

Safer speeds on local streets: Evidence summary



Road Safety

Introduction

Each year, well over a thousand people are killed and more than 37,000 are seriously injured on Australia's roads.¹ Each one of these is a tragedy for the people involved and their families.

After reducing with Covid-19 restrictions, the number of deaths has steadily increased each year, with 1,300 people killed in 2024 compared to 1,186 in 2019.² The number of serious injuries is growing by 3.3% per annum.¹

Road crashes are estimated to cost the national economy \$30 billion every year.²

The National Road Safety Strategy aims to halve road fatalities and reduce serious injuries by at least 30% by 2030, on the way to Vision Zero by 2050.

The Safe System philosophy is based on four principles:

- People make mistakes that can lead to road crashes
- The human body has a limited physical ability to tolerate crash forces before harm occurs
- A shared responsibility exists amongst those who plan, design, build, manage and use roads and vehicles and those who provide post-crash care to prevent crashes resulting in serious injury or death
- All parts of the system must be strengthened to multiply their effects; so that if one part fails, road users are still protected.³

Speed limit reductions are one of the most cost-effective measures available to practitioners to reduce the consequences of a mistake, the risk of a crash and the risk of fatal or serious injury if a crash does occur. So, they are a key measure to reduce death and serious injury on the road system.

A lead indicator of the National Road Safety Strategy is the share of high pedestrian CBD/town centre areas with a speed limit of 40 km/h or less.

A speed limit of 40 km/h has now been applied to many areas of Melbourne, including suburban centres on major roads, and to a range of regional town centres including Wonthaggi and Shepparton.

Internationally, 30 km/h speed limits are now commonly applied to urban areas in Japan and Europe. For example, it is now the default urban limit in Spain and Wales. Speed limits of 30 km/h are now being used in a variety of cities around the rest of the World, from Bogotá, Colombia to Accra, Ghana and Ho Chi Minh City, Vietnam.⁴ Speed limits of 20 miles per hour (32 km/h) are increasingly common in the UK and have been applied in various locations in the United States.

Closer to home, 30 km/h speed limits have been broadly applied to New Zealand CBD areas in recent years, including the four largest cities. Australia has been slower to apply 30 km/h, but it has been trialled in multiple locations in Sydney and Perth. Victorian towns and suburbs with 30km/h zones include Mildura, Warrnambool and Fitzroy and Collingwood in Melbourne.

¹ Commonwealth of Australia (2021). *National Road Safety Strategy 2021-30*.

² Bureau of Infrastructure and Transport Research Economics (2024). *Road Deaths Australia*, December 2024

³ Shelton, D, Beer, K, Tan, T, Mani, A and Beer, T (2021). *Guide to Road Safety Part 1: Introduction & The Safe System*. Austroads, Sydney, July 2021.

⁴ WHO (2021). 'Streets for Life campaign calls for 30 km/h urban streets to ensure safe, healthy, green and liveable cities' <https://www.who.int/news/item/17-05-2021-streets-for-life-campaign-calls-for-30-km-h-urban-streets-to-ensure-safe-healthy-green-and-liveable-cities>, 17 May 2021, accessed 15 December 2024.



Why are 40 and 30 km/h zones so much safer?

Lower speeds:

1. Reduce the risk of a crash
2. Reduce the risk of death or injury when a crash does occur.^{5,6}

The key difference between a crash at different speeds is the energy or force someone is exposed to. A crash occurring at 60 km/h results in four times the energy transfer compared to a crash at 30 km/h, even though the speed is only two times as much.⁶

In complex urban environments with multiple road users, drivers “are more likely to reach the threshold of their information processing capabilities when traveling at higher speeds.” At safer speeds, “decisions can be made in a more timely manner.”⁷

In addition, drivers are more willing to give way to pedestrians⁷ on crossings at lower speeds.⁵

Stopping distance

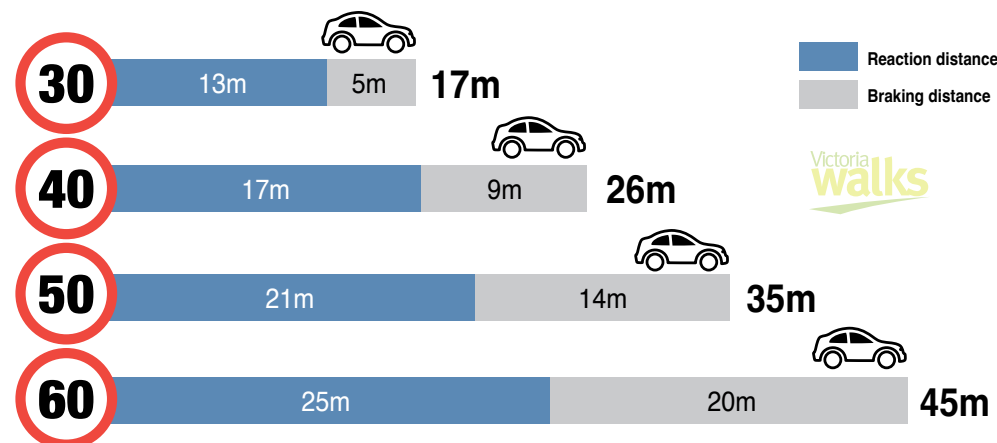
Stopping distance is made up of:

- Reaction distance – the distance travelled in approximately 1.5 seconds during which no braking is happening as the driver processes the need to stop
- Braking distance – the distance from when the driver starts braking to when the vehicle stops.

Similar to energy, braking distance is four times longer when speed is only two times higher.⁶ Travelling at a speed of 50 km/h, a vehicle will require about twice the stopping distance compared to travelling at 30 km/h – see Figure 1 at right. This assumes drivers recognise the critical situation and respond quickly.

STOPPING DISTANCE AT DIFFERENT SPEEDS

Minimum stopping distances, for dry roads. Braking distance will be longer on wet surfaces.



Source: <https://www.qld.gov.au/transport/safety/road-safety/driving-safely/stopping-distances>
Distances for 30 km/h calculated by Victoria Walks

Figure 1 – Distance required for a light vehicle to stop at different urban speeds



⁵ Global Road Safety Partnership (2023). *Speed management: a road safety manual for decision-makers and practitioners*, second edition. Global Road Safety Partnership, International Federation of Red Cross and Red Crescent Societies, Geneva.

⁶ Austroads (2024). *Guide to Road Safety Part 3: Safe Speed*.

⁷ Corben, B. (2022). 'Urban Road Design and Keeping Down Speed,' in K. E. Björnberg et al. (eds.), *The Vision Zero Handbook*, https://doi.org/10.1007/978-3-030-23176-7_35-1

Speed and the risk of fatality and serious injury

The factors outlined in the previous section have a cascading effect which means that the change in injury risk is much greater than the change in travel speed that causes it. This is outlined in the following diagram:

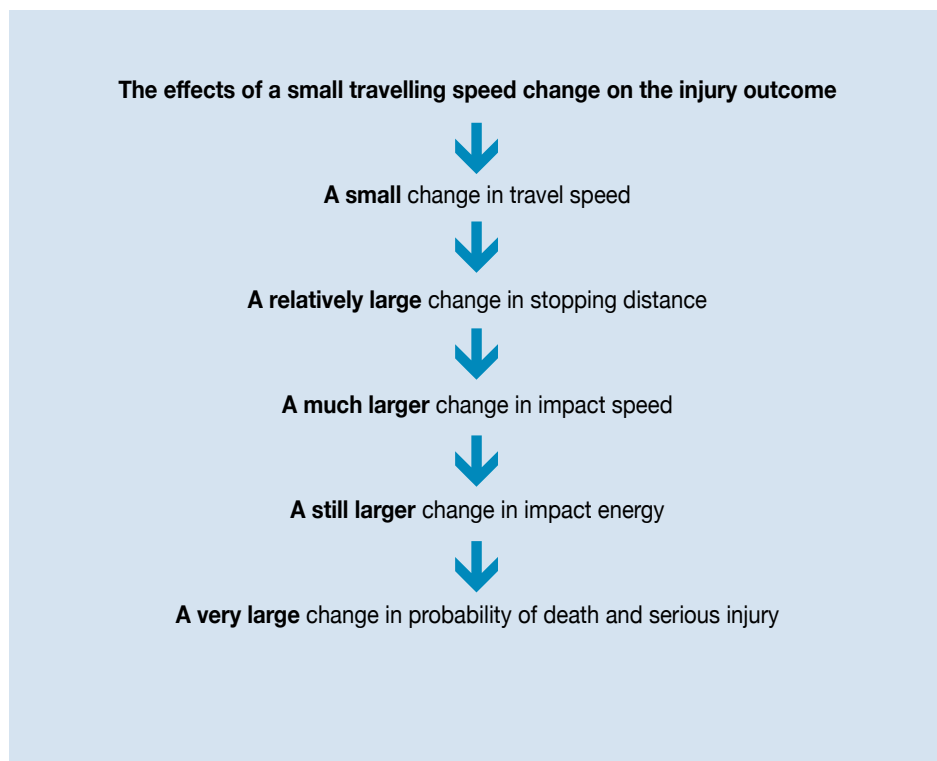


Figure 2 – Effect of a small travelling speed change on injury, from Austroads 2024.⁸

As a result of these cascading effects, it has been estimated that reducing urban speeds by 5 km/h would reduce fatal pedestrian crashes by 30%.⁹

Estimates vary on the risk of fatality in a crash at different speeds. However, it is generally agreed that the risk of death for a person hit while walking or riding increases exponentially above 30 km/h.

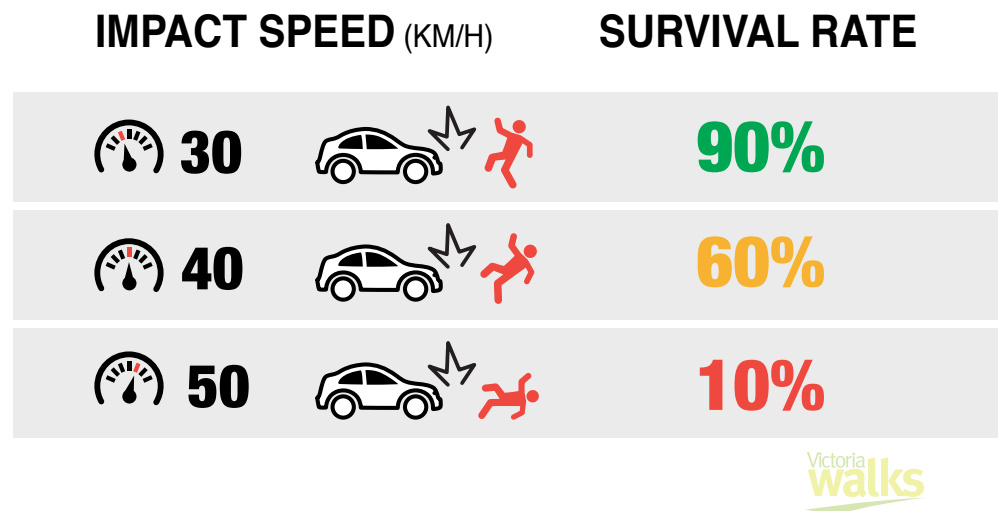


Figure 3 – Estimated pedestrian survival rate at different impact speeds^{10, 11}



⁸ Austroads (2024). *Guide to Road Safety Part 3: Safe Speed*, Figure 2.1

⁹ Leiter, J., Lewis, I., Kaye, S., Soole, D., Rakotonirainy, A. and Debnath, A. (2016). *Public Demand for Safer Speeds: Identification of Interventions for Trial*, Austroads, February 2016, citing McLean, Anderson, Farmer, Lee, & Brooks, 1994.

¹⁰ Transport for NSW (2024). 'Speeding' <https://www.transport.nsw.gov.au/roadsafety/topics-tips/speeding> accessed 13 December 2024

¹¹ Victoria Government Road Safety Partners (2023). Submission to Victorian Legislative Assembly Economy and Infrastructure Committee Inquiry into the impact of road safety behaviours on vulnerable road users.

Placing exact numbers on pedestrian survival rate is difficult, but necessary for concise and effective public communication. The survival rates in the graphic on the previous page are based on estimates of fatality risk commonly used by Australian agencies, including Transport for NSW¹⁰ and the Victorian Road Safety Partners.¹¹ However, some official sources use other estimates. The National Road Safety Strategy, for example, has lower estimates of fatality risk at all speeds. Importantly however, whatever numbers are used the relativities remain the same – 30 km/h is always significantly safer than 40 km/h, which is always significantly safer than 50 km/h.

The fatality risk at a certain impact speed is higher than the risk for the equivalent speed limit. The risk of fatality in a pedestrian crash in a 50 km/h zone, for example, is lower than the risk if the impact speed is 50 km/h. This is because drivers in urban areas often travel below the speed limit, especially when turning, and the driver will often brake before impact.

The graph below shows the relative proportions of injuries and deaths in different speed zones for people hit while walking or riding a bike. This illustrates that the relative risk of death or serious injury, compared to other injury, drops dramatically as urban speed limits decrease. Note the low proportion of fatal crashes in 40 km/h areas compared to higher speeds. Conversely, while 70 km/h speed zones are not very commonly applied and therefore have a small share of crashes, they have a higher share of fatalities than lesser injuries.

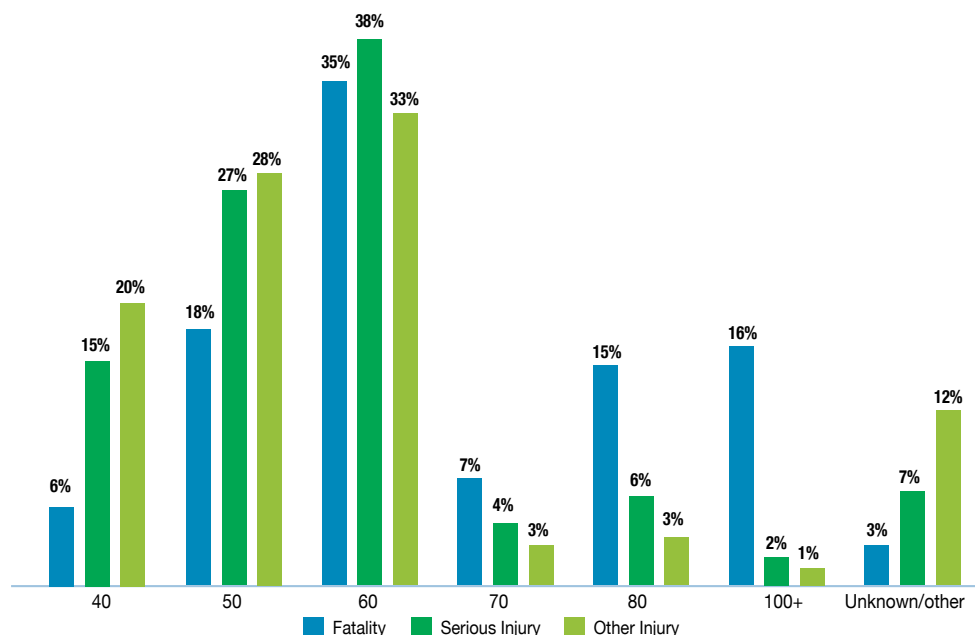


Figure 4 – Proportion of pedestrians and bike riders killed and injured by speed zone (2013-2022)¹²

Victoria's history demonstrates that safer speeds have been particularly critical in improving pedestrian safety. The graph below illustrates that the most significant reductions in pedestrian fatalities over the last four decades have come after the implementation and/or enforcement of safer speeds.

Reflecting all the factors above, many agencies note 30 km/h is the desirable speed limit when there is regular interaction between vehicles and vulnerable road users (anyone not in a motor vehicle). Examples include the Victorian Government Road Safety Partners,¹³ the Queensland Department of Transport and Main Roads,¹⁴ and the World Health Organisation.¹⁵

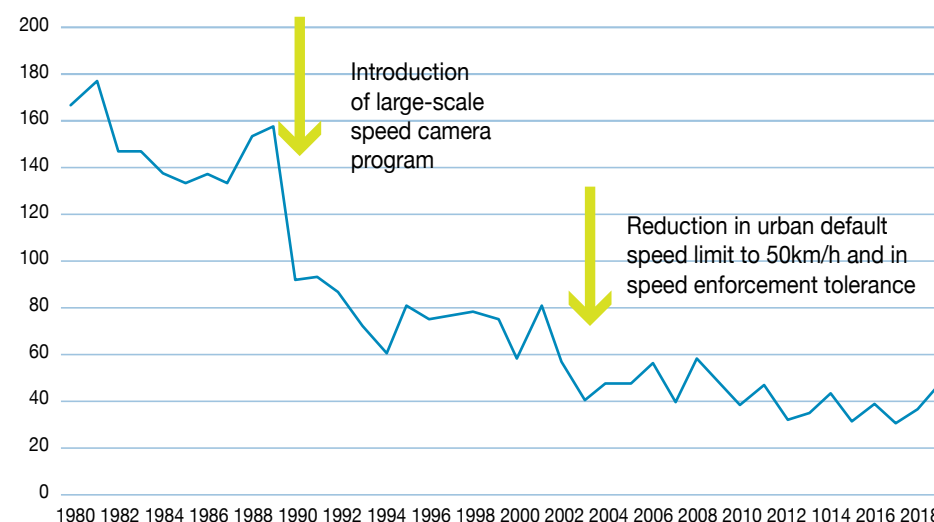


Figure 5 – Long term trends in annual pedestrian deaths in Victoria.¹⁶

¹² Victoria Walks analysis of TAC crash statistics, <https://www.tac.vic.gov.au/road-safety/statistics/online-crash-database>, February 2024.

¹³ Victoria Government Road Safety Partners (2023). Submission to Victorian Legislative Assembly Economy and Infrastructure Committee Inquiry into the impact of road safety behaviours on vulnerable road users.

¹⁴ TMR (2024). 'Speed management and integrated treatments,' <https://www.tmr.qld.gov.au/Travel-and-transport/Pedestrians-and-walking/Guidance-and-Resources/Pedestrian-and-Walking-Guidance-and-Resources/Speed-management-and-integrated-treatments>, accessed 13 December 2024.

¹⁵ WHO (2021). 'Campaign launched to make 30 km/h streets the norm for cities worldwide,' <https://www.who.int/news/item/22-03-2021-campaign-launched-to-make-30-km-h-streets-the-norm-for-cities-worldwide>, 22 March 2021, accessed 13 December 2024.

¹⁶ Corben, B. (2022). 'Urban Road Design and Keeping Down Speed,' in K. E. Björnberg et al. (eds.), *The Vision Zero Handbook*, https://doi.org/10.1007/978-3-030-23176-7_35-1

Studies of safer speed zones

40 km/h limits

In 2019, the speed limit in the Cairns CBD was reduced from 50 to 40 km/h. Comparing the two years before and after, road injuries reduced by 24% and there was a 36% reduction in walker and bike rider injuries.¹⁷

In 2012 and 2016 the City of Stonnington reduced the speed limit from 50km/h to 40km/h in parts of Toorak and Prahran in Melbourne. The total number of crashes reported by police reduced from 70 to 38 (when comparing the three-year periods before and after they were introduced) and the number of people injured fell 42%, from 137 to 79. The number of vulnerable road users (people walking, riding a bike or motorbike) who were injured fell from 46 to 22, although the number of serious injuries remained stable.¹⁸

30 km/h limits

A Canadian study found that reducing the speed limit from 40km/h to 30km/h on more than 300km of local roads in one area resulted in a 28% decrease in crashes with walkers and a 67% decrease in serious and fatal injuries.¹⁹

An analysis of 20 years of data from London found that introducing 32 km/h (20 mph) speed limits resulted in an estimated 42% drop in injury crashes with the effect on the numbers killed or seriously injured slightly greater than for injuries overall. The numbers of killed or seriously injured children were reduced by half. There was an estimated 32% decrease in pedestrian injuries.²⁰

A review of the impact of 30km/h speed limits in 40 cities across Europe found that the average reduction in crashes was 23%, the average reduction in injuries was 38% and for fatalities 37%.²¹

Results of the reduction of the speed limit from 40 to 30 km/h in an inner suburban area of the City of Yarra showed minimal reduction in the average speed of vehicles, which was already below 30 km/h. However, there was a significant reduction in higher end speeding – an 11% reduction in travelling above 40km/h and a 25% reduction above 50km/h. Further, there was a substantial reduction in serious injuries, from 16 in a four year period before the change, to just 6 in a four year period afterwards.²²

In New Zealand, the CBD of the regional city of New Plymouth has experienced a 45% reduction in crashes since the speed limit was reduced from 50 to 30 km/h in 2012.²³ In Christchurch, there was a 25% reduction in road crashes and a 37% reduction in injuries after a 30 km/h limit was introduced to the CBD in 2016.²⁴

Who is most affected?

Older walkers are particularly vulnerable to injury in a crash, mainly due to increased frailty.²⁵ The risk of serious injury to a 70 year old person hit at 30 km/h is comparable to a 20 year old hit at more than 60 km/h.²⁶

Although people aged 60 and older represent only 23% of the population, they made up 50% of pedestrian deaths and 34% of hospitalisations over the past decade in Victoria.²⁷

At the other end of the age spectrum, land transport accidents are the leading cause of death for children in Australia aged 1-14.²⁸

¹⁷ TMR (u.d.). *Case Study: Cairns CBD – 40 km/h speed limit change*, Queensland Department of Transport and Main Roads.

¹⁸ City of Stonnington (2024). 'Road Safety Improvement Program,' <https://connectstonnington.vic.gov.au/RSIP>, accessed 16 December 2024

¹⁹ Fridman, L., Ling, R., Rothman, L., et al. (2020). 'Effect of reducing the posted speed limit to 30 km per hour on pedestrian motor vehicle collisions in Toronto, Canada - a quasi experimental, pre-post study.' *BMC Public Health* 20, 56.

²⁰ Grundy, C. Steinbach, R., Edwards, P., Green, J., Armstrong, B. and Wilkinson, P. (2009). 'Effect of 20 mph traffic speed zones on road injuries in London, 1986-2006: controlled interrupted time series analysis,' *BMJ* 2009;339:b4469

²¹ Yannis, G. and Michalaraki, E. (2024). 'Review of City-Wide 30 km/h Speed Limit Benefits in Europe,' *Sustainability* 2024, 16, 4382. <https://doi.org/10.3390/su16114382>

²² Sobhani, A. (2024). 'Evaluating impact of 30 km/h speed limit trial,' *Proceedings of the 2024 Australasian Road Safety Conference*, Hobart, Tasmania

²³ Radio New Zealand (2023) 'New Plymouth officials propose lower speed limits after spike in crashes' <https://www.rnz.co.nz/news/national/498249/new-plymouth-officials-propose-lower-speed-limits-after-spike-in-crashes>, 18 September 2023, accessed 13 December 2024.

²⁴ Waka Kotahi (undated). 'Implementing safe and appropriate speed limits on central city streets, Safe System Case Study,' NZ Transport Agency

²⁵ Mantilla, J. and Burt, D. (2016). *Safer Road Design for Older Pedestrians*. Victoria Walks, Melbourne. Version 1.1. August 2016.

²⁶ Schubert, A., Babisch, S., Scanlon, J., Campoletano, E., Roessler, R., Unger, T. and McMurphy, T. (2023). 'Passenger and heavy vehicle collisions with pedestrians: Assessment of injury mechanisms and risk.' *Accident Analysis & Prevention*, Volume 190, September 2023.

²⁷ Victoria Walks analysis of TAC crash statistics, <https://www.tac.vic.gov.au/road-safety/statistics/online-crash-database>, February 2025.

²⁸ AIHW (Australian Institute of Health and Welfare) (2024). 'Deaths in Australia,' <https://www.aihw.gov.au/reports/life-expectancy-deaths/deaths-in-australia/contents/leading-causes-of-death> accessed 1 June 2024.

Other benefits

Encouraging walking and bike riding

International organisations including the UN have recognised the role that 30 km/h traffic speeds play in creating safer, more welcoming conditions for walking and cycling in the context of broader urban planning.²⁹

“ Evidence shows that 30 km/h streets where people mix with traffic not only save lives, but also promote walking, cycling and a move towards zero-carbon mobility. ”³⁰

In town centres, lower traffic speeds are a typical outcome of streetscape improvements (sometimes including speed limit reduction) that are also usually associated with higher pedestrian volumes and, where measured, economic activity.³¹ But research that is able to draw direct connections between speed and pedestrian activity is relatively rare.

A study from Basel, Switzerland, found a speed limit of 20 km/h on local roads resulted in residents being two to three times more likely to talk, play, observe and sit in the public space compared to streets with a speed limit of 50 km/h.³²

A study in San Francisco found that increased traffic speed of 10 mph was associated with reduction in the distance people were willing to walk of an average 60m.³³

A 32 km/h (20 mph) speed limit pilot scheme in South Central Edinburgh, UK, found that after speed limits were reduced from 30 mph, residents were strongly supportive and reported improved safety for children walking and playing, and improved walking and cycling conditions. There was a 7% increase in the number of trips walked, a 5% increase in the number of bicycle trips and a 3% reduction in car journeys in the year after the scheme was introduced.³⁴

Reduced emissions

Reduced travel speeds can help reduce harmful emissions and enhance traffic flow.³⁵ In an urban context where drivers often have to brake and accelerate, fuel consumption and emissions are generally much higher than driving at a consistent speed.³⁶ The optimum speed limit in built up areas to minimise CO₂ and NO_x emissions is 20 to 30 km/h for a small petrol car and less for larger vehicles.³⁷

A review of 30 km/h speed limits in Europe (generally reduced from 50 to 30 km/h) found that emissions reduced by an average of 18%.³⁸

Noise

The key factors that influence traffic noise are speed and volume. At speeds of up to 30 to 40 km/h, the vehicle engine is the dominant noise heard outside of the vehicle. Above that, the noise of the tyres on the road (rolling noise) is the main thing heard.³⁹

As petrol engines are replaced with electric engines the noise associated with vehicle engines will fall, so vehicle speed will become proportionally more significant as a cause of traffic noise.

The review of 30 km/h speed limits in Europe found that noise pollution was reduced by an average 2.5dB.³⁸

Economics

Reducing crashes has economic benefits, including reduced medical costs and vehicle related costs. For example, a leading insurance company in Wales found that vehicle claims dropped by 20% after the introduction of the urban default 20 mph limit.⁴⁰ The review of 30km/h speed limits in Europe found fuel use reduced by an average 7%.³⁸

The reduced injuries associated with reduction of the speed limit from 50 to 40 km/h in the Cairns CBD were estimated to save the community \$1.68 million in the following two years.⁴¹

It has been estimated that implementation of 30 km/h to local streets across Australia would save costs of \$3.5 billion per annum.⁴²

²⁹ Ignatova, A. (2024). *My Neighbourhood, UN-Habitat*, October 2024.

³⁰ WHO (2021). 'Streets for Life campaign calls for 30 km/h urban streets to ensure safe, healthy, green and liveable cities' <https://www.who.int/news/item/17-05-2021-streets-for-life-campaign-calls-for-30-km-h-urban-streets-to-ensure-safe-healthy-green-and-liveable-cities>, 17 May 2021, accessed 15 December 2024.

³¹ Hopkinson, L., Hiblin, B., Wedderburn, M., Chatterjee, K., Cairns, S. and Frearson, M. (2024) *The Pedestrian Pound* (3rd edition). Report by Transport for Quality of Life and partners for Living Streets, November 2024.

³² Kelly, J (2012). *Social Cities*, Grattan Institute, March 2012.

³³ Basu, R. and Sevtsuk, A. (2022). 'How do street attributes affect willingness-to-walk? City-wide pedestrian route choice analysis using big data from Boston and San Francisco,' *Transportation Research Part A*, Volume 163, pp 1–19, as reported in Hopkinson et al (2024).

³⁴ RSPA (2023). *Road safety factsheet: 20mph zones and speed limits*, The Royal Society for the Prevention of Accidents, Birmingham, UK, September 2023.

³⁵ Austroads (2024). *Guide to Road Safety Part 3: Safe Speed*.

³⁶ Department of Infrastructure, Transport, Regional Development, Communications and the Arts (2024). 'Fuel consumption label,' Green Vehicle Guide, <https://www.greenvehicleguide.gov.au/pages/ToolsAndCalculators/FuelConsumptionLabel>, accessed 16 December 2024.

³⁷ Future Transport London (2023). 'Urban Traffic Research,' <https://futuretransport.info/urban-traffic-research/>, accessed 16 December 2024.

³⁸ Yannis, G. and Michalaraki, E. (2024). 'Review of City-Wide 30 km/h Speed Limit Benefits in Europe,' *Sustainability* 2024, 16, 4382. <https://doi.org/10.3390/su16114382>

³⁹ Joint Transport Research Centre (2004). *Speed Management, Summary Document*, Joint OECD/ECMT (European Conference of Ministers of transport) Transport Research Centre.

⁴⁰ Butler, S. (2024). 'Vehicle damage claims in Wales fall 20% since speed limit cut to 20mph, says insurer.' The Guardian, 10 June 2024.

⁴¹ TMR (undated). *Case Study: Cairns CBD – 40 km/h speed limit change*, Queensland Department of Transport and Main Roads.

⁴² Van den Dool, D; Tranter, P and Boss, A (2017). 'Safe-Street Neighbourhoods: the role of lower speed limits,' *Journal of the Australian College of Road Safety* – Volume 28 No. 3, 2017

Community support

Surveys have found people generally understand that lower speeds are safer and broadly support them when described in the context of creating safer streets and better neighbourhoods:

- The survey undertaken for this project asked a representative sample of Victorians whether 'local streets shared by people walking, bike riding and driving' should be 50, 40 or 30 km/h. 46% of respondents chose 40km/h, 12% 30km/h, and 42% 50km/h at the start of the survey. At the end, after respondents had seen the pedestrian survival graphic shown on page 3 of this report, plus a range of values-based statements in support of safer speeds, support for 30km/h had risen to 28%, 40km/h remained at 46% and support for 50km/h had dropped to just 26%.⁴³
- A 2021 survey of a representative sample of Victorians found 53% agreed or strongly agreed that the government should introduce 30 km/h speed limits around schools; whilst 50% supported 30 km/h 'in busy shopping areas' and 39% 'in quiet residential streets'.⁴⁴
- A 2020 survey of Australians found that 64% of people support "reducing speed limits in neighbourhood streets to help create safer streets for people." In Victoria, the support was even higher at 66%.⁴⁵
- A 2017 survey by the federal government found 88% of people were supportive of 40 km/h speed zones in areas with high pedestrian activity, with 65% strongly agreeing they should be in place.⁴⁶

While support for safer speed limits is high when targeted to suitable locations, there may be majority opposition if applied in a non-targeted way. In one Victorian survey respondents were asked whether they would support 'changing the default speed limit on residential roads from 50 km/h to 40 km/h.' Results were 27% support, 55% oppose and 19% neutral.⁴⁷ We note that safer speeds may have enjoyed higher support on 'residential streets' as opposed to 'residential roads.'

Support for safer speed limits tends to increase after people experience it.⁴⁸ The 30 km/h trial across Fitzroy and Collingwood (City of Yarra) in inner Melbourne found community support from those living or working in the affected area increased from 47% beforehand to 68% in 2023.⁴⁹

⁴³ Glenn, E., Burt, D., Oulton, G., Rossiter, B. (2025). *Safer Speeds Survey Findings*, Victoria Walks, Melbourne, March 2025.

⁴⁴ Bartley, H. (2021). *Walking Survey 2021 (Panel Survey Report)* prepared for Victoria Walks by Bartley Consulting (unpublished).

⁴⁵ Heart Foundation (2020). *What Australia Wants: Living locally in walkable neighbourhoods*

⁴⁶ Van Souwe, J., Gates, P and Bishop, B (2018). *Community Attitudes to Road Safety – 2017 Survey Report*. Wallis Social Research, for Commonwealth Department of Infrastructure, Regional Development and Cities, June 2018

⁴⁷ Wallis Social Research (2023). *Road Safety Monitor 2022*, Transport Accident Commission, August 2023.

⁴⁸ McLaughlin, M., Beck, B., Bown, J. and Sharkey, M. (2021). 'Busted: 5 myths about 30km/h speed limits in Australia,' *The Conversation*, 20 May 2021 <https://theconversation.com/busted-5-myths-about-30km-h-speed-limits-in-australia-160547> accessed 15 December 2024.

⁴⁹ Millican, D (2023). 'Pre-trial study for 30 km/hr speed limit trial,' City of Yarra Council Meeting Agenda, 14 November 2023.



This report is part of the *Safer Speeds Communication Toolkit* prepared by Dr Eleanor Glenn, from Common Cause Australia, Duane Burr (Project Manager) and Dr Ben Rossiter of Victoria Walks, and Geoff Oulton from the Municipal Association of Victoria, March 2025.

Victoria Walks Inc is a walking health promotion charity. Our vision is healthier, connected communities through more people walking more every day.

© Victoria Walks Inc. Registration No. A0052693U

Level 8, 225 Bourke Street, Melbourne VIC 3000

P: +61 3 9662 3975

E: info@victoriawalks.org.au

www.victoriawalks.org.au

ISBN: 978-0-6453693-5-9

This publication is copyright. No part may be reproduced by any process except in accordance with the provisions of the Copyright Act 1968.

Recommended citation:

Burt, D; Eady, J; Glenn, E; Rossiter, B; Oulton, G; *Safer speeds on local streets: Evidence summary*, Victoria Walks, Melbourne, March 2025.

