

EVIDENCE-BASED INTERVENTION TALKING POINTS

LOWER SPEED LIMITS



What we mean by it¹

Lowering legally-allowed maximum speed limits using speed limit signage to provide safe mobility for all road users. Lower speed limits are most effective when supported with traffic calming measures and/or enforcement to increase compliance with the legal limit.

Where we need it

Roads where deaths or serious injuries occur among any road users from road crashes, regardless of the road function;
and/or

Roads of poor safety quality;
and/or

Areas where pedestrians need to cross or walk along the road, where vehicles enter and drive through a built-up area or where people walk and/or bike. In practice, this would include residential areas, villages, markets, retirement villages, school zones, healthcare, and hospital precincts, around places of worship, university hubs, public transport hubs and major train station zones, city centers, central business districts (CBD), and possible conflict points.

Key asks

- Prioritize lowering speed limits;
- Extensively lower speed limits: to 30 km/h in areas where people walk, bike, live and play; to 50 km/h where side impact crashes are possible; and to 70 km/h where head-on crashes are possible;
- Implement traffic calming measures and/or enforcement to promote compliance with the legal limit;
- Ensure speed zoning guidelines or regulations enable a broader introduction of lower speed limits.²

¹ Our definition is based on the following sources:

Turner, B., Job, S., & Mitra, S. (2021). *Guide for Road Safety Interventions: Evidence of What Works and What Does Not Work*. World Bank, Washington, DC., USA.

Wijers, P.J. (2021). *Speed reduction methods to promote road safety and to save lives*. *Making Cities Safer*.

² In many countries, guidelines direct where and how to apply the speed limit. Speed zoning guidelines may exist in addition to relevant speed limit laws or may exist without speed limit law.

Why we need it

Linkage to key global road safety documents

The extensive linkage between lower speed limits and the recommendations set out in existing key global road safety documents give more weight as to why this intervention ought to be implemented. Governments are able to demonstrate that they are putting recommended best practice into real practice when they implement lower speed limits.

Implementing lower speed limits achieves, supports, and/or promotes the implementation of:

- 16 recommended actions in the Global Plan;
- 3 of the Global Road Safety Performance Targets;
- 14 statements in the Stockholm Declaration;
- 8 recommendations of the Academic Expert Group of the 3rd Ministerial Conference on Global Road Safety;
- 13 interventions across 3 components in the Save LIVES package;
- 10 commitments in A/RES/76/294, the Political Declaration of the High-Level Meeting on Improving Global Road Safety.

To reduce deaths and injuries

Lower speed limits help countries achieve the Global Plan target

The Global Plan for the Decade of Action for Road Safety 2021–2030 (Global Plan)³ sets a target to reduce road traffic deaths and injuries by 50% by 2030. Achieving this target requires implementation of evidence-based interventions that are known to reduce road traffic deaths and injuries. Lower speed limits are one such evidence-based intervention.

Lower speed limits reduce the probability and severity of a crash

There is a strong relationship between speed and crash risk—the higher the speed, the greater the probability and severity of a crash. Therefore, the lower the speed, the greater lifesaving and injury reduction benefits. For example, a 10% decrease in mean speed leads to a 40% decrease in fatal crashes.⁴

In principle, a 1% reduction in average speed results in an approximate 2% decrease in injury crash frequency, a 3% decrease in severe crash frequency, and a 4% decrease in fatal crash frequency.⁵

Increased travel speeds lead to an exponential increase in crash related deaths and injuries (Figure 1): 75% of people will not survive a crash if hit by a car traveling at 50 mph (approximately 80 km/h). That reduces to 25% when the impact speed is 32 mph (approximately 51 km/h) and continues to decline as the speed of impact decreases.⁶

³World Health Organization. (2021). *Global Plan for the Decade of Action for Road Safety 2021-2030*.

⁴Elvik, R. (2009). *The Power Model of the relationship between speed and road safety*. The Institute of Transport Economics.

⁵International Transport forum. (2018). *Speed and Crash Risk*. International Traffic Safety Data and Analysis Group Research Report.

⁶National Association of City Transportation Officials. (2018). *Speed Kills*. In, *City Limits: Setting Safe Speed Limits on Urban Roads*.

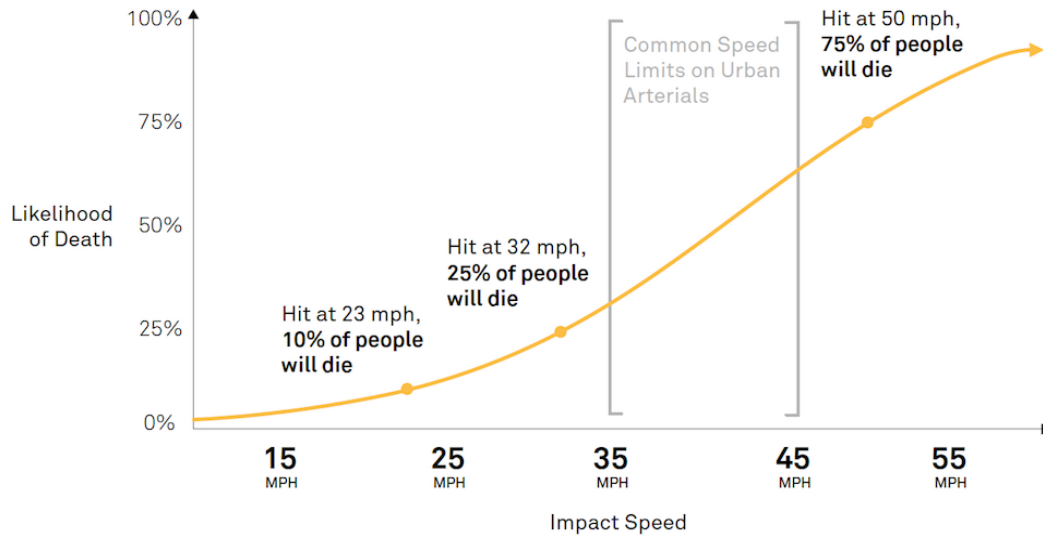


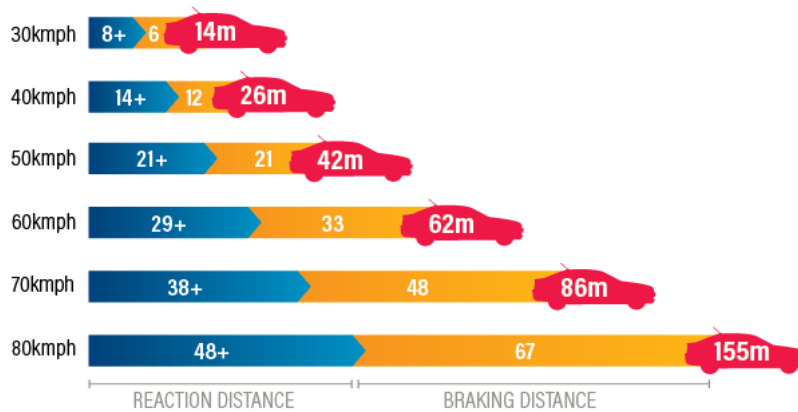
Figure 1: The likelihood of fatality increases exponentially with vehicle speed

Source: National Association of City Transportation Officials (NACTO)⁷

Lower speed limits allow road users to make less errors

A driver traveling at a higher speed will require a longer reaction and braking distance, increasing the probability of hitting a pedestrian, cyclist, or another vehicle. A car traveling at 30 km/h takes approximately 14 meters to come to a full stop but at 80 km/h, it takes a much longer distance at 155 meters (Figure 2).

Higher Vehicle Speeds Require Longer Stopping Times



Note: Above distances are typical distances. The total stopping distance also depends on the thinking distance, road surface, weather conditions and age/condition of the vehicle.

Figure 2: Relation between vehicle speeds and total stopping distance

Source: World Resources Institute (WRI)⁸ reproduced under Creative Commons Attribution 4.0 International License

⁷ National Association of City Transportation Officials. (2018). Speed Kills. In, City Limits: Setting Safe Speed Limits on Urban Roads.

⁸ Sharpin, A.B., Banerjee, S.R., Adriaola-Steil, C., & Welle, B. (2017). The Need for (Safe) Speed: 4 Surprising Ways Slower Driving Creates Better Cities. World Resources Institute.

Higher travel speeds also affect a driver's peripheral awareness due to a narrower field of vision. This impedes their ability to quickly predict or detect potential conflicts on the road.⁹ Lower travel speeds give more time and space for drivers and other road users to react and make decisions when errors occur.

Lower speed limits reduce vehicle travel speeds

Even small reductions in speed limits can result in safety gains. A 10% reduction in average speed in a city achieved through lower speed limits can result in 19% fewer injury crashes, 27% fewer death and serious injury crashes, and 34% fewer fatal crashes.¹⁰ On the other hand, a 5 mph (approximately 8 km/h) increase in maximum speed limit can result in an 8% increase in fatality rate on interstates and freeways, and a 3% increase in fatalities on other roads.¹¹

When existing 30 mph signs spaced one mile apart were replaced with 25 mph signs spaced a quarter of a mile apart on a 1.3 mile stretch of road in Seattle, USA, it led to reductions in 85th and 50th percentile speeds, as well as all crashes and resultant injuries and fatalities.¹²

Lowering speed limits protect vehicle occupants, in addition to pedestrians, cyclists and motorcyclists¹³

A crash test¹⁴ showed that at an impact speed of 40 mph (approximately 64 km/h), there was minimal damage into the space around the driver, but at 50mph (approximately 80 km/h), there was noticeable damage to the driver-side door opening, dashboard, and foot area. At 56 mph (approximately 90 km/h), the interior of the vehicle was significantly compromised, with the crash test dummy showing severe neck injuries and damage to its limbs.

Lowering speed limits is relatively easy to demonstrate effectiveness

Vehicle speed data can be collected inexpensively over days or weeks with minimal effort through simple, robust, and readily available technology. This allows for a relatively quick demonstration of the benefits of lowering speed limits and other speed-reduction interventions. Because it is a relatively low-cost, rapidly implementable intervention that can be readily demonstrated for effectiveness, lowering speed limits can be a particularly attractive way to reduce road deaths and injuries.¹⁵

Lower speed limits are even more effective when supported with traffic calming measures and/or enforcement

Speed camera enforcement is associated with a 57% decrease in vehicles exceeding the speed limit, resulting in as much as a 19% reduction in vehicle crashes and a corresponding 21% reduction in severity and fatality.¹⁶ Automated enforcement such as speed cameras can be advantageous because conventional manual enforcement (for example, radar used by traffic police) has not been able to meet up with the global increase in traffic volume and vehicle mileage.¹⁷ Cameras can also spot additional illegal behaviors such as disobeying traffic lights, distracted driving from mobile phone

⁹ Global Road Safety Facility. (2023). Speed Management Hub - Frequently Asked Questions, Note 8.2.

¹⁰ Transportation Alternatives New York. Too Fast, Too Furious: New York City's Speeding Epidemic and the Case for Local Control of Speed Limits.

¹¹ Farmer, C.M. (2019). The effects of higher speed limits on traffic fatalities in the United States, 1993–2017. Insurance Institute for Highway Safety.

¹² Seattle Department of Transportation. (2022). Speed Limits.

¹³ Sharpin, A.B., Adriazola-Steil, C., Job, S., et al. (2021). Low-Speed Zone Guide. World Resources Institute and The Global Road Safety Facility.

¹⁴ Insurance Institute for Highway Safety. (2021). New crash tests show modest speed increases can have deadly consequences.

¹⁵ Job, S. & Sakashita, C. (2016). Management of speed: The low-cost, rapidly implementable effective road safety action to deliver the 2020 road safety targets. *Journal of Road Safety*, 27(2), 65–70.

¹⁶ Steinbach, R., Perkins, C., Edwards, P., Beecher, D., Roberts, I. (2016). Speed Cameras to Reduce Speeding Traffic and Road Traffic Injuries. What Works: Crime Reduction Systematic Review Series. [No 8]. Cochrane Injuries Group, London School of Hygiene & Tropical Medicine.

¹⁷ Decina, L.E., Thomas, L., Srinivasan, R. (2007). Automated enforcement: A compendium of worldwide evaluations of results. Office of Research and Technology, National Highway Traffic Safety Administration, Washington DC, 20590, Issue DOT HS 810 763

use, and incorrect lane use.¹⁸ Speed cameras also help enforcement in difficult areas such as congested and dangerous areas and reduce the real or perceived issues of bias that comes with traditional face-to-face enforcement.¹⁹

In Bogotá, Colombia, driver compliance with the speed limit increased from an average of 29% to 86% when 30 km/h speed limit signs were complemented with traffic calming measures.²⁰

To implement a Safe System approach

Lowering speed limits demonstrates the adoption of the Safe System approach. The Safe System approach is a human-centric approach which dictates the design, use, and operation of our road transport system to protect the human road users.²¹

A Safe System approach means any road safety intervention ought to ensure that the impact speed remains below the threshold likely to result in death or serious injury in the event of a crash. Depending on the level of protection that the road users have and the type of crash, this threshold will vary. Typically, the impact speed must remain below 30 km/h for a pedestrian hit by a vehicle, below 50 km/h for a properly restrained motor vehicle occupant in a side impact crash, and below 70 km/h for a properly restrained motor vehicle occupant in a head-on crash.²² Lowering speed limits protects all road users.

History shows that countries that have adopted the Safe System approach implement evidence-based interventions, such as lower speed limits, and tend to have the lowest rate of fatality per population and the fastest rate of reduction in fatality numbers.²³

For economic benefits

Lower speed limits reduce costs for government, individuals, and businesses

Lowering speed limits saves lives and reduces the severity of crash injuries, thereby reducing economic costs and positively contributing to a country's economic growth. The economic costs related to injury and loss of life from traffic crashes include money needed to treat injuries, loss of hours worked, vehicle repair costs, insurance or third-party costs, and costs caused by increased congestion when a crash occurs.

Lower speed limits can contribute to increasing GDP

A [World Bank study](#) highlighted that halving road crash deaths and injuries could generate additional flows of income, with increases in GDP per capita over 24 years as large as 7.1% in Tanzania, 7.2% in the Philippines, 14% in India, 15% in China, and 22.2% in Thailand.²⁴

Lower speed limits are cost-effective

Reducing speed limits has been shown to be one of the most cost-effective speed management interventions achieving a benefit cost ratio of 14.29 (Figure 3). i.e., every US\$1 spent on lowering speed limits reaps a US\$14.29 benefit.

¹⁸ Job, S., Cliff, D., Fleiter, J.J., Flieger, M., & Harman, B. (2020). Guide for Determining Readiness for Speed Cameras and Other Automated Enforcement. Global Road Safety Facility and the Global Road Safety Partnership, Geneva, Switzerland.

¹⁹ Morain, S.R., Gielen, A.C., & Bhalla, K. (2016). Automated speed enforcement systems to reduce traffic-related injuries: closing the policy implementation gap. *Injury Prevention*;22:79-83.

²⁰ P99 & 100, Sharpin, A.B., Adriaola-Steil, C., Luke, N., Job, S., Obelheiro, M., Bhatt, A., Liu, D., Imamoglu, T., Welle, B., & Lleras, N. (2021). LOW-SPEED ZONE GUIDE. Bloomberg Philanthropies.

²¹ World Road Association. (2019). The Safe System Approach - Road Safety Manual: A Manual for Practitioners and Decision Makers on Implementing Safe System Infrastructure.

²² International Transport Forum. (2008). Towards Zero: Ambitious Road Safety Targets and the Safe System Approach, OECD Publishing, Paris.

²³ Welle, B., Sharpin, A.B., Adriaola-Steil, C., Job, S., Shotten, M., Bose, D., Bhatt, A., Alveano, S., Obelheiro, M., & Imamoglu, C.T. (2018). Sustainable & Safe: A Vision and Guidance for Zero Road Deaths. World Resources Institute.

²⁴ World Bank. (2017). The High Toll of Traffic Injuries: Unacceptable and Preventable. World Bank.

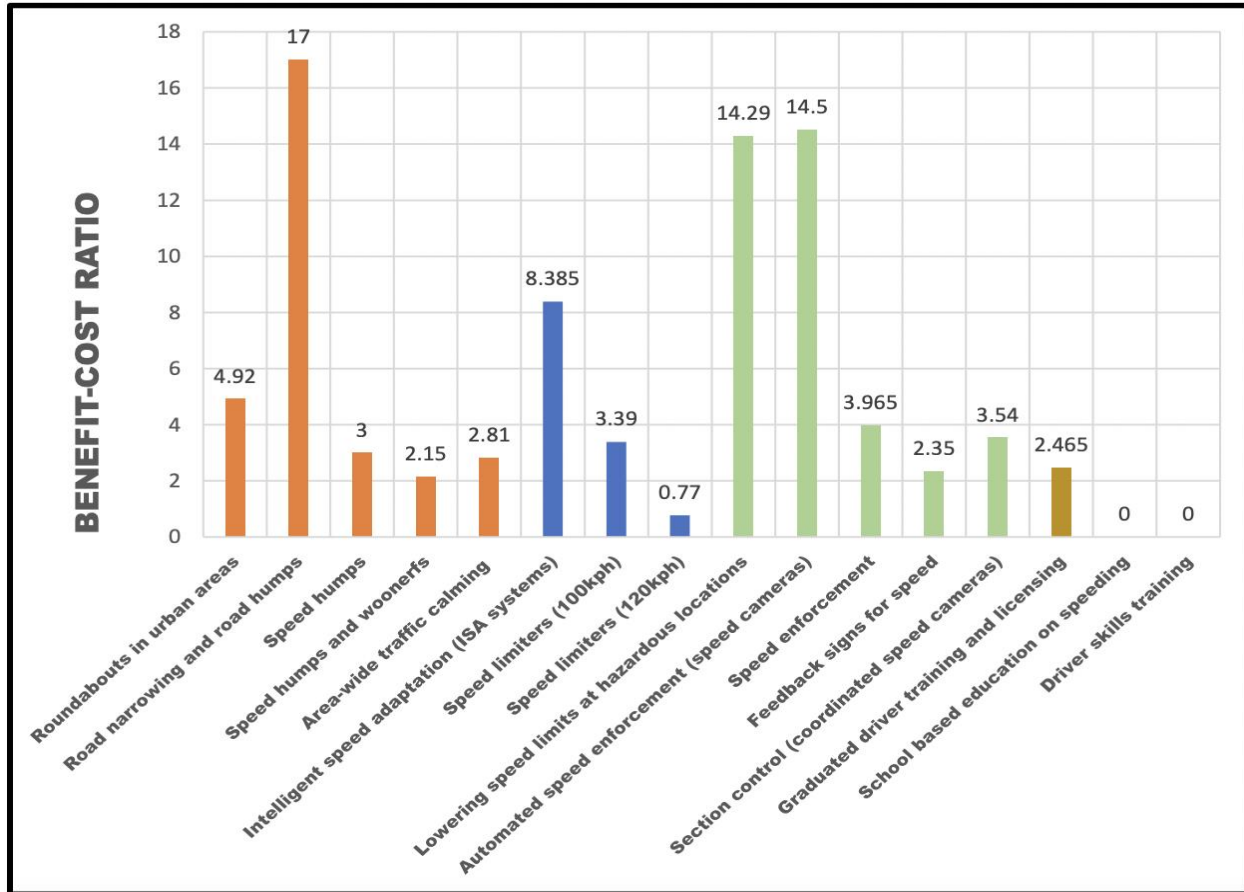


Figure 3 - Benefit Cost Ratios of various speed management interventions Source: World Bank²⁵

For co-benefits

Lower speed limits can reduce emissions

Small reductions in speed can reduce greenhouse emissions and significantly enhance fuel efficiency. Reducing motorway speed limits from 120 to 110 km/h have been shown to contribute to 12–18% in fuel savings.²⁶

Lower speed limits reduce carbon dioxide and nitrous oxide emissions from diesel cars, and particulate matter emission from both diesel and petrol cars, thus reducing air pollution.²⁷

Lower speed limits can reduce traffic congestion

Lower speed limits can improve traffic flow and reduce congestion. Reductions in speed limits as vehicles reach congested conditions result in a smoother flow of traffic and less stop/start traffic movement.²⁸ At lower speed limits, the following distance between vehicles can be shorter (as cars need less distance to stop than at higher travel speeds),

²⁵ Job, R.F.S. & Mbugua, L.W. (2020). Road Crash Trauma, Climate Change, Pollution and the Total Costs of Speed: Six graphs that tell the story. GRSF Note 2020.1. Washington DC: Global Road Safety Facility, World Bank.

²⁶ European Environment Agency. (2020). Do lower speed limits on motorways reduce fuel consumption and pollutant emissions? European Environment Agency.

²⁷ Williams, D. & North, R. (2013). An evaluation of the estimated impacts on vehicle emissions of a 20mph speed restriction in central London. Transport and Environmental Analysis Group, Centre for Transport Studies, Imperial College London.

²⁸ Job, R.F.S. & Mbugua, L.W. (2020). Road Crash Trauma, Climate Change, Pollution and the Total Costs of Speed: Six graphs that tell the story. GRSF Note 2020.1. Washington DC: Global Road Safety Facility, World Bank.

and there is improved merging of vehicles from the side streets. This allows the road to accommodate a larger number of vehicles traveling at a constant speed, thereby reducing congestion, and improving travel times.²⁹ The crash reduction benefits of lower speed limits also improve congestion by reducing the temporary disruptions in traffic caused by traffic crashes.³⁰

Lowering the speed limit on major arterials in the city of Sao Paulo in Brazil reduced congestion by 10% during the first month of implementation.³¹

Lower speed limits help countries to create a sustainable and equitable transportation system

Lower speeds increase opportunities for work and friendship and reduce health inequalities through improved accessibility for road users with restricted mobility, vision, hearing, or mental health, as well as pedestrians, cyclists, children, elderly, youth, and commuters.³²

Successful implementations

Bogotá, Colombia: 46 lives were saved from lowering speed limits from 60 km/h to 50 km/h

In Bogotá, a speed management program targeted five corridors with the highest casualty rates in 2018. The speed limit was lowered from 60 km/h to 50 km/h and speed cameras were set up to enforce compliance. As a result of this program, 46 lives were saved in 2019—a 21% drop in road deaths compared to the average for the three years prior (2015–2018). The interventions were therefore extended to 10 arterial corridors in 2019.³³

Fortaleza, Brazil: 68.1% reduction in fatal crashes from lowering speed limits from 60 km/h to 50 km/h

In Fortaleza, Brazil, a speed limit was lowered from 60 km/h to 50 km/h on 16 arterial roads. When before and after crash records on these roads were compared with those on comparable roads, where the speed limit remained at 60 km/h, statistical analysis indicated that the lowering of the speed limits contributed to an average reduction of 68.1% for crashes involving deaths, 29.7% for crashes involving pedestrians, 18.9% for crashes involving injured victims by 18.9%, and 16% for all crashes.³⁴

France: 209 lives were saved from lowering speed limits from 90 km/h to 80 km/h

France lowered the speed limit from 90 km/h to 80 km/h on two-way roads without a central median in July 2018. It resulted in a reduction of average speed by -3.4 km/h for all vehicles and 13% fewer fatalities compared to the rest of the French road network. 1,942 people were killed in crashes between July 2018 and June 2019, 209 less than the average number (2,151) between 2013 and 2017.³⁵

New South Wales, Australia: 45% reduction in deaths from lowering speed limits from 60 km/h to 50 km/h

In New South Wales, the urban speed limit was reduced from 60 km/h to 50 km/h in 1998. The new speed limits were marked with repeater signs and pavement markings and backed by publicity campaigns. Evaluation after 21 months of the program found a 22% reduction in all casualties and 45% reduction in fatalities.³⁶

²⁹ Global Road Safety Facility. (2023). Speed Management Hub - Frequently Asked Questions, Note 8.2.

³⁰ Global Road Safety Facility. (2023). Speed Management Hub - Frequently Asked Questions, Note 8.2.

³¹ Estado. (2015). Number of accidents drops 30% after new limits on Marginal roads

³² The European Federation for Transport and Environment (2001). Lower urban speed limits Better for citizens, better for the environment, better for all.

British Academy. (2014). "If you could do one thing..." Nine local actions to reduce health inequalities. The British Academy.

³³ P. 14, ITF. (2021). Road Safety in Cities: Street Design and Traffic Management Solutions. International Transport Forum Policy Papers, 99, OECD Publishing, Paris.

³⁴ Núcleo de Gestão da Informação (NGI). (2022). Análise Da Adequação Dos Limites De Velocidades Nas Vias De Fortaleza-Ce.

³⁵ Millot, M. & Violette, E. (2020). Lowering the speed limit to 80 km/h Assessment - 18-month items. Cerema Transport Infrastructures, January.

³⁶ P. 12-18, Narelle, H., Ungers, B., Vulcan, P., & Bruce, C. (2001). Evaluation of a 50 km/h Default Urban Speed Limit for Australia. Melbourne, Monash University Accident Research Centre, November.

Hungary: 18% reduction in deaths from lowering speed limits from 60 km/h to 50 km/h

In 1993, in Hungary, the speed limit in urban areas was reduced from 60 km/h to 50 km/h. This policy was imposed on 32% of the state roads. Road deaths were reduced by 18% while average speeds dropped by 8%. The lower speed limit was successful partly due to the intense publicity campaign and police enforcement.³⁷

Oslo, Norway: 28% reduction in deaths from lowering speed limits from 80 km/h to 60 km/h

In Oslo, lower speed limits were introduced on three major metropolitan highways in 2004 for environmental reasons. In the years between 2004 and 2007 in the winter months of November and March, the speed limits were lowered from 80 to 60 km/h. Mean speeds on these roads dropped by 7.5% from 76 km/h to 71 km/h and road deaths dropped by 28%.³⁸

Sweden: 41% reduction in deaths from lowering speed limits from 90 km/h to 80 km/h

In Sweden, the speed limit was reduced on many rural roads from 90 km/h to 80 km/h but increased on some high-standard motorways from 110 km/h to 120 km/h. The goal was to meet the needs of the environment and mobility while also adapting the speed limits to the safety classification of each road. On rural roads where the speed limit was lowered from 90 to 80 km/h, the mean speed decreased by 3.1 km/h, and the number of fatalities fell by 41%. On motorways where the speed limit was raised, the mean speed increased by 3.4 km/h, and the number of serious injuries increased by 15 per year.³⁹

How to implement it

The following guidance documents can support governments in the design and implementation of traffic calming measures:

- *Low-Speed Zone Guide* developed by the Global Road Safety Facility (World Bank) and the World Resources Institute;⁴⁰
- *Global Street Design Guide* developed by the Global Designing Cities Initiative;⁴¹
- *City Limits* developed by the National Association of City Transportation Officials;⁴²
- *Road Safety Toolkit* developed by the International Road Assessment Programme (iRAP);⁴³
- *Guide for Determining Readiness for Speed Cameras and Other Automated Enforcement* developed by the Global Road Safety Facility and the Global Road Safety Partnership.⁴⁴

³⁷ P. 29-31, OECD/International Transport Forum. (2018). *Speed and crash risk*. ITF (International Transport Forum), 82p.

³⁸ P. 43-44, OECD/International Transport Forum. (2018). *Speed and crash risk*. ITF (International Transport Forum), 82p.

³⁹ P. 45-48, OECD/International Transport Forum. (2018). *Speed and crash risk*. ITF (International Transport Forum), 82p.

⁴⁰ Sharpin, A.B., Adriazola-Steil, C., Job, S., et al. (2021). *Low-Speed Zone Guide*. World Resources Institute and The Global Road Safety Facility

⁴¹ Global Designing Cities Initiative. (2016). *Global Street Design*. Island Press; 2nd None ed. edition

⁴² National Association of City Transportation Officials. (2018). *City Limits: Setting Safe Speed Limits on Urban Roads*

⁴³ International Road Assessment Programme, iRAP. (2022). *The Road Safety Toolkit*.

⁴⁴ Job, S., Cliff, D., Fleiter, J.J., Flieger, M., & Harman, B. (2020). *Guide for Determining Readiness for Speed Cameras and Other Automated Enforcement*. Global Road Safety Facility and the Global Road Safety Partnership, Geneva, Switzerland