The impact of vehicle safety improvements on reducing road trauma in WA

July 2025

For the better

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Looking back over the last couple of decades, progress in road safety in WA has been inexcusably slow and an unforgivably high number of people continue to be killed and seriously injured (KSI) every day on WA's roads.

The WA Government has set a target to reduce KSIs by 50-70 per cent by 2030 compared with a 2015-2019 baseline. RAC has set more ambitious targets to halve the rate of KSIs on our roads by 2025, from a 2020 base. We have been exploring which road safety countermeasures should be prioritised in order to meet these targets, and this bulletin explores the potential role of vehicle safety improvements.

The role of vehicle age and safety features in road user protection

The introduction of passive safety features into the Australian vehicle fleet, for example seatbelts and airbags, have contributed to a significant reduction in road trauma since their implementation. Modern vehicles not only provide better occupant protection in the event of a crash but also reduce the risk of fatality or serious injury to other road users. In addition, new assistive technologies can reduce the risk of a crash occurring in the first place. Improvements in vehicle safety technology are predicted to have increased safety benefits as their penetration throughout the fleet increases.

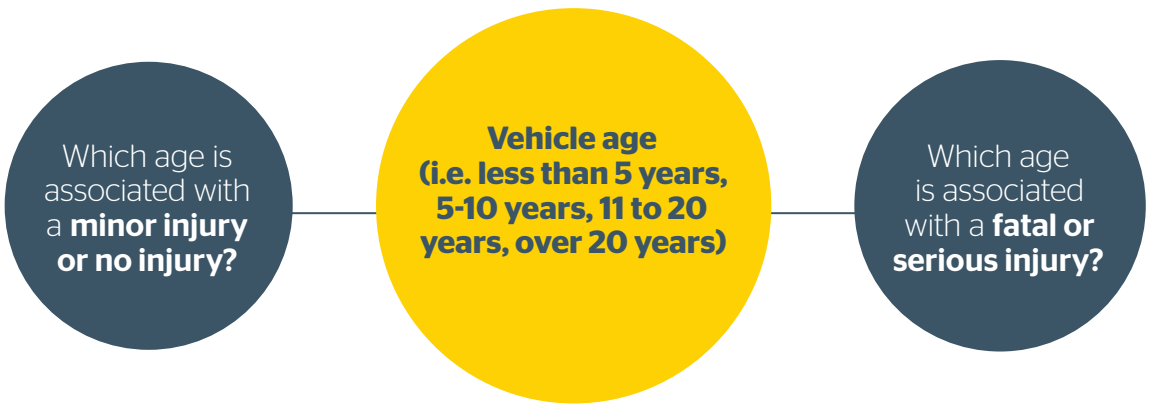
Modelling the impact of vehicle age and safety improvements in WA

In 2022, RAC commissioned the Centre for Accident Research and Road Safety – Queensland (CARRS-Q) to identify and analyse the road safety countermeasures that would have a significant impact on reducing the number of KSIs on WA roads within the next 5-10 years.

Analysing the WA crash data

WA crashes involving three road user groups (motor vehicle occupants, motorcyclists and cyclists/ pedestrians) were analysed to understand which vehicle characteristics were associated more strongly with fatal or serious injury and which were associated more strongly with minor injury or no injury. Vehicle characteristics could only be included in the analysis where they are recorded in WA crash data for the vast majority of crashes, and hence this analysis was limited to age of vehicle. The percentage reduction in KSIs resulting from reducing vehicle age (Figure 1), and how many KSIs could be prevented from 2022 to 2030 were able to be calculated (Table 1).

A separate literature review looked at evaluations of vehicle safety technologies to identify effective technologies. These evaluations were used to provide an estimate of the percentage reduction in KSIs resulting from their introduction, and to calculate how many KSIs could be prevented from 2022 to 2030 (Table 1).



What were the findings?

How does vehicle technology and design impact risk of fatal or serious injury?

The literature review identified safety features that prevent crashes occurring or minimise injury in the event of a crash. Some of these include:

- Autonomous emergency braking: a braking system that can sense a potential collision ahead and automatically apply the brakes to reduce the severity of the collision or avoid it entirely.
- Forward and/or rear collision warning: a system that uses radar or cameras to detect potential collisions and alert drivers with visual, auditory, or tactile cues.
- Lane keep assist: a system that warns the driver when the vehicle is leaving its lane and provides steering input to keep the vehicle in its lane in order to reduce run-off road and head-on crashes.
- Intelligent speed adaptation: compares a vehicle's travel speed to the speed limit and either provides visual, auditory or tactile feedback to the driver if the vehicle exceeds the speed limit or else prevents a vehicle exceeding the speed limit altogether.
- Electronic stability control: helps prevent loss of control by detecting and correcting oversteer or understeer by automatically applying brakes to individual wheels and potentially reducing engine power to help stabilise the vehicle.
- Collision notification systems: enables a vehicle to automatically contact emergency responders in the event of a serious crash and provide information such as the exact location.
- Mobile phone blocking: technology which blocks the signal of incoming phone calls and/or messages while driving.
- Vehicle design: design aspects can influence the severity outcome of the crash (e.g. more aggressive vehicles such as large SUVs are more likely than cars to cause injuries to other road users, and flatter and wider bumpers can protect against serious leg injuries in pedestrians).

How does vehicle age impact risk of fatal or serious injury?

When compared to vehicles aged 5-10 years old, the crash data modelling found that the risk of a fatal or serious injury to motor vehicle occupants noticeably increased as the age of the vehicle increased, while the risk decreased as the age decreased (Figure 1). The risk of a fatality or serious injury was most increased for vehicles over the age of 20 years old.

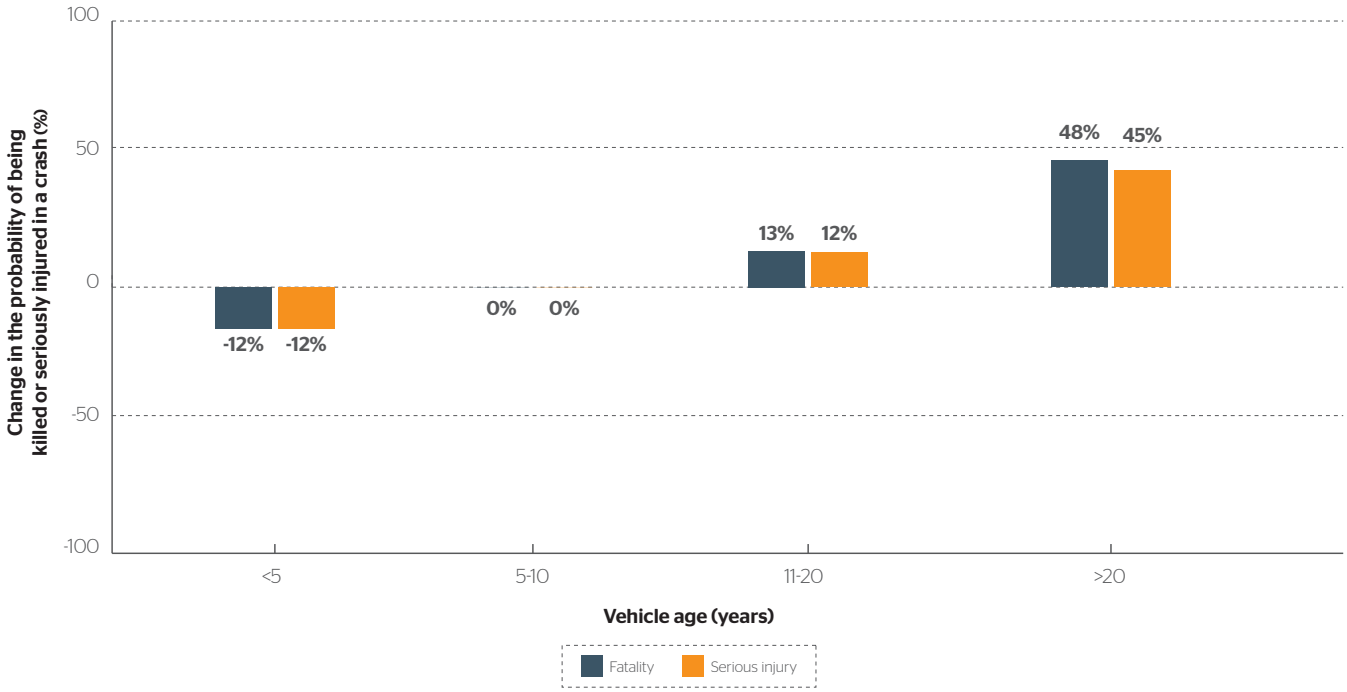


Figure 1: Percentage change in the probability of a motor vehicle occupant being killed or seriously injured in a crash by vehicle age (compared with a 5-10 year old vehicle)

Policy actions to save lives

Overall, the most effective vehicle safety improvement in terms of reducing fatal and serious injuries by 2030 was for a package of new technologies to be implemented across motor vehicles throughout all of WA. Table 1 shows a breakdown of the percentage reduction in KSIs and predicted KSI savings for each vehicle safety improvement type from 2022 to 2030.

Table 1: Predicted KSI saving for each vehicle safety improvement from 2022 to 2030

Vehicle safety improvements	Target mode of transport	% reduction in KSIs	Predicted KSI savings (2022 to 2030)
Package of new technologies across motor vehicles in metropolitan area^	» Motor vehicle occupants and pedestrians/cyclists	35%	986 people*
Automated Emergency Braking across motor vehicles in metropolitan area^	» Rear-end crashes involving motor vehicle occupants and pedestrians/cyclists	25%	558 people*
Replacing motor vehicles in WA over 10 years old with vehicles less than 5 years old	» Motor vehicle occupants	N/A	653 people**
Replacing motor vehicles in WA over 20 years old with vehicles aged 11 to 20 years old	» Motor vehicle occupants	N/A	141 people**

Notes: *this estimate is based on the literature review, **this estimate is based on the crash severity analysis, ^applied to half of vehicles >10 years old

Implementation considerations

As highlighted earlier, newer vehicles provide assistive technologies and more protection in the event of a crash. However, the CARRS-Q report identified some challenges and externalities when it comes to implementing wide-scale vehicle safety improvements.

The age of the vehicle fleet in Australia means that many vehicle safety improvements will require decades to become widespread. In addition, the small scale of the Australian market makes it difficult to mandate technologies not required in other countries, but requiring vehicle safety features that are already mandatory in larger markets, such as in the European Union, could markedly increase safety levels. For example, intelligent speed adaptation and lane keep assist have been mandatory in the European Union since 2024.

Additionally, many new vehicle safety features are not usually standard inclusions on less expensive vehicles but are available as additional extras or as standard features on luxury vehicles. This contributes to inequities in access to safe vehicles, particularly for some groups at higher risk such as low-income groups and young drivers.

Another challenge with vehicle safety improvements is that drivers may not know what safety features their vehicle is fitted with, or understand how to use them. This can potentially contribute to lower effectiveness of these safety features. Some devices are poorly designed from a human factors perspective (e.g. providing large numbers of false alarms or warnings that are not easily understood) which may lead drivers to disable these systems. Therefore, education on how to use these safety features, and the importance of them, is crucial.

Vehicle safety improvements in action: Choosing a safer vehicle

Improvements to vehicle design and safety features in new cars are made every year, which is why newer cars usually offer better protection in the event of a crash. Safety rating systems provide an indication or guide of the relative levels of protection offered by a vehicle in the event of a crash.

The most reliable sources of information regarding the safety ratings of passenger vehicles are the Australasian New Car Assessment Program (ANCAP) and Used Car Safety Ratings (UCSR). While there's no equivalent rating system for motorcycles, the safety of motorcycle gear is assessed through the Consumer Rating and Assessment of Safety Helmets (CRASH) program and the Motorcycle Clothing Assessment Program (MotoCAP).

Australasian New Car Assessment Program

ANCAP crash tests cars to measure passive crash protection and conducts performance assessment on safety features and technologies to measure active crash avoidance. Assessed cars are awarded a star rating from 1 to 5 to indicate relative safety performance, where 5 stars is the safest. When choosing a newer vehicle, make sure to check the ANCAP safety rating of the vehicle via the ANCAP website prior to making your final decision.

RAC recognises that **safer vehicles** can save lives, so in 2012 we made a major commitment to road safety by choosing to not insure any vehicle that was built in, or after 2012 with an ANCAP rating of less than 4 stars. Further, we do not finance vehicles with an ANCAP rating below 4 stars. RAC is also a member organisation supporting the work of ANCAP.

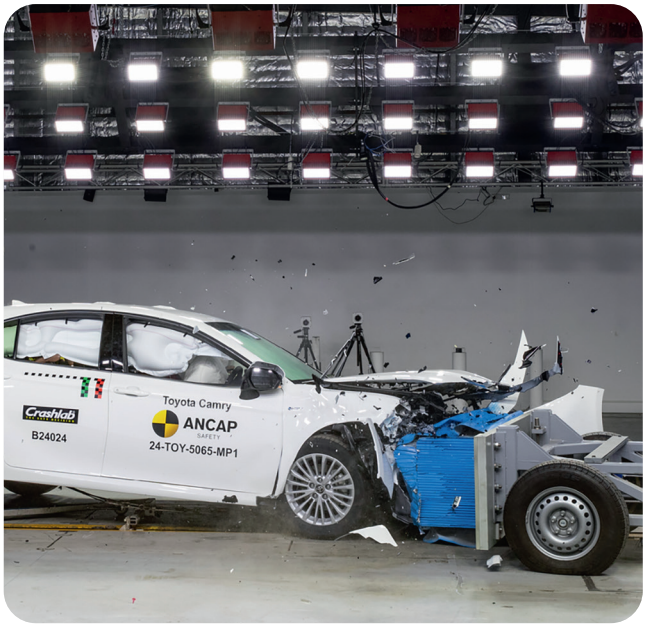


Photo credit: ANCAP

Used Car Safety Ratings

UCSRs are safety ratings focusing on used vehicles and determined through the independent analysis of real-world crash statistics. Vehicles are awarded an Overall Safety star rating from 1 to 5, with higher star ratings being a safer choice. The Overall Safety star rating applied to each vehicle rated considers three components of vehicle safety performance:

1. How well the vehicle protects its driver from being killed or seriously injured in a crash (Driver Safety rating)
2. How well the vehicle protects other drivers, pedestrians, cyclists and motorcyclists from being killed or seriously injured in a crash (Other Road User Safety rating)
3. The reduction in likelihood of being involved in a crash through key crash avoidance technologies being available in the vehicle (Crash Avoidance rating)

CRASH and MotoCAP

Motorcyclists are extremely vulnerable road users as they have little protection during a crash, which is why helmets and protective gear is so important. CRASH provides helmet buyers with independent and consistent information on the levels of protection from injury in a crash provided by motorcycle helmets and the comfort level of the helmet. MotoCAP tests motorcycle jackets, pants and gloves using scientific methods to provide star ratings for motorcyclists to encourage them to choose gear with the best protection and breathability. Both programs use a star rating from 1 to 5, where 5 stars provides the best protection. Look for the **CRASH** and **MotoCAP** star ratings when selecting your helmet and protective clothing. When buying a new motorbike, make sure it is equipped with safety technologies, such as stability control, to increase your safety and reduce your risk of a crash too.

Where we stand

To reduce the unacceptable impact of road trauma in WA, RAC advocates and supports the Safe System approach, which seeks safe road users, safe speeds, safe vehicles, safe roads, and post-crash care.

RAC's Vision 2030 sets ambitious targets for reducing the rate of fatalities and serious injuries on WA roads and looks to a future where all parts of the Safe System approach have been strengthened.

This project has improved our understanding of the vehicle safety improvements predicted to have the most impact on reducing fatal and serious injury.

Our other publications explore further the crash characteristics most strongly associated with fatal and serious injury and the potential for speed limit reductions and safer infrastructure to prevent these devastating crashes.

To learn more about how we are already **advocating change**, head to our website to read our most recent Public Policy document, Social & Community Impact Report and State and Federal Budget Submissions. RAC's public policy positions reflect where we stand on issues that support our Vision and help achieve our targets. Our policies are developed based primarily on the best available evidence, including the findings from projects like this.

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