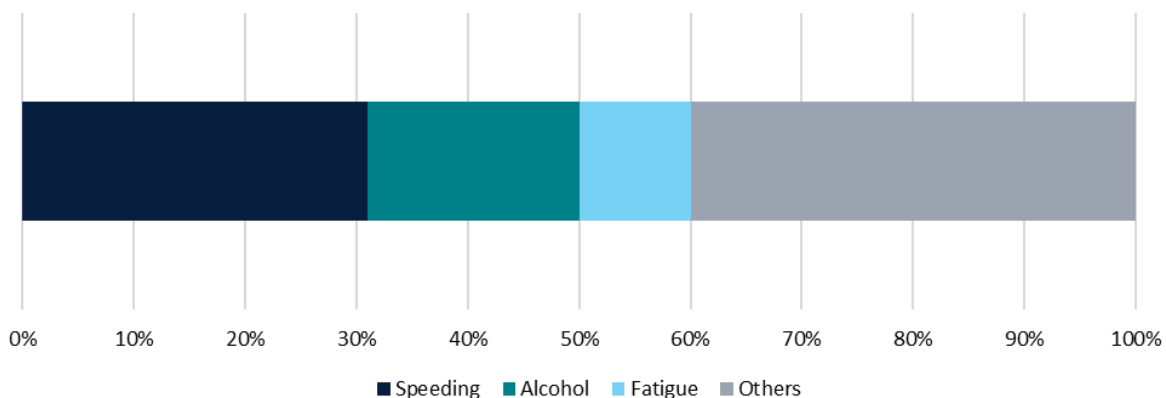
Source: Hassouna, F., & Pringle, I. (2019). Analysis and prediction of crash fatalities in Australia. The Open Transportation Journal, 13(1).

Speeding

The relationship between speed and crash outcomes is well established, as higher speeds increase both the likelihood of a crash occurring *and* the severity of its consequences. Even small increases in average traffic speed can lead to disproportionately higher risks of death and serious injury, particularly for vulnerable road users such as pedestrians and cyclists.

Higher speed increases the risk of collision primarily due to the need for a faster reaction time in response to unexpected events. At higher speeds, vehicles cover greater distances during the driver's reaction time, reducing the margin for error. Higher speeds also diminish a vehicle's manoeuvrability and significantly increase stopping distances.[39]

When a vehicle does crash, higher speeds mean a disproportionate amount of kinetic energy that needs to be dispersed, as it increases with the square of the speed.[40] This higher energy manifests as a higher risk to both the occupants of the car and those outside it. A pedestrian struck by a vehicle travelling at 30 km/h has a high chance of survival, but survival prospects fall sharply as speed increases: at 40 km/h the risk of death is about

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[36] Visontay, E. (2025) *Australia's road toll hits 12-year high as pedestrian and cyclist fatalities rise.* The Guardian. Accessed at: https://www.theguardian.com/australia-news/2025/jan/27/australia-road-toll-2024-1300-deaths-highest-in-more-than-a-decade

[37]   Hassouna, F., & Pringle, I. (2019). Analysis and prediction of crash fatalities in Australia. *The Open Transportation Journal*, *13*(1).

[38] Australian Automobile Association (2025) *Road deaths continue to climb*. Accessed at: https://www.aaa.asn.au/2025/09/road-deaths-continue-to-climb/

[39]   Ibid.

[40]   OECD 2018, Speed and Crash Risk

twice as high. The same principle also applies for vehicle occupants, as a collision at 100 km/h carries substantially more risk of fatality than one at 80 km/h.

To estimate the impact of speed on risk, Swedish researcher Göran Nilsson published the Nilsson's Power Model, which illustrates that on average, a 10% increase in speed will result in approximately 20% increase in crashes that result in an injury, 30% increase in severe crashes and 40% increase in fatal crashes.[41] This model has been widely cited and employed in the road safety research communities across the world.[42] Australian studies have reached similar conclusions, showing that lowering speed limits leads to measurable reductions in road trauma.[43]

Australia's reduction of urban default speed limit from 60 km/h to 50 km/h in the late 1990s and early 2000s has been estimated to reduce fatalities by 50% in Victoria, by 37% in Western Australia and 26% in South Australia.[44] In South Australia, the speed limit reductions from 110 km/h to 100 km/h on rural arterial roads in 2003 was associated with a reduction in fatalities of 20%.[45] This is consistent with international experience, where reductions in speed limits were associated with improved road safety. For example, in Wales, the default speed limit was reduced to 20 miles per hour (m/h) in 2023, which is equivalent to 32 km/h. After 12 months of reducing the speed limits, road fatalities in Wales reduced by 11.8%.[46] Further, in Zurich, Switzerland, the reduction of the speed limit to 30 km/h was associated with a 25% reduction in road fatalities.[47] In Sweden, a reduction in rural speed limits from 90 km/h to 80 km/h was associated with a 14% reduction in fatalities per year.[48] Ireland has recently reduced the default speed limit on rural roads from 80 km/h to 60 km/h, but as this change only took effect in February 2025, it is too soon to understand the impacts of the speed limit reduction on road safety outcomes.[49]

Taken together, the introduction and lowering of speed limits in Australia has delivered considerable increases in safety to date and would be expected to continue to do so if lowered to levels comparable to those overseas.

Alcohol and other drugs

Driving under the influence of alcohol or other drugs increases the risk of a crash by impairing driver psychomotor skills, co-ordination, attention, reaction times and judgement of speed and distance.[50] As such, it is a major cause of road fatalities in Australia, with drink driving estimated to contribute to 12% of road fatalities, and drug-driving estimated to contribute to 16.8% of road fatalities.[51] Among drivers undergoing

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41   Nilsson, G. (1982). Effects of speed limits on traffic accidents in Sweden.
42   Elvik, R., Christensen, P., & Helene Amundsen, A. (2004). Speed and road accidents: an evaluation of the power model. Transportøkonomisk Institutt.
43   https://www.nrspp.org.au/resources/speed-and-crash-risk/
44   NHMRC 2001. *Reducing speed, improving safety: Case Study*
45   National Health and Medical Research Council. (2021). Reducing speed, improving safety: Case Study. Retrieved from: https://www.nhmrc.gov.au/about-us/resources/impact-case-studies/reducing-speed-improving-safety.
46   Transport for Wales (2025). *Default 20mph speed limit on restricted roads | National monitoring report (July 2025).* Retrieved from: https://tfw.wales/national-monitoring-report-july-2025.
47   Yannis, G., & Michelaraki, E. (2024). Review of city-wide 30 km/h speed limit benefits in Europe. *Sustainability*, *16*(11), 4382.
48   Vadeby, A., & Forsman, Å. (2018). Traffic safety effects of new speed limits in Sweden. *Accident Analysis & Prevention*, *114*, 34-39.
49   Irish Road Safety Authority. (2025). Rural Speed Limit sign means drive 60 km/h or slower. Retrieved from: https://www.rsa.ie/road-safety/campaigns/rural-speed-limit.
50   Love, S., Rowland, B., & Davey, J. (2023). Exactly how dangerous is drink driving? An examination of vehicle crash data to identify the comparative risks of alcohol-related crashes. *Crime Prevention and Community Safety*, *25*(2), 131-147.
51   Australian Department of Infrastructure, Transport, Regional Development, Communications, Sports and the Arts. (2025). Police enforcement. Retrieved from: https://datahub.roadsafety.gov.au/safe-systems/safe-road-use/police-enforcement#anchor-download-data-

police random breath testing, 0.6% of 10.3 million tests (57,801) were positive for alcohol in 2022 (with a Blood Alcohol Content (BAC) over the legal limit of 0.05 g of alcohol per 100ml of blood.[52]).

As alcohol reduces inhibition, it can increase risk-taking behaviour such as speeding among drivers. A study of fatal road traffic accidents in Queensland from 2011 to 2015 found that of drivers that crashed with evidence of driver intoxication due to alcohol or drugs, 61% were speeding.[53] Speeding was also found to be five times more likely to be a contributing factor in an alcohol-related crash than in a non-alcohol-related crash.[54] Therefore, the relationship between speeding and driving under the influence of alcohol or other drugs is bi-directional, with both factors increasing the risk of crashing.

Fatigue

Driving while fatigued can cause drivers to lose focus on the road or fall asleep while driving. Driving while tired contributes to between 16-20% of crashes in Victoria,[55] while 5.3% of crashes on high-speed roads (≥100 km/h) in Queensland were sleep related.[56] An international systematic review and meta-analysis found that driving while tired had a pooled odds ratio of between 1.29 and 1.34 on the risk of a road traffic accident.[57],[58] However, research from Australia estimates that people who drive after only 5 hours sleep are 4.4 times as likely to crash as those who drive after 8 hours sleep.[59] People who drive after only 3 hours sleep are estimated to be 10 times more likely to be involved in a crash.[60]

Sleep-related vehicle crashes have been reported on high-speed and low-speed roads in Australia. Of crashes reported to be sleep-related, 59% occurred on high-speed roads (>100 km/h), and 41% occurred on low-speed roads (≤60 km/h).[61]

Other determinants

There are a number of factors other than speed which can impact road safety. This includes:

- distracted driving
- vehicle safety
- poor road conditions
- younger drivers
- failure to wear seatbelts or helmets.

While individually some of these factors are small, Figure 9 suggests that collectively these factors may be more important than speed, alcohol or fatigue. Further, in many cases reducing one factor can mitigate the impact of another. For example, reduced speed before a collision can increase the time a fatigued or

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[52] Australian Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts. (2024). *Police enforcement.* Retrieved from: https://datahub.roadsafety.gov.au/safe-systems/safe-road-use/police-enforcement#anchor-risky-road-behaviour.

[53] Freeman, J., Parkes, A., Armstrong, K., & Davey, J. (2021). Characteristics of fatal road traffic crashes associated with alcohol and illicit substances in Queensland (2011-2015). *Journal of road safety*, *32*(3), 4-14.

[54] Love, S., Rowland, B., & Davey, J. (2023). Exactly how dangerous is drink driving? An examination of vehicle crash data to identify the comparative risks of alcohol-related crashes. *Crime Prevention and Community Safety*, *25*(2), 131-147.

[55] Transport Accident Commission (n.d.). Tired Driving. Retrieved from: https://www.tac.vic.gov.au/road-safety/staying-safe/tired-driving.

[56] Filtness, A. J., Armstrong, K. A., Watson, A., & Smith, S. S. (2017). Sleep-related crash characteristics: Implications for applying a fatigue definition to crash reports. *Accident Analysis & Prevention*, *99*, 440-444.

[57] The pooled odds ratio refers to the odds of the outcome occurring among cases compared to the controls

[58] Moradi, A., Nazari, S. S. H., & Rahmani, K. (2019). Sleepiness and the risk of road traffic accidents: A systematic review and meta-analysis of previous studies. *Transportation research part F: traffic psychology and behaviour*, *65*, 620-629.

[59] Transport Accident Commission (n.d.). Tired Driving. Retrieved from: https://www.tac.vic.gov.au/road-safety/staying-safe/tired-driving.

[60] Monash University. (2021). Fatigue test trial for drowsy drivers. Retrieved from: https://www.monash.edu/news/articles/fatigue-test-trial-for-drowsy-drivers .

[61] Filtness, A. J., Armstrong, K. A., Watson, A., & Smith, S. S. (2017). Sleep-related vehicle crashes on low speed roads. *Accident Analysis & Prevention*, *99*, 279-286.

distracted driver has to react to an unexpected incident, while in a collision a lower speed would mean the vehicle needs to dissipate less kinetic energy to protect their driver.

2.2   The need for government intervention in road safety

Government action may be needed where markets fail to provide the most efficient and effective solution to a problem. This is typically described as a market failure. While the road network is not a typical market, these types of failures still apply, and are discussed in the sections below.

These failures justify governments' roles in setting safety standards, providing infrastructure, enforcement, education, and regulation across the entire road network.

2.2.1   Negative externalities and moral hazard

Externalities are defined as costs and benefits of an activity that are experienced by people or organisations other than those directly involved in the activity. Negative externalities thus occur when a third party experiences a cost or negative impact despite not being directly involved in the activity. Similarly, a moral hazard occurs when insured people take more risks due to their insurance from the costs of that risk. In this way, insurance increases the level of negative externality while driving by externalising an otherwise internalised cost (the cost of damage to the driver's own vehicle and person).

Examples of negative externalities caused by unsafe driving include:

- **Injury and fatalities:** other road users, pedestrians and bicycle riders can be put at risk through reckless driving and have a high risk of injury or death if they are involved in a crash with a vehicle. In NSW, drivers and motorcyclists make up 64% of fatalities and 55% of serious injuries,[62] while bicycle riders and pedestrians account for 20% of fatalities and 27% of serious injuries.[63]
- **Emergency response and infrastructure costs:** when a crash occurs, a variety of emergency responses can be observed depending on the scale of the incident, including the need for ambulances and police in the event of serious injuries or fatalities. These costs are typically not all carried by the individual who causes the crash
- **Cost of vehicle damage:** when insured, the cost of repair are in some part borne by the insurers. In such a case, drivers do not bear the burden of a crash and so may not take sufficient steps to avoid them.
- **Traffic flow disruption:** major accidents can lead to extended disruptions to thoroughfares, disrupting traffic flow and can force vehicles onto low-capacity roads. This can lead to greater congestion and strain on infrastructure and extend the impact to emergency services, public transport, and freight delivery systems.

These negative externalities of unsafe driving, ranging from increased injuries and fatalities to environmental damage illustrate the clear moral hazard that drivers often drive recklessly because they do not bear the full costs of their actions. The importance of safe road use is discussed further in Section 2.3.

2.2.2   Imperfect information

Imperfect information refers to a situation where decision-makers do not have access to all the information they need to make an informed decision. Where this occurs, decision-makers may make different decisions than they would if they knew all the information. This can occur in the road safety context where drivers overestimate their ability to drive safely.

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[62]   Ibid.

[63]   Ibid.

Drivers across all age ranges frequently overestimate their driving ability,[64] as drivers rely on their subjective definitions of what is a "good driver."[65] Younger drivers in particular have been shown to demonstrate overconfidence[66].

In unfamiliar environments where road condition knowledge is limited, drivers may take unnecessary risks such as speeding or cause other drivers to have to respond to hazardous driving.[67] As drivers act as individual agents, they operate under the false assumption that other drivers will act according to their true capabilities, which is often inconsistent with the driver's self-perceived skill. This can also occur when engineers are aware of hazards, road design limitations, and traffic patterns that drivers may not be without the postage of speed limits and other signage.

Additionally, there is evidence that at least some drivers do not have a good understanding of their risk when:

• driving while fatigued/sleepy (noting that drivers may not be able to tell when they are fatigued or sleepy)[68]

• drink driving[69]

• speeding, as some drivers believe speeding can be safe given a sufficient skill (noting drivers tendency to overestimate their ability, established above)[70]

These forms of information failure, when combined can lead to an overall underestimation of the risk on the road. This in turn leads to less care being taken, and an increased risk of collisions.

2.3   The policy response

The Australian, state and territory governments have introduced a number of measures to address the market failures outlined above and improve road safety. The full portfolio of these interventions is categorised in the *Safe System Approach* framework as: safe speeds, safe roads, safe vehicles, safe people and post-crash care.[71] While it would be impractical to describe every road safety intervention, a sample of key interventions are summarised in Table 8 alongside safe system categories, the underlying principles, and a mapping to the Action Plan principles.

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[64]   Mairean, C. & Havarneanu, C.E. (2018). The relationship between drivers' illusion of superiority, aggressive driving, and self-reported risky driving behaviours. Transportation Research Part F: Traffic Psychology and Behaviour, 55, 167-174. https://doi.org/10.1016/j.trf.2018.02.037

[65]   Association for Psychological Science. (2014). When it comes to driving, most people think their skills are above average. https://www.psychologicalscience.org/news/motr/when-it-comes-to-driving-most-people-think-their-skills-are-above-average.html#:~:text=If%20you%20ask%20someone%20to,make%20them%20a%20bad%20driver.%E2%80%9D

[66]   Gregersen N.P. (1996). Young drivers' overestimation of their own skill – an experiment on the relation between training strategy and skill. Accident; Analysis and prevention, 28(2), 243-250. https://doi.org/10.1016/0001-4575(95)00066-6

[67]   Ren, Y., Li, X., Tan, L., Zuo, S. (2010). Notice of Retraction: Research on the influence of information asymmetry on traffic safety on curved sections. 2010 IEEE International Conference on Emergency Management and Management Sciences, Beijing, China, 185-188. doi: 10.1109/ICEMMS.2010.5563470.

[68]   Armstrong, K. (n.d.) *How do perceptions of risk associated with driving while fatigued and perceptions of effectiveness of countermeasures effect willingness to engage in fatigue reducing countermeasures?* 1st International Conference on Human Factors in Transportation. Accessed at: https://eprints.qut.edu.au/55106/1/Kerry_Armstrong_San_Fran_Presentation_V1.pdf

[69]   Ibid

[70]   Hatfield, J., Soames Job, R.F. (2006) Beliefs and Attitudes about Speeding and its Countermeasures.

[71]   Austoads 2021, *Guide to Road Safety.*

The 'Safe System' approach

The Safe System philosophy has been part of road safety practice throughout the Australian states and territories for more than 20 years, providing principles by which an inherently safe road system can be created. It is based on the premise that road users can never be prevented from making errors, despite ongoing efforts to minimise their occurrence. As a result, when crashes inevitably occur, no one should be killed or seriously injured – that is, the road system needs to operate within the biomechanical limits of the road user.

All the interventions described in Table 8 work together to improve road safety by deterring risk taking behaviour (speed limits, alcohol laws), mitigating the impact (safer cars, better infrastructure), or by ensuring the safety of people after an accident takes place (faster medical care). This combined approach acknowledges that road safety interventions are often multiplicative – for example, lower speeds make it easier for safer cars to protect drivers, which in turn will need less urgent medical care. As such, the best way to improve road safety is through a coordinated, multi-faceted approach.

The responsibility for each of the interventions in Table 8 sits with various stakeholders – sometimes within the same intervention. For example, while state and territory governments set speed limits for some roads, others are set by local councils. As such, governments coordinate their policy responses through the 10-yearly Road Safety strategies and 5-yearly Action Plans, including the current Strategy and Action Plan described before.

Table 8   Safe system approaches

Safe system	Example interventions	Underlying principles of these interventions	Action plan principles
Safe roads	• Median barriers; shoulder sealing, rumble strips; roundabouts/raised safety platforms • Protected bike/pedestrian facilities • High-friction surfaces	Separate and simplify movements; remove or cushion hazards; reduce conflict angles; manage kinetic energy at high-risk points; create forgiving infrastructure that limits crash severity.	Infrastructure planning and investment Regional road safety Remote road safety
Safe speeds	• Speed limits • Variable limits/managed motorways • Fixed and average-speed cameras • Speed-setting reviews	Set credible, survivable speeds matched to function and users; use general deterrence to sustain compliance; adapt limits to conditions to keep impact forces within human tolerance.	Risky road use
Safe vehicles	• ADR-mandated ESC/AEB/lane support • Fleet procurement informed by safety ratings; motorcycle ABS; heavy-vehicle AEBS/ESC • Alcohol interlocks for offenders	Prioritise crash avoidance then protection; embed fail-safe and stability systems; shape the fleet toward higher safety performance; control high-risk cohorts at the source.	Vehicle safety Heavy vehicle safety

Safe system	Example interventions	Underlying principles of these interventions	Action plan principles
Safe road users	• Random breath/drug testing; graduated licensing • Seatbelt/child-restraint and helmet enforcement; mobile-phone detection • Fatigue management for heavy vehicles	Deter impairment and distraction; phased learner/provisional experience; maximise restraint use; manage fatigue and other high-risk behaviours through enforcement, education, and graduated sanctions.	Aboriginal and Torres Strait Islander people Vulnerable road users Workplace road safety
Post-crash care	• **Rapid emergency management and trauma systems** • **Automatic crash notification** • **Safe-clearance incident management** • **Trauma registries**	Minimise time to definitive care; protect responders and prevent secondary crashes; use linked data for continuous system learning and treatment optimisation.	Aboriginal and Torres Strait Islander people Vulnerable road users Workplace road safety

Source: ACIL Allen analysis of National Road Safety Action Plan 2023–25

2.3.1 Default speed limits by state and territory

As a part of the Safe Speed principle, governments set speed limits to improve road safety. Default speed limits are one type of intervention and, as mentioned before, apply wherever authorities have not otherwise specified the speed limit of a given road.

Outside built-up areas, most states and territories have a default speed limit of 100 km/h, aside from Western Australia and the Northern Territory, where the default speed limit is 110km/h. In Tasmania, the maximum default speed limit on unsealed roads outside built-up areas is 80 km/h.

In built-up areas, the default speed limit in most states and territories is 50 km/h, apart from the Northern Territory, where it is 60 km/h. However, in the Northern Territory many local governments have gazetted a default speed limit of 50 km/h in built-up areas.

Some states place restrictions on learner and provisional drivers in many states, with maximum speeds between 90 km/h to 100 km/h for these drivers.

The default speed limits in each state and territory in Australia are outlined in Table 9.

Table 9   Default speed limits by State and Territory

State or Territory	Default speed in built-up areas	Default speed outside built-up areas	Expectations or additional considerations
Australian Capital Territory	50 km/h	100 km/h	
New South Wales	50 km/h	100 km/h	Learner drivers and Provisional P1 drivers may not drive faster than 90 km/h
Northern Territory	60 km/h, unless local government has gazetted lower default limit	110 km/h	

State or Territory	Default speed in built-up areas	Default speed outside built-up areas	Expectations or additional considerations
Queensland	50 km/h	100 km/h	
South Australia	50 km/h	100 km/h	Heavy vehicles over 12 tonnes GVM or a bus GVM over 5 tonnes maximum speed is 100 km/h, except for road trains where a speed limit of 90 km/h applies for most roads
Tasmania	50 km/h	100 km/h sealed, 80 km/h unsealed	Learner and Provisional drivers must not drive faster than 90 km/h
Victoria	50 km/h	100 km/h	
Western Australia	50 km/h	110 km/h	

Source: ACT Government (2019), ACT Road Rules Handbook; NSW Government (n.d), Speed Limits, Retrieved from https://www.nsw.gov.au/driving-boating-and-transport/roads-safety-and-rules/safe-driving/speed-limits-and-cameras/speed-limits, Northern Territory Government (2020). Road Users' Handbook.; Queensland Government (2024). Speed Limits. Retrieved from: https://www.qld.gov.au/transport/safety/rules/speed-limits, Government of South Australia (2025). Driver's Handbook; Tasmanian Government (2022). Tasmanian Road Rules; Victorian Government (2017). Road Safety Road Rules 2017.; Main roads Western Australia (2023) Speed Zones. Retrieved from: https://www.mainroads.wa.gov.au/technical-commercial/technical-library/road-traffic-engineering/traffic-management/speed-zones/.

2.4   Need for further government intervention in managing default speed limits

As mentioned before, Australia's road safety performance has declined over recent years, with road fatalities per 100,000 population increasing from 4.3 in 2021 to 4.7 in 2024. This upward trend contrasts sharply with the sustained improvements seen in similar advanced economies like the United Kingdom, United States and New Zealand, which have achieved their safety gains through comprehensive approaches that include lower default speed limits.

Australian governments recognised the need for additional intervention in this space through the Strategy and the Action Plan, which commit to reviewing default speed limits for roads outside of built-up areas as part of a broader effort to reduce road trauma.

2.4.1   Policy imperatives

As discussed in Section 1.3, governments have agreed to ambitious road safety targets through the Strategy, including a 50% reduction in road fatalities and a 30% reduction in serious injuries by 2030, progressing toward the ultimate goal of zero deaths and serious injuries by 2050.

The Strategy embeds speed management across all key themes (safe roads, safe vehicles, and safe road use) as a key component of its multifaceted approach. This strategic positioning highlights that further government action on default speed limits is essential for achieving comprehensive road safety improvements.

Without proactive action in managing default speed limits alongside other safety measures, Australia risks falling further behind international best practice and failing to meet its targets to reduce road deaths by 50% and serious injuries by 30% by 2030.

The 'Safe System' approach and speed

Depending upon the level of protection available, different travel speeds within the system have different thresholds. For drivers and passengers in a reasonably modern vehicle, the maximum speed at which a head-on crash is permissible is around 70 km/h. In a carriageway departure crash into a rigid roadside object such as a tree or non-frangible pole, the threshold before serious or fatal outcomes becomes much more likely drops to 50 km/h. Side impact crashes between vehicles approaching at right angles are also limited to 50 km/h before the likelihood of death or serious injury increases sharply. It is apparent that legally permissible travel speeds are frequently well in excess of these thresholds, and the current road system is therefore not Safe System-compliant.

To meet Safe System standards on high-speed roads, particularly in regional and remote areas, it would be necessary to match allowable speeds with infrastructure quality. Where current travel speeds of 100 km/h and higher are desired, suitable road safety measures would need to be implemented to prevent crashes from exceeding human limits. Measures such as flexible mid- and side-barrier, coupled with suitable intersection improvements such as roundabouts or grade separation are highly effective in preventing serious outcomes for vehicle occupants. Nevertheless, such measures are expensive, particularly if they were to be constructed on tens of thousands of kilometres of roads throughout country Australia.

2.4.2   Evidence on cost effectiveness of speed management interventions

As discussed in previous sections, speed remains fundamentally linked to both crash occurrence and severity, even small reductions in average speeds produce disproportionately large safety benefits by giving drivers more time to react and dramatically improving survivability when crashes do occur.

Unlike some road safety interventions that require infrastructure upgrades or behavioural change campaigns, adjusting speed limits requires a significantly lower level of resources and has an immediate effect on risk levels.

2.5   Summing up

The discussion above suggests that, in principle, there is a case for a reduction in the default speed limits in the ARR on the basis of:

- **Deteriorating road safety** – Australia's road safety outcomes have worsened despite improvements in vehicle safety technology and sustained government intervention efforts, with fatality rates increasing while international peers achieve significant reductions.
- **The existence of market failures** – imperfect information and negative externalities mean that individual drivers may unintentionally impose unacceptable risks on others. Default speed limits help address these failures by providing clear guidance on default roads and preventing speeds that generate disproportionate dangers for all users.
- **Cost effective policy mechanism** – speed management is an essential component of a comprehensive road safety approach that offers practical value as a proven, cost-effective intervention. Alternative non-regulatory approaches (including infrastructure upgrades and education campaigns) remain important but typically deliver lower safety returns per dollar invested and prove insufficient without complementary speed guidance.
- **Recent policy commitments** – the Action Plan specifically identified ARR default speed limit reform as a priority contribution the Australian Government can make to the broader national road safety effort.

The case for reduced default speed limits in the ARR is carefully assessed in this RIA to determine whether the proposed changes are likely to be beneficial for the Australian society overall.

2.6   Questions for stakeholders

- Does the RIA adequately identify and define the problem?
- Are there any other problems not considered by this RIA?
- Does the RIA establish a case for amending the default speed limits in the ARR?

3.   Objectives and options

What are the objectives of government action? What policy options are being considered to achieve these objectives?

3.1   Objectives of government action

The objectives of further government action in managing default speed limits outside built-up areas can be summarised to:

- improve the safety of default roads outside built-up areas
- reduce road deaths and serious injuries on default roads outside built-up areas
- contribute towards reaching the trauma reduction targets set by the Strategy.

3.2   Policy options

The objectives of the policies and commitments driving change in road safety across Australia are very broad and, as such, there are a wide range of policy measures that can contribute towards the achievement of these objectives. Many of these options are unrelated to default speed limits and/or outside the remit of the Australian Government. In light of this, and the specific commitment in the Action Plan to examine the impact of lowering default speed limits, the RIA focuses solely on options that relate to default speed limits outside built-up areas and are within the remit of the Australian Government.

The policy options formally considered in this RIA were developed in discussion with stakeholders and are discussed in more detail in the sections below.

The RIA focuses solely on options that relate to default speed limits outside built-up areas and are within the remit of the Australian Government.

3.2.1   Base case (status quo)

The base case or status quo is an option where there are no changes are made to the ARR rules. Currently, the ARR state that:

> **(3) The default speed-limit applying to a driver for any other length of road is:**
>
> **(a) for a driver driving a bus with a GVM over 5 tonnes, or another vehicle with a GVM over 12 tonnes—100 kilometres per hour; or**
>
> **(b) for any other driver—100 kilometres per hour or as otherwise provided under another law of this jurisdiction.**
>
> **Rule 25, (3), Part 3, Page 29 Australian Road Rules**

As described in Table 9 there are instances where jurisdictions provide for alternative default speed limits. Those differences notwithstanding, for the purposes of this RIA, the base case represents the current ARR speed settings. The approach to handling these differences in our model is described in Section 4.1.1.

3.2.2 Reform options

In consultation with state and territory road authorities, a range of options to reduce default speed limits were identified for assessment in this RIA. These discussions highlighted several key principles guiding the development of reform options, namely that:

- speed limits should, for simplicity, be set in multiples of 10 km/h
- a lower speed limit should be considered for unsealed roads, reflecting their higher safety risks
- a 70 km/h speed limit should be considered, as it aligns with the Safe System principles.[72]

On this basis, the proposed reform options explore different speed limits for sealed and unsealed roads outside of built-up areas, as outlined in Table 10. These options will be assessed independently, noting that various combinations of options may also be feasible, except where the proposed speed limit for unsealed roads would fall below that for sealed roads.

Table 10 Proposed options for sealed and unsealed roads

	Options
Options considered for sealed roads	1. 90 km/h
	2. 80 km/h
	3. 70 km/h
Options considered for unsealed roads	1. 80 km/h
	2. 70 km/h

Source: ACIL Allen

3.2.3 Alternative approaches

The OIA Guidelines require that a RIA identifies a range of viable options, including, as appropriate, non-regulatory, self-regulatory and co-regulatory options. [73] As noted above, this RIA will focus the discussion of alternative approaches to options that relate to managing default speed limits outside built-up areas.

Non-regulatory approaches

Relevant non-regulatory approaches which focus on managing speed in default roads through information provision and incentives already exist in various forms at both the national and state level. For instance:

- road safety infrastructure
- educational campaigns about the risk of particular driving behaviours
- provision of public transport options.

The statistics discussed in Section 2.1.1 highlights that voluntary approaches have had mixed results, with a sustained period of decreases in road fatalities and injuries, followed by a recent increase. Furthermore, investment in additional infrastructure as an alternative policy typically delivers lower safety returns per dollar invested and prove insufficient without complementary speed guidance.

Finally, alternative approaches (such as infrastructure) are costly in comparison to changes to the default limit. Research conducted in South Australia showed that speed limit reductions can have an unparalleled impact safety at a very low direct cost (Table 11).

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[72]   OECD (2008). Figure 4, p. 19 *Towards Zero: Ambitious Road Safety Targets and the Safe System Approach*. Transport Research Centre, International Transport Forum.
[73]   Commonwealth of Australia, Department of the Prime Minister and Cabinet 2021, *Regulatory Impact Analysis Guide for Ministers' Meetings and National Standard Setting Bodies*, May.

Table 11 Cost of obtaining reductions on state-controlled roads in South Australia with infrastructure changes or speed limits on 100 km/h roads

Treatment option	Serious casualty crash reduction (%)	Cost of treatment	Cost of 20% serious casualty crash reduction
10 km/h speed limit reduction	20%	<$1m	<$1m
Shoulder sealing	14%	$104m	NA
Roadside barriers	18%	$526m	NA
Median barriers	14%	$2,142m	NA

Source: Austroads

Quasi-regulation

The quasi-regulatory approach covers a wide range of rules or arrangements that are not part of explicit government regulation but seek to influence the behaviour of businesses and individuals. Examples include: voluntary codes and standards such as the Australasian New Car Assessment Program (ANCAP), guidance notes and information like the National Road Safety Data Hub, industry-government agreements and accreditation schemes.[74]

The Australian Government Best Practice Regulation Handbook (2007)[75] provides a checklist for the assessment of when quasi-regulation should be considered (see the box below). Australian governments already take extensive quasi-regulatory action. While further action of that type may be appropriate, this is not considered in this assessment.

Checklist for the assessment of quasi-regulation

Quasi-regulation should be considered where:

- □ there is a public interest in some government involvement in addressing a community concern and the issue is unlikely to be addressed by self-regulation
- □ there is a need for an urgent, interim response to a problem in the short term, while a long-term regulatory solution is being developed
- □ government is not convinced of the need to develop or mandate a code for the whole industry
- □ there are cost advantages from flexible, tailor-made solutions and less formal mechanisms
- □ there are advantages in the government engaging in a collaborative approach with industry, with industry having substantial ownership of the scheme. For this to be successful, there needs to be:
  - □ a specific industry solution rather than regulation of general application
  - □ a cohesive industry with like-minded participants, motivated to achieve the goals
  - □ a viable industry association with the resources necessary to develop and/or enforce the scheme
  - □ effective sanctions or incentives to achieve the required level of compliance, with low scope for benefits being shared by non-participants
  - □ effective external pressure from industry itself (survival factors), or threat of consumer or government action.

Proposed quasi-regulation approaches should not restrict competition.

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[74] Department of the Prime Minister and Cabinet 2020, *The Australian Government Guide to Regulatory Impact Analysis*, https://www.pmc.gov.au/sites/default/files/publications/australian-government-guide-to-regulatory-impact-analysis.pdf, accessed 17 September 2020, P. 30.

[75] Australian Government 2007, *Best Practice Regulation Handbook*, Canberra, http://regulationbodyofknowledge.org/wp-content/uploads/2013/03/AustralianGovernment_Best_Practice_Regulation.pdf, accessed 17 September 2020.

Summing up

In light of the discussion above, the RIA does not formally analyse alternative approaches to achieve the objectives of government action. This approach recognises that:

- there are a range of non-regulatory measures already in place to encourage speed management at both the national and state level
- it has been acknowledged (through the Strategy the Action Plan and other policies) that a suite of policies and tools are needed to improve road safety (including regulation)
- the need for regulation in this space has been established in the past, with various regulations relating to speed limits already in place.

3.3   Questions for stakeholders

- Does the RIA present clear, well differentiated options that can achieve the stated policy objective?
- Which of the options analysed have the ability to meet the stated objectives? How could these be enhanced?
- Are there any other feasible options to address the problems identified in the previous chapter that have not been assessed in the RIA and should be considered?
- Of the options discussed in this chapter which would be the most effective at achieving the stated objectives and why?
- Which is your preferred option and why?
- Are the objectives as expressed above appropriate?

4.   Modelling approach

4.1   General framework

Consistent with best regulatory practice, the analysis of the impact of the proposed changes to default speed limits was undertaken using a cost benefit analysis (CBA) framework.

CBA is an economic analytical tool used to assess the costs and benefits of regulatory proposals. Costs and benefits are examined from the perspective of the community as a whole to identify the proposal with the highest net benefit. Table 12 summarises the costs and benefits that will be modelled.

Table 12   Costs and benefits framework

High level impact	Detailed benefits	Price	Quantity
Benefits			
Avoided costs of fatalities and serious injuries	Avoided fatalities	Office of Impact Assessment (OIA) value of a statistical life	MUARC scenario modelling
	Avoided serious injuries	Based on Australian Transport Assessment and Planning (ATAP) Guidelines	MUARC scenario modelling
	Avoided minor injuries	Based on Australian Transport Assessment and Planning (ATAP) Guidelines	Proportional to serious injuries
Avoided fuel consumption	Cost of fuel Emissions benefits	Estimates from ACIL Allen's previous New Vehicle Efficiency Standard (NVES) work	Estimated share of VKT on default roads, adjusted by speed change estimates output by MUARC's modelling
Other intangible benefits	Improved community amenity, reduced noise, reduced road maintenance, and enhanced perceptions of safety	Qualitative discussion	Qualitative discussion
Costs			
Travel time	Private travel time Business travel time Logistics travel time	Austroads estimates of value of travel time Logistics company estimates of cost of travel time	Estimated share of VKT on default roads, adjusted by speed change estimates
Government costs	Administrative costs	Departmental estimates	
Other intangible costs	Social acceptance and public opinion	Qualitative discussion	Qualitative discussion

Source: ACIL Allen

Scenario-based modelling

CBAs typically make a central estimate of the costs and benefits on the basis of relatively certain estimates of quantity and price, allowing for any deviations from these to be handled in sensitivity analysis. However, in attempting to estimate the costs and benefits of a default speed reductions, there are too many uncertainties to be able to make a firm estimate. As will be discussed further in sections 4.2 and 4.3, the vehicle-kilometres travelled (VKT) (that is to say, the amount of driving) and the share of fatal and serious injury (FSI) crashes

that occur on default roads are unknown across jurisdictions. While the VKT and FSI on default roads cannot exceed the VKT and FSI on all roads, there is very limited information on what their true values might be.

As such, there is no way to develop a robust central estimate for each option. To ameliorate these risks, a scenario-based approach has been taken.

By modelling several scenarios, it can be identified whether an option would have a positive (or negative) result under any set of reasonable assumptions. This approach incorporates the uncertainty around the share of FSI and VKT into a range of final results.

In using these scenarios, both the plausible best- and plausible worst-case scenarios are modelled. In this way, it can be determined if there are any reasonable scenarios under which the reforms would or would not lead to a positive net benefit. As such, instead of one set of results, a range would be presented.

These results will be expressed both in terms of the benefit-cost ratio (BCR) and net present value (NPV). An explanation of these measures is provided in Table 13.

Table 13   Net impact measures

Measure	Description	Success measurement	Comparative ability
Net present value (NPV)	Sum of discounted annual net benefits (benefits minus costs)	Policy is beneficial to society if NPV is greater than zero	Provides the ability to compare programs according to the total economic return of each, where the option with the largest NPV should generally be favoured
Benefit-cost ratio (BCR)	Ratio of the present value of total benefits to the present value of total costs	Policy is beneficial to society if BCR is greater than one	Provides the ability to compare programs according to the degree to which benefits outweigh costs for each, where the option with the largest BCR should be favoured

Timeframe

Consistent with best practice and previous RIAs, it is assumed that compliance and enforcement actions begin the year that the amendments take effect and are modelled to extend for a period of 10 years (that is, costs and benefits associated and attributed to the policy are to be modelled for 10 years). After this period, it is assumed that in a normal cyclical policy review, a new cost benefit analysis results in either the regulations being superseded, revised or extended.

It will be assumed that implementation will take place in 2026, meaning the analysis covers the period of 2026 to 2035.

Discount rate

Discounting is an economics concept that involves in effect reducing costs and benefits that occur in the future to their values in the present using a discount rate. The discount rate is the rate at which the weight given to future consumption decreases in economic models. This process converts costs and benefits that occur in different periods of time to the same unit to enable comparisons.

The OIA guidelines require the calculation of net present values at an annual central real discount rate of 7%, with sensitivity analysis conducted using a lower bound discount rate of 3% and an upper bound discount rate of 10%.[76]

Compliance

The standard assumption in regulatory analysis is full compliance with proposed new requirements. However, for the modelling of speed limits in the RIA, it is assumed less than 100% compliance as some drivers breach the speed limits (e.g. due to habitual driving patterns, inadequate signage awareness, etc).

This approach accounts for the well documented phenomenon whereby vehicle users do not decrease their speed proportionally to speed limit reductions.[77] This behaviour is often exacerbated on roads with default speed limits. The exact speed changes have been derived from MUARC's modelling, drawing on extensive domestic and international literature.

4.1.1   Stakeholder consultation

To support the development of this model, ACIL Allen held 6 workshops with key stakeholders, with a particular focus on the proposed parameters of the models, costs and benefits, and the implementation measures required to achieve compliance. The workshops included:

1.   Jurisdictional road authorities from each state and territory government, as well as the Australian Local Government Association
2.   Jurisdictional police authorities
3.   Delivery and logistics businesses
4.   Road safety academics
5.   Statutory insurers
6.   Motorist groups.

Additional details of who was engaged are provided in Appendix A – Stakeholder consultation overview.

4.1.2   Interactions with state and territory legislation

While the ARR are national model laws, states and territories can choose to adopt the law or not, or to make amendments. As such, (and as described in Table 9) default speed rules are applied with variations in some states and territories.

In line with previous RIAs, this analysis does not address the interaction between the proposed amendments to the ARR and the existing and planned state and territory policies. The analysis assumes that each of the states and territories will apply amendments to the ARR and compares the current speed limits to the proposed ones.

Therefore, the baseline for this RIA is that all default roads have a speed of 100 km/h, and this is compared to a situation where all roads have new defaults in line with the options in Section 3.2. Given this, the results of the analysis in this RIA should be interpreted as to represent the costs and benefits associated with decreasing speed limits from the existing ARR settings to the new ones. This approach allows for a like with like comparison between states and with previous RIAs and avoids having to make assumptions about the likely policy responses of different states and territories.

Notably, all the technical modelling undertaken by ACIL Allen and MUARC has been done on this basis.

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[76] Office of Impact Analysis, *Cost Benefit Analysis*, 2023. Accessed at: https://oia.pmc.gov.au/sites/default/files/2023-08/cost-benefit-analysis.pdf
[77] Austroads, *Impact of Lower Speed Limits for Road Safety on Network Operations*, 2010. Figure 3.2

4.2   Establishing a baseline

The baseline is the scenario against which the costs and benefits of the proposed changes are assessed. It reflects a situation in which the default speed limit is not reduced. Establishing a baseline involves understanding and projecting the various factors that would be affected by the change in default speed limits, assuming that change does not occur. For this purpose, the following are considered:

*   Fatal and Serious Injuries (FSI)
*   Vehicle Kilometres Travelled (VKT)
*   vehicle efficiency.

The methodology to develop these baseline estimates is discussed below.

4.2.1   Fatal and Serious Injuries (FSI)

MUARC has a national fatality and serious injury dataset, compiled for the development of the National Road Safety Strategy 2021-2030, which will be used as the basis for estimating the number and distribution of FSI by speed zone in Australia. Furthermore, this dataset incorporates improved estimates of serious injury numbers by matching against state and territory hospitalisation data. Notably, for the purposes of this report, there is no distinguishing between the definitions of serious injuries used between the jurisdictions. That is to say that anything that a state or territory reports as a serious injury, is counted as a serious injury.

MUARC has recently prepared an updated Baseline Trauma Trends Model (BTTM) that makes highly informed FSI projections that take into account a wide range of underlying trends. The BTTM incorporates both road safety and non-road safety-related trends (including the complex effects seen during and post-COVID) and has demonstrated strong correlations with actual road trauma. The BTTM will be used to estimate current absolute FSI numbers.

The remaining key variables for the analysis will need to be derived either by estimation or through scenario modelling, in accordance with the procedures outlined in subsequent sections. In addition, the model to be developed will allow probabilistic inputs to accommodate ranges via Latin Hypercube simulation methods[78], thereby accommodating the levels of uncertainty inherent in such an analysis.

Non-serious injuries

In discussions with stakeholders, it was established that the numbers of non-serious injuries (defined here as any injury resulting from a crash that does not result in admission to hospital) are under-reported as many do not involve police or others who would be able to report on such a crash. Nevertheless, in 2022 the Bureau of Infrastructure and Transport Research Economics (BITRE) provided an estimate of non-serious injuries (described in their report as non-hospitalised injuries) which show that they are approximately 2.47 times as prevalent as serious (hospitalised) injuries.[79] However, the relationship between speed and non-serious injuries is different than those for fatalities and serious injuries, and as such there would be a greater reduction in serious injuries than in non-serious injuries.

Given these limitations, moderate or minor injuries are not included in the central case. However, the inclusion of non-serious injuries into the modelling was expressly requested by jurisdictional authorities to ensure that the full picture was captured.

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[78] Latin Hypercube is a method similar to Monte Carlo simulation that provides more robust outputs.
[79] BITRE (2022). Table 0.1 *Social cost of road crashes*. Accessed at:
   https://www.bitre.gov.au/sites/default/files/documents/social-cost-of-road-crashes.pdf#:~:text=There%20were%20an%20estimated%20965%2C700,compared%20to%20216%2C500%20in%202020 06

For the purposes of this report, an indicative estimation of the number of reduced minor or moderate injuries was included, but only in sensitivities (i.e., not in the central estimate). To do so, the modelling assumes there are 2.47 times as many non-serious injuries prevented as serious injuries.

4.2.2   Vehicle Kilometres Travelled (VKT)

The rate at which roads are used is an important factor in apportioning the reduction in FSI and the cost of increased travel time as a result of reduced speed limits. As such, it is crucial to both forecast the total vehicle kilometres travelled and the split of this travel between signed and default roads by region.

The proposed reduction in default speed limit would affect all forms of motorised vehicles, including:

* passenger vehicles (including motorcycles)
* light commercial vehicles (LCV)
* rigid trucks
* articulated trucks
* buses.

In order to estimate the costs and benefits of the proposed policy change accurately, it is necessary to produce a forecast of VKT on *default roads* by *vehicle type* by *remoteness region* by *travel purpose*. Available data on VKT does not exist at this level of detail, therefore, the following steps to produce this forecast series were taken:

1. Develop a projection of VKT by *vehicle type* using regression modelling.
2. Project number of vehicles based on population projection and assumed ownership rate by *vehicle type*.
3. Calculate average annual VKT per vehicle *by vehicle type* for each of the forecast year based on output of step 1.
4. Develop assumptions on ratio of VKT travelled by *vehicle type* in each *remoteness region*.
5. Calculate VKT for each *vehicle type* in each *remoteness region* based on outputs from steps 2, 3 and 4.
6. Split VKT output from step 5 by *travel purpose*.
7. Calculate VKT on *default roads* by *vehicle type* by *remoteness region* by *travel purpose* based on outputs from above steps and assumptions on VKT on default roads.

This methodology is further outlined below.

Total VKT projection

As part of previous NVES work, which involved modelling the effects of a fuel efficiency standard for new cars in Australia,[80] total passenger and light commercial vehicle VKT in Australia were forecasted. This forecast was created using a regression model based on real GPD, population and the consumer-price index (CPI) of fuel.[81]

To acquire VKT forecast for remaining types of vehicles, the regression model used for the NVES modelling was replicated with different combinations of independent variables of real GDP, population and consumer price index (CPI) for fuel, and their natural logs. It was found that the natural log of population most closely fits the data. A summary of the forecasts is shown in Table 14 below.

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[80] Department of Infrastructure, Transport, Regional Development, Communications and the Arts (2024). Cleaner, Cheaper to Run Cars: The Australian New Vehicle Efficiency Standard: Consultation Impact Analysis.

Table 14 Summary of VKT by vehicle type forecasts

Vehicle type	2025	2034
Passenger vehicles	183.99 billion	195.10 billion
Light commercial vehicles	59.85 billion	68.48 billion
Rigid trucks	12.08 billion	13.52 billion
Articulated trucks	9.31 billion	10.46 billion
Buses	2.59 billion	2.85 billion
Motorcycles	2.57 billion	2.82 billion

Source: ACIL Allen analysis

Number of vehicles projection

Using the total VKT projection developed as described above, it is possible to derive projection of the number of vehicles for the assessment period using assumptions on vehicle ownership per capita for each vehicle type. For private vehicles, studies have shown that private vehicle ownership per capita is different by age group. Younger people are less likely to own a private vehicle in modern day compared to older generations.[82] Non-private vehicles, such as trucks and buses, are typically driven by different factors such as road freight demand and public transport demand and investments. It is unlikely that any seismic change in vehicle ownership patterns due to demographics would occur during the assessment period. Therefore, it is reasonable to assume little to no change in the number of vehicle per capita. This analysis assumes that vehicle ownership per capita remains constant to 2024 (see Table 15), and the increase in number of vehicles is driven solely by the growth in population.

Table 15 Number of vehicle per capita

Vehicle type	Vehicle per capita (2024)
Passenger vehicles	0.5773
Light commercial vehicles	0.1499
Rigid trucks	0.0232
Articulated trucks	0.0046
Buses	0.0037
Motorcycles	0.0357

Source: ACIL Allen analysis based on BITRE and ABS

Based on the above assumptions and population projection by remoteness region, a forecast of number of vehicle-by-vehicle type was developed. The 2034 projection is shown in Table 16 below.

Table 16 Summary of number of vehicles forecasts, 2034

Vehicle type	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote
Passenger vehicles	13,020,196	3,103,027	1,364,257	175,095	105,314
Light commercial vehicles	3,380,610	805,681	354,220	45,462	27,344
Rigid trucks	522,466	124,516	54,744	7,026	4,226
Articulated trucks	103,081	24,567	10,801	1,386	834
Buses	82,913	19,760	8,688	1,115	671
Motorcycles	804,677	191,774	84,314	10,821	6,509

Source: ACIL Allen analysis

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[82] Julene Paul, Evelyn Blumenberg, Vehicle ownership rates: The role of lifecycle, period, and cohort effects, Transportation Research Interdisciplinary Perspectives, Volume 21, 2023, 100892, ISSN 2590-1982, https://doi.org/10.1016/j.trip.2023.100892.

Average annual VKT

Based on the above outputs, a projection of average VKT by vehicle type for each year of the assessment period could be developed. A summary of this projection is shown in Table 17 below. It shows a slight decrease in average VKT for most vehicle types except for light commercial vehicles. This aligns with historical data on the estimated car kilometres travelled per capita that has been decreasing since 2006, suggesting that on average, Australian are driving less.[83] This analysis estimated the average VKT per annum for all vehicle types decreased by 3% between 2013-14 and 2019-20.[84]

Table 17   Average VKT per vehicle per year by vehicle type (km)

Vehicle type	2025	2035
Passenger vehicles	11,409	10,764
Light commercial vehicles	14,585	14,844
Rigid trucks	19,437	19,355
Articulated trucks	75,925	75,882
Buses	26,082	25,452
Motorcycles	2,753	2,698

Source: ACIL Allen

People who live in more remote regions typically drive more compared to people that live in large metropolitan areas, typically due to the larger geographical spread of destinations. In Australia, the Northern Territory, which has a high proportion of very remote areas, had the highest average kilometres travelled per passenger vehicle in 2020 and 2018 compared to other states and territories.[85,86,87] There is also a higher level of car dependence in regional and remote areas due to the lack of viable alternative transport methods available in more remote areas, such as alternative public transport options like trains or active transport like cycling.[88]

To derive the VKT distribution by region, total VKT for each remoteness region based on assumed ratios of distance travelled by region for each vehicle type was calculated. The assumed ratios for each vehicle type are shown in Table 18 below.

Table 18   Ratio of distance travelled by remoteness region

	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote
Ratio	1	1.05	1.1	1.2	1.3

Source: ACIL Allen

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[83] Charting Transport (2020). Update on Australian transport trends (December 2020). Retrieved from: https://chartingtransport.com/2021/01/03/update-on-australian-transport-trends-december-2020/#:~:text=In%202019%2D2020%2C%20there%20were,certainly%20due%20to%20COVID%2D19..

[84] ACIL Allen analysis based on BITRE and ABS.

[85] Australian Bureau of Statistics. (2020). Survey of Motor Vehicle Use, 2020. Retrieved from: https://www.abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/12-months-ended-30-june-2020/92080DO002_202006.xls

[86] Australian Bureau of Statistics. (2018). Survey of Motor Vehicle Use, 2018. Retrieved from: https://www.abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/12-months-ended-30-june-2020/92080DO002_201806.xls

[87] Australian Bureau of Statistics. (2023). Remoteness Areas. Retrieved from: https://www.abs.gov.au/statistics/standards/australian-statistical-geography-standard-asgs-edition-3/jul2021-jun2026/remoteness-structure/remoteness-areas

[88] Lim, K. L., Lu, Y., Kimpton, A., Zahnow, R., Li, T., Dodson, J., ... & Corcoran, J. (2024). Please mind the gap: Examining regional variations in private vehicle carbon dioxide emissions and fuel consumption—The case of Australia. *Journal of Transport Geography, 121*, 104023.

VKT by trip purpose

To understand the travel time and logistics costs resulting from speed limit reductions, it is necessary to understand the composition of trips drivers take. The latest ABS Survey of Motor Vehicle Use provides the VKT by type of vehicle and by use, as summarised in Table 19 below.

The modelling for the RIA assumes that the composition of VKT by purpose remains constant in the future and that there are no changes in composition induced by the proposed default speed limit reduction.

For light commercial vehicles, rigid trucks, and articulated trucks, business use is divided between laden and unladen. The difference in the time cost of laden and unladen business use is dependent on how optimised the schedule is. It is assumed that all freight businesses conduct their travel on an optimised schedule, presenting a higher estimate of freight time cost.

Table 19   Proportion of VKT by vehicle type by purpose, 2019-20 financial year

Vehicle type	All business use	To and from work	Personal and other
Passenger vehicles	19%	27%	54%
Light commercial vehicles	61%	15%	24%
Rigid trucks	97%	2%	1%
Articulated trucks	100%	0%	0%
Motorcycles	9%	32%	59%
Buses	96%	1%	3%

Source: ACIL Allen analysis, based on ABS, Survey of Motor Vehicle Use 2020

This travel purpose split is different from available estimates for travel time costs (such as the ATAP guidelines that is used for this analysis that split travel time costs by *Personal travel*, *Business*, and *Freight)*. To align these sources of estimates, *To and from work* and *Personal and other* travel both have a similar time cost to *Business* under the ATAP estimates. And that *All business use* has the following distribution based on vehicle type:

- for Articulated trucks and Rigid trucks, *All business use* is assumed to have a similar time cost to *Freight*
- for passenger vehicles, LCVs, buses, and motorcycles, *All business use* is assumed to have a similar time cost to *B11usiness*.

The realigned estimates are shown in Table 20. It is assumed that this distribution of VKT by purpose remains unchanged during the assessment period, as it is unlikely that there would be any significant changes in travel behaviour during this period.

Table 20   Adjusted proportion of VKT by vehicle type by purpose

Vehicle type	Personal travel	Business	Freight
Passenger vehicles	80.82%	19.18%	0.00%
Light commercial vehicles	39.25%	60.75%	0.00%
Rigid trucks	3.02%	0.00%	96.98%
Articulated trucks	0.10%	0.00%	99.90%
Buses	4.09%	95.91%	0.00%
Motorcycles	90.55%	9.45%	0.00%

Source: ACIL Allen analysis, based on ABS, Survey of Motor Vehicle Use 2020

VKT by type of road

It is critical that only VKT on default roads are considered in the analysis to avoid overestimating the costs and benefits associated with the proposed change. The proposed reduction in default speed limit is only applicable to the following types of roads:

• sealed and default roads outside built-up areas
• unsealed and default roads outside built-up areas.

Data and studies on VKT by road types appear to be limited. As part of our stakeholder engagement, estimates from the state and territory governments were requested as to the proportion of driving in each area that is done on default sealed and unsealed roads. It was noted that data in this area is scarce to non-existent, as most traffic counts and speed data are collected from locations where speed limit signs are present, creating a bias that underrepresents travel on default roads. To address this, this RIA implemented a lower, middle and upper estimates of the proportion of VKT that occurs on default roads by travel reasons derived through requests to state and territory governments.

Table 21   Assumed proportion of VKT on default roads

	Lower	Middle	Upper
Personal travel (including commute)			
Sealed roads	5%	10%	30%
Unsealed roads	2%	5%	10%
Business/ "on-the-clock" travel (non-freight, excluding commute)			
Sealed roads	5%	10%	30%
Unsealed roads	2%	5%	10%
Freight			
Sealed roads	2%	5%	10%
Unsealed roads	1%	3%	5%

Source: ACIL Allen

The table above should be interpreted as such: of all the personal travel that occurs in rural areas, for example, a lower bound estimate is that 5% occurs on default sealed roads and 2% occurs on default unsealed roads. The upper bound estimates are therefore very liberal estimates for the amount of driving that occurs on these default roads.

4.2.3   Vehicle fuel efficiency

The extent to which reduced travel speeds translate into improved fuel efficiency depends on the composition of the vehicle fleet and its overall average fuel efficiency. Different vehicle types respond differently to changes in speed, with factors such as engine displacement, aerodynamics, transmission type, and vehicle age influencing the magnitude of efficiency gains. In a fleet dominated by newer, more efficient vehicles, the relative improvements from speed reductions may be smaller, whereas fleets with older or less efficient vehicles may experience more significant benefits.

Passenger vehicles and LCVs

Assessing the benefits over time required considering the year-on-year improvements in vehicle fuel efficiency as a result of technological improvements or policy, such as the NVES and increased EV uptake. To make such a projection for passenger vehicles and LCVs, modelling conducted for the Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts (the Department) as

part of the assessment of the impact of the NVES[89] was drawn upon. Real world efficiencies (as opposed to tested efficiencies) were used as this aligns better with actual driver habits.

Motorcycles, trucks and buses

The ABS provides estimates of fuel efficiency by vehicle group in its Survey of Motor Vehicle Use.[90] Its latest release was in 2020, and this publication has been ceased. A summary of fuel efficiency by vehicle type from 2012 to 2020 is shown in Table 22. These fuel efficiency estimates are used as a basis for projection of future fuel efficiency for these vehicle types.

Table 22 Fuel efficiency by vehicle type (litre/100km)

Year	Rigid trucks	Articulated trucks	Motorcycles	Buses
2012	28.7	57.7	5.9	29.0
2014	28.4	56.9	5.9	28.8
2016	28.0	56.3	5.6	27.8
2018	28.6	55.2	5.8	28.4
2020	28.6	53.1	6.1	27.8

Source: ABS, Survey of Motor Vehicle Use 2020, Table 1

There is very little publicly available data that tracks year-on-year improvements in motorcycle fuel efficiency, either in Australia or internationally. Unlike passenger vehicles, which are subject to mandatory fleet-wide efficiency reporting, motorcycles have not been systematically monitored in most markets. In fact, the limited data that do exist from the ABS (table above) suggest the opposite of steady improvement: between 2016 and 2020, the ABS Survey of Motor Vehicle Use shows average motorcycle fuel consumption increased from 5.6 L/100 km to 6.1 L/100 km. Despite the absence of clear evidence of recent efficiency gains, it was conservatively assumed a 1% year-on-year improvement in motorcycle fuel efficiency going forward. This assumption reflects the expected ongoing introduction of more efficient engine and vehicle technologies, which are likely to deliver incremental gains over time even if they are not yet visible in historical statistics.

There is little definitive Australian information as to expected gains in large engine efficiency improvements. A review of the international literature suggests efficiency gains between 1% and 2% year on year might be realised:

- The International Council on Clean Transportation (ICCT) estimates that tractor-trailer efficiency technologies could cost-effectively reduce CO2 emissions by 24%, corresponding to a 29% improvement in fuel economy[91] over the period 2021 to 2035 (equivalent to around 2% per year).
- The Center for Alternative Fuels, Engines & Emissions (CAFEE), West Virginia University: Heavy-Duty Vehicle Diesel Engine Efficiency Evaluation and Energy Audit, October 2014 final report suggests fuel efficiency gains of 18.3% over the 10-year period 2010-20 were expected.[92]
- While a number of other reports suggest improvement in the order of 1.4 – 2.0%, they are unclear as to timeframes and detail as to the applications considered.

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[89] Department of Infrastructure, Transport, Regional Development, Communications and the Arts (2024). *Cleaner, Cheaper to Run Cars: The Australian New Vehicle Efficiency Standard: Consultation Impact Analysis.* https://www.infrastructure.gov.au/sites/default/files/documents/cleaner-cheaper-to-run-cars-the-australian-new-vehicle-efficiency-standard-consultation-impact-analysis-february2024.pdf

[90] ABS 2020, *Survey of Motor Vehicle Use, Australia 2020.* Accessible at https://www.abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release

[91] International Council on Clean Transportation (ICCT); White Paper (C. Buysse, B. Sharpe, O. Delgado): *Efficiency technology potential for heavy-duty diesel vehicles in the United States through 2035.* Accessed 31 August 2025. https://theicct.org/wp-content/uploads/2021/12/efficiency-tech-potential-hdvs-us-2035-nov21.pdf

[92] Center for Alternative Fuels, Engines & Emissions (CAFEE), West Virginia University: *Heavy-Duty Vehicle Diesel Engine Efficiency Evaluation and Energy Audit, October 2014 Final Report.* Accessed 31 August 2025. https://theicct.org/wp-content/uploads/2021/06/HDV_engine-efficiency-eval_WVU-rpt_oct2014.pdf

Efficiency gains can be expected in both engine design and other vehicle efficiency technology improvements (i.e. aerodynamics, rolling resistance and tyre technologies, regenerative braking, accessory electrification etc.). However, realisation of projected gains is also subject to both use (in vehicles) and driver behaviour. In many applications outcomes are determined by a combination of many different factors which need to be coupled with gains delivered by engine design.

It is assumed that technology efficiency gains will deliver year on year improvements of 1.83% for buses and trucks. Given the limited data, the fuel efficiencies for motorcycles, trucks and buses are assumed to be the same across the regions.

Table 23   Summary: Fuel efficiency assumptions (litres/100km)

Vehicle	Region	2025	2036
Passenger vehicles	Major cities	9.80	5.59
	Inner regional	9.92	6.13
	Outer regional	10.00	6.49
	Remote	10.17	7.18
	Very remote	10.18	7.22
Light commercial vehicles	Major cities	11.43	7.87
	Inner regional	11.46	8.62
	Outer regional	11.47	8.88
	Remote	11.48	9.06
	Very remote	11.48	9.08
Motorcycles	All	5.86	5.25
Rigid trucks	All	26.56	21.68
Articulated trucks	All	49.32	40.25
Buses	All	25.82	21.07

Source: ACIL Allen

Conversion to real-world emissions

The conversion from litres per 100 km to grams of CO_2 per kilometre depends on the type of fuel consumed. Drawing on the ABS Survey of Motor Vehicle Use, a weighted share of vehicle type using petrol and diesel was calculated and then applied to conversion factors from International Council on Clean Transportation research[93] (26.8 gCO_2/km per litre/100 km for diesel and 23.4 gCO_2/km for petrol). These conversion factors are a blunt instrument and, given they are for passenger vehicles, likely over-estimate the efficiency of larger vehicles likes trucks and buses.

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[93] International Council on Clean Transportation (2024). *On the way to 'Real-World' CO₂ Values? The European Passenger Carm Market after 5 years of WLTP.* *https://theicct.org/wp-content/uploads/2024/01/ID-76-%E2%80%93-EU-WLTP_final.pdf*

Table 24   Fuel efficiency assumptions (grams of carbon per kilometre)

Vehicle	Region	2025	2036
Passenger vehicles	Major cities	237	135
	Inner regional	240	148
	Outer regional	242	157
	Remote	246	174
	Very remote	246	175
Light commercial vehicles	Major cities	299	206
	Inner regional	299	225
	Outer regional	300	232
	Remote	300	237
	Very remote	300	237
Motorcycles	All	137	123
Rigid trucks	All	712	581
Articulated trucks	All	1,322	1,079
Buses	All	686	560

Source: ACIL Allen

4.2.4   Fuel costs

To estimate how changes in fuel efficiency from reduced speeds will impact drivers, it is necessary to make assumptions about future fuel prices.

Fuel costs play a critical role in translating efficiency gains into monetary savings, as even small improvements in litres per 100 kilometres can result in different cost impacts depending on whether fuel prices are high or low. There may be energy efficiency gains for electric vehicles driven at reduced speeds; however, the literature on this is conflicting. It was assumed that efficiency gains from a reduction in speed of electric vehicles is similar to that of petrol and diesel (international combustion engine, or ICE) vehicles, and that the operating costs of electric vehicles are similar to fuel costs. The forecasted fuel prices used in the modelling were developed using advice from the Department of Industry and Science and set of conservative growth assumptions.

Table 25   Projected fuel costs ($/litre)

Input	2026	2036
Petrol price	$1.62	$1.91
Diesel price	$1.61	$1.91

Source: ACIL Allen based on advice from the Department of Industry, Science and Resources

4.3   Determining the impact of change

4.3.1   Impacts of change

Under the above assumptions, most *vehicles travelling on default roads* will do so at lower speeds over the corresponding segments of their usual routes. C*eteris paribus*, this change will result in the following:

- Benefits:
  - Improved road safety: fewer FSI and collisions, reducing associated economic and social costs.
  - Reduced fuel consumption: vehicles consume different volumes of fuel at different speeds, with lower speeds generally leading to reduced fuel use.

- Lower vehicle emissions: driving at lower speeds can result in reduced emissions, depending on vehicle type and operating conditions.
- Improved public health: lower emissions contribute to better air quality, which can reduce adverse health impacts.
- Other intangible benefits: such as improved community amenity, reduced noise, reduced road maintenance, and enhanced perceptions of safety.

- Costs:
  - Increased travel time: lower speeds extend journey durations for road users.
  - Government costs: expenses associated with implementing the changes and educating the public
  - Other intangible costs: potential impacts such as reduced convenience or perceived loss of mobility, and social resistance (e.g. public opposition or negative media attention related to lowering speed limits).

4.3.2 Road safety benefits

Modelling the reduction in Fatal and Serious Injuries

The relationship between speed changes and injury outcomes is a powerful one, with small reductions in travel speed leading to much larger reductions in fatal and injury outcomes. This has been formalised into Nilsson's power law, which takes the following form:[94]

$$\left(\frac{n_{after}}{n_{before}}\right) = \left(\frac{v_{after}}{v_{before}}\right)^{p}$$

Where:

- v_{before} is mean travel speed before the speed change
- v_{after} is mean travel speed after the speed change
- n_{before} is number of crashes (fatal or serious) before the speed change
- n_{after} is number of crashes (fatal or serious) after the speed change
- p is a power factor (for fatal or serious)

Since that Nilsson's original paper, additional research has refined this original work. In one analysis, Elvik et al.[95] undertook a meta-analysis of 49 studies, including several from Australia, to generate recent estimates, resulting in p taking the value 5.493 (95% C.I. 5.334-5.652) for fatalities and 3.951 (95% C.I. 3.849-4.053) for serious injuries.

The size of these values means that, for example, a 3% reduction in travel speeds (e.g., from 100 km/h to 97 km/h) results in a 15% reduction in deaths and an 11% reduction in serious injury. These reductions have been shown to be true of individual crashes as well as at aggregate level.

The sections below document the method used to estimate the potential benefits in terms of savings in fatal and serious trauma from reduced default speed limits on sealed and unsealed roads outside of built-up areas throughout Australia.

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[94] Nilsson, G., 2004. Traffic Safety Dimensions and the Power Model to Describe the Effect of Speed on Safety. Bulletin 221. Lund Institute of Technology, Department of Technology and Society, Traffic Engineering, Lund. https://portal.research.lu.se/en/publications/traffic-safety-dimensions-and-the-power-model-to-describe-the-eff

[95] Elvik, R., Vadeby, A., Hels, T., van Schagen, I., 2019. Updated estimates of the relationship between speed and road safety at the aggregate and individual level. Accident Analysis & Prevention 123, pp. 114-122. https://www.sciencedirect.com/science/article/abs/pii/S000145751830839X?via%3Dihub

Speed reduction analysis

The process for estimating FSI reductions on sealed and unsealed roads outside of built-up areas where the default speed limit applies is a 5-step process:

1. Determine numbers of current FSI on sealed and unsealed roads throughout Australia from an aggregate national FSI dataset.

2. For the sealed roads, estimate the proportion of FSI occurring on roads subject to the default speed limit outside of built-up areas.

3. Estimate current (pre-change) travel speeds on sealed and unsealed roads subject to the default speed limit outside of built-up areas.

4. For preset default speed limit change scenarios, estimate the expected travel speed changes that will result.

5. Using the relationships from Elvik *et al*,[96] estimate projected FSI reductions for each of the speed limit change scenarios.

Modelling was undertaken in Analytica,[97] which allows uncertainties in model inputs to be taken into account by allowing them to be expressed as probability distributions. Monte Carlo-like probabilistic simulation is then used to select a random sample for each and generate probabilistic outputs. Median Latin hypercube[98] was used as recommended in Analytica as the default due to its better stability characteristic compared with Monte Carlo simulation. A sample size of 1,000 was used, with no obvious benefits to accuracy or repeatability observed for higher values. Therefore, outputs are expressed as a mean (or 50th percentile estimate), along with 5th and 95th percentile ranges.

Casualty pools

The first step in estimating the benefits of speed reductions is to determine the number of FSI exposed to the changes, meaning numbers of fatalities and serious injuries occurring on the defined road lengths.

A national fatality and serious injury dataset, compiled for the development of the National Road Safety Strategy 2021-2030, was used. Sourced from data provided by each of the Australian states and territories and compiled by MUARC, it contains FSI unit record data for the period July 2015 to June 2018 for 26 variables, but with the following used for this analysis: severity (fatal/serious), state/territory, ARIA+ region,[99] speed limit and road surface. Additionally, the dataset incorporates improved estimates of serious injury numbers by weighting police-reported serious injury by road user type against state and territory hospitalisation data.

Since the dataset is now around 6 years old, the MUARC Baseline Trauma Trends Model (BTTM) (constructed December 2024) was used to estimate current and future FSI numbers for the analysis. The BTTM makes highly informed FSI projections for each jurisdiction, that take into account a range of both road safety and non road safety-related trends (including the complex effects seen during and post-COVID). The BTTM was used to scale the casualty pools described in the following sections for the period 2025 to 2030 (where BTTM predictions end), with an exponential curve fit used to extend the predictions to the desired year of 2036.

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[96] Elvik, R., Vadeby, A., Hels, T., van Schagen, I., 2019. Updated estimates of the relationship between speed and road safety at the aggregate and individual level. Accident Analysis & Prevention 123, pp. 114-122. https://www.sciencedirect.com/science/article/abs/pii/S000145751830839X?via%3Dihub

[97] See analytica.com

[98] See docs.analytica.com/index.php?title=Monte_Carlo_and_probabilistic_simulation

[99] See www.abs.gov.au/statistics/standards/australian-statistical-geography-standard-asgs-edition-3/jul2021-jun2026/remotene8-structure/remoteness-areas

Total projected FSI for Australia from the BTTM and extrapolated values are shown in Table 26 and Table 27 below.

Table 26   Total projected annual FSI for Australia, 2025-2030. Source: MUARC Baseline Trauma Trends Model

Year	Fatalities	Serious Injuries
2024	1,249	41,808
2025	1,296	43,646
2026	1,338	45,577
2027	1,380	47,592
2028	1,424	49,706
2029	1,469	51,922
2030	1,515	54,248

Table 27   Extrapolated FSI for Australia, 2031-2036. Source: author calculations

Year	Fatalities	Serious Injuries
2031	1,566	56,633
2032	1,617	59,146
2033	1,669	61,770
2034	1,723	64,511
2035	1,779	67,373
2036	1,836	70,362

Note that the dataset contained no speed zone information for the ACT. As this jurisdiction contributes 0.8% of fatalities and 0.2% of serious injuries and likely has a very small proportion of default speed-limited or unsealed roads outside of built-up areas, its exclusion from these calculations was likely of little consequence.

Furthermore, it should also be noted that the default speed limit outside of built-up areas in WA and the NT is 110 km/h, compared with 100 km/h in NSW, Victoria, Queensland, South Australia and Tasmania. The incorporation of this difference will be discussed in the specific subsections below.

Default speed-limited roads outside of built-up areas

To determine numbers of FSI on sealed rural high-speed roads, FSI in 100 km/h (110 km/h for WA and NT) speed zones with surface type, 'sealed' and in Regional and Remote areas was extracted. Police-reported data do not report whether the speed limit applicable at a crash site was a default or signed speed zone, so to determine the proportion of FSI where the default was applied, ACIL Allen requested estimates from jurisdictional representatives. These varied from 3-25% in Queensland, 9% (Victoria), 38-43% (NSW), 27-58% (WA). Consequently, scenarios bracketing the range were chosen for the calculations: a lower estimate of 10%, an upper estimate of 38% and an approximate midpoint of 20%. The figures in Table 28 and Table 29 were the source for the scaling factors to be derived from the BTTM and default proportion scenarios.

Table 28   Estimated annual fatalities (Jul 2015-Jun 2018) on sealed high-speed roads, rounded

State	Regional	Remote	Total
NSW	94	2	95
Vic	94	0	94
QLD	73	19	92
WA	41	26	67
SA	12	1	13
Tas	14	0	14
NT	1	6	7
Total	**327**	**54**	**381**

Table 29 Estimated annual weighted serious injuries (SI) (Jul 2015-Jun 2018) on sealed roads outside of built-up areas, rounded

State	Regional	Remote	Total
NSW	817	21	837
Vic	788	0	788
QLD	965	288	1,253
WA	345	195	540
SA	322	21	343
Tas	174	0	174
NT	3	50	53
Total	3,414	574	3,988

Unsealed roads

On unsealed roads, FSI in 100 km/h (110 km/h for WA and NT) speed zones with surface type, 'unsealed' and in Regional and Remote areas was extracted. The resultant annual FSI are shown in Table 30 and Table 31.

Table 30 Estimated annual fatalities (Jul 2015-Jun 2018) on unsealed roads outside of built-up areas, rounded

State	Regional	Remote	Total
NSW	5	2	7
Vic	7	0	7
QLD	1	3	4
WA	2	4	6
SA	3	1	4
Tas	0	0	0
NT	1	7	7
Total	19	16	35

Table 31   Estimated annual weighted SI (Jul 2015-Jun 2018) on unsealed roads outside of built-up areas, rounded

State	Regional	Remote	Total
NSW	92	27	119
Vic	128	0	128
QLD	53	42	96
WA	36	69	106
SA	121	32	152
Tas	4	0	4
NT	4	53	56
Total	438	224	661

Pre-implementation travel speeds

Estimates of pre-change travel speeds were derived from a previous modelling exercise undertaken for the Department. Additionally, a Western Australian report[100] provided travel speed estimates for sealed rural default and unsealed default roads in WA.

From these sources, a mean of 91.0 km/h (95% C.I. 86.9-95.1 km/h) was used for sealed default speed-limited roads outside of built-up areas and 61 km/h (95% C.I. 48.7-73.3 km/h) for unsealed default speed-limited roads outside of built-up areas. A higher standard deviation was applied to the unsealed road estimates to reflect the diversity of such roads across Australia.

Post-implementation travel speed changes

Several default speed limit reductions were requested to be investigated for each of the default road types. Based on previous experience and in consultation with Dr Strandroth, the speed reductions detailed in the following sections were thought to be realistic in the absence of changed signage or increased police enforcement, as would be expected for speed limit changes on other classes of road.

The presence of a higher current default in WA and the NT was not considered separately, with the assumption implicit in the model that the *proportional reductions* would be similar in these 2 jurisdictions.

Sealed roads where the default speed limit applies

Three scenarios were provided for modelling involving a reduction in the default speed limit on sealed roads to 90, 80 or 70 km/h. The corresponding travel speed reductions used were 3.0 km/h (95% C.I. 0.5-5.5 km/h), 7.0 km/h (95% C.I. 4.5-9.5 km/h) and 11.0 km/h (95% C.I. 8.5-13.5 km/h) respectively. It was noted that the large reduction to 70 km/h has few precedents, so the reductions were selected to be conservative. For comparison, the Norwegian Road Safety Handbook[101] evaluated 143 speed limit changes in Norway within the range -35 km/h to +25 km/h, with the resultant relationship suggesting speed reductions of 3.5, 7.6 and 12.6 km/h would be expected for speed limit reductions of 10, 20 and 30 km/h respectively.

Unsealed roads where the default speed limit applies

On unsealed default speed-limited roads, reductions to 80 and 70 km/h were modelled, with corresponding travel speed reductions used were 3.0 km/h (95% C.I. 0.5-5.5 km/h), 7.0 km/h (95% C.I. 4.5-9.5 km/h) respectively. Despite representing nominal reductions of 20 km/h and 30 km/h from the 100 km/h default, these reductions were chosen conservatively given the typically lower travel speeds on unsealed roads and even lower perception of enforcement compared with sealed roads. It should be noted that, despite mean travel speeds on unsealed roads being assumed to be lower than the proposed new limits, a reduction in travel speeds has still been applied. The reason for this is that the nature of unsealed roads varies substantially across Australia and higher speeds are likely on a substantial proportion of them, particularly in those jurisdictions with substantial remote region networks like WA, Qld and NSW. Furthermore, the associated national publicity campaigns that would necessarily accompany any future changes will increase speed awareness and likely lead to lower speed choices by drivers.

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[100] Main Roads WA, 2024. Review of Default 110 km/h (unzoned) Speed Limits in Rural Areas – Summary Report. Prepared by Abley, May 2024.
[101] TØI, 2019. Traffikksikkerhetshånboken, Avsnitt 3.11 Fartsgrenser [Road Safety Handbook, Section 3.11 Speed Limits]. Transportøkonomisk institutt Stiftelsen Norsk senter for samferdselsforskning, Ed. Alina Høye, Rune Elvik. https://www.tshandbok.no/del-2/3-trafikkregulering/doc660/

Savings in fatalities and serious injuries

Using the method described in the above, crash reduction factors were determined from the power model and are shown in Table 32 and Table 33 below. These were then applied to the corresponding scaled casualty pools (in accordance with the BTTM or by extrapolation as discussed earlier) to determine FSI saved per scenario per road type in the desired year.

Table 32 Crash reduction factors, sealed roads where the default speed limit applies

Speed reduction scenario	Fatalities	Serious injuries
100/110-90 km/h	0.17 (95% C.I. 0.03-0.29)	0.12 (95% C.I. 0.02-0.22)
100/110-80 km/h	0.36 (95% C.I. 0.25-0.46)	0.27 (95% C.I. 0.18-0.36)
100/110-70 km/h	0.51 (95% C.I. 0.42-0.59)	0.40 (95% C.I. 0.32-0.47)

**Table 33	Crash reduction factors, unsealed roads where the default speed limit applies**

Speed reduction scenario	Fatalities	Serious injuries
100/110-80 km/h	0.24 (95% C.I. 0.05-0.42)	0.18 (95% C.I. 0.03-0.32)
100/110-70 km/h	0.49 (95% C.I. 0.33-0.64)	0.38 (95% C.I. 0.25-0.52)

Costs of Fatal and Serious Injuries

The reduction in occurrence and severity of vehicle crashes has a myriad of benefits, not least of which is the saving of human life. In Australia, as specified by the OIA, the value of a statistical life (VSL) is $5.7m and the value of statistical life year is $245,000 in 2024 dollars.[102]

However, there are alternative values for the VSL. One of these, as calculated by Australian Transport Assessment and Planning (ATAP) Guidelines, quantify a range of costs of vehicle crashes disaggregated by severity.[103] The table below outlines the breakdown of costs associated with fatal crashes and serious injury crashes.

Table 34 Average casualty costs per person

Cost component	Fatal crash		Serious injury crash	
	2013($)	2025($)	2013($)	2025($)
Human costs				
Ambulance costs	$510	$703	$510	$703
Hospital in-patient costs	$2,756	$3,799	$11,026	$15,198
Other medical costs	$2,043	$2,816	$16,552	$22,815
Long-term care	$-	$-	$125,246	$172,640
Labour in the workplace	$732,187	$1,009,250	$34,620	$47,720
Labour in the household	$609,085	$839,566	$28,867	$39,790
Quality of life	$672,766	$927,344	$72,180	$99,493
Insurance claims	$18,495	$25,494	$32,592	$44,925
Criminal prosecution	$2,386	$3,289	$690	$951

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[102] Australian Department of the Prime Minister and Cabinet, Office of Impact Analysis, *Value of statistical life.* https://oia.pmc.gov.au/resources/guidance-assessing-impacts/value-statistical-life

[103] Australian Transport Assessment and Planning Guidelines, *Crash costs. https://www.atap.gov.au/parameter-values/road-transport/4-crash-costs*

Cost component	Fatal crash		Serious injury crash	
	2013($)	2025($)	2013($)	2025($)
Correctional services	$13,117	$18,081	$-	$-
Workplace disruptions	$12,449	$17,160	$12,794	$17,635
Funeral	$2,620	$3,611	$-	$-
Coroner	$860	$1,185	$-	$-
Total human cost	$2,069,274	$2,852,297	$335,077	$461,872
Vehicle costs				
Repairs	$13,585	$18,726	$11,352	$15,648
Unavailability of vehicles	$1,724	$2,376	$1,529	$2,108
Towing	$405	$558	$360	$496
Total vehicle costs	$15,714	$21,660	$13,241	$18,251
General costs				
Travel delays	$73,483	$101,289	$88,935	$122,588
Insurance administration	$47,089	$64,908	$56,993	$78,559
Police	$9,474	$13,059	$3,255	$4,487
Property	$1,526	$2,103	$1,846	$2,545
Fire	$498	$686	$603	$831
Total vehicle costs	$132,070	$182,046	$151,632	$209,010
Total combined costs	$2,217,058	$3,056,003	$499,950	$689,133

Source: Adapted from BTE (2000) by ARRB Group Ltd.

For the purposes of the modelling, the OIA's VSL of $5.7 million (scaled to 2025 dollars) for fatal crashes and ATAP's cost estimate of $689,133 for serious injuries was used.

When measuring the impact of non-serious injuries, the same source as the above was used, which lists a value of or $26,953 (2025$).[104] This value of non-serious injuries is used only in sensitivity testing.

4.3.3 Fuel consumption reduction benefits

Consumption of petrol and diesel in petrol and diesel vehicles produce greenhouse gas (GHG) emissions. The main GHG produced by petrol and diesel vehicles is CO_2, but they also produce nitrous oxide (N_2O) and methane (CH_4). These GHG emissions have a negative environmental impact in that they contribute to global warming and climate change.

There is evidence to suggest that increased speed can increase fuel consumption and therefore increase CO_2 emissions. Vehicle speeds have a major impact on fuel efficiencies, with most vehicles operating at their optimal efficiency at moderate speeds. At high speeds, above 60 mph (96.6 km/hr), fuel efficiency decreases

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[104] Australian Transport Assessment and Planning (n.d.), Based on (and adjusted for inflation) Table 13, section 4.3 Estimation of average crash costs by injury severity, *4. Crash costs*. Accessed at: https://www.atap.gov.au/parameter-values/road-transport/4-crash-costs

due to increased air resistance, while at lower speeds, features such as lower speed limits, higher intersection density were associate with lower efficiencies.[105]

The Australian Government's Green Vehicle Guide notes that a car can use up to 25% more fuel driving at 100 km/h than it would driving at 90 km/h.[106] The fuel savings are highly dependent on the vehicle, conditions, and habits of the driver, as well as the speed at which the car is travelling.

The figure below (**Figure** 10) highlights this point, showing that a reduction in speed at 100 km/h can decrease emissions, but may increase emissions at 50 km/h. The unit $g/CO_2/km$ (grams of carbon dioxide per kilometre) is a standard measure of the amount of CO_2 emitted by a vehicle for every kilometre it travels, serving as an indicator of its environmental impact and fuel efficiency.

Figure 10 Emission factor curve for a passenger vehicle with a petrol engine calibrated for Australia
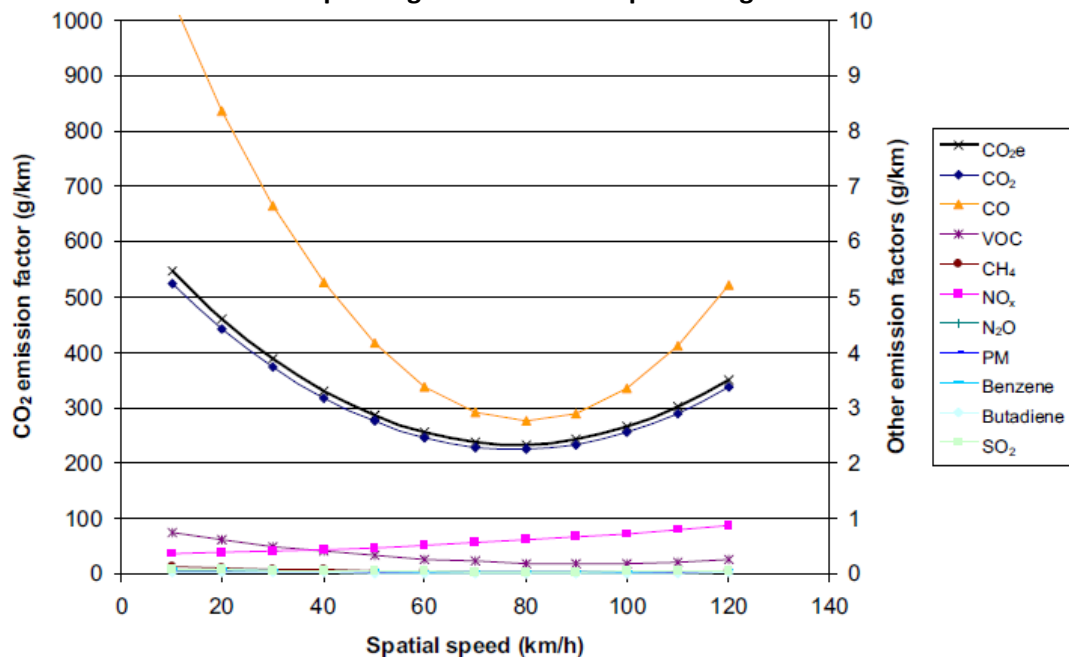
Source: Austroads, Impact of Lower Speed Limits for Road Safety on Network Operations, 2010.

The proportional change in fuel efficiency is calculated using the ATAP free-flow model:[107]

$$Fuel\ consumption\ (l\ per\ 100km) = C_0 + C_1 V + C_2 V^2$$

Where C_0, C_1 and C_2 are vehicle-specific model coefficients and V is average travel speed in km/h. The change in fuel efficiency before and after the speed reduction scenarios is therefore based on this formula and the actual speed reductions as derived by MUARC.

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[105] Wang, X., Chao, L., Kostyniuk, L., Shen, Q. & Bao, S. 2014, 'The influence of street environments on fuel efficiency: insights from naturalistic driving', *International Journal of Environmental Science and Technology*, vol. 11, no. 8, pp. 2291–2300.

[106] Green Vehicle Guide. *Reducing your emissions.*
https://www.greenvehicleguide.gov.au/pages/UnderstandingEmissions/TipsToReduceYourEmissions

[107] Australian Transport Assessment and Planning Guidelines (2016). *Road Parameter Values*. Accessed at:
https://www.atap.gov.au/sites/default/files/pv2_road_parameter_values.pdf

Table 35   Average change in fuel efficiency (l/100km) by speed example, by vehicle type

Vehicle type	Vehicle category	Fuel efficiency when speed = 91 km/h	Fuel efficiency when speed = 88 km/h	% change in efficiency
Small Car	Passenger vehicles	7.94	7.76	-2.3%
Medium Car	Passenger vehicles	9.28	9.09	-2.1%
Large Car	Passenger vehicles	11.46	11.25	-1.8%
Courier Van-Utility	LCV	9.77	9.51	-2.6%
4WD Mid-Size	LCV	12.28	12.05	-1.9%
Light Rigid	Rigid trucks	13.87	13.35	-3.8%
Medium Rigid	Rigid trucks	21.46	20.81	-3.0%
Heavy Rigid	Rigid trucks	38.33	37.06	-3.3%
Heavy Bus	Buses	31.40	30.60	-2.6%
Artic 4 Axle	Articulated trucks	51.80	50.02	-3.4%
Artic 5 Axle	Articulated trucks	53.31	51.65	-3.1%
Artic 6 Axle	Articulated trucks	57.59	55.91	-2.9%

Source: ATAP, ACIL Allen

Motorcycles are assumed to have the same percentage change in fuel efficiency as the average of the passenger vehicles.

4.3.4   Fuel efficiency and emissions benefits

The actual on-road CO2 emission intensity of vehicles remains an area of uncertainty, given the relative lack of real-world testing data. Current historical data relies on estimations based on several variables and controlled vehicle testing, which is known to differ from real world results.

The calculation for the reduction in emissions for each road type and speed reduction modelled scenario i is as follows:

$$\sum_{r=1}^{5} \left(Average\ Fuel\ Efficiency_{r,0} - Average\ Fuel\ Efficiency_{r,i} \right) \times VKT_r$$

Where r is the remoteness area (as defined by the ASGS Edition 3 Remoteness Areas for Australia[108]). In simple terms, the emissions abatement for each scenario is calculated as the difference in fuel efficiency (in grams of CO_2/km) before and after slowing down for each road type and remoteness area, multiplied by the VKT on those respective roads (see also **Figure** 12).

4.3.5   Cost of carbon benefit

There are multiple approaches to estimate the cost of GHG emissions. Because the burden (costs) of emissions is almost entirely borne by third parties (neither the consumer, nor the electricity generator), it is an example of an economic externality. The value of GHG emissions, therefore, is not internalised in the market, which means that individuals do not make decisions based on the overall impact. This is a classic market failure, making the value of emissions difficult to estimate accurately.

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[108] Australian Bureau of Statistics (2023). Remoteness Areas. Accessed at:
https://www.abs.gov.au/statistics/standards/australian-statistical-geography-standard-asgs-edition-3/jul2021-jun2026/remoteness-structure/remoteness-areas

Two approaches have been taken to estimate the value of GHG emissions:

- The social cost of carbon (SCC, or sometimes rendered as SC-CO2), which tries to estimate the marginal impact of an additional tonne of carbon based on the future costs associated with those emissions. The SCC is an inherently difficult to use measure, both because of the difficulty in measuring the impact of a tonne of carbon a long time in the future; and because of the assumptions around the discount rate used to evaluate those impacts. Typically, the SCC is given as a very high, high, medium, and low value – deriving from different measures of the discount rate. This is the approach most commonly taken before the advent of carbon markets, and was the approach in the United States and currently in many places throughout the world.
- The resource cost of carbon, which is based on the current cost of abatement. In the Australian context, this is the present value of the spot price for fixed delivery of a tonne of carbon (delivered to the Emissions Reduction Fund, ERF).

These 2 methods can be roughly[109] described as a demand-price and a supply-price (respectively). In a perfectly operating market – with accurate information, well-defined property rights, and rational decision making – these 2 prices would be identical, and the carbon market would equilibrate. Both approaches introduce uncertainty and inaccuracy for different reasons. However, both approaches have been used in policy contexts and have been upheld in courts in legal contexts.

For this analysis, the first approach was used and a value of emissions reductions as published by the AER.[110] The AER's value of emissions reductions is:

> **the 2022-23 average of the generic Australian Carbon Credit Unit spot price (AUD\$33/tonne CO2-e) with a growth rate of 10% p.a. averaged with a linear interpolation of:**
>
> 1. *From 2024-29: the IPCC Fifth Assessment Report Representative Concentration Pathway 2.6 (commonly referred to as RCP2.6) scenario, median marginal cost of abatement figures, converted into 2023 AUD dollars.*
>
> 2. *From 2030-2050: the IPCC Sixth Assessment Category 2 (commonly referred to as C2) emissions scenario median marginal cost of abatement figures, converted into 2023 AUD dollars.*
>
> **Beyond 2050, the 2050 value should apply.[111]**

This RIA will use the AER's cost of carbon estimates as shown in Figure 11 below. The total dollar value of the reduction in emissions is therefore the total tonnes of abated carbon per year multiplied by the social cost of carbon in that year.

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[109] <u>Very</u> roughly. The resource cost of carbon represents a part of a truncated supply curve, however the social cost of carbon represents an equilibrium price of a modelled hypothecated market. As noted in the text, neither is accurate for myriad reasons. The social cost of carbon is more accurately derived from the demanded abatement, and the resource cost of carbon is more accurately derived from the *current* supply costs of carbon.

[110] Australian Energy Regulator (2024). *Valuing emissions reduction.* Accessed at: https://www.aer.gov.au/documents/aer-valuing-emissions-reduction-final-guidance-and-explanatory-statement-may-2024

[111] Ibid.

Figure 11 Cost of carbon estimates (AUD, $2025)
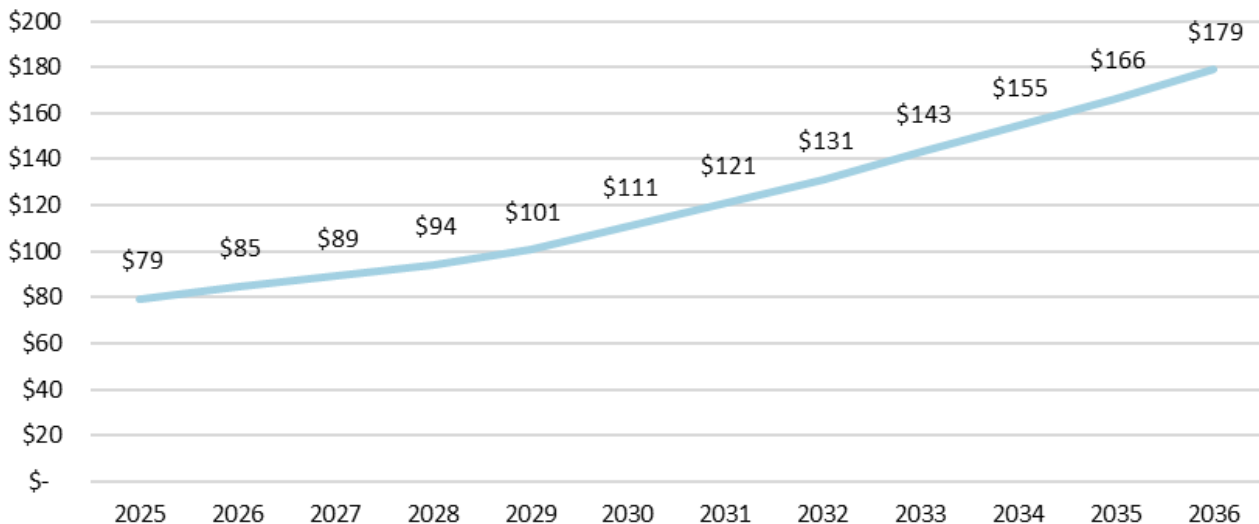
Source: Australian Energy Regulator (2024). Valuing emissions reduction

4.3.6 Fuel cost savings benefit

As with emissions savings, the fuel cost saving for each modelled scenario will be calculated as:

$$\sum_{r=1}^{5} \left(Average\ Fuel\ Use_{r,0} - Average\ Fuel\ Use_{r,i} \right) \times VKT_r \times Average\ Fuel\ Cost$$

In simple terms, the fuel cost saving for each scenario is calculated as the difference in fuel use (litres per kilometre) before and after speed reductions for each road type and remoteness area, multiplied by the VKT on these respective roads, multiplied by average fuel cost.

There is a direct and measurable relationship between fuel efficiency and fuel consumption, which is commonly reported as litres per 100 kilometres (L/100km). Vehicles that consume more fuel per distance travelled tend to emit more CO_2, as emissions are directly tied to the amount of fuel burned. In general, as fuel use increases, CO_2 emissions also increase proportionally. This relationship allows one metric to be converted into the other, assuming a consistent emissions factor for the type of fuel used. For example, burning one litre of petrol produces approximately 2.3 kilograms of CO_2.[112]

The efficiency gains from reducing speed for electric vehicles are assumed to have the same efficiency gains as those of petrol and diesel vehicles. Similarly operating costs for EVs (i.e. charging costs) are assumed to be on par with conventional fuels. This approach might slightly overstate the fuel costs saving benefit as electric vehicle operating costs are lower than fuel costs. However, since electric vehicles only make up a small proportion of the vehicle fleet (and hence, VKT) on roads outside of built-up areas, the difference is likely very marginal.

A conservative assumption was taken that the cost of fuel between the remoteness regions is consistent. However, it is that prices for fuel in regional and remote areas are consistently higher than urban areas.[113]

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[112] National Transport Commission (2019). Carbon Dioxide Emissions Intensity for New Australian Light Vehicoes 2018. Accessed at: https://www.ntc.gov.au/sites/default/files/assets/files/Carbon%20dioxide%20emissions%20intensity%20for%20new%20Australian%20light%20vehicles%202018.pdf

[113] ACCC. Fuel prices in regional locations. Accessed at: https://www.accc.gov.au/consumers/petrol-and-fuel/fuel-prices-in-regional-locations

Figure 12 Approach to modelling emissions abatement and fuel cost savings for each road type, remoteness areas, and modelling scenario
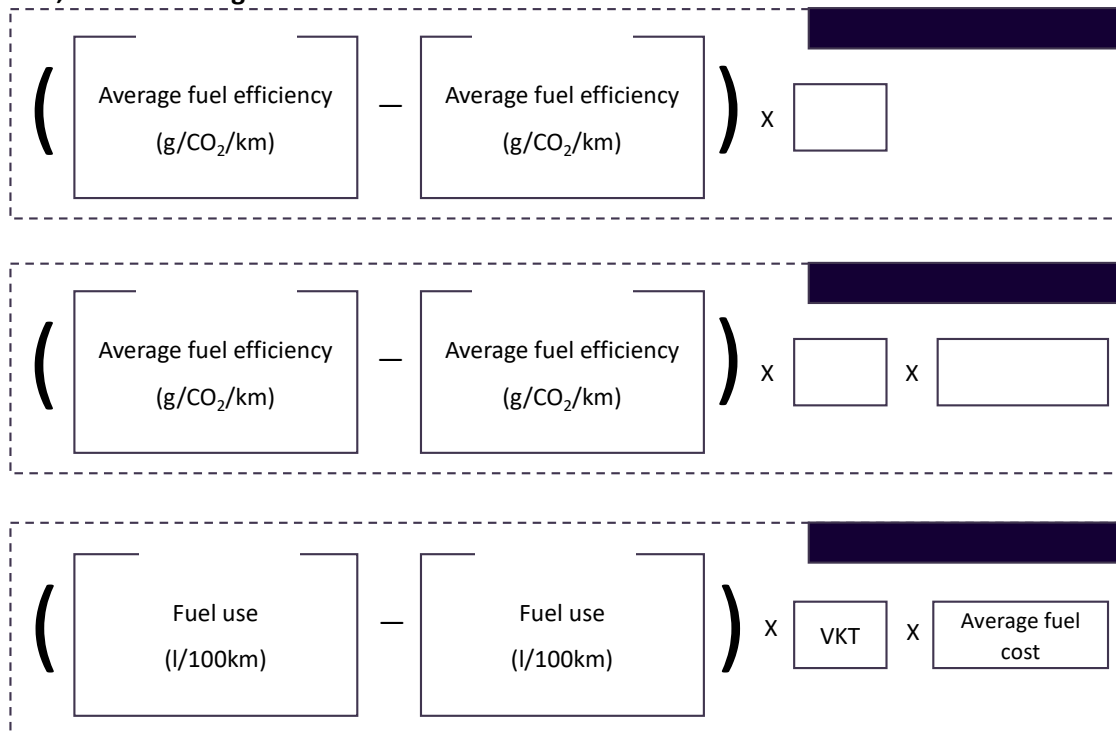
Source: ACIL Allen

4.3.7 Health benefits

Vehicle emissions consist of various air pollutants, including carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM), and volatile organic compounds (VOC).[114] These emissions can lead to numerous negative health impact in humans, including heart conditions, lung disease, and cancer. The proposed reduction in default speed limit will have an impact in reducing emissions by reducing fuel consumption of petrol and diesel vehicles, thus generating a benefit in terms of reduced risk to human health.

Calculating health benefits from reduced emissions is complex and ideally requires modelling atmospheric damage from fine air particulate matter.[115] Such an exercise is beyond the scope of this project.

To calculate the health benefits associated with speed reductions, annual estimates for health cost due to emissions based on assumptions incorporated in the 2022 Fuel Quality RIS[116] were used. The benefits are calculated on a $/litre of fuel basis and are approximately $0.0947 per litre of fuel saved.

4.3.8 Other intangible benefits

Additional benefits of reducing speed limits may include:

- reduced noise pollution
- slower degradation of road infrastructure
- greater traffic flow.

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[114] Green Vehicle Guide, *Vehicle emissions*, Accessed at:
https://greenvehicleguide.gov.au/pages/UnderstandingEmissions/VehicleEmissions
[115] See U.S. Department of Transportation, *CAFE Model Documentation*, April 2022, Section 6, pg.148.
[116] Department of Climate Change, Energy, the Environment and Water; *Better fuel for cleaner vehicles Draft Regulation Impact Statement for consultation*, November 2022. Accessed at: https://consult.dcceew.gov.au/better-fuel-for-cleaner-vehicles

The modelling and quantification of each of these benefits would be complex and resource intensive. Given the parameters of this RIA, quantitative estimates for these benefits were not included in the model. Instead, a brief qualitative discussion of each is provided below.

Reduced noise pollution

Reducing speed limits may reduce levels of noise pollution, which in turn has a range of health benefits including preventing cardiovascular disease, improving sleep quality, and mental wellbeing.[117] Slower travelling vehicles produce less noise as they require less power from the engine, and therefore produce fewer revolutions per minute (RPMs). Noise pollution can also be harmful for human health through hearing loss and sleep disturbances. Further, relationships have been observed between the body's stress responses to sound and cardiovascular issues, including hypertension and ischemic heart disease, type II diabetes, and mental wellbeing impacts.[118,119] These health impacts have direct costs in medical expenditure, and indirect costs in terms of quality-of-life reductions and impacts on worker productivity[120]. A study investigating willingness to pay for traffic noise reduction found that people who were annoyed by noise were willing to pay US$7.55, and those extremely annoyed by noise were willing to pay $8.83 annually to reduce their annoyance to zero.[121]

A study investigating the benefits of reducing the speed limit to 30 km/h in Switzerland found that reductions in noise pollution were estimated to prevent 1 death and 72 hospital admissions due to cardiovascular disease, 17 incident diabetes cases, 1127 cases of high annoyance among individuals, and 918 cases of sleep disturbance.[122] The prevention of pollution-related mortality and morbidity due to these causes is therefore likely to be associated with benefits to the health system and increased quality of life in the population.

Slower degradation of road infrastructure

Decreasing speed may degrade the road at a slower rate, as driving at slower speeds produces less heat on the road surface, and therefore fewer cracks or damage will develop.[123] Maintaining the road infrastructure requires a significant amount of public spending in Australia. While maintenance costs may be due to a range of factors, the degradation of the road due to heat produced by vehicles travelling at high speeds is likely to contribute to this cost. This in turn means that reducing speed limits may mean road infrastructure lasts longer, and some savings may be obtained through less frequent spending on maintenance and repairs of roads. However, the extent of savings is not known, and it may be minimal.

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[117] Chen, X., Liu, M., Zuo, L., Wu, X., Chen, M., Li, X., ... & Hao, G. (2023). Environmental noise exposure and health outcomes: an umbrella review of systematic reviews and meta-analysis. *European journal of public health*, *33*(4), 725-731.

[118] Welch, D., Shepherd, D., Dirks, K. N., & Reddy, R. (2023). Health effects of transport noise. *Transport Reviews*, *43*(6), 1190-1210.

[119] Chen, X., Liu, M., Zuo, L., Wu, X., Chen, M., Li, X., ... & Hao, G. (2023). Environmental noise exposure and health outcomes: an umbrella review of systematic reviews and meta-analysis. *European journal of public health*, *33*(4), 725-731.

[120] Verhaeghe, N., Vandenbulcke, B., Lelie, M., Annemans, L., Simoens, S., & Putman, K. (2025). Cost-Effectiveness of Strategies Addressing Environmental Noise: A Systematic Literature Review. *International Journal of Environmental Research and Public Health*, *22*(5), 803.

[121] Kim, K., Shin, J., Oh, M., & Jung, J. K. (2019). Economic value of traffic noise reduction depending on residents' annoyance level. *Environmental Science and Pollution Research*, *26*(7), 7243-7255.

[122] Rossi, I. A., Vienneau, D., Ragettli, M. S., Flückiger, B., & Röösli, M. (2020). Estimating the health benefits associated with a speed limit reduction to thirty kilometres per hour: A health impact assessment of noise and road traffic crashes for the Swiss city of Lausanne. *Environment international*, *145*, 106126.

[123] Mustafa, S., Sekiya, H., Hamajima, A., Maeda, I., & Hirano, S. (2021). Effects of speeds and weights of travelling vehicles on the road surface temperature. *Transportation Engineering*, *5*, 100077.

Greater traffic flow

Reducing high speeds may increase traffic flow, by creating a more even distribution of traffic on the road. The relationship between speed and traffic flow is shown in Figure 13 below, which shows that throughput is maximised at approximately 60 km/h, and at speeds above 70 km/h, traffic flow decreases.

Therefore, reducing the default speed limit outside built-up areas (where it is currently often 100 km/h or greater), may improve traffic flow. This could mean people spend less time in traffic and have more consistent travel times.

Figure 13 Traffic flow (vehicle/hour) by travel speed on an urban motorway
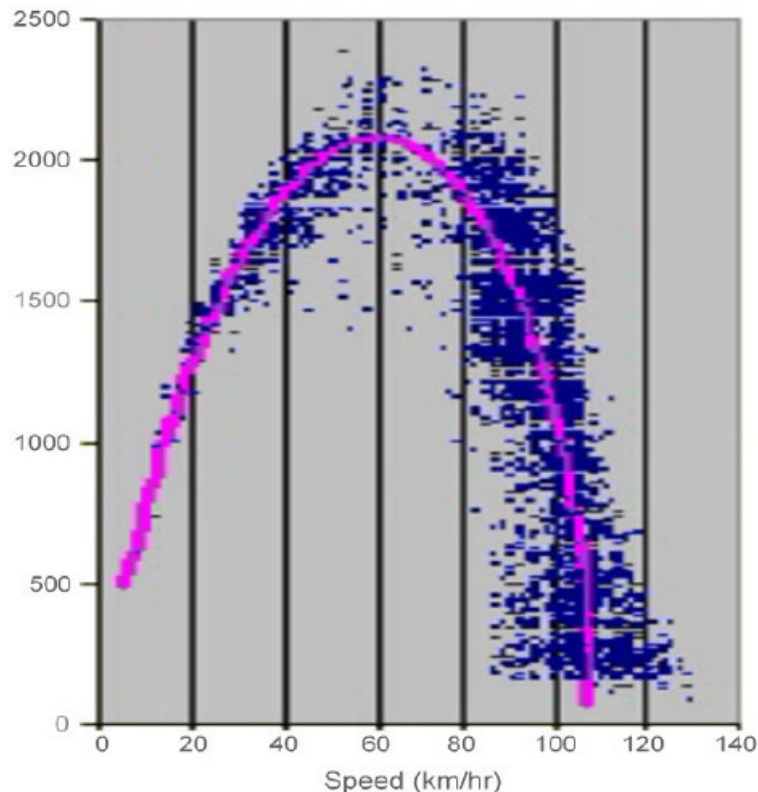
Source: OECD Transport Research Centre. (2006). Speed management.

4.3.9   Travel time costs

Reducing speed limits can result in increased travel time, introducing potential costs to road users.

Research indicates that reducing speed limits from 60 km/h to 50 km/h across an entire road network can lower spatial speeds from approximately 48 km/h to 40 km/h, resulting in a roughly 20% increase in average trip duration.[124] However, it is important to note that arterial and local road travel times were not separately evaluated in this context. Conversely, other estimates based on expected mean travel speeds suggest more modest travel time increases, around 4-5%, when reducing speed limits by 10 km/h.[125]

In addition to commuter impacts, reductions in speed limits can significantly affect long-distance freight movements. Increased transit times can raise logistical costs, affect delivery schedules, and potentially reduce the efficiency of supply chains. These impacts will particularly affect sectors reliant on timely deliveries and tight scheduling.

The costs to road users primarily manifest as commuter delays and can negatively impact labour productivity. Estimating the Value of Travel Time (VTT) can be particularly complex, as it varies significantly based on

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[124] Austroads (2010). *Impact of Lower Speed Limits for Road Safety on Network Operations.* Austroads Ltd. Pg 14
[125] Ibid.

factors such as an individual's income, age, trip purpose, and vehicle occupancy. There are several methods used to quantify the value of travel time, including stated and revealed preference approaches, and wage-based methods, which assume that the value of time saved corresponds to a proportion of the traveller's hourly wage. In freight contexts, value of time is often calculated based on delivery delays, inventory holding costs, and supply chain disruptions.

For the purpose of economic appraisals in Australia, the ATAP provide a standardised set of value of time estimates (2025$). These are summarised in Table 36. These are the estimates that will be used in the modelling. These costs are the standard applied to a range of transport costs, with the freight costs in particular confirmed by industry stakeholders in consultation.

Table 36 ATAP time value estimates

Vehicle	Occupancy rate persons/vehicle	Value per occupant $/person-hour	Freight non-urban $/vehicle-hour
Cars (all types)			
Private	1.7	$20.66	$-
Business	1.3	$67.03	$-
Light utility vehicles			
Courier Van-Utility	1.0	$35.03	$-
4WD Mid-Size Petrol	1.5	$35.03	$-
Rigid trucks			
Light Rigid	1.3	$35.03	$1.08
Medium Rigid	1.2	$35.45	$2.91
Heavy Rigid	1.0	$36.10	$9.95
Buses			
Heavy Bus (driver)	1.0	$35.45	$-
Heavy Bus (passenger)	20.0	$20.66	$-
Articulated trucks			
Artic 4 Axle	1.0	$36.96	$21.41
Artic 5 Axle	1.0	$36.96	$27.29
Artic 6 Axle	1.0	$36.96	$29.44

The calculation of the costs associated with an increase in travel time will be determined by multiplying the relevant VKT for the vehicle by the difference in speeds before and after the speed reduction scenario by the average value of travel time for the vehicle class.

Figure 14 Approach to modelling travel time costs for each vehicle type, road type, remoteness areas, and modelling scenario
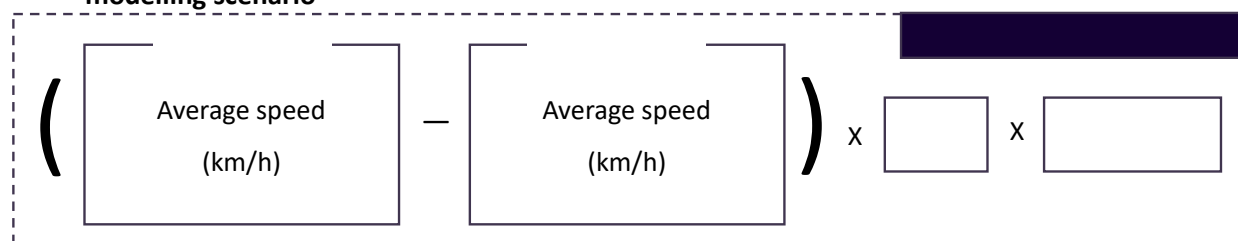
While it is typically assumed that the costs incurred by businesses are passed through to the consumer in the form of increased prices for goods and services, for the purposes of this report, only the first order distributional impacts have been identified. That is to say that additional freight and business costs are described as accruing to freight and businesses. Who bears the cost in practice depends on the elasticities of demand and supply, and an exercise to determine these are outside the scope of this exercise.

4.3.10 Government costs

Implementing speed limit reductions on default roads primarily involves administrative costs rather than physical infrastructure expenses, given that existing signage will remain unchanged. The primary administrative activities include revising state and territory legislation to reflect the updated speed regulations. This legislative update involves costs associated with the drafting, reviewing, and approval processes within government agencies and parliamentary bodies.

Another significant financial consideration is the potential reduction in government revenue due to decreased fuel-excise receipts. As vehicles operate more efficiently at reduced speeds, fuel consumption will decrease, resulting in lower revenue from fuel taxes. This decline may have implications for road maintenance budgets and other transport-related public expenditures, necessitating adjustments to fiscal planning. These figures will be calculated using the fuel reductions calculations described above. Notably, these would be considered an economic transfer rather than a cost to Government (but reflected in the distributional analysis).

In addition to the costs described above, it is assumed that governments will undertake media campaigns to inform drivers of the new limits. While jurisdictional stakeholders agreed that such a campaign would be necessary, a cost was not established. For the purposes of estimating a cost, it was assumed that the national cost of any campaign would be equal to the Australian Government's 2024-25 National Road-Safety Education and Awareness campaign, which cost $10.8 million. For the purpose of modelling, it is assumed that:

- these costs would be a one-off cost
- these campaigns are necessary to get the level of compliance described above
- there would be separate campaigns for sealed and unsealed road changes.

4.3.11 Other possible costs

Implementing speed limit reductions also carries costs beyond administrative and economic considerations, particularly in terms of public perception and social acceptance. Public opinion may influence speed limit reductions, as demonstrated in 2025 when the Adelaide City Council rejected a proposal to introduce a blanket 30 km/h speed limit across the city in response to strong community opposition.[126] Similar resistance has been seen internationally, such as the 470,000-signature petition against Wales's implementation of a 20 miles per hour speed limit. [127]

4.4   Questions for stakeholders

- Are the lists of costs and benefits considered in this methodology sufficient to capture the costs and benefits of the proposed change?
- Do the scenarios considered capture the full range of uncertainty about the costs and benefits of the policy?
- Are there any additional data that ought to have been considered when constructing the baseline FSI, VKT, efficiency and fuel costs?
- Is the approach to measuring the impact of policy change appropriate? Where assumptions have been made, do you have any specific alternative assumptions that ought to have been considered?

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[126] InDaily SA, 2025. *Council rejects blanket 30 km/h speed limits*. https://www.indailysa.com.au/news/just-in/2025/01/29/council-rejects-blanket-30km-h-speed-limits

[127] BBC, 2024. *£5m pot for 20mph roads review after backlash.* https://www.bbc.com/news/articles/c51ydq51e57o

5.   Net impacts on the economy

5.1   Sealed roads

5.1.1   Reduction in fatalities and serious injuries

As noted in Chapter 4, available data do not specify the exact share of FSI on sealed default speed-limited roads outside built-up areas. Table 37 shows the projected reduction in fatalities in Australia (2026–2036) by speed reduction scenario, with sensitivity testing on the percentage of FSI in these areas.

Table 37   Annual avoided FSI by option by scenario

Speed reduction scenario	% of FSI on default-speed limited roads sealed roads outside of built-up areas		
	10%	20%	38%
Fatalities avoided			
Low (100 km/h to 90 km/h)	95	190	361
Medium (100 km/h to 80 km/h)	201	401	763
High (100 km/h to 70 km/h)	286	572	1,087
Serious injuries avoided			
Low (100 km/h to 90 km/h)	1,444	2,888	5,487
Medium (100 km/h to 80 km/h)	3,156	6,312	11,992
High (100 km/h to 70 km/h)	4,644	9,287	17,646

Given the link between speed and FSI, it is expected that lowering speed limits reduces FSI. As the default speed decreases (from 100 to 90, 80, and 70), fatalities and serious injuries decrease across all FSI percentage assumptions.

5.1.2   Cost-benefit analysis

The model allows for assumptions both about the proportion of fatalities that occur on sealed default speed-limited roads outside of built-up areas and the proportion of total driving that occurs on those roads.

As a result, there are a range of assumption permutations that are possible for each speed reduction scenario. While not perfectly correlated, the more driving that occurs on sealed default speed-limited roads, the greater the proportional FSI on those roads. In fact, research has shown that these roads actually account for disproportionately higher FSI relative to the amount of driving. As such, the outputs presented in this section will be those on the diagonal (highlighted in the table below).

The tables below show the BCR outputs for all 9 assumption permutations for each reduction scenario.

Table 38   Benefit-cost ratio (BCR) results by option by scenario

VKT Bound	% of FSI on default sealed roads outside of built-up areas		
	10%	20%	38%
100 km/h to 90 km/h			
Lower bound VKT estimate	2.4	4.5	8.4
Middle VKT estimate	1.4	2.4	4.3
Upper bound VKT estimate	0.6	1.0	1.7
100 km/h to 80 km/h			
Lower bound VKT estimate	2.2	4.1	7.5
Middle VKT estimate	1.2	2.2	3.9
Upper bound VKT estimate	0.6	0.9	1.5
100 km/h to 70 km/h			
Lower bound VKT estimate	1.9	3.6	6.6
Middle VKT estimate	1.1	1.9	3.4
Upper bound VKT estimate	0.5	0.8	1.3

The tables below show the NPV outputs for all 9 assumption permutations for each reduction scenario.

Table 39   Net present value (NPV) results by option by scenario (2025$)

VKT Bound	% of FSI on default sealed roads outside of built-up areas		
	10%	**20%**	**38%**
100 km/h to 90 km/h			
Lower bound VKT estimate	$678.7	$1,705.9	$3,554.6
Middle VKT estimate	$341.5	$1,368.7	$3,217.4
Upper bound VKT estimate	-$1,016.3	$10.9	$1,859.6
100 km/h to 80 km/h			
Lower bound VKT estimate	$1,348.7	$3,567.9	$7,562.3
Middle VKT estimate	$478.3	$2,697.4	$6,691.9
Upper bound VKT estimate	-$3,003.3	-$784.1	$3,210.3
100 km/h to 70 km/h			
Lower bound VKT estimate	$1,759.7	$4,988.9	$10,802.2
Middle VKT estimate	$298.1	$3,527.4	$9,340.7
Upper bound VKT estimate	-$5,537.0	-$2,307.8	$3,505.5

The central estimates are the diagonal (highlighted in the table above) figures, and represent the lower, middle and upper assumption groupings shown in the NPV and sensitivity tables. These sets of assumptions are called the central VKT-FSI assumption groupings. Central estimates BCRs:

Table 40   Central estimate BCRs

Speed reduction scenario	Lower estimate	Middle estimate	Upper estimate
Low (100 km/h to 90 km/h)	2.4	2.4	1.7
Medium (100 km/h to 80 km/h)	2.2	2.2	1.5
High (100 km/h to 70 km/h)	1.9	1.9	1.3

The table overleaf shows the costs, benefits, NPV and BCR for each central estimate VKT-FSI assumption groupings.

For all central estimate assumption groupings, each speed reduction achieves a positive NPV and BCR. The largest BCRs are achieved through the reduction of speed on sealed default roads from 100 km/h to 90 km/h. While the NPVs increase as speed is reduced further, so too do the travel time costs, leading to a lower overall BCR for these speed reduction scenarios.

The sensitivity tables highlight the NPVs for the speed reduction scenarios varying key inputs. For all discount rates, all speed reduction scenarios produce positive NPVs. A significant reduction in the value of a statistical life (here using a casualty-cost approach estimate of $3,056,003[128]) still produces positive NPVs for all speed reduction scenarios. The inclusion of minor injuries has a relatively small impact, but does increase all NPVs from the central case estimates.

The model tested the sensitivity of the travel cost assumptions by increasing all hourly travel costs estimate for all vehicles by 10%. Even with this increase in costs, final NPVs remain positive for all speed reduction scenarios.

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[128] Australian Transport Assessment and Planning Guidelines, *Crash costs. https://www.atap.gov.au/parameter-values/road-transport/4-crash-costs*

	100 km/h to 90 km/h			100 km/h to 80 km/h			100 km/h to 70 km/h		
	Lower	Middle	Upper	Lower	Middle	Upper	Lower	Middle	Upper
Avoided fatalities and serious injuries	($m)	($m)	($m)	($m)	($m)	($m)	($m)	($m)	($m)
Avoided fatalities	$368.4	$736.8	$1,399.9	$779.3	$1,558.6	$2,961.5	$1,111.0	$2,222.2	$4,221.6
Avoided serious injuries	$658.8	$1,317.7	$2,503.2	$1,439.9	$2,879.7	$5,471.2	$2,118.7	$4,236.8	$8,050.6
Avoided fuel consumption	($m)	($m)	($m)	($m)	($m)	($m)	($m)	($m)	($m)
Cost of fuel	$109.0	$226.8	$636.7	$242.5	$504.7	$1,416.0	$362.5	$754.7	$2,115.7
Emissions abatement	$18.7	$39.1	$109.2	$41.7	$87.0	$242.8	$62.3	$130.1	$362.9
Health benefits	$6.1	$12.7	$35.7	$13.6	$28.3	$79.5	$20.3	$42.3	$118.7
Total benefits	$1,161.1	$2,333.0	$4,684.7	$2,503.3	$5,029.9	$10,091.5	$3,674.9	$7,386.1	$14,869.5
Costs - dollar values	($m)	($m)	($m)	($m)	($m)	($m)	($m)	($m)	($m)
Travel time									
Personal	-$256.3	-$512.7	-$1,538.0	-$626.6	-$1,253.2	-$3,759.6	-$1,033.9	-$2,067.8	-$6,203.4
Business	-$197.0	-$394.0	-$1,181.9	-$481.5	-$963.0	-$2,889.0	-$794.5	-$1,588.9	-$4,766.8
Freight	-$19.0	-$47.6	-$95.1	-$46.5	-$116.3	-$232.6	-$76.7	-$191.9	-$383.7
Information campaign	-$10.1	-$10.1	-$10.1	-$10.1	-$10.1	-$10.1	-$10.1	-$10.1	-$10.1
Total costs	-$482.4	-$964.3	-$2,825.1	-$1,154.6	-$2,332.5	-$6,881.2	-$1,915.2	-$3,858.7	-$11,364.0
Overall results									
NPV	$678.7	$1,368.7	$1,859.6	$1,348.7	$2,697.4	$3,210.3	$1,759.7	$3,527.4	$3,505.5
BCR	2.4	2.4	1.7	2.2	2.2	1.5	1.9	1.9	1.3

	100 km/h to 90 km/h			100 km/h to 80 km/h			100 km/h to 70 km/h		
	Lower	Middle	Upper	Lower	Middle	Upper	Lower	Middle	Upper
Central case	$678.7	$1,368.7	$1,859.6	$1,348.7	$2,697.4	$3,210.3	$1,759.7	$3,527.4	$3,505.5
Discount rate									
3%	$856.2	$1,724.5	$2,355.6	$1,700.1	$3,400.2	$4,085.9	$2,224.3	$4,456.7	$4,501.9
10%	$578.4	$1,167.8	$1,580.4	$1,150.5	$2,300.9	$2,719.0	$1,497.8	$3,003.7	$2,949.1
Value of statistical life									
$3,056,003	$503.7	$1,018.9	$1,194.9	$978.7	$1,957.4	$1,804.1	$1,232.1	$2,472.3	$1,500.9
Inclusion of minor injuries									
Including minor injuries	$742.4	$1,496.3	$2,101.9	$1,488.1	$2,976.1	$3,739.8	$1,964.7	$3,937.4	$4,284.6
Increased travel costs									
Increased hourly travel costs by 10%	$631.4	$1,273.3	$1,578.1	$1,233.3	$2,464.2	$2,522.2	$1,569.1	$3,142.6	$2,370.1

5.2   Unsealed roads

Governments record whether an FSI crash occurs on an unsealed road, and as such there is no need to model different FSI scenarios, as was done above. Based on the records of FSI on unsealed roads, the estimates of FSI reduction are shown in Table 41.

Table 41   Modelled reductions in fatalities and serious injuries on unsealed roads by option

Speed reduction scenario	Annual reduction in FSI
Fatalities	
100 km/h to 80 km/h	123
100 km/h to 70 km/h	248
Serious injuries	
100 km/h to 80 km/h	4,182
100 km/h to 70 km/h	8,847

As with sealed roads, there are greater reductions in fatalities and serious injuries on unsealed roads as speed limits are reduced.

Table 42 below shows the BCRs for each VKT bound assumption. Bar one exception, both speed reduction scenarios for all VKT assumptions produce positive BCRs. When a large proportion of driving is assumed on unsealed roads (i.e. upper bound for VKT), a speed limit reduction form 100 km/h to 70 km/h produces a negative BCR.

Table 42   Unsealed roads BCR by option by VKT scenario

VKT on unsealed roads	BCR	
	100 km/h to 80 km/h	100 km/h to 70 km/h
Lower bound VKT estimate	5.4	4.6
Middle VKT estimate	2.2	1.9
Upper bound VKT estimate	1.1	0.96

Table 43 below shows the NPVs for each VKT bound assumption. As with the above, all scenarios except one produce positive NPVs.

Table 43   Unsealed roads NPV by option by VKT scenario

VKT on unsealed roads	NPV ($m)	
	100 km/h to 80 km/h	100 km/h to 70 km/h
Lower bound VKT estimate	$1,964.4	$3,948.6
Middle VKT estimate	$1,340.4	$2,367.5
Upper bound VKT estimate	$320.3	-$214.8

The table below outlines the costs and benefits associated with each speed reduction scenario and VKT assumption. Given the number of FSI remain the same, as the VKT assumptions increase, the BCRs and NPVs decrease.

The following table shows the NPVs of each speed reduction scenario and VKT assumption after varying key parameters. The signs of the NPVs (whether a result is positive or negative) for all scenarios and assumptions remain the same after testing for each sensitivity – except for that of the upper VKT assumption with a speed reduction of 100 km/h to 70 km/h, with the inclusion of the reduction in minor injuries. Here, where minor injuries are included, the benefits outweigh the costs, and the result is a positive NPV (unlike the central estimate which produced a negative NPV).

	100 km/h to 80 km/h			100 km/h to 70 km/h		
	Low VKT bound	Middle VKT	Upper VKT bound	Low VKT bound	Middle VKT	Upper VKT bound
Avoided fatalities and serious injuries	($m)	($m)	($m)	($m)	($m)	($m)
Avoided fatalities	$477.6	$477.6	$477.6	$963.4	$963.4	$963.4
Avoided serious injuries	$1,907.9	$1,907.9	$1,907.9	$4,036.2	$4,036.2	$4,036.2
Avoided fuel consumption	($m)	($m)	($m)	($m)	($m)	($m)
Cost of fuel	$17.0	$45.2	$85.1	$33.9	$90.5	$169.4
Emissions abatement	$3.0	$7.9	$14.8	$5.9	$15.9	$29.6
Health benefits	$1.0	$2.5	$4.8	$1.9	$5.1	$9.5
Total benefits	$2,406.4	$2,441.2	$2,490.2	$5,041.2	$5,110.9	$5,208.0
($m)	($m)	($m)	($m)	($m)	($m)	($m)
Travel time						
Personal	-$232.1	-$580.2	-$1,160.4	-$581.6	-$1,454.1	-$2,908.2
Business	-$178.3	-$445.8	-$891.7	-$446.9	-$1,117.4	-$2,234.7
Freight	-$21.5	-$64.6	-$107.7	-$54.0	-$161.9	-$269.8
Information campaign	-$10.1	-$10.1	-$10.1	-$10.1	-$10.1	-$10.1
Total costs	-$442.0	-$1,100.7	-$2,169.9	-$1,092.6	-$2,743.4	-$5,422.8
Overall results	($m)	($m)	($m)	($m)	($m)	($m)
NPV	$1,964.4	$1,340.4	$320.3	$3,948.6	$2,367.5	-$214.8
BCR	5.4	2.2	1.1	4.6	1.9	0.96

NPVs ($m)	100 km/h to 80 km/h			100 km/h to 70 km/h		
	Low VKT bound	Middle VKT	Upper VKT bound	Low VKT bound	Middle VKT	Upper VKT bound
Central case	$1,964.4	$1,340.4	$320.3	$3,948.6	$2,367.5	-$214.8
Discount rate						
3%	$2,469.8	$1,696.7	$432.8	$4,965.7	$3,006.7	-$192.8
10%	$1,678.6	$1,139.8	$258.8	$3,373.8	$2,008.3	-$221.8
Value of statistical life						
$3,056,003	$1,737.6	$1,113.7	$93.6	$3,491.1	$1,910.1	-$672.3
Inclusion of minor injuries						
Including minor injuries	$2,149.0	$1,525.1	$505.0	$4,339.2	$2,758.1	$175.8
Increased travel costs						
Increase costs by 10%	$1,921.2	$1,231.4	$104.4	$3,840.3	$2,094.2	-$756.1

6. Other impacts

6.1 Regulatory burden

When considering the burden additional regulations place on businesses, individuals and community organisations, OIA recommends using its Regulatory Burden Measurement Framework (RBMF), which defines 2 types of costs compliance and delay costs (Table 44), which are discussed below.

Table 44 Regulatory Burden measurement Framework

Compliance costs	
Administrative costs	Costs incurred by regulated entities primarily to demonstrate compliance with the policy (usually record keeping and reporting costs)
Substantive compliance costs	Costs incurred to deliver the outcomes being sought (usually purchase and maintenance costs)
Delay costs	
Application / Approval delay	Expenses and loss of income through application or approval delay

6.1.1 Compliance costs

Administrative costs refer to activities conducted by individuals or organisations to *demonstrate* compliance, including keeping records, conducting tests and more. Given the nature of default speed limits, there are no administrative costs associated with compliance.

Substantive compliance costs refer to those costs incurred to deliver the outcomes being sought. The RBMF provides some examples of these types of costs:

- costs of providing training to employees to meet regulatory requirements
- costs of purchasing and maintaining plant and equipment
- costs of providing information for third parties, such as providing financial statements to consumers
- costs of operation (for example, energy costs)
- costs of professional services needed to meet regulatory requirements (for example legal, tax and accounting advice)
- costs incurred in purchasing permits through non-government market mechanisms in order to meet a particular outcome.[129]

These are captured in the quantified time costs described in Chapter 5. In line with the RBMF, these are presented as a 10-year undiscounted total regulatory burden on individuals, businesses and community organisations. Based on the data available, community organisations and businesses are not able to be separated out, but separate freight and business travel has been identified (see Table 45, Table 46).

Table 45   10-year regulatory burden on sealed roads ($ million)

	Business (freight)	Business / community organisations (business travel)	Individuals (personal travel)	Total cost change
Lower bound				
90 km/h, sealed	$378.5	$291.2	$28.2	$697.9
80 km/h, sealed	$342.7	$263.7	$31.9	$638.3
70 km/h, sealed	$925.3	$711.9	$68.9	$1,706.1
Middle bound				
90 km/h, sealed	$757.1	$582.5	$70.4	$1,410.0
80 km/h, sealed	$856.8	$659.2	$95.6	$1,611.6

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[129] OIA (2024) *Regulatory Burden Measurement Framework*. Accessed at:
  https://oia.pmc.gov.au/sites/default/files/2024-02/regulatory-burden-measurement-framework.pdf

	Business (freight)	Business / community organisations (business travel)	Individuals (personal travel)	Total cost change
70 km/h, sealed	$1,850.6	$1,423.8	$172.1	$3,446.6
Upper bound				
90 km/h, sealed	$2,271.2	$1,747.4	$140.8	$4,159.5
80 km/h, sealed	$1,713.6	$1,318.4	$159.4	$3,191.4
70 km/h, sealed	$5,551.9	$4,271.5	$344.3	$10,167.7

Table 46 10-year regulatory burden on unsealed roads ($ million)

	Business (freight)	Business / community organisations (business travel)	Individuals (personal travel)	Total cost change
Lower bound				
80 km/h, unsealed	$1,526.8	$1,174.7	$113.6	$2,815.1
70 km/h, unsealed	$858.9	$660.8	$79.9	$1,599.6
Middle bound				
80 km/h, unsealed	$3,053.6	$2,349.3	$284.0	$5,686.9
70 km/h, unsealed	$2,147.3	$1,652.1	$239.7	$4,039.0
Upper bound				
80 km/h, unsealed	$9,160.7	$7,048.0	$568.0	$16,776.8
70 km/h, unsealed	$4,294.6	$3,304.2	$399.4	$7,998.2

There may be some small costs as drivers are informed as to the new limit, but otherwise it is not expected that there will be any new equipment, reporting, professional services or permits required.

6.1.2 Delay costs

Delay costs refer to the expenses and loss of income incurred by an individual or organisation as a result of the time taken to complete and approve a regulatory application. As there are no applications or approvals required as a result of the default speed limits, there are no expected delay costs.

6.2   Effects on competition

On an economy-wide basis, any effects on competition are expected to be minimal. It could be argued that by limiting the speeds available on some roads, businesses that rely on such roads may be at a disadvantage compared to those that do not. For example, businesses that are only accessible by default roads may take longer to access by customers or freight than those that are accessible by other methods or do not require travel. While the primary impact of that is captured in the time costs described in Section 4.3.9, there may be additional equilibrium effects as businesses re-orient away from areas only accessible by default roads. Given the additional time that would actually be spent on these roads, the costs are expected to be small.

Further, there are some natural limits to the extent to which this can harm competition: local- and state governments have the ability to sign roads up to a higher limit, restoring access back to those businesses. While this depends on councils or road authorities actually making such changes, they nevertheless provide an opportunity to rectify meaningful competition impacts.

6.3   Questions for stakeholders

- Are there any additional regulatory burdens that have not been considered?
- Are there any additional impacts on competition that have not been considered?

7.   Implementation and review

How will you implement and evaluate your chosen option?

The Australian Road Rules (ARR) is a model law that is adopted by states and territories to ensure nationally consistent road rules. As model a law, the ARR does not have legal effect until adopted by individual jurisdictions. The National Transport Commission (NTC) is responsible for maintaining and reviewing the ARR.[130]

7.1   Implementation and Consultation

Once relevant Ministers have agreed to the policy, the NTC works with Parliamentary Counsel to prepare legally robust amendments. Draft amendments are then released for public consultation, allowing stakeholders to provide feedback to inform any necessary refinements.

7.2   Approval and Adoption

Following consultation, amendments are finalised and submitted to the Infrastructure and Transport Ministers' Meeting for approval. Jurisdictions then adopt the amendments according to their legislative processes. Jurisdictions may adopt the amendments as drafted or with variations to suit local requirements.

7.3   Risks and Considerations

Key considerations include drafting complexity, inter-jurisdictional coordination, and alignment with other policies. Public consultation may identify practical challenges or stakeholder concerns that require adjustments before final approval.

7.4   Timeframe and evaluation

The process including drafting, consultation and approval typically takes about 18 months. Actual timing may vary depending on the complexity of the amendments, the volume of consultation feedback, and jurisdictional legislative schedules.

The ARRs is a model law. States and territories may choose conduct evaluations of any amendments incorporated into jurisdictional road rules

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[130] The information in this section relating to the implementation, review and evaluation of the proposed policy was provided by the NTC.

# 8.	Conclusion

The impacts of reducing default speed limits on default roads outside of built-up areas are complex to assess due to limitations in existing road safety datasets. In particular, there is no comprehensive data on vehicle-kilometres travelled or the proportion of fatal and serious injury crashes that occur on roads outside of built-up areas with default speed limits. Recognising this uncertainty, a scenario-based modelling approach was adopted for the analysis, supported by the best available evidence. While this scenario analysis provides a structured way of understanding the potential impacts of the proposed policy options on the Australian economy, it does not provide a definitive conclusion about its overall impacts.

Figure 15 summarises the estimated NPVs and BCRs of the range of scenarios considered to be the most likely (the central case scenarios)[131]. Overall, the modelling indicates that reductions in default speed limits are likely to deliver a net societal benefit under all central case scenarios examined. This conclusion holds across both sealed and unsealed roads, though the scale of benefits varies depending on the extent of the reduction.

Typically, the decision rule to identify a preferred policy option in regulatory analysis is to select the option with the highest net benefit to society (see the box below for details on the OIA's recommended decision rule to identify the best policy option in an RIA). However, given the uncertainty associated with the NPVs in Figure 15, it is reasonable to also consider the efficiency with which outcomes would be achieved under each option.

- A **reduction to 70 km/h** generates the largest net benefits in absolute terms under the central assumptions. However, marginal costs rise more steeply than marginal benefits. For example, on sealed roads, compared to a reduction to 80 km/hr, decreasing the speed limit to 70 km/hr doubles the estimated benefits but triples the estimated costs.
- A **reduction to 80 km/h** provides a more efficient outcome. Each dollar of cost is associated with an estimated $2.20 in benefits, compared with $1.50 under the 70 km/h scenario (on sealed roads). The scale of benefits is lower, but they are achieved at proportionately lower cost.
- This highlights a trade-off between maximising absolute benefits (with 70 km/h) and achieving a more efficient balance of benefits and costs (with 80 km/h).

Figure 15 Potential impact of the proposed policy options under different scenarios
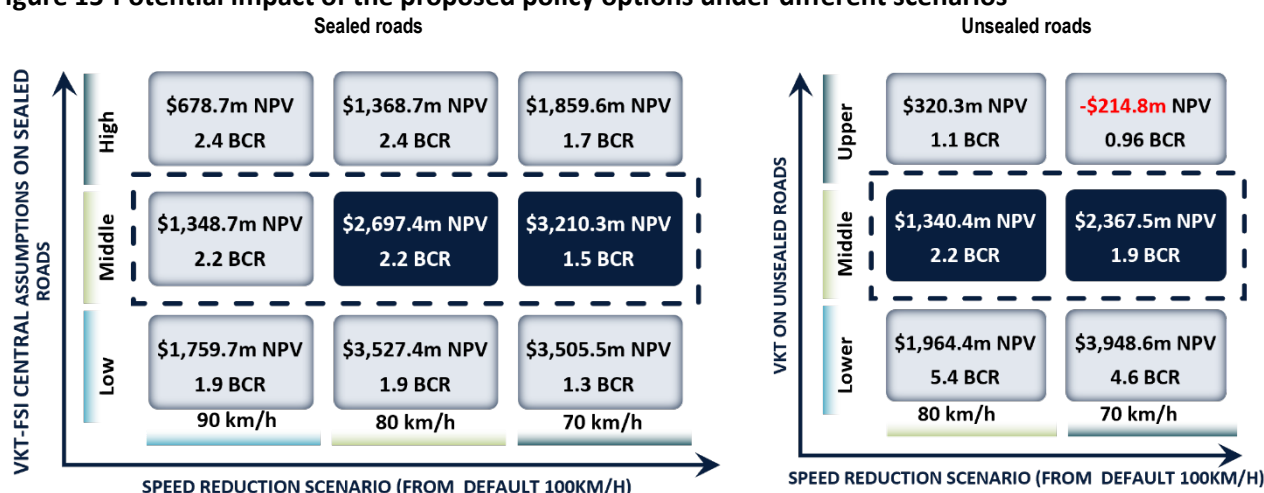
Notably, there are other considerations that are important when making a decision about the proposed speed limit reductions, including:

- Compliance and behavioural responses – evidence suggests that not all drivers comply fully with default speed limits or adjust their speed proportionally to speed limit changes. This reduces the certainty of achieving modelled outcomes, particularly under larger reductions (to address this, we have used relatively conservative assumptions on speed change).

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[131] The impacts of the full range of scenarios analysed are included in Chapter 5.

- Stakeholder views – larger reductions are likely to face stronger community resistance. A large reduction to 70 km/h has few precedents.
- Implementation risks – lower speed limits impose additional travel time costs and may generate equity concerns for regional and remote communities with fewer transport alternatives.
- Staged implementation – introducing an initial reduction to 80 km/h provides an opportunity to assess impacts and compliance before considering further reductions.
- The analysis above shows that there is a trade-off in considering a preferred option. Ultimately, decision-makers are best placed to weigh these factors, considering their potential impacts on different communities.

Following consultation, the Decision RIA will recommend a preferred option to amend the Australian Road Rules. State and territory governments may consider alternate options that will deliver net benefits, as well as other jurisdictional considerations, when amending their road rules.

The figures in this report are estimates based on the best information available at the time of the analysis, and assumptions have been used where data was not available. The purpose of this Consultation RIA is to seek stakeholder feedback on a number of important questions to inform a future review of default speed limits outside of built-up areas in the Australian Road Rules. Some of these questions seek to gain more information that could be used in the Decision RIA to improve the estimates provided above.

What is the best option from those considered?

A RIA must recommend a preferred option from among those presented and analysed. Typically, the decision rule to identify the preferred policy option is to select the option with the highest net benefit to society as a whole. However, there are some circumstances where an option, other than the one with the highest net benefit, could be recommended. The circumstances where a 'second best' option could be recommended include:

When the option would deliver significant benefits that cannot be monetised. The OIA's CBA guidance notes that 'if a proposal is advocated despite monetised benefits falling significantly short of monetised costs, the RIA should explain clearly why non-monetised benefits would tip the balance and the nature of the inherent uncertainties in the size of the benefits'[132].

When the option would provide higher resilience in the face of uncertainty. As noted by the OIA, an option can be recommended that has a lower expected value of net benefits, but with a smaller chance of imposing a significant net cost on the community (lower 'downside risks').[133]

Where the option with the highest net benefit disproportionately impacts a vulnerable sector of the community. Indeed, the OIA's CBA guidance indicates that decision makers 'may decide to reject an option with the largest NPV if it has significant adverse equity impacts.'[134]

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[132] Commonwealth of Australia, Department of the Prime Minister and Cabinet. (2020). *Cost-benefit analysis guidance note*, March, p. 12.
[133] Ibid., p. 9.
[134] Ibid., p. 13.

Appendix A—Stakeholder consultation overview

Table 47   Stakeholder groups

Stakeholder group	Invitees
Jurisdictional road authorities and local government	• ACT City and Environment Directorate • Transport for NSW • NT Department of Infrastructure, Planning and Logistics • QLD Department of Transport and Main Roads • SA Department for Infrastructure and Transport • Tas Department of State Growth • Vic Department of Transport and Planning • WA Road Safety Commission • Australian Local Government Association
Jurisdictional police authorities	• Victoria Police • New South Wales Police • Queensland Police • South Australia Police • Western Australia Police • Tasmania Police • Australian Capital Territory Police • Northern Territory Police • Australian Federal Police
Delivery and logistics businesses	• Australian Trucking Association • Australian Logistics Council • NatRoad Australia • National Road Freighters Association • Australian Livestock and Rural Transporters Association • Bus Industry Confederation
Road safety academics	• Queensland University of Technology CARRS-Q • University of NSW Transport and Road Safety (TARS) Research Centre • University of Adelaide Centre for Automotive Safety Research • Australasian College of Road Safety
Statutory insurers	• AAMI • Allianz • NRMA/IAG • QBE • Victorian Transport Accident Commission • Tasmanian Motor Accidents Insurance Board • Western Australian Insurance Commission of Western Australia

Stakeholder group	Invitees

Motorist groups	• Australian Automotive Association, and member bodies, including
	    • NRMA
	    • RACV
	    • RACQ
	    • RAA (SA)
	    • RAC (WA)
	    • RACT
	    • AANT
	
	• Australian Motorcycle Council