



Mr Gerry McInally  
Committee Secretary  
Joint Select Committee on Road Safety  
PO Box 6100  
Parliament House  
CANBERRA ACT 2600

Dear Mr McInally

The Australasian New Car Assessment Program (ANCAP SAFETY) welcomes the opportunity to provide a submission to the Australian Parliament's Joint Select Committee on Road Safety.

ANCAP works within the *Safe Systems* approach to road safety. The *Safe Systems* approach recognises that people make mistakes and there are physical limits to the amount of force that our bodies can take. Actions targeted to achieve safe roads, safe vehicles and safe people can work together to achieve this aim.

As Australasia's leading independent vehicle safety advocate, ANCAP has been successful in driving improvements in vehicle safety in Australia for more than 25 years - successfully fulfilling the *Safer Vehicles* pillar through a dual approach:

- Technical testing and vehicle safety assessment.
- Consumer communications and advocacy activities

More than 740 vehicle models hold a current ANCAP safety rating with 95 per cent of all new light vehicles sold in 2019 covered by an ANCAP safety rating. This high level of market penetration, combined with high levels of consumer awareness, positions ANCAP to hold a unique ability to accelerate the provision and market uptake of new vehicle safety features and technologies.

Through rewarding vehicle brands and educating consumers, ANCAP is able to encourage the early adoption of new safety systems that exceed any minimum regulatory standard. It is important that ANCAP exists in parallel and complementary to regulation, as influencing consumer choice to drive market uptake will influence vehicle brands decisions quicker than the regulatory process.

ANCAP works with the support of 23 member organisations including the Australian Government, Australian and New Zealand automobile clubs, State and Territory governments, the New Zealand Government, the Victorian Transport Accident Commission, Insurance Australia Group and the FIA Foundation. Continued support from our members, stakeholders and other partners is required to assist ANCAP in addressing key road safety challenges:

- Encouraging vehicle turnover / fleet renewal through the uptake of newer, safer vehicles.
- Enhancing safety thus reducing road trauma in regional and remote areas and cities - through the encouragement of new vehicle safety technologies such as autonomous emergency braking (AEB) and lane support systems (LSS).
- Independent testing and assessment of connected and automated vehicles (CAV) - to build confidence among consumers, regulators and industry.
- Engaging with mobility service providers (car-share & road-share) to encourage the consideration of safer vehicles by all road users regardless of their vehicle ownership status.

ANCAP's submission to the Joint Select Committee on Road Safety Inquiry follows.

Yours sincerely

James Goodwin  
Chief Executive

31 January 2020



# SUBMISSION TO THE JOINT SELECT COMMITTEE ON ROAD SAFETY

JANUARY 2020

## THE ROLE OF ANCAP

The Australasian New Car Assessment Program (ANCAP Safety) is Australasia's independent vehicle safety authority.

ANCAP works within the *Safe Systems* approach to road safety. The *Safe Systems* approach recognises that people do make mistakes and that there are physical limits to the amount of force our bodies can take. Our activities fall predominantly within the *Safe Vehicles* pillar, while also acknowledging our role within the Safe Roads pillar.

ANCAP complements regulation, with its key focus to eliminate road trauma through independent assessment, market influence and consumer advocacy – empowering consumers with information to make safer vehicle choices and encouraging vehicle brands to improve their vehicle designs.

### **ANCAP Vision**

*Safer vehicles for all*

### **ANCAP Mission**

*Work with members and partners to eliminate road trauma through independent assessment, market influence and consumer advocacy.*

ANCAP safety ratings are published for a range of new passenger, sports utility (SUV) and light commercial vehicles (LCV) entering the Australian and New Zealand markets, using a rating system of 0 to 5 stars.

ANCAP star ratings indicate the level of safety a vehicle provides for occupants and pedestrians in the event of a crash, as well as its ability — through technology — to avoid or minimise the effects of a crash. These independent safety ratings are used to compare the relative safety between vehicles of similar size in the same market category, and have become a critical factor in vehicle selection for private consumers and business fleet buyers and operators.

ANCAP's safety rating criteria influence vehicle design and specification, and ANCAP has a key role in educating the community, and in particular vehicle fleet managers about new and emerging vehicle technologies; promoting the benefits of new safety technologies; and building confidence and demand.

ANCAP safety ratings are based on a series of internationally recognised, independent crash tests and safety assessments – involving a range of destructive physical crash tests, an assessment of on-board safety features and equipment, and performance testing of automated collision avoidance technologies. ANCAP continuously updates its safety rating criteria to influence and promote new and emerging vehicle safety features as well as to target new aspects of vehicle safety.

ANCAP works in partnership with 23 member organisations including the Australian Government, Australian and New Zealand automobile clubs, State and Territory governments, the New Zealand Government, the Victorian Transport Accident Commission, Insurance Australia Group and the FIA Foundation.

The Australian Government, represented by the Department of Infrastructure, Transport, Cities and Regional Development (DITCRD) has been an important member of ANCAP since 2009. During this time, the Australian Government's support has assisted ANCAP to achieve and maintain coverage of at least 90% of the new car market each year.

ANCAP acts as a key conduit between ANCAP members and governments on policy development, community engagement and advocacy activities relating to the safety of light passenger vehicles.

ANCAP's non-regulatory program exists in parallel and complementary to the Australian Government's regulatory vehicle standards, the Australia Design Rules (ADRs). See **Attachment A**.

## KEY ROAD SAFETY CHALLENGES

ANCAP has identified the following key road safety challenges in connection with the *Safe Vehicles* pillar:

- KEY CHALLENGE 1:** Increasing in fatalities and serious injuries in major cities and urban areas.
- KEY CHALLENGE 2:** A high proportion of fatalities in regional and remote areas.
- KEY CHALLENGE 3:** Too many older vehicles.
- KEY CHALLENGE 4:** Automated driving not well understood.
- KEY CHALLENGE 5:** Connected and automated vehicle technologies and infrastructure working together.
- KEY CHALLENGE 6:** Changing vehicle ownership and usage patterns.

ANCAP's *Strategic Plan 2018-2023* aims to address these challenges, however actions from a range of stakeholders are also required to return significant safety benefits.

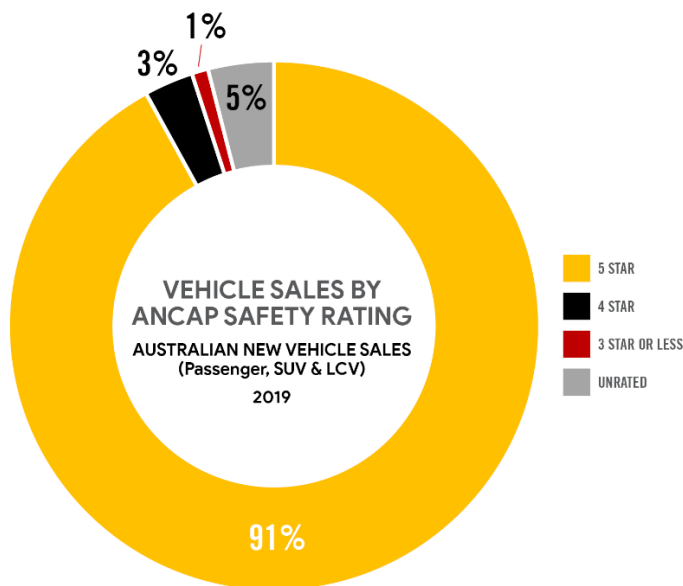


Figure 1 – New vehicle sales by ANCAP safety rating (2019)

## KEY CHALLENGE #1

### INCREASING FATALITIES & SERIOUS INJURIES IN MAJOR CITIES / URBAN AREAS

**Challenge:** Vulnerable road user deaths are on the rise in urban areas with pedestrian and cyclist deaths increasing significantly.

**Action:** Accelerate the uptake of collision avoidance technologies such as autonomous emergency braking (AEB) to significantly reduce crashes in cities and urban areas.

#### Autonomous Emergency Braking (AEB) – light vehicles

Increasing the uptake of new vehicle safety technology, such as autonomous emergency braking (AEB) will play a significant role in reducing crashes and resultant injuries in cities and urban areas.

Many international studies show there is a substantial reduction in crashes in light vehicles fitted with AEB systems:

- 55% reduction in police-reported crashes<sup>1</sup>
- 38% reduction in real world rear end crashes<sup>2</sup>
- 54-57% risk reduction of real-world rear-end crashes in metro areas (35-41% risk reduction in all areas)<sup>3</sup>
- An estimated 46% reduction in rear-end striking crashes<sup>4</sup>

ANCAP has been testing and evaluating AEB systems for light vehicles in a broad range of daytime and night-time scenarios since 2018. The current and planned scenarios include:

- Car to car rear with target car braking
- Car to car (approaching head-on) with test car turning across target car path (i.e. a typical right hand turn across approaching traffic on a two-lane road)
- Car to adult pedestrian crossing vehicle path
- Car to child pedestrian crossing vehicle path
- Car to adult pedestrian walking towards the car (i.e. to replicate pedestrian walking along the side of the road where there is no separated footpath)
- Car to adult pedestrian where the car is turning at an intersection and a pedestrian is crossing the road
- Reversing car to pedestrian
- Car to bicyclists (both child and adult cyclists)

It is not possible for a passenger car, SUV or LCV to achieve a 5 star ANCAP safety rating without an effective AEB or lane support system.



Figure 2 - AEB Scenarios: Car to car rear, Car to adult cyclist and Car to pedestrian

#### AEB Advocacy

One of ANCAP's key advantages is the flexibility to introduce comparative testing and assessment of vehicle safety features and technologies ahead of development and implementation of a regulation. ANCAP (and our European counterpart organisation, Euro NCAP) are able to use early research to identify and encourage technologies that are potentially beneficial without the constraints required for regulatory action, i.e. the full cost-benefit analysis required by the Australian Government.

ANCAP has been advocating to promote fast uptake of new automated vehicle safety technology for a number of years. As a result, Australian consumers now have access to a wide range of vehicles fitted with safety technologies that significantly exceed the minimum regulatory vehicle safety standards available.

<sup>1</sup> Insurance Institute for Highway Safety (IIHS) & Highway Loss Data Institute (HLDI), USA, 2018

<sup>2</sup> ANCAP, Euro NCAP, DoIRD research by B. Fildes, 2015

<sup>3</sup> ICROBI study by M. Rizzi, A. Kullgren, C. Tingvall, 2014

<sup>4</sup> UMTRI and GM, A. Leslie, R. Kiefer, M. Meitzner, C. Flannagan, 2019

ANCAP's encouragement of AEB has resulted in the availability of AEB increasing very quickly (from approx. 35% in 2015 to more than 75% of the Australian new car market in 2019) with almost 60% of vehicles now having AEB fitted as standard. **Figure 3** shows that across the top 100 selling passenger cars, SUVs and light commercial vehicles at the end of 2019, AEB and LSS were available on almost 80% of light vehicles sold.

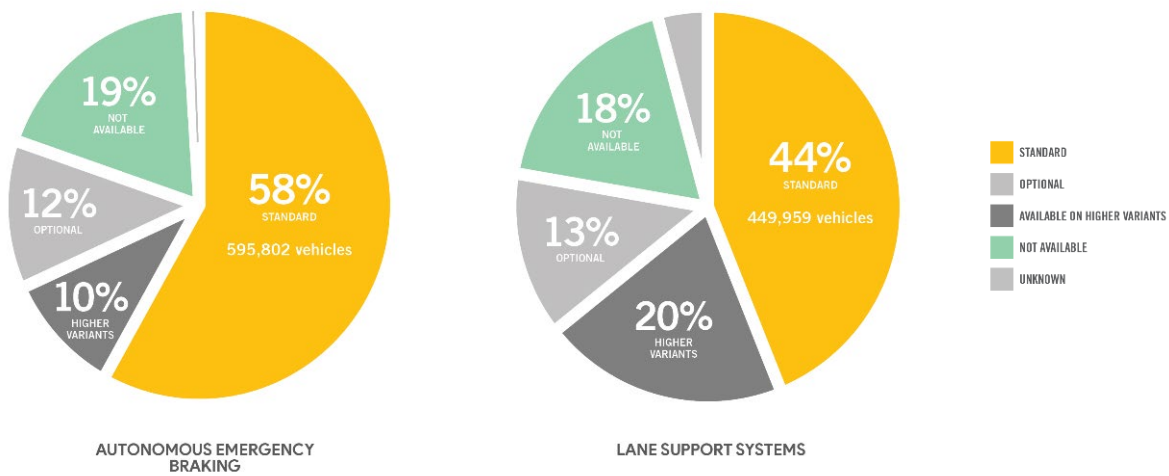


Figure 3 - Availability of AEB and LSS in Australia (2019)

#### What else needs to be done

Despite ANCAP's best efforts, there is not universal fitting of AEB (or LSS) across all new light vehicles. Regulation will play an important role in closing the gap to a 100% fitting rate across the market. For example, an ADR (harmonised with the UN Regulation) to mandate fitting of AEB could deliver 100% fitting rate of AEB on new vehicles by 2024 (see **Figure 4**), which is the same timeframe as proposed in Europe.

Action 4 in the *National Road Safety Action Plan 2018-2020* calls for increased fitting of AEB on both heavy and light vehicles through the development and implementation of new standards (i.e. ADRs) and also increasing the voluntary uptake through fleet purchasing and consumer information via ANCAP.<sup>5</sup>

A new UN Regulation (No. 152) for light vehicle AEB was agreed at the November 2019 meeting of the international forum on vehicle regulations (UN Working Party 29). UN Regulation No. 152 has a scope that includes "to avoid or mitigate the severity of an impact with a pedestrian" and includes a test requirement for a pedestrian crossing in front of the vehicle.

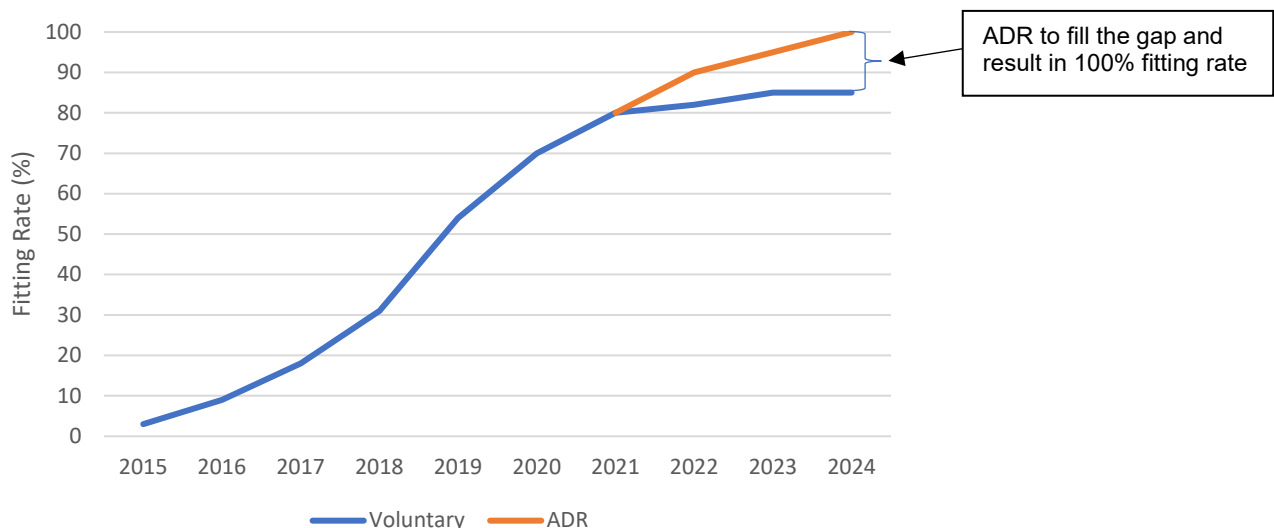


Figure 4 - AEB with mandatory fitting under an ADR<sup>6</sup>

<sup>5</sup> Transport and Infrastructure Council, National Road Safety Action Plan 2018-2020, [www.roadsafety.gov.au](http://www.roadsafety.gov.au) [accessed 17 January 2020].

<sup>6</sup> Voluntary fitting rates for 2015-2019 based on ANCAP estimates of AEB fitting, and 2020-2024 based on fitting rates of ESC prior to mandating via an ADR. Mandatory fitting rates via an ADR based on EU proposed mandated timing.

In their recently released new General Safety Regulation, the European Union (EU) recently mandated AEB on light vehicles in two stages (see **Attachment B**):<sup>7</sup>

- For AEB capable of detecting moving vehicles and stationary objects (from 6 July 2022 for new approvals and from 7 July 2024 for all new registrations).
- For AEB capable of detecting pedestrians and cyclists (from 7 July 2024 for new approvals and from 7 July 2026 for all new registrations).

In August 2019 the Australian Government released a Regulation Impact Statement (RIS) on mandating AEB on goods vehicles over 3.5 tonnes GVM and buses<sup>8</sup> by mandating the relevant UN Regulation No. 131.

### Autonomous Emergency Braking (AEB) – light & medium goods vehicles

In 2019, ANCAP conducted a market survey to estimate the availability of AEB (and other safety technologies) to light goods vehicles (over 3.5 tonnes and up to 8 tonnes GVM<sup>9</sup>) and medium goods vehicles (over 8 tonnes GVM with a GCM<sup>10</sup> of less than 39 tonnes).<sup>11</sup>

The survey showed availability of various safety technologies is growing among these segments. ANCAP estimates of fitting of AEB were:

- Light goods vehicles: AEB was available on up to 45% of the market.
- Medium goods vehicles: AEB was available on almost 80% of the market (standard on more than 37% of the market).

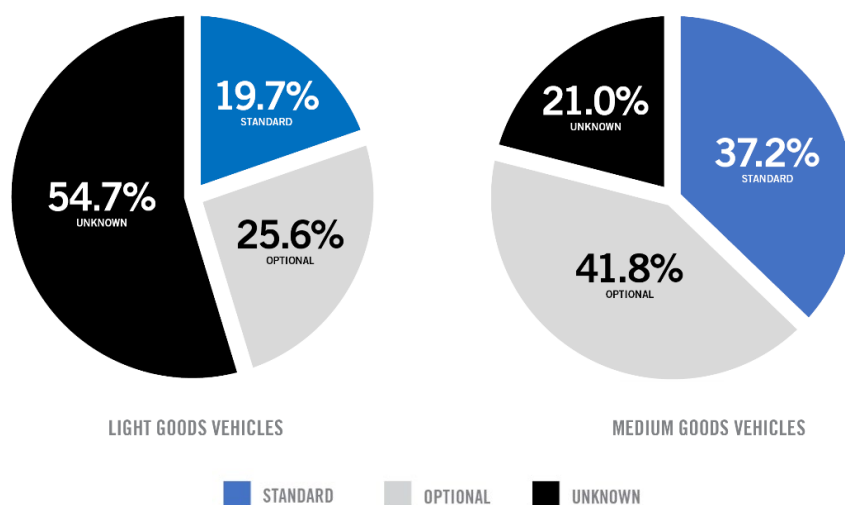


Figure 5 - Availability of AEB on light and medium goods vehicles

### Heavy Vehicles and Blind Spot Detection of Bicycles

A new UN Regulation No. 151 for blind spot detection of cyclists, dated 15 November 2019, has been released.<sup>12</sup> This regulation applies to goods vehicles greater than 8 tonnes GVM, but the regulation also allows approvals to other goods vehicles (over 3.5 tonnes GVM) and to all buses.

### Recommendation

ANCAP recommends:

- The Australian Government mandate AEB (by adopting the UN Regulation No. 152 as an ADR) on all passenger cars, off-road passenger cars and light goods vehicles (ADR categories MA, MB, MC and NA) in a similar timeframe to the European Union.
- The Australian Government finalise the process to mandate AEB on goods vehicles over 3.5 tonnes GVM and all buses.
- The Australian Government consider mandating UN Regulation No. 151 for blind spot detection of bicyclist for all goods vehicles (greater than 3.5 tonnes GVM) and all buses.

<sup>7</sup> Regulation (EU) 2019/2144 of the European Parliament and Council of 27 November 2019.

<sup>8</sup> Australian Government, Department of Infrastructure, Transport, Cities and Regional Development, Regulation Impact Statement Reducing Heavy Vehicle Crashes: Autonomous Emergency Braking, August 2019.

<sup>9</sup> Gross Vehicle Mass (GVM) is the maximum laden mass of the vehicle (measured at all axles) as specified by the manufacturer.

<sup>10</sup> Gross Combination Mass (GCM) is the total of the GVM plus the maximum mass of any trailer (measured at all axles) that can be towed.

<sup>11</sup> Truck Industry Council T-Mark data segment definitions used to analyse sales data for AEB and ESC fitting rates.

<sup>12</sup> UN Regulation No. 151, Uniform provision concerning the approval of motor vehicles with regard to the Blind Spot Information System for the Detection of Bicycles, 15 November 2019.

## KEY CHALLENGE #2

### HIGH PROPORTION OF FATALITIES IN REGIONAL AND RURAL AREAS

**Challenge:** Two-thirds (66%) of road deaths occur in regional and rural areas. High-speed, single vehicle, run-off road crashes remain the most common fatality crash type in these areas.

**Actions:** Accelerate the uptake of collision avoidance technology such as (high-speed or inter-urban) AEB, LSS and speed assist systems (SAS) to reduce these types of rural and regional road crashes.

#### Fitting of Vehicle Safety Technologies

ANCAP's testing and advocacy activities have resulted in AEB and LSS being available on 80% of new light vehicles sold at the end of 2019. However, on some models AEB and/or LSS is only available on a higher specification variant, or as an option (at additional cost). To address these limitations, and the remaining 20% of vehicles without AEB available, the Government will need to mandate AEB and LSS via an ADR.

A new UN Regulation (No. 152) for light vehicle AEB was agreed at the November 2019 meeting of the international forum on vehicle regulations (UN Working Party 29). In addition to the requirement to avoid pedestrians, UN Regulation No. 152 includes a test for avoiding (or mitigating the severity of) a rear-end in lane collision with a passenger car.

In their recently released new General Safety Regulation, the European Union (EU) recently mandated AEB on light vehicles in two stages (see **Attachment B**):<sup>13</sup>

- For AEB capable of detecting moving vehicles and stationary objects (from 6 July 2022 for new approvals and from 7 July 2024 for all new registrations).
- For AEB capable of detecting pedestrians and cyclists (from 7 July 2024 for new approvals and from 7 July 2026 for all new registrations).

#### Future ANCAP testing of Safety Assist technologies

ANCAP was established in the early 1990s, and since then has evolved in line with advances in vehicle safety technology. With the introduction of advanced collision avoidance technology which improves vehicle safety through its ability to avoid or minimise the effects of a crash, ANCAP's forward plan incorporates the testing and assessment of a range of emerging safety technologies.

From 2020, ANCAP (and European counterpart organisation, Euro NCAP) will introduce new tests and assessments including:

- Primary (active) safety (crash avoidance):
  - Driver monitoring – to address driver distraction and impairment through alcohol and fatigue.
  - Autonomous Emergency Steering – in-lane steering support.
  - AEB - Further developments in AEB to include crash scenarios for cross-junction, head-on and reversing accidents.
  - V2X Communications – vehicles exchanging information with each other, the infrastructure and other road users.
  - Child presence detection - which can detect a child left alone in a car and alert the driver and/or emergency services or take action such as opening windows or activating air conditioning.
- Secondary (passive) safety:
  - Whiplash testing – will be reviewed to rationalise and simplify testing and assessment.
  - Pedestrian protection – new test tools to yield more realistic test results.
- Tertiary safety:
  - Rescue information – the availability of standardised rescue sheets to assist emergency services.
  - Multi-collision braking – the vehicle applies brakes after a collision, to minimise the risk of a second collision.

**Figure 6** provides a timeline for the implementation of these new tests and assessment protocols.

<sup>13</sup> Regulation (EU) 2019/2144 of the European Parliament and Council of 27 November 2019.



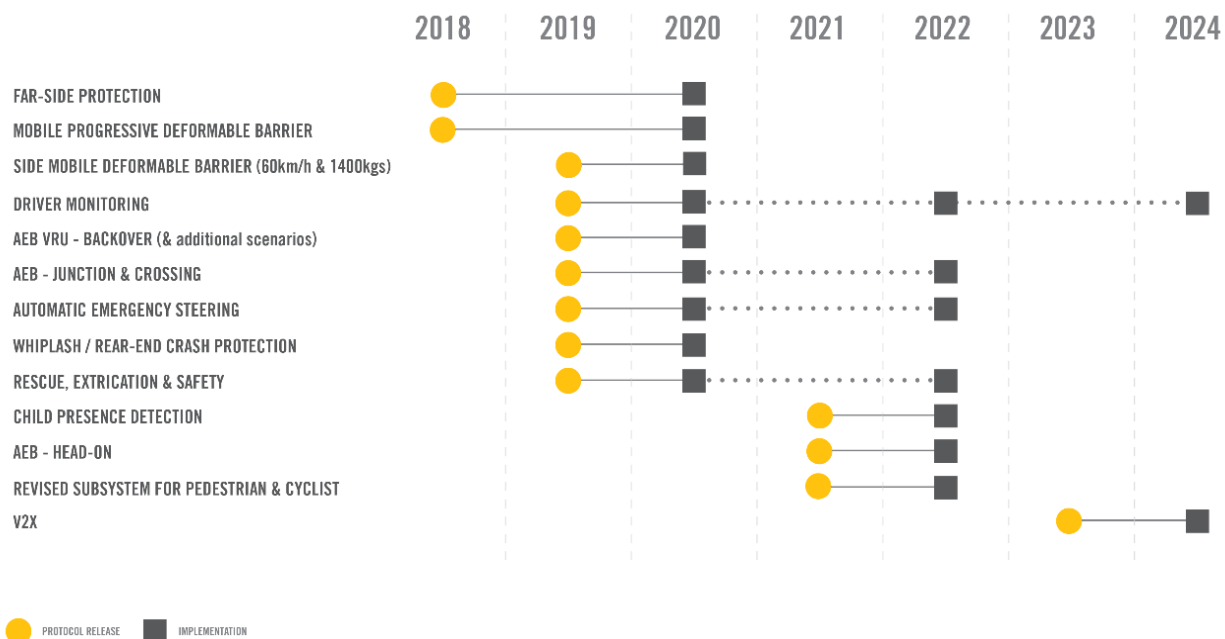


Figure 6 - Implementation timeline for ANCAP testing to 2024

## Recommendation

ANCAP recommends:

- The Australian Government mandate AEB (by adopting the UN Regulation No 152 as an ADR) on all passenger cars, off-road passenger cars and light goods vehicles (ADR categories MA, MB, MC and NA) in a similar timeframe to the European Union.
- The Australian Government participate in any UN Regulation development in this area and introduce requirements in the same timeframe as the EU:
  - Emergency lane keeping and intelligent speed assistance systems for new vehicles from July 2022.
  - Expand the AEB requirement to detect cyclists and other passenger crossing scenarios from July 2024.



### KEY CHALLENGE #3 TOO MANY OLDER VEHICLES

**Challenge:** The average age of the Australian light vehicle fleet is approximately 10 years, yet the average age of vehicles involved in fatalities is increasing.

**Actions:** Advocate for a range of initiatives to reduce the average age of the Australian vehicle fleet to reduce fatalities and serious injuries.

It has been demonstrated that newer vehicles are safer, however, it also needs to be recognised that not all consumers can afford to purchase a new vehicle.

#### Fatal Crashes and Vehicle Age

ANCAP has analysed detailed Australian fatal crash data over the period 2014-2016 supplied by the Bureau of Infrastructure, Transport and Regional Economics (BITRE) National Crash Database. The analysis focuses on the age of passenger vehicles (including SUVs) involved in fatal crashes where the fatality was an occupant of the passenger vehicle.<sup>14</sup>

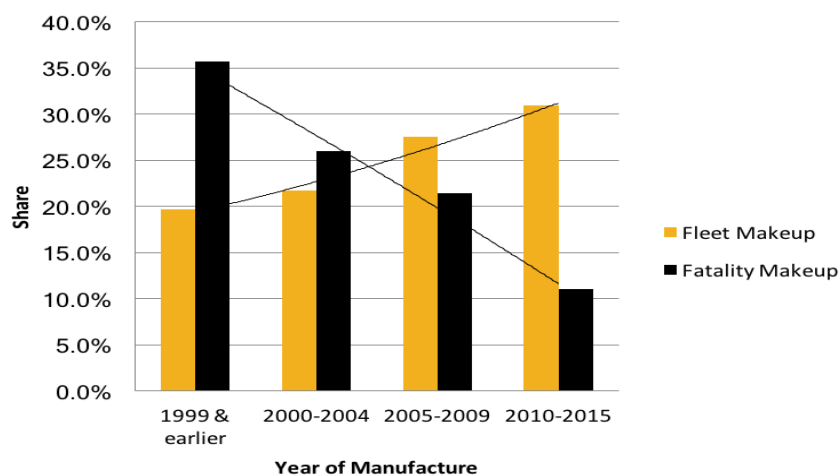


Figure 7 - 2014 Passenger Vehicles: Share of occupant fatalities vs share of registrations

Analysis of the occupant fatalities in light passenger vehicles by vehicle age found that in 2014, vehicles that were 15 years or older (those built in 1999 and earlier) accounted for just 20% of the registered passenger vehicle fleet yet are involved in 36% of fatal crashes. In contrast, newer vehicles (those built 2010-2014) accounted for 31% of the fleet yet were involved in just 11% of fatal crashes. This analysis also found that the average age of passenger vehicles involved in fatal crashes in 2014 was 12.5 years – 2.7 years older than the average age of the registered passenger vehicle fleet.

Analysis of 2015 crash data found that vehicles that were 15 years or older (built in 2000 or earlier) accounted for 20% of the registered passenger vehicle fleet yet were involved in 33% of fatal crashes. Vehicles that were 5 years old or less (built in 2011 or later) accounted for 31% of the registered fleet yet were involved in just 13% of fatal crashes. The average age of vehicles involved in fatalities was 12.9 years – 3.1 years older than the fleet average.

<sup>14</sup> The Age of Light Vehicles Involved in Road Fatalities, J. Smith, Journal of the Australasian College of Road Safety – Vol 29 No.3, 2018

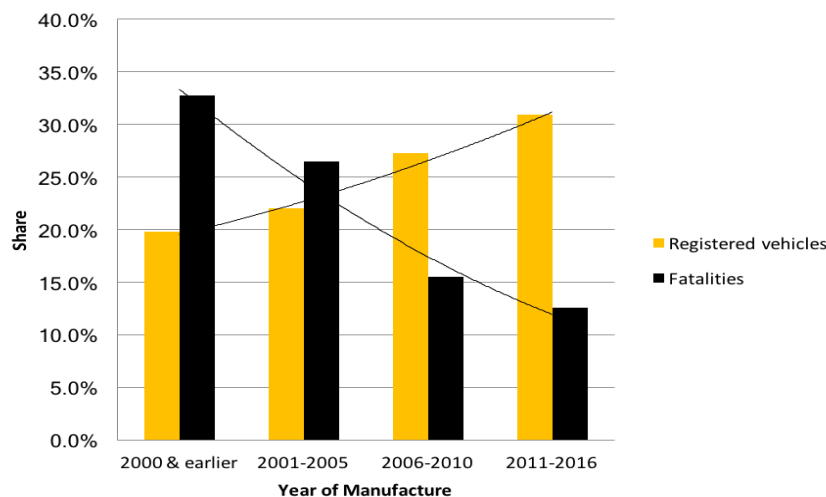


Figure 8 - 2015 Passenger Vehicles: Share of occupant fatalities vs share of registrations

In 2016, the analysis found that vehicles that were 15 years and older (built in 2001 or earlier) represented 20% of the registered passenger vehicle fleet yet were involved in 36% of fatalities. Again, the youngest group of cars aged 5 years or less (built 2012 or later) represented the largest portion of the registered passenger vehicle fleet at 31% yet were involved in the fewest crashes at 12%. The average age of vehicles involved in fatalities was 13.1 years – 3.3 years older than the average age of the registered passenger vehicles.

In comparing the involvement and number of registered vehicles, the 2016 data revealed that the rate of fatal crashes per registered vehicle for the oldest vehicle group (15 years or older) was four times higher than that of the newest vehicles (up to 5 years old).

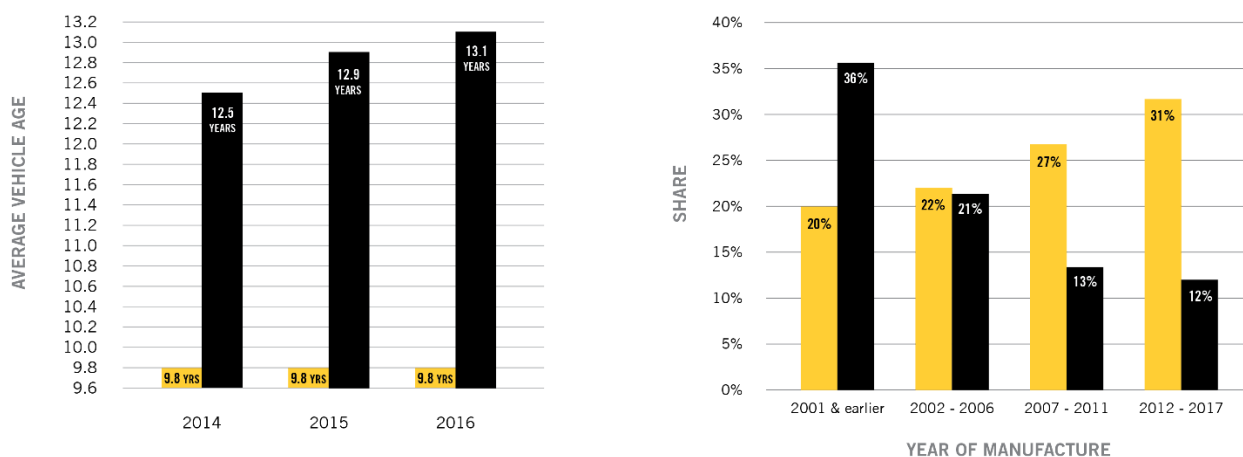


Figure 9 – Fatalities vs. Registered Vehicles

Over the period analysed, the average age of registered passenger vehicles remained constant at 9.8 years. Despite this, the data shows that the average age of passenger vehicles involved in fatal crashes increased from 12.5 years in 2014 to 13.1 in 2016.

It is worth noting that the analysis found that considerably older vehicles, such as the 'classic cars', were not identified as an issue, with vehicles built prior to 1990 accounting for roughly 3% of occupant fatalities. The 2016 data showed that vehicles built over the period 1998-2002 represented the worst age group, accounting for just over a quarter of occupant fatalities passenger vehicles during that year.

## Young Drivers

Research from Transport for NSW found that older occupants and young adult occupants were more likely to be injured in older cars<sup>15</sup>. The research found that the young adult group aged 17-20 years had the highest proportion of fatalities from vehicles aged more than 15 years old. Young drivers (17-25 years old) are over-represented in road injury statistics.<sup>16</sup>

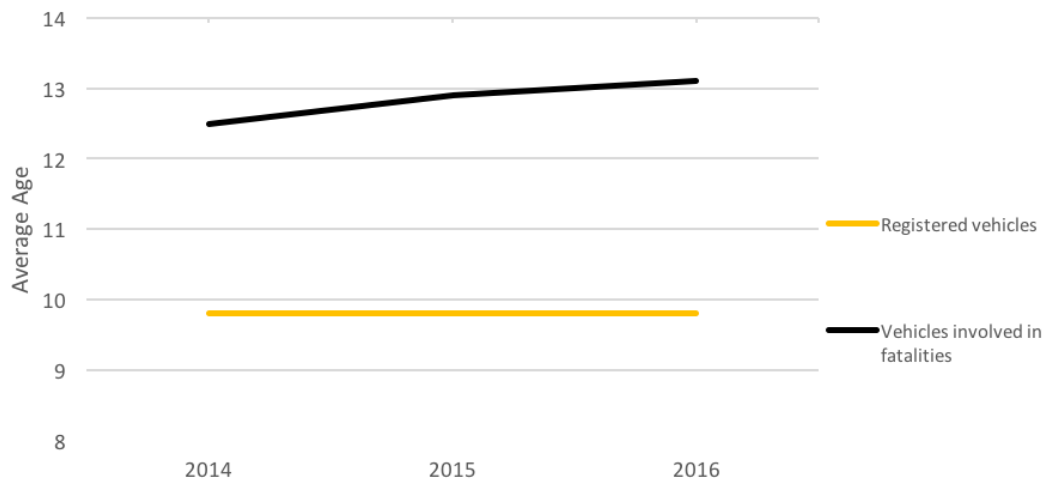


Figure 10 - Average age of registered passenger vehicles vs the average age of passenger vehicles involved in occupant fatalities

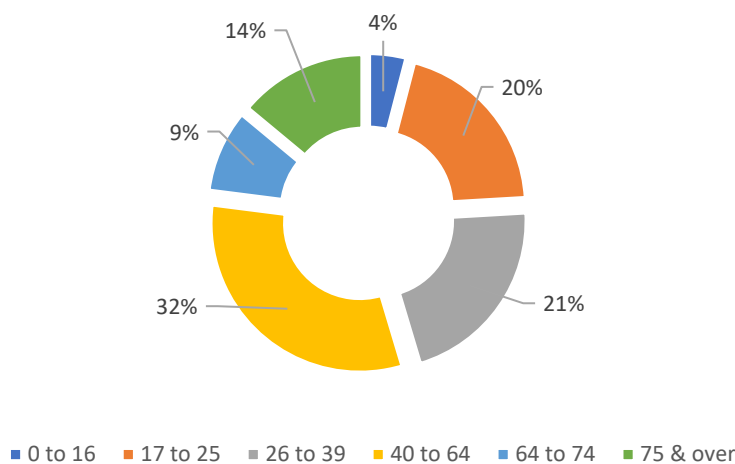


Figure 11 – Road deaths by age group (2019)<sup>17</sup>

## The Australian Vehicle Fleet

The Australian vehicle fleet consists of approximately 19.5 million motor vehicles, with roughly 17 million (91%) of those being passenger vehicles (including SUVs) and light commercial vehicles.

The average age of all vehicles registered in Australia is 10.2 years. The average age of passenger vehicles is 9.9 years old, while light commercial vehicles is 10.5 years old. The average age of both passenger vehicles and light commercial vehicles increased slightly over the past decade from 9.8 and 10.4 years respectively.<sup>18</sup>

This means that once a new vehicle is introduced into the market it is likely to be in-service for 20 years.

<sup>15</sup> Transport for NSW Centre for Road Safety, Vehicle and Technology – Trauma Trends, March 2017.

<sup>16</sup> Australian Government, Department of Infrastructure, Transport, Cities and Regional Development, Statistical Report, Road Trauma Australia 2018 Statistical Summary.

<sup>17</sup> Australian Government, Department of Infrastructure, Transport, Cities and Regional Development, Road Safety Statistics, [www.bitre.gov.au/statistics/safety](http://www.bitre.gov.au/statistics/safety) [accessed 20 January 2020].

<sup>18</sup> Australian Bureau of Statistics (ABS), 9309.0 2019 Motor Vehicle Census, 31 January 2019.

The in-service fleet grows at (around) 2% (between 350,000 and 400,000 units) per year. The new vehicle market is between 1.1 million and 1.2 million units each year. This means that every year around 800,000 (4%) vehicles exit the in-service fleet.

Thirty-nine per cent (39%) of the registered fleet (approximately 7.6 million vehicles) are passenger and light commercial vehicles that are more than 10 years old. These vehicles are unlikely to be fitted with safety features such as electronic stability control (ESC) or side curtain airbags, which are proven safety features that we expect from new vehicles.

Twenty-eight per cent (28%) of the registered fleet (approximately 5.4 million) are passenger and light commercial vehicles that are 5 years old or less. These vehicles are amongst the safest in the fleet and are likely to be fitted with more safety technology including electronic stability control, side curtain airbags and offer high levels of occupant protection.

### **Used Car Safety Ratings (UCSR)**

There are approximately 1 million new car sales per year and between 3 and 4 million used car sales per year. Therefore, around 75% to 80% of Australians purchase a used car rather than a new car.

Prior to 2020, ANCAP has focused on providing consumers with safety information on new vehicles. From 2020, the Used Car Safety Ratings program will be integrated into ANCAP and ANCAP will be able to provide consumers with information on the relative safety for the life of a vehicle (new and used).

The Used Car Safety Ratings are determined through analysis undertaken by Monash University through the support of ANCAP members (government and non-government, including the Australian Government), the NSW State Insurance Regulatory Authority and the NZ Accident Compensation Corporation.

The UCSR are based on fatality and serious injury crash statistics collected from car crashes in Australia and New Zealand between 1990 and 2017. Over eight million police reported crashes were analysed in the latest UCSR.

The UCSR system covers both the role of the vehicle in determining injury outcomes (secondary safety) and the contribution of vehicle design and specification to crash risk (primary safety). Secondary safety includes driver protection (crashworthiness) and protection for other road users (aggressivity).

UCSRs are published using a star rating for driver protection. Driver protection ratings indicate the relative safety of vehicles in preventing severe injury to their own drivers in the event of a crash. The driver protection star rating provides advice on the relative safety of each model against other models within the same market segment, i.e. a small car receiving a 5 star rating provides a higher level of driver protection than a small car receiving a 1, 2 or 3 star rating.<sup>19</sup>

### **What else needs to be done**

All vehicle owners and operators should be encouraged to purchase newer, safer vehicles. This is of particular importance when considering the demographics at greatest risk – young drivers. Access to and the affordability of newer, safer cars can be a precluding factor and ANCAP is calling on governments, vehicle brands, dealerships, insurance companies and financiers to introduce initiatives to assist those most at risk and with the oldest vehicles to update their vehicles to reduce the risk or effects of a crash.

### **Recommendation**

ANCAP recommends the purchase and use of the newest vehicles possible, and calls on key industry stakeholders (governments, insurers, financiers, dealers, vehicle brands) to implement initiatives and offer incentives to assist with the purchase of newer, safer vehicles.

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<sup>19</sup> Monash University, Vehicle Safety Ratings Estimated from Police Reported Crash Data: 2019 (Report No. 338).

#### KEY CHALLENGE #4 AUTOMATED DRIVING IS NOT WELL UNDERSTOOD

**Challenge:** Public interest in automated vehicles and technologies is high, although public understanding of the capabilities of the technology is low and often misunderstood.

**Actions:** ANCAP has a key role to play in providing the research, assessment and education needed to ensure faster and effective uptake of new safety technologies.

#### KEY CHALLENGE #5 CONNECTED & AUTOMATED VEHICLE TECHNOLOGIES & INFRASTRUCTURE WORKING TOGETHER

**Challenge:** Connected and automated vehicle technologies are dependent on the road physical (lines, signs etc.) and digital infrastructure.

**Actions:** Education and advocacy is required with all government and non-government agencies that design, build and maintain roads to ensure vehicle safety technology and infrastructure work together.

#### Connected and Automated Vehicles (CAV)

Vehicle technology continues to evolve, and industry is at the beginning of a significant technology change with the introduction of connected and automated vehicles (CAV).

There are automated vehicle technologies already available in vehicles being delivered to the market that assist with some of the driving tasks (SAE Level 1 systems<sup>20</sup>). These include AEB, LSS, Adaptive Cruise Control (ACC) and Lane Keep Assist (LKA). It is expected that vehicles with even more automated systems will be delivered to the market out to the 2030s and beyond.

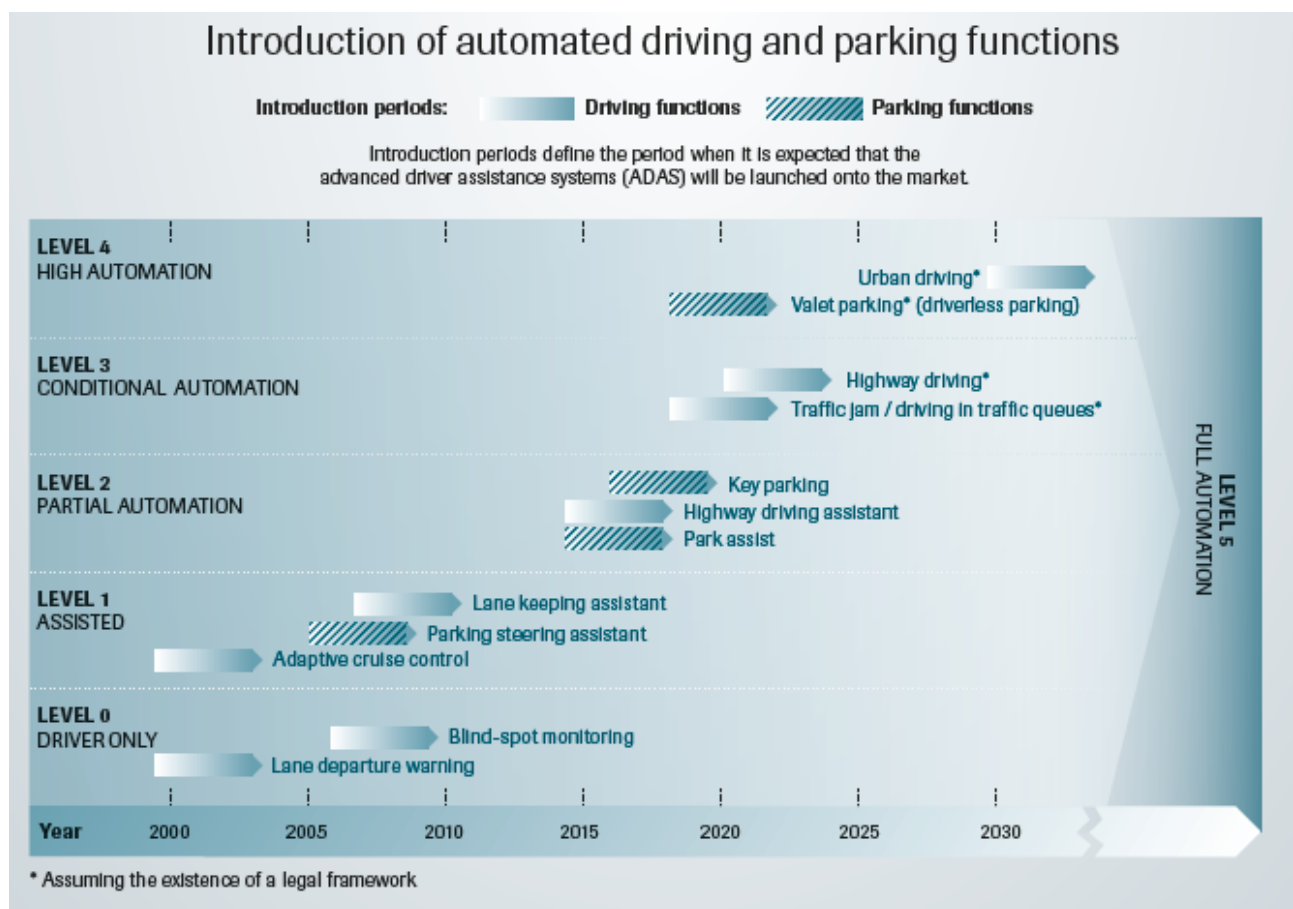


Figure 12 - Timeline for introduction of automated driving and parking functions<sup>21</sup>

<sup>20</sup> See Attachment C CAV infographic for description of SAE Levels.

<sup>21</sup> VDA, Automation – From Driver Assistance Systems to Automated Driving, [www.vda.de/en](http://www.vda.de/en) [accessed 16 September 2019].

Along with increasing levels of automation, vehicles are becoming more connected. There will be many highly automated driving systems (SAE levels 3, 4 or 5) that will require vehicle communications, vehicle to vehicle (V2V), vehicle to infrastructure (V2I) and/or vehicle to other (V2X) communications to deliver the full safety, environmental or community benefit.

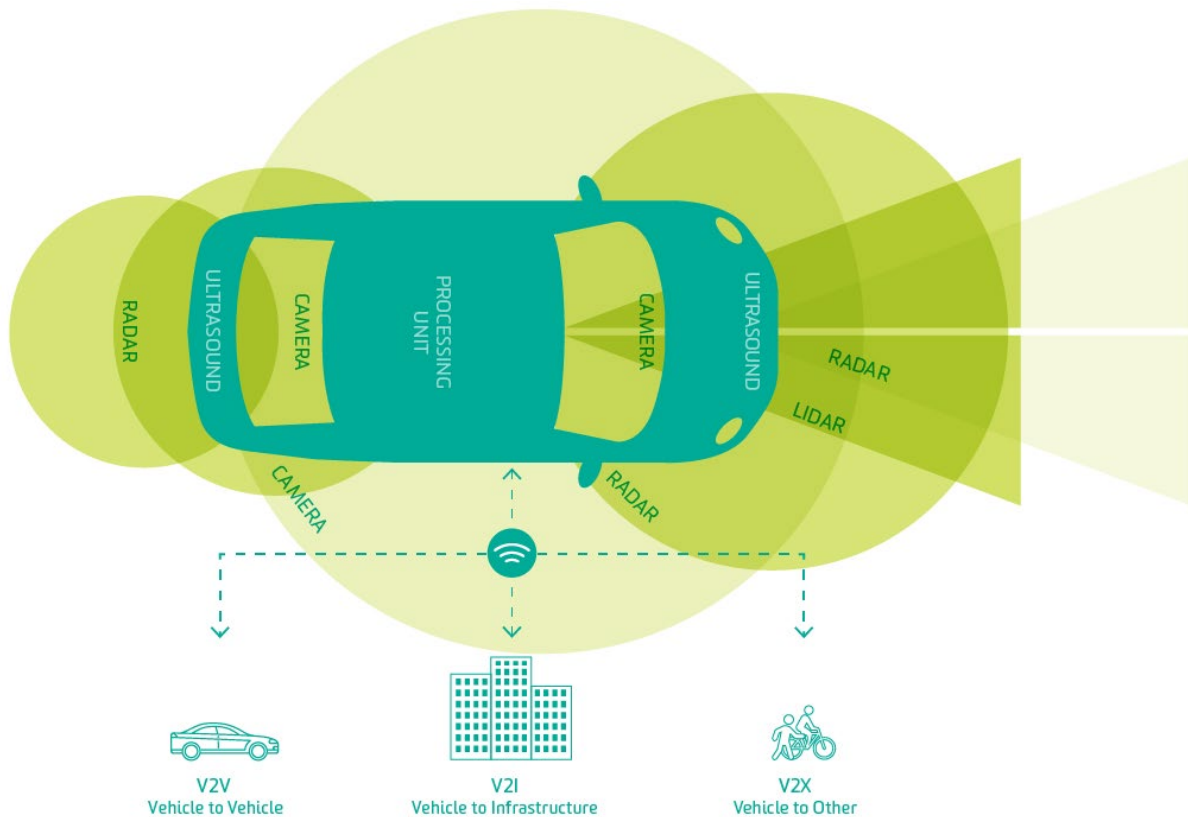


Figure 13 - The Connected Vehicle<sup>22</sup>

### New and Future CAV Technology

Vehicle manufacturers and suppliers are continually developing and introducing new CAV technology. Highlighted through the awarding of a Technology Award as part of a high-profile Car of the Year Awards program in the United Kingdom (January 2020), were vehicles that “are not only innovative by today’s standards but will also establish new platforms for the future.”<sup>23</sup> The safety technologies considered by the award were:

- Subaru ‘Driver Focus’ Driving Monitoring System
- BMW Drive Recorder
- Land Rover Ultra-Wideband radio technology for keyless entry
- Mazda Driver Monitoring (Mazda 3 and CX-30)
- Mercedes-Benz Route-based Speed Adaption
- Volkswagen Car2X communication (VW Golf)

See **Attachment D** for an explanation of each technology.

In the future, a car will have many different CAV technologies and a vehicle may utilise many different technologies (different SAE Level systems) across a single journey.

<sup>22</sup> ARRB, A Roadmap to Automated Vehicles, [www.arrb.com.au/autonomous-vehicles-cav](http://www.arrb.com.au/autonomous-vehicles-cav) [accessed 16 September 2019].

<sup>23</sup> Thatcham Research What Car? Awards 2020, [www.thatcham.org/what-we-do/what-car-awards-2020](http://www.thatcham.org/what-we-do/what-car-awards-2020) [accessed 20 January 2020].

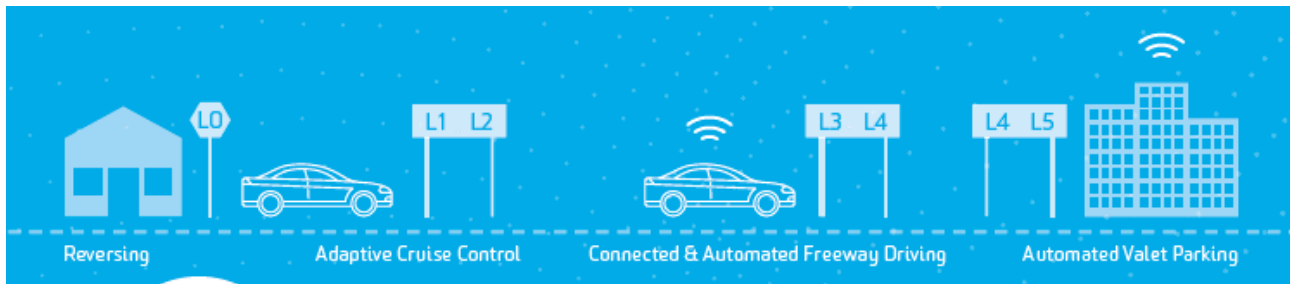


Figure 14 - A CAV may operate across many levels during a single journey<sup>24</sup>

### Community Education Activities

As part of its community education and advocacy role, ANCAP has conducted a number of community engagement activities to promote and explain the availability, function, benefits and limitations of automated driving systems currently available on new vehicles.

'Safety Experience' drive days have been conducted in Adelaide, Melbourne and regional NSW providing fleet operators, the media and general consumers with a first-hand opportunity to safely experience autonomous emergency braking technology. Public displays and media events have also been held in Perth, Sydney, Brisbane, Adelaide and Canberra demonstrating the availability of this technology across a broad range of vehicle price points, brands and market segments.

### National Leadership

The Australian Government has established the Office of Future Transport Technology within the Department of Infrastructure, Transport, Cities and Regional Development whose role is to coordinate the Australian Government's work to prepare for CAV.

The Australian Government has developed a National Policy Framework that outlines the following roles for Government:<sup>25</sup>

- Policy leadership – providing a clear, nationally coordinated approach across different levels of government, being responsive to changes in the technological environment
- Enabling – ensuring that the private sector is able to bring beneficial new technology to market
- Supportive regulatory environment – ensuring that community expectations of safety, security and privacy are appropriately considered in new technology deployments
- Investment – investing in research, development and real-world trials that benefit the entire transport network customer base or provide a sound basis for government decision-making (including collaboration with the private sector).

ANCAP recognises that it has a national leadership role and in recent years has broadened its assessment to include effectiveness testing of automated vehicle technologies including autonomous emergency braking (AEB) and lane support systems (LSS). ANCAP's assessment will continue to expand to include other CAV technology. From 2020 ANCAP will assess driver monitoring systems (DMS) and automated emergency steering (AES). ANCAP has plans to include vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) as part of ANCAP assessments and ratings in coming years.

### What else needs to be done

#### Vehicles

Automated vehicle technology is expected to provide significant safety benefits to the community, governments and the economy. To deliver these benefits throughout a vehicle's life, a national and consistent approach to new vehicle and in-service safety is required.

ANCAP supports a national approach to vehicle safety regulation, both for when vehicles first enter the market, and when in-service. The European Union (EU) has recognised the need to introduce new vehicle regulations for CAV technology. In December 2019 the EU updated to their General Safety Regulation to include specific requirements for CAV (to be introduced from 2022 – see **Attachment B**):<sup>26</sup>

- Systems to replace the driver's control of the vehicle, including signalling, steering, accelerating and braking;
- Systems to provide the vehicle with real-time information on the state of the vehicle and surrounding area;
- Driver availability monitoring systems;
- Event data recorders for automated vehicles;
- Harmonised format for the exchange of data between vehicles;
- Systems to provide safety information to other road users.

<sup>24</sup> ARRB, A Roadmap to Automated Vehicles, [www.arrb.com.au/autonomous-vehicles-cav](http://www.arrb.com.au/autonomous-vehicles-cav) [accessed 16 September 2019].

<sup>25</sup> The Office of Future Transport Technology, [www.infrastructure.gov.au](http://www.infrastructure.gov.au) [accessed 17 January 2020].

<sup>26</sup> Regulation (EU) 2019/2144 of the European Parliament and Council of 27 November 2019.



Consistent national vehicle standards (i.e. ADRs), harmonised with international standards (UN Regulations), set the minimum benchmark for the introduction of new vehicles and new vehicle safety technology into Australia. Any unique Australian standards, at either a national or individual state/territory level will either delay the introduction of new vehicle safety technology or increase the cost of the technology.

#### Infrastructure

Some of the automated vehicle technologies already in service rely on infrastructure for their effective function. For example, lane support systems need to be able to “read” the lane marking to assist with keeping the vehicle within the intended lane.

To deliver the community benefits from the higher levels (Levels 3 & 4) of connected and automated vehicle (CAV) systems, high quality physical and digital road infrastructure is required.

Austrroads, under their *Future Vehicles and Technology* program<sup>27</sup>, are identifying the infrastructure standards required and undertaking audits of the current road infrastructure.

Infrastructure owners and funders need to plan for the assessment, maintenance and upgrade (where necessary) of Australia’s physical and digital road infrastructure to facilitate effective operation of CAV.

#### Recommendation

ANCAP recommends:

- The Australian Government participate in development of UN Regulations for CAV and introduce as ADRs in same/similar timeframe to the EU.
- The Australian Government continue to provide national leadership and coordinate activities of the various government (both state and federal) agencies.
- Funding be specifically allocated to upgrade road physical and digital infrastructure to facilitate the introduction of CAV.

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<sup>27</sup> Austrroads, Future vehicles and technology program, [www.austrroads.com.au](http://www.austrroads.com.au) [accessed 20 January 2020].

## KEY CHALLENGE #6

### VEHICLE OWNERSHIP AND USE PATTERNS ARE CHANGING

**Challenge:** The rise of the sharing economy has seen the introduction and growth of mobility service providers such as car-share and ride-share schemes.

**Actions:** There are new audiences for the vehicle safety message such as mobility service providers, new fleets and the users of these services.

The introduction and growth of mobility services including car-share and ride-share, along with changes in vehicle ownership and use, such as declining vehicle ownership among young people, will see ongoing change in vehicle ownership and use.

In the development of their *Advice on Automated and Zero Emissions Vehicles Infrastructure*<sup>28</sup>, Infrastructure Victoria concluded there would be a mix of ownership models. While ride-share and car-share would continue to grow, the current ownership models of private owners and business/commercial fleets would continue.

#### Safe Vehicle Choices for Business and Fleets

In 2019, 54% of all new light vehicles were purchased by businesses, governments or rental fleets.<sup>29</sup> As such, business, commercial and government fleet purchases have a significant influence on vehicle safety.

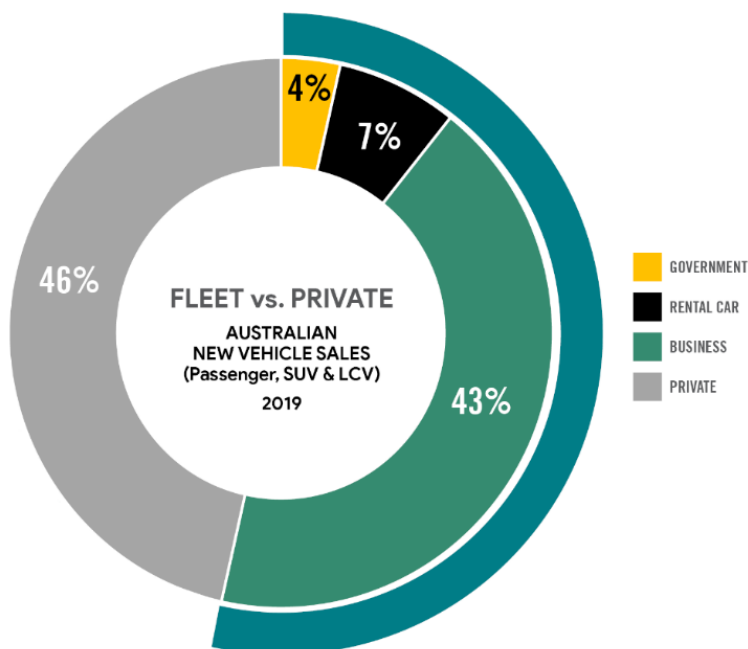


Figure 15 - Vehicle sales by buyer type (2019)

Vehicle use is a significant contributor to work-related injury with around 30% of all work-related injuries involving a vehicle. This is the number one contributor to work related injuries.<sup>30</sup>

To assist, businesses, commercial and government fleets, ANCAP has developed a guide on choosing a safe vehicle. ANCAP recommends that fleets and commercial buyers choose vehicles that hold a maximum 5 star rating with a datestamp of no more than three (3) years old. This will ensure vehicle purchases dynamically include the most up-to-date safety features as assessed under ANCAP's independent rating program.

<sup>28</sup> Infrastructure Victoria, *Advice on Automated and Zero Emissions Vehicles Infrastructure*, October 2018.

<sup>29</sup> VFACTS 2019.

<sup>30</sup> Austroads, *Vehicles as a Workplace: Work Health and Safety Guide*, March 2019.

## Australian Government Fleet Vehicle Selection Policy

The Australian Government's Department of Finance Fleet Vehicle Selection Policy<sup>31</sup> includes:

*When selecting vehicles within the Australian Government Fleet, procurement officials must ensure that the vehicle:*

- 1. Has a five star ANCAP rating;*
- 2. Meets the minimum fit for purpose requirements;*
- 3. Provides value for money; and*
- 4. Addresses environmental considerations.*

ANCAP welcomes the inclusion of the 5 star ANCAP rating requirement within this and other vehicle purchasing and use policies. However, ANCAP recommends that these policies are updated to include "with a datestamp of no more than three (3) years old" to ensure vehicles with the most recent safety features assessed by ANCAP are included.

The Australian Government provides vehicles to its senior executives via the Executive Vehicle Scheme and also to Members of Parliament and Senators. The Fleet Vehicle Selection Policy does not currently apply to these vehicles.

### Grey Fleet

The term 'grey fleet' refers to privately-owned vehicles that are used for business travel. This includes those used through novated leases, or where the company reimburses the employee for work-related vehicle expenses, or where the employee uses their car and claim work-related costs as deductions for income tax purposes.

ANCAP member organisation, the NRMA advises that a vehicle is treated as a 'place of work' when driven for work purposes, regardless of who owns it under various Australian Workplace Health & Safety-related Acts (see following extract from the Commonwealth Work Health and Safety Act 2011), and this places a duty on organisations to ensure that vehicles used for work, whether supplied by the company or privately owned are safe.<sup>32</sup>

*Commonwealth Work Health and Safety Act 2011,*

#### *8 Meaning of workplace*

*(1) A workplace is a place where work is carried out for a business or undertaking and includes any place where a worker goes, or is likely to be, while at work.*

*(2) In this section, place includes:*

- (a) a vehicle, vessel, aircraft or other mobile structure; and*
- (b) any waters and any installation on land, on the bed of any waters or floating on any waters.*

There should be no distinction between safety for company-supplied vehicles and the grey fleet.

### Safe Vehicle Choices for Uber and Other Ride-Share Operators

From 1 October 2019, Uber introduced a policy that requires all drivers who sign up to the Uber Australia ride-share platform to drive a vehicle with a 5 star ANCAP safety rating. This policy is likely to see significant safety benefits both for Uber drivers, their passengers and other road users.

Other ride-share operators have safe driving policies and promote safe and responsible driving by their operators. However, to date, Uber are the only ride-share company that have adopted a 5 star ANCAP safety rating requirement.

### ANCAP Recommendations for Fleet Purchasing and Use

ANCAP recommends that all commercial users, governments and business develop and implement policies that cover traditional employer-owned fleets as well as the grey fleet.

ANCAP recommends fleets and commercial users purchase vehicles which hold a maximum 5 star ANCAP safety rating with a "TESTED" datestamp of no more than three (3) years old. The datestamp is a key element of each vehicle rated by ANCAP as it identifies the year requirements against which a model was tested. Purchasing 5 star vehicles with the most current datestamp possible will ensure vehicles have the most up-to-date safety features assessed by ANCAP.

Many businesses keep their vehicles for three (3) years while a private owner may keep their vehicle for up to five (5) years. There needs to be a balance between providing the latest vehicle safety technology against ensuring a return on the cost of a new vehicle. Therefore, ANCAP recommends that any vehicle used for work purposes (company owned/leased, or privately owned/leased) should hold a 5 star ANCAP rating with a datestamp of no more than six (6) years old.

<sup>31</sup> Australian Government, Department of Finance, Fleet Vehicle Selection Policy, [www.finance.gov.au](http://www.finance.gov.au) [accessed 3 January 2020].

<sup>32</sup> NRMA, Grey Fleets, [www.mynrma.com.au/business/news/grey-fleets](http://www.mynrma.com.au/business/news/grey-fleets) [accessed 17 January 2020].

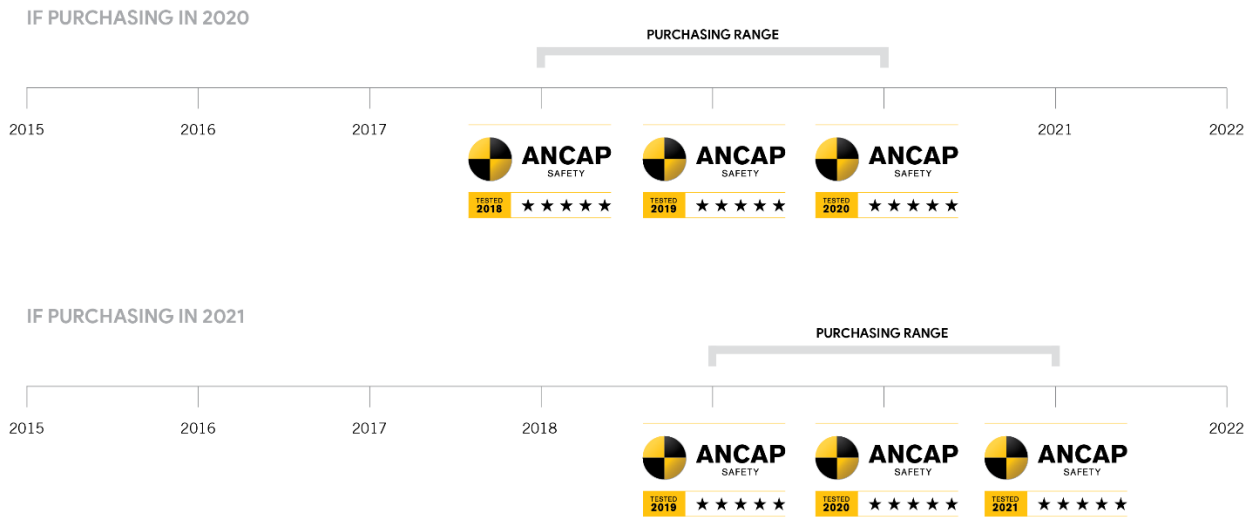


Figure 16 - ANCAP Vehicle Purchasing Guide

### What else needs to be done

Many businesses and governments either provide vehicles directly to employees as part of their salary package or allow employees to purchase a vehicle through a novated lease and salary sacrifice arrangement. Both of these avenues allow employees access to modern vehicles at a lower cost than a direct purchase.

These vehicles are often used by employees for work purposes (i.e. grey fleet) and therefore the employer has a workplace health and safety obligation.

Leadership by governments (Commonwealth, State and Territory) is required to introduce and establish vehicle purchasing and use policies.

### Recommendation

ANCAP recommends:

- The Australian Government maintains its current fleet purchasing policy and continues to purchase light vehicles with a 5 star ANCAP rating.
- The Australian Government demonstrate leadership in the area of 'grey fleets' and introduce a purchase and use policy that aligns with their policy for fleet purchasing:
  - Vehicles purchased under a salary sacrifice arrangement must have a 5 star ANCAP rating with a datestamp no older than three (3) years.
  - Vehicles used for work-related purposes must have a 5 star ANCAP safety rating with a datestamp no older than six (6) years.
- Ride-share and car-share organisations be encouraged to introduce policies that require all their operators to drive a vehicle with a 5 star ANCAP safety rating with a datestamp no older than six (6) years.

## SUMMARY AND RECOMMENDATIONS

ANCAP works within the *Safe Systems* approach to road safety. The *Safe Systems* approach recognises that people make mistakes and there are physical limits to the amount of force that our bodies can take. Actions targeted to achieve safe roads, safe vehicles and safe people can work together to achieve this aim.

As Australasia's leading independent vehicle safety advocate, ANCAP has been successful in driving improvements in vehicle safety in Australia for more than 25 years - successfully fulfilling the *Safer Vehicles* pillar through its technical testing & assessment and consumer communications & advocacy activities.

More than 740 vehicle models hold a current ANCAP safety rating with 95 per cent of all new light vehicles sold in 2019 covered by an ANCAP safety rating. This high level of market penetration, combined with high levels of consumer awareness, positions ANCAP to hold a unique ability to accelerate the provision and market uptake of new vehicle safety features and technologies.

ANCAP's independent testing provides consumers with an independent assessment of vehicle safety and to validate manufacturer claims of functionality and safety performance to established protocols covering both the Australasian and European markets. In parallel, ANCAP continues its work to encourage industry development, performance and market supply of these new and emerging vehicle safety technologies to increasingly stringent thresholds.

ANCAP complements regulation, with the ability to encourage the fitting of new safety features and technologies ahead of any regulatory requirement. Through rewarding vehicle brands and educating consumers, ANCAP is able to encourage the early adoption of new safety systems that exceed any minimum regulatory standard. It is important that ANCAP exists in parallel to regulation, as influencing consumer choice to drive market uptake will influence vehicle brands decisions quicker than the regulatory process.

The Australian Government has been an important member of ANCAP since 2009 providing significant benefit to the Australian community in our collective goal to eliminate road trauma.

## KEY POINTS

ANCAP presents the following key points for consideration by the Joint Select Committee on Road Safety:


1. ANCAP is complementary to regulation and it is important that ANCAP continues to exist in parallel to regulation.
2. Australia should mandate new vehicle safety technology such as AEB and LKA in the same timeframe as the European Union.
3. Newer cars are safer, and the most at-risk drivers should be encouraged to purchase newer vehicles.
4. The Australian Government must continue to provide national leadership and coordinate activities and infrastructure investment to facilitate the effective introduction of CAV technologies.
5. The Australian Government must demonstrate leadership and extend the 5 star ANCAP safety rating requirements in its current vehicle fleet purchasing and use policies to the 'grey fleet'.

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## ATTACHMENTS

- ATTACHMENT A:** ANCAP and ADRs – Why both are needed  
**ATTACHMENT B:** Summary of European Union General Safety Regulation  
**ATTACHMENT C:** CAV Infographic  
**ATTACHMENT D:** What Car? Technology Award 2020

ATTACHMENT A



# ANCAP and ADRs

## Why both are needed

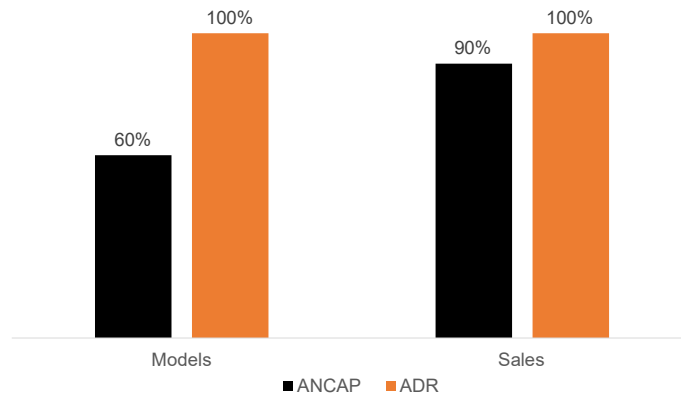
CANBERRA  
19 November 2019

1

ANCAP	ADR
Safety only	Safety, environmental and theft
Relative measure: 0 to 5 stars	Pass/fail criteria
Measures how far above the minimum (regulation) standard	Sets minimum standard
Alignment with Euro NCAP	Harmonised with international (UN) Regs (and accept EU, US, Japan Regs)
Agile & flexible: able to keep pushing safety and introduce test before ADR	Government regulation constraints (i.e. BCR requirements)
Cannot cover all vehicles (models & variants)	All vehicles must comply

2

## Coverage of light vehicles



3

## ADRs – light vehicles



4



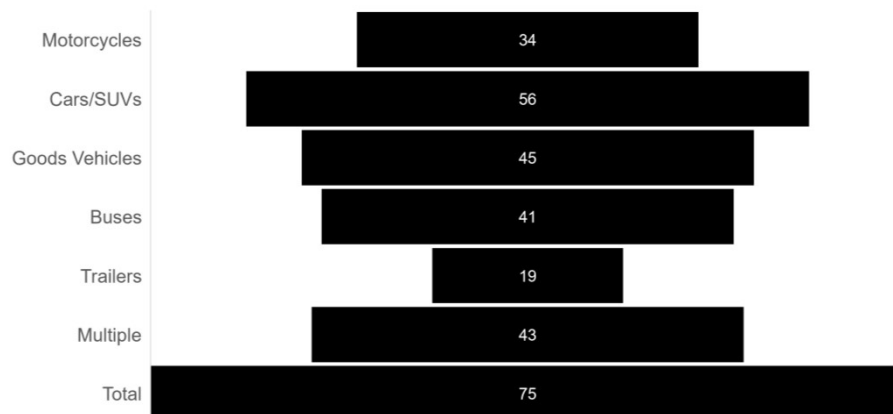
## Coverage – vehicle types



Vehicle type	ANCAP	ADR
Motorcycles	✗	✓
Passenger cars	✓	✓
SUVs	✓	✓
LCVs	✓	✓
Buses	✗	✓
Trucks (goods vehicles)	✗	✓
Trailers	✗	✓

5

## ADRs – total number

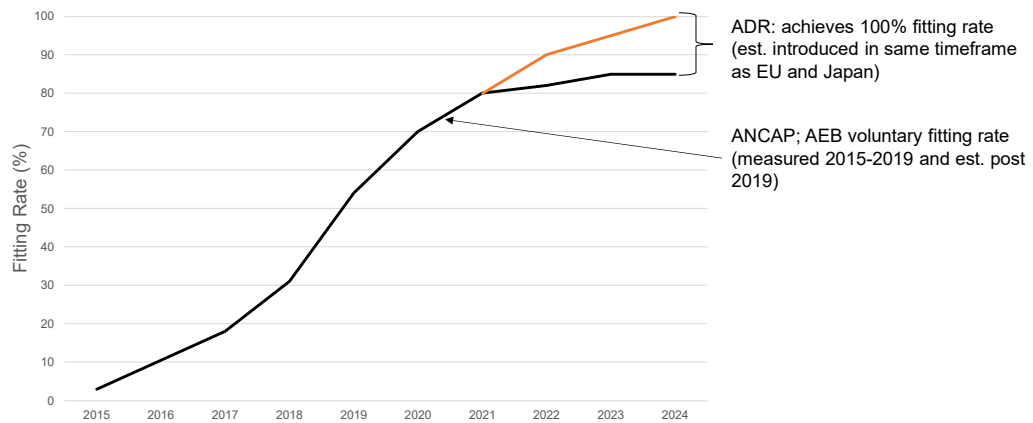


6

## Case Study: AEB



ANCAP and ADR working together to achieve 100% fitting rate



**ATTACHMENT B****SUMMARY OF EUROPEAN UNION GENERAL SAFETY REGULATION**

The following table provides a summary of the recent European Union General Safety Regulation (EU GSR) as it applies to passenger cars, SUVs and light commercial vehicles (LCVs) <sup>1</sup> along with the status of similar technologies in both ANCAP assessments and in Australian Regulation (e.g. if mandated via an ADR).

EU GSR		ANCAP STATUS	AUSTRALIAN REGULATION/ADR STATUS
Mandated from: 6 July 2022 (new approvals) 7 July 2024 (all registrations)	AEBS (UN R152) capable of detecting moving vehicles and stationary objects	Included in ANCAP AEB ratings from 2018	Consideration for mandating AEB included in National Road Safety Action Plan 2018-2020. RIS process for light vehicles yet to start.
	Full width barrier test (UN R137)	Included in ANCAP ratings from 2018	Accepted as alternative to ADR 69/00. Consideration to mandate (to replace ADR 69/00) included in 2018-2020 National Road Safety Action Plan.
	Pole side impact (UN R135)	Included in ANCAP ratings from 2018	Mandated as ADR 85/00 from: 1 Nov 2017 (new models) 1 Nov 2021 (all vehicles)
	Emergency lane keeping	Lane Support Systems included in ANCAP ratings from 2018	National Road Safety Action Plan 2018-2020 action to "Influence industry to apply" new safety technologies.
	Intelligent speed assistance (ISA) systems (advisory system)	Speed Limit Information Function (SLIF) (advisory system) and Speed Control Function (SCF) included in ANCAP ratings from 2018	National Road Safety Action Plan 2018-2020 action to "Influence industry to apply" new safety technologies.
	Alcohol interlocks	NOT ASSESSED	UNKNOWN
	Driver drowsiness and attention detection systems	Driver monitoring included in ANCAP ratings from 2020	NTC and Qld TMR projects to address driver distraction.
	Event data recorders	NOT ASSESSED	UNKNOWN
	Protection against cyber attacks	Standards and regulation development being monitored by ANCAP and Euro NCAP	Australian government participating in relevant WP. 29 working groups. Not included in NTC automated vehicle program.
	Systems for automated vehicles	Standards and regulation development being monitored by ANCAP and Euro NCAP	Australian government participating in relevant WP. 29 working groups. Not included in NTC automated vehicle program.
Mandated from: 7 July 2024 (new approvals) 7 July 2026 (all registrations)	Enlarged pedestrian protection head impact zone	Included in ANCAP ratings from 2008	Australian Government does not plan to propose mandating pedestrian protection (including current UN R127).
	AEBS capable of detecting pedestrians and cyclists	Included in ANCAP ratings from 2018	Australian Government participating in relevant WP. 29 working groups.
	Advanced driver distraction recognition systems	Under consideration by ANCAP and Euro NCAP for inclusion in post 2022	UNKNOWN

<sup>1</sup> Regulation (EU) 2019/2144 of the European Parliament and Council of 27 November 2019.



## LEVEL ZERO DRIVER

Standard cruise control  
& audible warnings may  
be present



L0

## LEVEL ONE FEET OFF

Either steering  
or acceleration  
can be  
automated



L1

## LEVEL TWO HANDS OFF

Both steering &  
acceleration can  
be automated.  
System will  
require human  
input in certain  
situations, e.g.  
automatic lane  
changing



L2

## LEVEL THREE EYES OFF

Both steering &  
acceleration can  
be automated.  
System will  
request human  
input if  
necessary



L3

## LEVEL FOUR MIND OFF

Driverless  
within  
prescribed  
environments  
but requests  
input in  
unexpected  
circumstances



L4

## LEVEL FIVE DRIVERLESS

Completely  
driverless.  
Vehicle does  
not need human  
input; it can  
problem solve



L5

<2000s

2000s

2010s

2020s

2030s

2040s

### LEVELS OF AUTOMATION

# A ROADMAP TO AUTOMATED VEHICLES (AV)

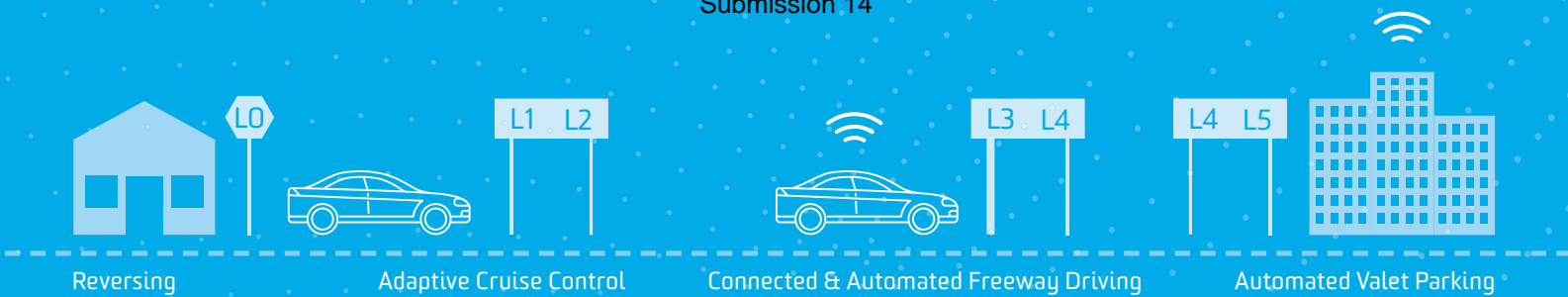
AVs represent a major technological advancement in the transport sector. Over the next four decades, this technology will influence and shape our future mobility and be instrumental in improving our quality of life.

AVs are being developed by major automotive brands all across the world, and vehicles with lower levels of automation are already driving on our roads. As the technology advances over the coming years, more and more of the actual control of the vehicle will transfer from the driver to the vehicle itself.

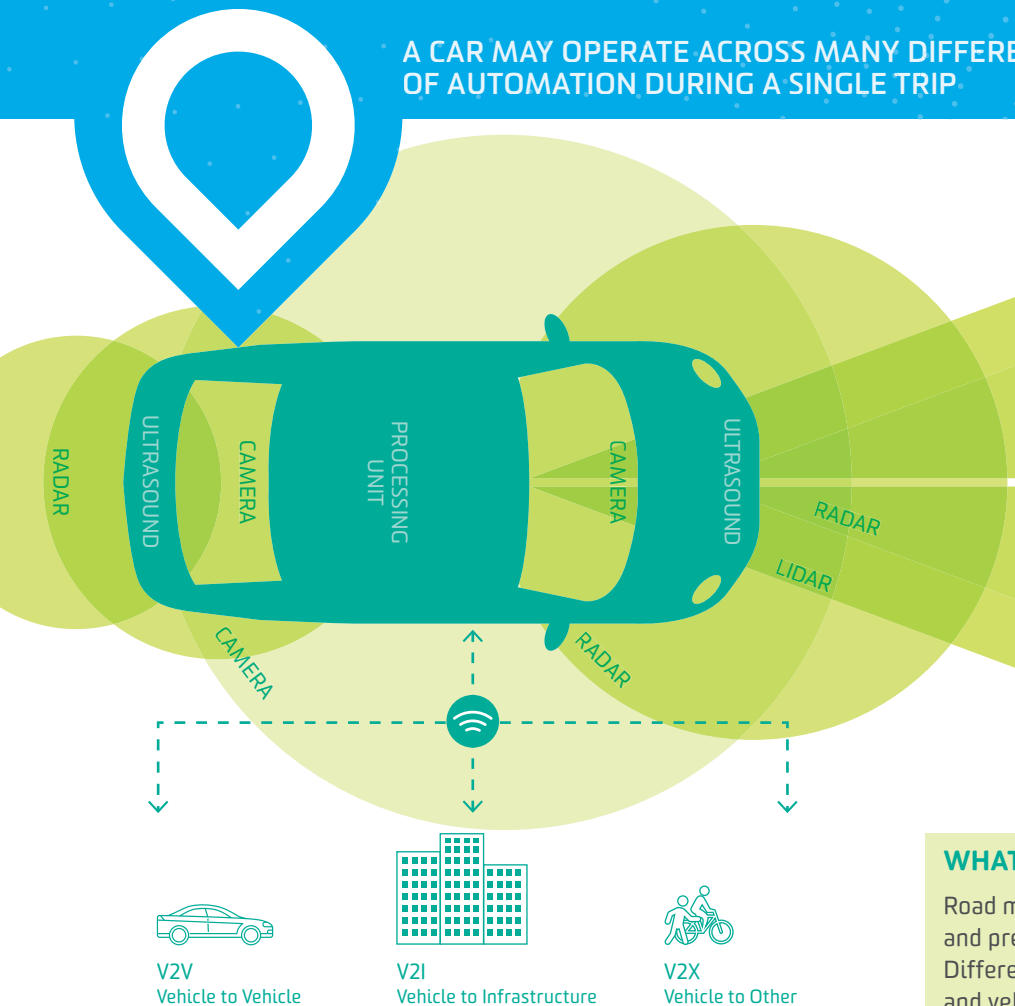
The main benefits of AVs include increased safety, reduced driver fatigue, improved fuel efficiency and lower emissions which in turn reduce pollution and offer health and environmental benefits to the community.

As technology develops, these vehicle will also be able to connect to their environment and other road users — increase in connectivity; they will become Connected & Automated Vehicles (CAVs)

For more information please visit  
[arrb.com.au/autonomous-vehicles](http://arrb.com.au/autonomous-vehicles)  
or email us at [info@fcai.com.au](mailto:info@fcai.com.au)



## A CAR MAY OPERATE ACROSS MANY DIFFERENT LEVELS OF AUTOMATION DURING A SINGLE TRIP



### FEATURES

Sensors are combined to operate as a single unit to produce automated functionality via a processing unit.

#### RADAR

Powerful radio waves used to detect long-range objects

#### CAMERAS

Optically captures objects

#### LIDAR

Light Radar uses short range optical light to detect objects

#### ULTRASOUND

Uses soundwaves to produce images

### WHAT NEEDS TO BE DONE

Road markings and signage need to be updated and prepared to accommodate the new technology. Different Communication networks like 4G/5G and vehicle to infrastructure (V2I) need to be established. The Australian Road Rules also need to adapt to encapsulate this new era of driving and more emphasis needs to be put on Cyber Security and Privacy.

### COMMUNICATION STRUCTURES ENABLE V2V, V2I & V2X

Using a combination of networks and technology, CAVs are able to connect with their wider environment, communicating V2V, V2I and V2X.

### BENEFITS



#### SUPPORTS THE ENVIRONMENT

Decreasing congestion reduces travel time and means vehicles aren't idling for long periods of time, which means less fuel used and lower emissions.



#### IMPROVES SAFETY

AVs are always monitoring and scanning their environment; they give human drivers an additional set of senses. This makes long distance driving and sitting in traffic easier by taking control of most driving functions, thereby reducing fatigue.



#### EASES CONGESTION

Using vehicle sensors and V2I technology assists with congestion by providing a smoother traffic flow and reduced driver reaction time.

## **ATTACHMENT D**

### **What Car? Technology Award 2020**

#### **SUBARU FORESTER DRIVERFOCUS**

Subaru's 'DriverFocus' Driver Monitoring System (DMS) has been named as the winner of the 2020 What Car? Car of the Year Technology Award, ensuring driver vigilance remains centre stage at a time when automated technology is changing the relationship between motorists and their vehicles. Subaru's DriverFocus system features a dashboard-mounted camera and infrared sensor which uses facial recognition software to monitor eye movements while driving. The system detects if the driver tries to use their mobile device, if their gaze is wandering, or if they are falling asleep. It sounds a warning alert which gets louder the longer the situation endures.

#### **BMW DRIVE RECORDER**

Runner up for the Thatcham Research-sponsored What Car? Technology Award is the BMW Drive Recorder. It uses integrated cameras to record video footage from different points around the vehicle, before saving them for USB export or later viewing on the control display. In the event of a collision, footage of the 20 seconds leading up to impact – and the 20 seconds after it – is saved automatically, providing video evidence of the incident.

#### **LAND ROVER'S ULTRA-WIDEBAND RADIO TECHNOLOGY FOR KEYLESS ENTRY**

Land Rover's ultra-wideband radio technology is employed on its keyless entry system. The technology, currently featured on its Discovery model, employs ultra-wideband (UWB) technology to counter the threat of relay attacks. Keyless-car thieves can use digital devices to relay signals from car to key fob, tricking the vehicle into thinking it is in close proximity. UWB tech uses a wide range of frequencies to transmit the codes needed to unlock the doors and start engine, giving thieves little chance to lock onto the signal and fool the vehicle.

#### **MAZDA DRIVER MONITORING ON MAZDA 3 AND CX-30**

Part of the wider I-ACTIVSENSE array of safety technology, uses infrared camera and LED technology to monitor the driver's eye width, blink rate, and facial expressions to determine levels of drowsiness and fatigue. Also monitors the driver's line of sight and eye movements to assess whether they are paying attention to the road. Driver Monitoring sounds a warning alert if the situation becomes dangerous and will activate automated features such as braking to address the problem.

#### **MERCEDES-BENZ ROUTE-BASED SPEED ADAPTATION ON VARIOUS MODELS**

Uses map data to anticipate bends, roundabouts and junctions by slowing the vehicle to appropriate speeds. Once navigated, the vehicle accelerates back up to speeds pre-set by the driver. Integration with Active Distance Assist maintains a safe distance from vehicles in front.

#### **VOLKSWAGEN CAR2X COMMUNICATION ON GOLF 8**

Exchanges road data with all Car2X-equipped vehicles within 800 metres, irrespective of make and model. Combines with information from road infrastructure, such as traffic lights, to warn drivers of upcoming hazards and give current traffic updates.

#### **VOLKSWAGEN EMERGENCY ASSIST ON VOLKSWAGEN ARTEON**

Integrates Adaptive Cruise Control, Side Assist, Lane Assist and Park Assist functions to bring the car safely to a standstill in the event of driver blackout. Before taking action, Emergency Assist attempts to rouse the driver with brake jolts, steering jerks and by sounding an alarm.