

RESEARCH PROJECT SUMMARY

POTENTIAL ROAD SAFETY BENEFITS OF MAKING SAFER VEHICLE CHOICES IN AUSTRALIA AND NEW ZEALAND

AUGUST 2020

RESEARCH UNDERTAKEN BY
MONASH UNIVERSITY ACCIDENT RESEARCH CENTRE (MUARC)



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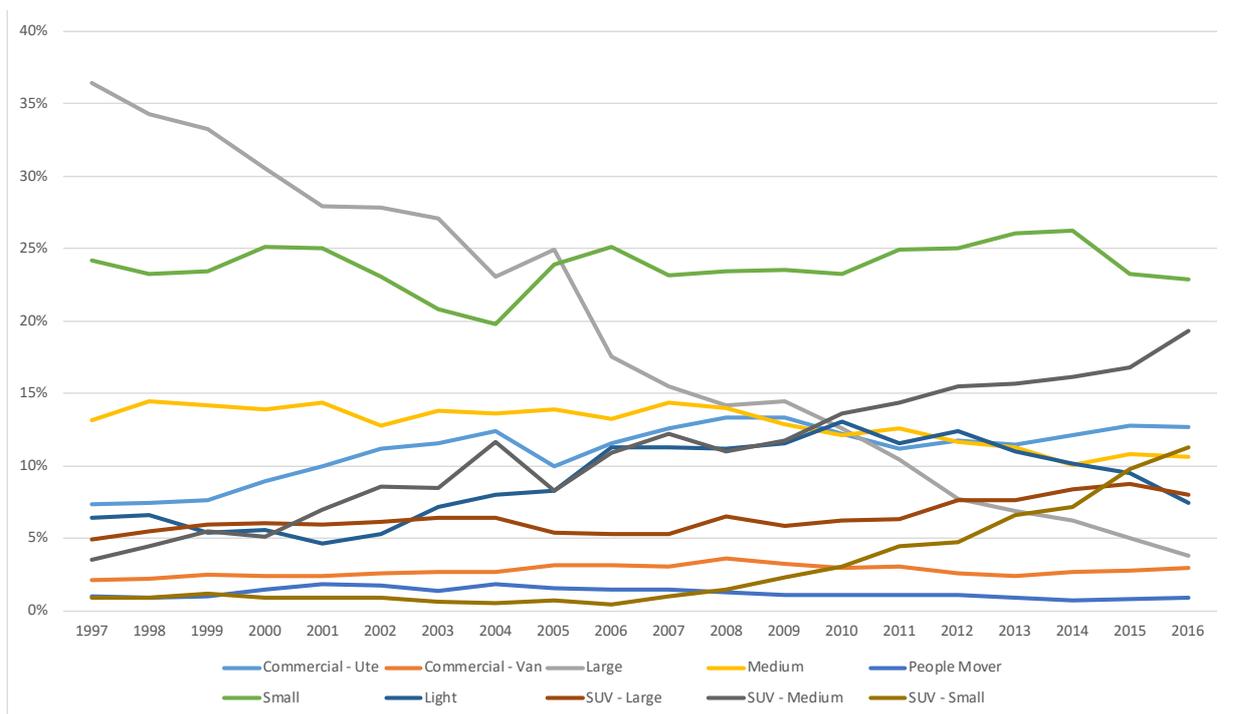
Potential Road Safety Benefits of Making Safer Vehicle Choices in Australia and New Zealand

August 2020

PROJECT OBJECTIVES

- A previous study conducted by the Monash University Accident Research Centre (MUARC) published in 2004 estimated that if all drivers involved in crashes reported to police in Australia had had been driving the safest available vehicle in the same market group as the vehicle in which they crashed, road trauma involving light vehicles could have been reduced by 26% compared to the levels observed. Since then, the profile of the Australasian vehicle fleet has changed significantly with large car sales having rapidly declined - being replaced in the market by utilities and medium and small SUVs as illustrated in the following figure.

*Percentage of new vehicle sales by market group (Australia)
1997-2016*



- The aim of this study was to estimate the current potential road safety benefits of optimising safer vehicle choices in Australia and New Zealand based on more recent vehicle purchasing and use behaviours, and the current light vehicle fleet profile.
- A sub-aim of the project was to examine the road trauma impact of the increasing numbers of utilities in the light vehicle fleet. Utilities were a particular focus of the study since data from the Used Car Safety Ratings show that, compared to regular passenger cars, utilities offer inferior levels of protection from serious injury to their occupants in a crash but are more likely to cause injuries to other road users with which they collide. In 2016, three of the top 10 selling vehicle models in Australia (and New Zealand) were the Toyota Hilux (No. 1), Ford Ranger (No. 4) and Mitsubishi Triton (No. 9).

MEASURES & METHODS

All light vehicles

- This study considered optimising safer vehicle choices on the basis of two (2) measures derived from the existing the Used Car Safety Ratings database.
 1. Crashworthiness (measuring the impact on vehicle occupants only).
 2. Total Secondary Safety (measuring the impact on all road users involved in a crash – pedestrians, cyclists and occupants of crash partner vehicles – and hence the overall impact on road trauma across the community).
- The 2016 light vehicle fleet profile was considered in Australia and the 2015 and 2016 light vehicle fleet in New Zealand. Only crashed vehicles were considered, as these are the vehicles leading to recorded road trauma.
- The potential benefit of safer vehicle choices were measured by considering the average safety of vehicles in the 2016 Australian or 2015-2016 NZ fleet as observed by examining the average crashworthiness and total secondary safety of the vehicles crashed. Potential trauma savings were estimated by substituting the actual crashworthiness or total secondary safety ratings of the crashed vehicles for the ratings of the safest vehicle available based on a number of scenarios and calculating the average across the safer vehicle choices. From this, the estimated trauma savings associated with safer vehicle choices could be calculated directly.
- Scenarios for safer vehicle choices considered were:
 1. Substituting for the safest vehicle across all vehicles in the fleet in 2016 regardless of the age and market group of the vehicle crashed.
 2. Substituting for the safest vehicle across all vehicles in the fleet in 2016 of the same market group but regardless of the age of the vehicle crashed.
 3. Substituting for the safest vehicle across all vehicles in the fleet in 2016 of the same age but regardless of the market group of the vehicle crashed.
 4. Substituting for the safest vehicle across all vehicles in the fleet in 2016 of the same age and market group of the vehicle crashed.
- Scenario 4 was considered the most realistic and hence most likely to be achieved in practice.

Utilities

- The impact of utilities in the fleet was estimated by substituting all crashed utilities in the fleet with either medium SUVs or medium cars to estimate the impact on average safety.

Increased ESC Fitment

- The potential benefits of increasing Electronic Stability Control fitment to all vehicles in the fleet was estimated by considering the proportion of crashed vehicles that were not fitted with ESC and the proportion of crashes involving these vehicles that would have been prevented if ESC was fitted.

RESULTS

Australia

- Optimising safer vehicle choices based on the total secondary safety of the vehicle produced the largest road trauma reduction (benefit) for the community.
- If every crashed vehicle in 2016 had total secondary safety equivalent to the safest vehicle available of any age across all market groups, road trauma from light vehicles involved crashes in 2016 would have been 59% lower than that observed.
 - This is considered a hypothetical maximum benefit since it would require replacing all vehicles with the safest available vehicle at any point in time. This benefit is unlikely to be achieved in reality since it would require significantly changing the age and market group profile of the entire fleet at a single point in time.
- More realistically, if every crashed vehicle in 2016 had a level of total secondary safety equivalent to the safest vehicles available within the same market group and year of manufacture, road trauma from light vehicles involved crashes in 2016 would have been 33% lower than that observed.
 - This is considered a realistic potential improvement since it involves choosing / using the safest vehicle of the type wanted based on the same age and market group profile of vehicles that exist currently (i.e. maintaining the same age and market group profile of new vehicle sales).
 - The estimated improvement in the current study of 33% is greater than the 26% estimated in the previous [2004] study indicating that there is greater potential to reduce serious road trauma through safer vehicle choices than there was previously.
 - Optimising safer vehicle choice within year of manufacture and market group could save up to 290 fatalities and 5800 serious injuries in Australia per annum with a cost saving to the community of around \$2 billion.

- Increased sales and subsequent use (VKT) of commercial utilities over the past 10-year period has likely increased overall light vehicle related road trauma by between 2% and 5% at a cost to the community of \$170m-\$300m annually. This is due to commercial utilities not providing particularly high levels of occupant protection in comparison to passenger vehicles and SUVs and being extremely likely to seriously injure or kill other road users with which they collide. The change in purchase and use preference towards these vehicles has therefore resulted in a negative road safety outcome.
- Although ESC in Australia is now mandated for all new light vehicles from 2012 (passenger cars) or 2015 (light commercial vehicles), if all light vehicles in 2016 were fitted with the technology, total road trauma in 2016 could have been reduced by 4.8%. Similarly, if all vehicles in 2016 were fitted with AEB, which is not yet mandated, serious road trauma in 2016 could have been reduced by 5.4%

New Zealand

- Estimated potential road trauma savings in New Zealand through safer vehicle choices were also substantial although slightly less in magnitude compared to those estimated for Australia.
 - If the entire fleet had a level of total secondary safety equivalent to the best available across all vehicles, it was predicted that fatal and serious injury would be reduced by 33.5% and overall road injury social cost by 30%.
 - If the entire fleet had total secondary safety equivalent to the best available within each year of manufacture a 23% reduction in injury social costs was predicted.
 - An increasing disparity in the safety of the most and least safe vehicles available in NZ was observed for more recent year of manufacture vehicles.

IMPLICATIONS

- Other research has shown that vehicle safety improvements have made a major contribution to reducing road trauma over the last 15 years. This research shows that there is still substantial untapped potential for safer vehicle choices to contribute even further to achieving road trauma reductions.
- There is significant potential for reducing road trauma and Australia and New Zealand through encouraging safer vehicle choices. Potential from encouraging the purchase of vehicles with improved secondary safety has increased over recent years. These results highlight the importance of influencing levers to improve safer vehicle choices including:
 - Independent vehicle safety test and advocacy organisation, ANCAP
 - Regulation of proven effective crash avoidance technologies such as AEB
 - Consideration of other potential programs or incentives to encourage safer vehicle choices
- Changing market preferences towards market groups of vehicles has had a measurable impact on road trauma. Determining mechanisms to discourage consumers from less safe market groups would be beneficial.

CONCLUSION

There is potential to achieve significant road trauma reductions in Australia and New Zealand through prioritising safety in the purchase of new vehicles. If all new vehicles purchased were equivalent in safety to the safest available at the time within the type chosen, long term reductions in serious road trauma of over 30% could be achieved. To achieve this, it is important for those buying a vehicle to choose one that not only protects their own occupants from injury in the event of a crash but also other road users with which they collide.