



Road Safety



Policy advice paper

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Road Safety: Policy advice paper

The report can be downloaded at engineersaustralia.org.au

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Introduction

Road crashes have a significant impact on Australian society, causing immense pain and suffering to individuals and families, as well as imposing substantial economic costs on the country. This cost is significantly more than the cost of road congestion, yet road safety receives much less funding.

Despite federal, state and territory governments adopting Road Safety Strategies and Road Safety Action Plans over the years, including 'Safe System' and 'Vision Zero' approaches from other countries, Australia continues to record deaths and serious injuries on its roads at approximately double the rate of best practice countries, regardless of the measures used.

The paper is intended to give guidance to policy makers and for the information of transport professionals to improve road safety. The guidance provided is at a high level because the specific actions by many different participants¹ are far too numerous to describe. The paper does not represent a formal policy position of Engineers Australia but will act as a catalyst for renewed dialogue with a wide range of authorities to reform road safety, address the stagnation currently being experienced in road safety, and achieve better sustainable outcomes faster, for the long term.

The paper highlights six essential priorities:

1. Efficient and effective implementation.
2. Measuring outcomes and setting targets.
3. Responsibility and accountability.
4. Capability and culture.
5. Managing crash forces.
6. Future focus.

This paper has been prepared by a working group of the Transport Australia Society (TAs). It represents a consensus of the views of the working group and has been peer reviewed by a panel of national and international experts.

About Engineers Australia

As Australia's national body for engineering, we are the voice and champion of our 120,000-plus members. We provide them with the resources, connections, and growth they need to do ethical, competent and high-value work in our communities.

A mission-based, not-for-profit professional association, Engineers Australia is constituted by Royal Charter to advance the science and practice of engineering for the benefit of the community. We back today's problem-solvers, so they can shape a better tomorrow.

Transport Australia society is a technical society for transport professionals in Australia. It focusses on key transport decisions affecting the wellbeing, productivity and sustainability of our cities and regions.

¹ Participants means any individual, agency or organisation that can contribute to improving road safety. Participants include but go beyond stakeholders or governments to include the general public, road users, companies, suppliers, supporting organisations, researchers and more. This also recognises that different participants have varying degrees of authority, responsibility and ability to achieve outcomes.

See: Australasian College of Road Safety, Policy Paper (2023), *A new systems thinking approach to road safety*.
<https://acrs.org.au/wp-content/uploads/A-new-systems-thinking-approach-to-road-safety-FINAL.pdf>

Purpose of this paper

There is no shortage of expert opinion and advice on how Australia can significantly reduce the number of people that are killed or seriously injured on our roads each year. This perspective is included in road safety strategies and action plans that have been adopted by federal, state and territory governments. Unfortunately, the objectives of these strategies have never been fully met, meaning further improvements are needed. This paper identifies a clearer direction for implementation of the various federal, state and territory road safety strategies consistent with Engineers Australia's [Future of Transport discussion paper](#).

Effective implementation of road safety strategies is essential to achieve meaningful reductions in road crashes and fatalities. While adopting thorough and robust strategies and initiatives is valuable, it is ultimately their successful implementation that will make a difference on Australia's roads. Implementation to date has clearly been ineffective with insufficient accountability with respect to applying the necessary resources and/or directives to meet the stated targets and is therefore a significant failure of the road safety system in Australia².

Road safety occurs in the greater context of communities, economic activity, the environment and transport system as a whole³. Engineers have recognised future needs and challenges that affect what we are trying to achieve⁴. In this context, this paper proposes solutions to overcome barriers and challenges to successful implementation of Road Safety Strategies including issues such as funding, political will, and a lack of awareness (or buy in) from key participants. Specific areas where road safety resources and efforts need to be prioritised are identified, to ensure that these efforts occur and are maintained. The scope of the paper is limited to road safety rather than other broader transport or societal issues with a primary focus on issues relevant to engineering. While road safety has substantial economic impacts, it is the human cost of lives, injuries, grief and disruption that sets it apart.

This paper seeks to engage participants in a dialogue around road safety, encouraging them to share their views and experiences on what has worked well and what hasn't, and how to overcome challenges to successful implementation. Overall, the purpose of this road safety paper is to achieve a shift in mindset from simply adopting new Strategies to prioritising effective implementation through collaboration and action to achieve a significant reduction in deaths and serious injuries on Australian roads.

Background

One of the greatest costs of transport is road deaths and injuries. Any road trauma, either injury or death, is unacceptable. Therefore, it is vitally important to reduce the personal cost to the community and financial costs to the economy that road trauma causes.

Tragically, 1,266 people died on Australian roads in 2023⁵ and 39,505 people were hospitalised due to road traffic crashes in 2021⁶. In addition to the human toll and effects on the community, road crashes also impose an economic burden in terms of medical expenses, lost productivity, and property damage.

² Woolley, J., Crozier, J., McIntosh, L., & McInerney, R. (2018). *Inquiry into the National Road Safety Strategy 2011–2020*. www.roadsafety.gov.au/nrss/inquiry

³ Engineers Australia (2021). *Urban Transport Systems A Transport Australia Society, Discussion Paper*. www.engineersaustralia.org.au/sites/default/files/2022-01/Urban-Transport-Systems-TAS-Discussion-Paper-December-2021-revised.pdf

⁴ Engineers Australia (2023). *The Future of Transport, Discussion Paper*. www.engineersaustralia.org.au/sites/default/files/2023-01/future-transport-discussion-paper-jan-2023.pdf

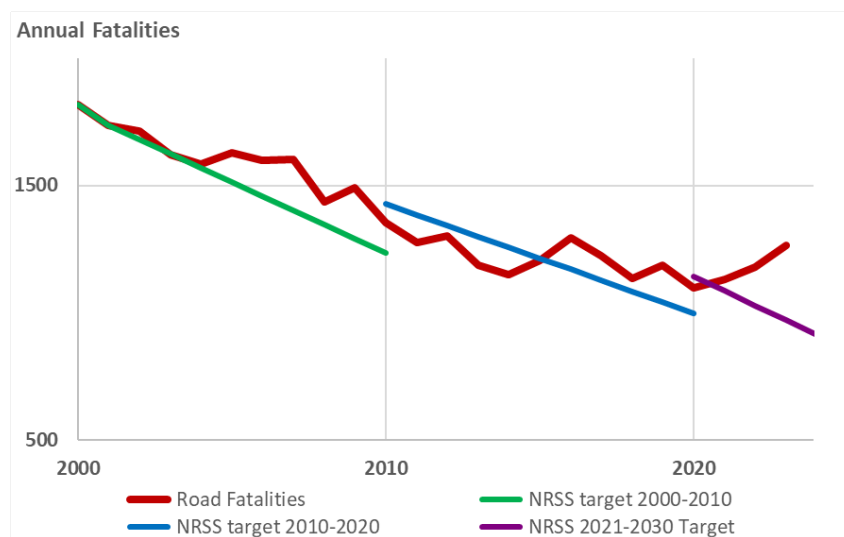
⁵ Bureau of Infrastructure and Transport Research Economics (BITRE) (2023). *Road Deaths in Australia*. BITRE, Canberra. www.bitre.gov.au/sites/default/files/documents/rda_dec2023.pdf

⁶ DITRDCA (2021). *Hospitalised injuries from Road Crashes*. www.officeofroadsafety.gov.au/data-hub/serious-injuries-data

Furthermore, the number of injuries are increasing and Figure 1 illustrates that, tragically, road safety is not improving. This is a reversal of the long term improvement trend experienced previously.

Every week around 24 people die⁷ and about 766 are seriously injured⁸ on Australian roads. Between 2012 and 2018 the number of hospitalised injuries increased by 16 per cent⁹. The economic cost of road crashes is estimated to be more than \$27 billion each year¹⁰, which is significantly more than the estimated cost of road congestion¹¹, yet road safety receives much less funding, priority and accountability¹². In 2010, 1,353 people died on Australian roads compared to the Australian *National Road Safety Strategy* (NRSS)¹³ target of 1,233, as Figure 1 shows. By 2020 there were 1,097 deaths compared to the NRSS target of 998 and more than 1,500 lives could have been saved if the strategies had achieved the targets.

Figure 1 – Road Deaths in Australia and National Road Safety Strategy (NRSS) targets¹⁴



From the 1970s to the 1990s Australia was a leader in reducing road crash casualties,¹⁵ however progress has plateaued over the last decade and our safety performance is now behind many developed countries. Table 1 shows that our fatal crash rate is twice that of best practice countries.

⁷ BITRE (2023), *Road Trauma Australia*

2022 statistical summary. BITRE, Canberra.

⁸ Office of Road Safety (2023). *National road safety data hub*. www.officeofroadsafety.gov.au/data-hub

⁹ BITRE (2022), *Road trauma*

Australia 2021: Statistical summary, BITRE, Canberra ACT.

¹⁰ Steinhäuser, R., et al. (2022) *Social cost of road crashes*. BITRE, Canberra.

¹¹ BITRE (2015). *Traffic and congestion cost trends for Australian capital cities*. Information Sheet 74. BITRE, Canberra.

¹² As can be seen from national and State budget figures.

¹³ DITRDCA (2021). *National Road Safety Strategy 2021-30*. www.roadsafety.gov.au/nrss

¹⁴ BITRE (2023). *Road Trauma Australia—Annual Summaries*. BITRE, Canberra.

www.bitre.gov.au/publications/ongoing/road_deaths_australia_annual_summaries

and National Road Safety Strategies indicated.

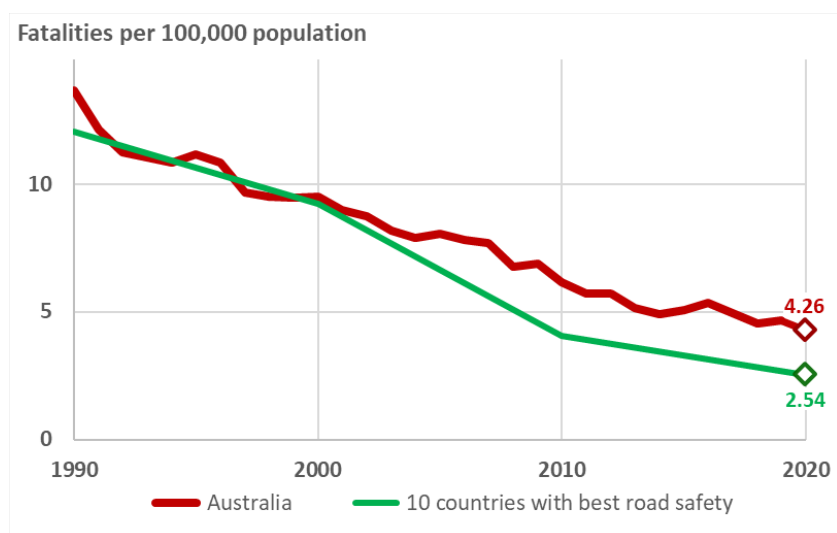
¹⁵ McDermott FT. *Prevention of road accidents in Australia*. *Pediatrician*. 1983-1985;12(1):41-5.

Table 1 – Comparison between Australia and leading countries.¹⁶

Comparative measure (2020)	rate	rank
Fatalities per 100,000 population (36 countries)		
Norway	1.73	1
Sweden	1.98	2
Iceland	2.20	3
Australia	4.26	20
Fatalities per 10,000 registered vehicles (36 countries)		
Norway	0.23	1
Iceland	0.23	2
Sweden	0.32	3
Australia	0.55	18
Fatalities per 100 million vehicle kilometres travelled (VKT) (15 countries)		
Iceland	0.21	1
Norway	0.21	2
Sweden	0.26	3
Australia	0.44	9

The limited improvement in Australia compared with other leading countries is illustrated in Figure 2. Australia has not kept pace with leading countries and has regressed to being ‘average’. Between 2010 and 2020 Australia’s fatality rate declined by 31 per cent, while the OECD median rate declined by 35 per cent and the ten leading countries declined by 37 per cent.¹⁶ If Australia achieves its 2021-2030 NRSS target at a rate similar to other leading countries, then around 3,300 lives will be saved and many more will not be injured.¹⁷

Figure 1 – International comparison of changes in countries road safety



¹⁶ BITRE (2023). *International Road Safety Comparisons-Annual*.

www.bitre.gov.au/publications/ongoing/international_road_safety_comparisons#:~:text=In%20terms%20of%20the%20fatality,d eclined%20by%205.4%20per%20cent.

¹⁷ Inconsistencies with data reporting regarding road injuries make it difficult to estimate this number. According to the Office of Road Safety, in 2021 there were 39,505 Hospitalised Injuries in Australia resulting from road crashes, which is 35 times the fatality rate). www.officeofroadsafety.gov.au/data-hub/serious-injuries-data.

Unfortunately, these general indicators hide specific issues. Road safety has been improving in urban areas but deteriorating in regional and remote areas, for rigid trucks, for vulnerable road users and for other specific situations. The NRSS has identified nine priorities and eight enabling actions to focus attention on. Some of these have not been clearly identified in previous road safety strategies including indigenous people and workplace road safety. Focussing attention, resources and responsibility on specific topics is essential to achieve improvements. However, all efforts also need to be interconnected and integrated to optimise outcomes collaboratively. System safety cannot be achieved by individual participants acting independently or implementing countermeasures individually in isolation.

Much of Australia's road safety management is very similar to other leading countries, but there is always more to learn and apply. There are also similarities and differences between states, territories and countries which should be carefully considered. For instance, legislation varies considerably. In Sweden, Vision Zero was legislated, and included a "duty of care" requirement which increased its impact. Among the 175 participating countries in a survey, Australia was one of only 32 countries where the NRSS was not specifically funded¹⁸.

In the past, the engineering approach to road safety included three primary activities: engineer the road; educate the driver; and enforce the road rules.¹⁹ Since the mid-2000s, Australian authorities have implemented 'Safe System' road safety strategies. This approach is based on the principles that people make mistakes, that road safety is a shared responsibility amongst many participants, the human body has a limited physical ability to tolerate crash forces before harm occurs, and that the road system should be safe and forgiving. This means all parts of the system need to be strengthened.²⁰

While Safe System has different forms it often focuses on establishing a system of safe speeds, safe roads, safe vehicles, safe people and post-crash care.²¹ Since the mid-2000s, a substantial reduction in deaths has been achieved, but serious injuries have increased rather than reduced and the targets have not been met overall. Application of contemporary system safety management in other hazardous industries to design the road system to take account of drivers' normal human characteristics provides an opportunity to improve road safety management further.

There are many skilled road safety professionals in Australia with experience in critical areas. Nevertheless, road safety capability, knowledge and practice needs to be continually improved. Implementation of the Safe System approach has been mixed. It is more difficult for local councils, transport operators, general businesses and vehicles to implement than state government agencies. Efforts are often incomplete partly due to inadequate understanding and capability.

Contrary to Safe System principles, blaming drivers and victims remains commonplace in driver education and safety campaigns. This is reinforced by comments urging motorists to take more care on the roads whenever a senior official or politician is interviewed after a fatal crash. We never tell pilots to take more care after a fatal airplane crash; we investigate thoroughly and take action to eliminate or reduce the probability of the event recurring.

Road safety data focuses on the overall numbers of deaths and injuries and less on specific issues causing crashes. Condition factors linked to crashes for roads are identified in programs such as Australian Road Assessment Program (AusRAP)²² star ratings. For vehicles, the Australasian New Car Assessment Program (ANCAP)²³ crashworthiness testing program has been a major success for consumers when purchasing vehicles, significantly increasing awareness of vehicle safety.

¹⁸ World Health Organization (2018). *Global status report on road safety 2018*. WHO, Geneva.

¹⁹ Transport Australia Society (2019). *Road Safety Discussion Paper*. Engineers Australia. www.engineersaustralia.org.au/sites/default/files/2022-06/road-safety-discussion-paper.pdf

²⁰ Austroads (2016). *Safe System Assessment Framework*. Research Report AP-R509-16. <https://austrroads.com.au/publications/road-safety/ap-r509-16>

²¹ Austroads (2021). *Guide to Road Safety Part 1: Introduction and The Safe System*. Report AGRS01-21. <https://austrroads.com.au/publications/road-safety/agrs01>

²² Austroads. *Australian Road Assessment Program (AusRAP)*. <https://austrroads.com.au/safety-and-design/road-safety/ausrap>

²³ Australasian New Car Assessment Program (ANCAP). www.ancap.com.au

Opportunities

Efficient and effective implementation

Prioritising road safety and implementing Road Safety Strategies at all levels of government and across all participants presents significant opportunities to improve road safety outcomes. All participants must contribute to the best of their capability, have clear responsibilities with specific objectives and be held accountable for achieving set targets.

Road safety should not be a separate activity, but must be embedded throughout all stages from transport policy and planning all the way through to infrastructure design, delivery, operations and maintenance. It should not be seen as the responsibility of governments or corporations or individuals in isolation. Rather, road safety is the shared responsibility of multiple participants who must work together to ensure safe, efficient and equitable transport. All system participants share a duty of care for road safety in every state under health and safety legislation.

Unfortunately, this is often not the case in practice. Agencies often operate in isolation while companies and the public pay insufficient attention to safety for themselves or their employees. This is at least partly because not all the participants are clear about their roles and responsibilities.

Governments must establish dedicated and independent road safety agencies or departments responsible for developing and implementing comprehensive strategies, coordinating efforts across different sectors, and monitoring progress without unwarranted external influence. These agencies can collaborate with law enforcement agencies, transport departments, and industry associations to ensure a comprehensive, coordinated and holistic approach. At the industry level, companies and organisations must play a greater and leading role in improving their road safety and influencing communities. Multi-agency stakeholder and expert groups can improve strategies and programs, while also increasing efficiency of delivery.

To achieve this, it will be necessary to change the function of existing road safety agencies from what is primarily seen as a promotion and communications function to an expert panel responsible for ensuring that all government agencies prepare and submit Road Safety Action Plans with appropriate, achievable, and measurable targets that will result in a coordinated approach to significantly reduce the number of people killed and seriously injured on Australian roads every year. New strategies can be developed and applied to leverage collaboration and provide tools that help guide integrated delivery of multifaceted programs.

Measuring outcomes and setting targets

Measuring outcomes by establishing key performance indicators (KPIs) that describe objectives quantitatively is essential for monitoring and evaluating road safety efforts to ensure progress and accountability.

KPIs and targets need to be relevant and specific²⁴ and can include the number of fatalities and serious injuries, adherence to safe system speeds, and the implementation of safety infrastructure. In addition, by setting specific targets relevant to individual focus areas, and regularly tracking progress against these indicators, governments and industries can identify areas for improvement and allocate resources accordingly.

Shared goals and KPIs help integrate and coordinate programs across agencies working on various aspects of community issues. For example, countering drink driving requires multiple agencies to coordinate their activities even though some of them are outside the transport portfolios²⁵. This

²⁴ SMART measures are an example of suitable indicators and targets (specific, measurable, assignable, realistic and time-related), e.g. Doran, G. T. (1981). *There's a S.M.A.R.T. way to write management's goals and objectives*. Management Review. 70 (11): 35–36

²⁵ Salmon, Paul M., et al. *Bad behaviour or societal failure? Perceptions of the factors contributing to drivers' engagement in the fatal five driving behaviours*. Applied ergonomics 74 (2019): 162-171.

approach ensures that road safety remains a priority and that responsible parties can be held accountable for their actions and achievements. Road safety agencies must independently monitor, review and report on progress towards targets for individual focus areas and participants responsible for outcomes.

Responsibility and accountability

Defining clear organisation and position descriptions, roles, and responsibilities for relevant participants is essential for successful oversight and implementation of road safety strategies.

Governments have the greatest responsibility to ensure the safety of people travelling on our roads. Sweden accepted this responsibility by enshrining its Vision Zero principles and the moral target of zero deaths and serious injuries into legislation²⁶. Recently, Australian Workplace Health and Safety (WHS) reforms have strengthened duty of care provisions and included industrial manslaughter as a crime. Road safety would benefit from similar clear directions and legal powers.²⁷

Individual agencies need to have clear responsibilities for specific and measurable outcomes and ensure that strategies and programs are efficiently and effectively implemented in a timely manner. In its simplest form, accountability describes who is responsible for achieving what in a particular timeframe. Therefore, responsibilities need to be relevant and specific to individuals' and organisations' activities that contribute to road safety outcomes. Government law enforcement agencies, transport departments, and road agencies must collaborate with industry, vehicle manufacturers, interest groups and others to ensure a coordinated and holistic approach.

Accountability can be assisted with reporting and independent reviews by regulators, Auditors General and Parliaments. Assessments like AusRAP should be published and readily available.

At the industry level, companies and organisations have a responsibility to implement road safety programs within their operations, train employees on safe driving, adopt technologies that enhance vehicle safety and manage outcomes. Vehicle manufacturers have a responsibility to provide safe vehicles while ANCAP ratings and government oversight can provide accountability to consumers and the community.

Clear position descriptions and well-defined roles and responsibilities ensure that everyone involved understands their specific obligations, leading to improved accountability and more effective road safety outcomes. Performance measures and targets need to be clearly described in position descriptions with well-defined roles and responsibilities to ensure that everyone involved understands their specific obligations. This will lead to improved accountability and more effective road safety outcomes. Doing so will require new techniques and practices for any agencies and others involved.

Capability and culture

All participants who can contribute to improving road safety need appropriate levels of capability and a positive attitude to safety. The general public, companies and many other participants have a poor understanding of road safety and do not act as safely as they could. Participants beyond road users also require education because the system will fail if we rely on road users alone to adopt safe attitudes, be capable and follow rules. To make their best contribution, all participants need to have good skills, knowledge, experience and resources as well as a safe attitude.

People and companies need clearer reasons to act, and government must ensure they have strong incentives for doing so (i.e. both 'carrots' and 'sticks'). There is little activity to inform and educate drivers. Simply telling them to "Drive Safely" or something similar is common but ineffective. The typical

²⁶ Swedish Parliament. (1997). *Swedish Parliament Protocol 1997/98:13. Decision on Vision Zero for road traffic safety.*

²⁷ Allens, Australia (2023). *Industrial manslaughter laws around Australia.* www.allens.com.au/insights-news/insights/2022/01/Industrial-manslaughter-laws-around-Australia/

seasonal road safety campaigns are targeted at drivers to drive better when most already think that they aren't bad drivers. Most drivers think that they drive well and in cars that are safe enough, yet easily report poor driving by others on a regular basis.²⁸ Most authorities involved in road safety have good plans, yet they are often poorly appreciated across the whole organisation and are not well implemented. Many companies and authorities (such as local government and private industry) do not have sufficient resources or skills to manage road safety as well as they could.

More effective education and training can be provided to the general public and individual road users. These may explain new road rules, encourage safer driving like planning trips and encouraging vehicle maintenance, etc. More education and training can be provided to companies, such as through the National Road Safety Partnership Program (NRSPP)²⁹ and Construction Logistics and Community Safety Australia (CLOCS-A)³⁰. Other government agencies have a significant role to play in educating and influencing behaviour and regulating safe workplaces.³¹

General community and business attitudes towards road safety are relatively lax compared to other modes of transport such as maritime, railways or aviation. These and other 'safety-critical industries' engage with all participants to improve how work is done, or the 'safety culture' in a workplace. Consequently, in conjunction with other efforts, safety in these industries is much higher than on our roads. Developing a culture of safety requires an understanding of the issues and impacts to motivate better behaviour. Public health has been a leader in this regard, where community attitudes to smoking, alcohol and other damaging behaviours have dramatically changed. Improving the safety culture of everyone involved in road transport and beyond provides a significant opportunity not currently being applied³².

In both government and private sectors of the transport industry, individuals and agencies need to have the appropriate levels of skill, knowledge, experience and resources to apply when prioritising safety. Engineers Australia and its Transport Australia society can play an important role in promoting the importance of road safety to the community, relevant agencies and transport professionals, and in identifying good road safety practice. Transport professionals have conceived, designed, implemented and led the development of many improvements to road infrastructure and vehicles. Notable are the many blackspot projects, improved road and vehicle standards, and improved processes such as road safety audits and safe system assessments. Nevertheless, there can be a perception that road safety is managed by road safety specialists and is not considered part of mainstream road infrastructure management.

Therefore, the Transport Australia society should examine the engineering profession's role in road safety. This includes to acknowledge historical approaches without blame, and to identify good road safety practice for transport professionals to take up their shared system responsibility. We should also acknowledge the good work in the past that has led to reduced road trauma. Past activity such as blackspot programs should be examined in the context of funding and system design to ensure that future programs are based on holistic perspectives regarding context and alternative countermeasures.

Managing crash forces

The high transfer of kinetic energy in road crashes is the path by which deaths and serious injuries result on roads. The first approach to minimising crash forces is the elimination of crashes, when possible, which can be achieved with crash avoidance technology, improved driver capability and so on. However, road safety

²⁸ Mikoski, P. et al. (2019). *Drivers' assessments of the risks of distraction, poor visibility at night, and safety-related behaviors of themselves and other drivers*. Transportation research part F, 62, 416-434.

²⁹ National Road Safety Partnership Program website (NRSPP, 2023). www.nrspp.org.au

³⁰ Construction Logistics and Community Safety – Australia website (2023) <https://clocs-a.org.au/>

³¹ WorkSafe Victoria (2023). *Driving: Everything about driving in one place*. www.worksafe.vic.gov.au/work-related-driving.

³² e.g. Wiegmann, D.A., von Thaden, T.L. & Gibbons, A.M. (2007). *A review of safety culture and its potential application to traffic safety*. Washington, DC: AAA Foundation for Traffic Safety. www.aaaafoundation.org/wp-content/uploads/2018/02/ImprovingTrafficSafetyCultureinUSFS.pdf

activities have failed to manage crash forces adequately when high impact force crashes occur, so greater effort needs to be applied to reduce crash frequency and severity.

One of the key principles in the safe system approach to road safety is to recognise that crashes are inevitable, but crashes with high energy transfer cause serious harm. The aim is to reduce the instance of high energy transfer, either by eliminating the crash likelihood, or reducing the energy transfer.

Energy transfer is dependent on several factors including speed, mass, crash angles, protection systems and avoidance. It therefore needs to be controlled through policies on holistic and comprehensive speed management³³, road and intersection design and assessment, mandatory minimum star rating for cars and crash avoidance technology on all vehicles. Roads need to be managed to ensure safety for all road users. Vulnerable road users need to be protected with appropriate facilities and controls.

Implementation to manage crash forces would include:

1. All government agencies with a role in managing roads and behaviour on the roads should identify appropriate and effective methods for reducing impact forces and set targets that can be measured and that they will be held accountable for³⁴. Road authorities should change road management priorities from increasing capacity to reducing speeds where there is a likelihood of crashes with vulnerable road users. Examples of these would be to redirect funding from additional lanes on roads to managing speed by installing raised crossings and roundabout intersections.
2. All road users need high levels of protection when crashes occur. All government agencies with a role in vehicle standards, importation and roadworthiness need to improve vehicle safety. Measures should include minimum star ratings for licensing vehicles, regular inspections of older vehicles, mandatory crash avoidance technology, and early adoption of design improvements such as low frontal height.
3. New vehicle technologies have been demonstrated to help avoid crashes and reduce crash forces and are widely available. However, their deployment in Australia lags international best practice, particularly in Europe. It also lags for commercial vehicles including utility vehicles which are commonly used for recreational and family purposes. Governments and industry should set higher standards for new vehicles and for their use as work vehicles, consistent with their duties of care under Workplace Health and Safety laws.

Emerging Opportunities

While we must focus attention and efforts on counteracting immediate and emerging safety issues, we also need to understand emerging opportunities and use them to respond to new safety threats which will occur in the transport system from internal and external influences.

Our world has been changing more rapidly and becoming more unpredictable in recent decades. This makes managing risks and taking opportunities more difficult³⁵. The way we travel, how travel is provided, what we demand from freight operators and a plethora of new technologies can either degrade road safety or contribute to improvements in transport³⁶. Introducing new technologies creates new and different interactions and challenges to maintain safety, within the technology and

³³ e.g. Global Road Safety Partnership (2008). *Speed management: a road safety manual for decision-makers and practitioners*.

³⁴ e.g., in WA only 11% of the 1,213 published Speed Camera Locations were locations where a fatal or serious crash had occurred within the last 3 years. Implementing a target to increase this to at least 50% in the first year can be implemented without additional cost (except loss of revenue from sites with high volumes but low or no crashes) and is easily measured. From WA Police Force (2023) Perth Metropolitan Mobile Road Safety Camera Deployment Locations. www.police.wa.gov.au/~media/Camera-locations-July-2023.pdf?la=en

³⁵ Solomon, L.K. & Ertel, C. (2014). *Leadership in a VUCA world: Design strategic conversations to accelerate change*. Leadership Excellence Essentials, February 2014, 17-18.

³⁶ Engineers Australia (2023). *The future of transport discussion paper*. www.engineersaustralia.org.au/sites/default/files/2023-01/future-transport-discussion-paper-jan-2023.pdf

interfacing with the road environment and human factors. The German Motor Vehicle Monitoring Association DEKRA sums up three key issues when preparing for the future:³⁷

4. Accident Statistics: We urgently need to make better use of the data to prevent accidents and point to emerging solutions.
5. The Human Factor: Complexity of systems must be controllable in any traffic situation.
6. Technology: Modern operating concepts must not cause extra distraction.

The application of Intelligent Transport Systems³⁸ brings opportunities for significantly improving road safety. These opportunities involve technologies applied as a part of the road infrastructure, on-board vehicles and combinations of both. Such technologies have a wide range of complementary purposes including direct intervention, driver assistance, driver monitoring and feedback, enforcement, fleet information and more. These systems can provide substantial and different data that can enable better information for road safety policy, planning and countermeasure design. At the same time, technology can introduce additional or new types of failure (such as through increased complacency, distraction, poor design, or software errors). The relative significance of these effects need to be carefully evaluated and balanced before they are introduced³⁹.

Available now on many new vehicles, Advanced Driver Assistance Systems⁴⁰ such as Adaptive Cruise Control, Automatic Emergency Braking and Lane Keep Assist are becoming familiar to many drivers. Looking to the future, much work is occurring globally to (amongst other things) significantly improve road safety in the overlapping fields of:

7. Co-operative transport systems (C-ITS) - potentially preventing between 20–50 per cent of serious crashes⁴¹,
8. Automated Vehicles - with Level 1 to Level 5 automation as defined by the Society of Automotive Engineers International (SAE)⁴²,
9. Connected and Automated Vehicles - important trials are occurring including in Queensland⁴³.

Many new technology opportunities can be implemented immediately while others need to be urgently investigated, resourced and deployed by several different government and private participants. Some more recent technologies being employed include:

10. Fatigue detection, monitoring and management systems⁴⁴,
11. Automated enforcement, such as mobile phone camera detection⁴⁵,

³⁷ Dekra (2023). *Road Safety Report 2023: Technology and People*. <https://dekraproduct-media.e-spirit.cloud/59f0c4f3-818a-42a7-b329-bc991b5a1ce6/media/dekra-vs-r-2023-en-online.pdf>

³⁸ Implementation and application of ICT to manage the transport system.

³⁹ Bainbridge, L. (1983). *Ironies of automation*. In *Analysis, design and evaluation of man-machine systems* (pp. 129-135). Pergamon.

⁴⁰ Federal Chamber of Automotive Industries (2012). *Advanced Driver Assistance Systems*. www.fcai.com.au/Safety/advanced-driver-assistance-systems

⁴¹ Logan, Young, Allen & Horberry (2017). *Safety Benefits of Cooperative ITS and Automated Driving in Australia and New Zealand*. Austroads report AP-R551-17

⁴² SAE International (2017). *Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles*. SAE J3016. www.sae.org/standards/content/j3016_202104/

SAE is the leading international automotive engineering organisation and seeks to advance mobility knowledge and solutions. Setting industry standards and providing information for the industry are important SAE activities.

⁴³ Queensland Government (2021). *Cooperative and Highly Automated Driving Pilot*. <https://www.qld.gov.au/transport/projects/cavi/cooperative-and-highly-automated-driving-pilot>

⁴⁴ National Heavy Vehicle Regulator (2019). *Fatigue Monitoring Trial*. www.nhvr.gov.au/safety-accreditation-compliance/fatigue-management/about/fatigue-monitoring-trial

⁴⁵ NRMA website (2023). *Mobile Phone Detection Cameras operating in NSW*. www.mynrma.com.au/cars-and-driving/driver-training-and-licences/resources/mobile-phone-detection-cameras-rolling-out

12. Blind spot detection and warning systems⁴⁶, which are valuable in reducing truck crashes with cyclists.

Moving forward

Governments have adopted Road Safety Strategies and Action Plans but their objectives have never been fully met. Implementation has clearly been ineffective with insufficient effort and accountability. Impediments to successful implementation include funding, political will, a lack of involvement by key stakeholders, and critical areas where road safety resources and efforts have not been prioritised.

We have the knowledge and expertise to reduce the rate of deaths and serious injuries on our roads to a level comparable with leading countries and more. Whilst this would not be 'zero' in the immediate future, it would save approximately 600 lives a year in Australia by 2030 compared to current trends.⁴⁷

Road Safety Strategies can and should be improved, but the greatest hurdle is the reluctance shown by governments, agencies, companies, the transport industry, professionals, interest groups and others to implement road safety strategies and action plans in a consistent manner across all areas. Relevant agencies need the commitment of government in providing adequate resources and the resources must extend beyond those with direct responsibility for road safety programs. These include sufficient staff capabilities, funding, equipment, data and information, systems and processes.

Funding the above does not necessarily impose a financial burden as it can be funded by re-prioritising existing funding allocations from 'congestion busting' projects to road safety projects.

Recommendations for Government

Transport Australia society strongly recommends the following action to improve Australia's road safety and reduce the number of deaths and serious injuries continuing to occur each year.

1. All states and territories should commit to implementing road safety action plans that clearly identify measurable targets for all relevant government departments to achieve a significant reduction in the number of people killed and seriously injured on Australian roads every year in specific target areas.
2. Similar to Sweden, governments should pass legislation that includes specific targets for road safety improvement, including a duty of care provision.
3. Governments should provide adequate capabilities and resources (staff, funding, equipment, information, etc) to ensure road safety strategies and action plans are implemented.
4. Road safety action plans should clearly describe the roles and responsibilities for all participants together with their specific responsibilities for achieving outcomes (or targets) in specific focus areas. These include the transport sector and wider industry, the general public and government agencies, not limited to transport.
5. Independent Road Safety Agencies should be established (or repurposed) to be responsible for ensuring that all proposed actions in the state or territory's Road Safety Action Plan are achievable and measurable
6. Governments should make all road safety data and information freely available. More comprehensive and consistently recorded data is required to clearly describe causal factors and be analysed to better inform road safety countermeasures.

⁴⁶ Heavy Vehicle (Vehicle Standards) National Regulation (2023), Part 2, 13B, Blind spot information systems. UN ECE Regulation No. 151 (2020). *Uniform provisions concerning the approval of motor vehicles with regard to the Blind Spot Information System for the Detection of Bicycles.*

⁴⁷ Based on road safety performance levels achieved in other comparable countries, e.g. International Transport Forum (ITF, 2022), *Road Safety Annual Report 2022*, OECD Publishing, Paris. www.itf-oecd.org/road-safety-annual-report-2022

7. Governments should monitor and report on the implementation of road safety strategies and actions plans, including individual focus areas and against the intended targets.
8. Governments should monitor and report on the contributions of all participants to improving road safety.
9. Governments should lead the immediate deployment of new technologies already available. Other technologies need to be urgently developed and applied by governments and other participants, especially the motor vehicle industry and fleet managers.
10. Governments should lead improvements to the road safety culture in road users and others responsible for road safety. Individuals and companies need clearer reasons to act, and government must ensure that they have strong motivations for doing so.

Recommendations for Transport Professionals

Transport professionals involved in road planning, design, construction and operations have a legal and professional duty of care to consider road safety in all their work activities. This duty of care must be met as far as possible within the resources available. It may not be traded off against other project outcomes such as economy, performance or environment. Transport Australia society recommends transport professionals adopt the following best practices:

11. Engineers engaged in roads and traffic engineering must engage in a program of professional development to fully meet their professional responsibilities for road safety outcomes. This could be undertaken with the assistance of the Transport Australia society.
12. Engineers should maintain close liaison with technical bodies involved in road safety such as Austroads⁴⁸ and Standards Australia. The aim should be to maintain technical currency as design standards evolve to incorporate Safe System principles.
13. Engineering courses should have course content related to transport that includes training in road safety principles for analysis, design and operation.
14. Transport professionals should keep themselves up-to-date and informed of emerging technologies, their application to road transport, and the benefits and risks to road safety.

⁴⁸ The Association of Australian and New Zealand transport agencies.