FCAI Submission to House of Representative’s inquiry into the social issues relating to land-based driverless vehicles in Australia

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EXECUTIVE SUMMARY

The FCAI welcomes the opportunity to respond to the House of Representatives Standing Committee on Industry, Innovation, Science and Resources' inquiry into the social issues relating to land-based driverless vehicles in Australia.

The FCAI is the peak industry organisation representing vehicle manufacturers and importers of passenger motor vehicles, SUVs, light commercial vehicles and motor cycles in Australia.
The FCAI and member companies recognise the potential of connected and automated vehicles (CAV) to provide significant safety, environmental and social benefits to Australia through reductions in crashes, reduced congestion and increased mobility.

This submission will focus on the key technical and regulatory issues that need to be addressed to facilitate the large-scale introduction of connected and automated vehicles. New light vehicles (passenger cars, SUVs and LCVs) being introduced into Australia are being fitted with increasing levels of automation, and models introduced from late 2017/early 2018 are expected to be equipped for connectivity (i.e. V2V and V2I communications).

Australia's annual sales of new vehicles are less than 1.5 per cent of global production. As a small market and a taker of technology from around the world, Australia is not in a position to develop its own set of unique standards. To deliver the social and environmental benefits from connected and automated vehicles, in the same timeframe as major overseas markets, it is important that Australia harmonise with key, relevant overseas markets' vehicle technical and operation standards.

In 2016, the FCAI and member companies strongly supported the Australian Communications and Media Authority's (ACMA) proposed regulatory arrangements to support the introduction of connected and automated vehicles in Australia by harmonizing with the European spectrum and standards.

This is a significant and positive step towards a connected and automated vehicle system in Australia. However, there remains a risk to delivering the full benefits of connected and automated vehicles, and/or interference with other radiocommunications activities, if vehicles produced for either the US or Japanese domestic markets are introduced into Australia.

An appropriate regulatory system is required to ensure vehicles that are fitted with CAV technology entering into service in Australia are able to comply with the relevant Australian regulatory standards, and as such are inter-operable with Australia's CAV system. The most appropriate method is to use the existing vehicle regulation and certification system administered by the Federal Government's Department of Infrastructure and Regional Development (DIRD).

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1.0 INTRODUCTION

The Federal Chamber of Automotive Industries (FCAI) is the peak industry organisation representing the vehicle manufacturers and importers of passenger vehicles, light commercial vehicles and motorcycles in Australia.

The FCAI member companies recognise the potential for automated and connected vehicles to provide significant safety and environmental benefits to Australia through reductions in motor vehicle accidents (including accidents with other vehicles, pedestrians and cyclists) along with reduced congestion. Appendix B outlines in more details the current opportunities and challenges of introducing more automated and connected vehicles into Australia.

New light vehicles (passenger cars, SUVs and LCVs) being introduced into Australia today are being fitted with increasing levels of automation, and models introduced from late 2017 or early 2018 are expected to include features that will facilitate connectivity – vehicle to vehicle (V2V) and vehicle to infrastructure (V2I) communications. This is an important initial step towards fully autonomous, or "driverless" vehicles.

This group of technologies is collectively referred to as connected and automated vehicles (CAV), and offer fundamental, long term economic benefits and mobility solutions, as well as also lead to environmental benefits. CAV also offers the prospect to improve road safety during the transport of people and freight by providing an important tool to assist with reducing urban congestion.

Implementation of CAV will provide benefits in terms of:

- Reduced traffic accidents with reductions in injuries and fatalities.
- Reduced traffic congestion.
- Reduction in energy consumption in road transport (leading to a reduction in CO_2 and pollutant emissions).
- Reduced transport costs with economic benefits.
- Maximise the use of the existing road infrastructure and substantially reduce the investment required for additional infrastructure.
- Improved inter-modal transport with reduction in transport costs and traveler benefits.
- Improved connectivity options with public transport and parking.

To facilitate the introduction of automated and connected vehicles, it is important that Australia harmonise with a relevant overseas market's technical and operational standards. In this case, the European standards are the appropriate standards to adopt as the Australian government has a long term policy of harmonizing vehicle regulatory standards with the international United Nations Regulations, which are also adopted throughout Europe.

2.0 CONNECTED AND AUTOMATED VEHICLES

2.1 Integrated Approach

The FCAI and our member brands consider that the introduction of more automated and connected vehicles, and the infrastructure to support them are important to assist in delivering many of the government's objectives to grow the economy and improve the social amenity and living standards of Australians including by improving mobility, reducing traffic congestion and to contribute positively to reductions in CO_2 vehicle pollutant emissions.

The vehicle industry can positively contribute to many government policy initiatives and deliver social amenity as part of an "Integrated Approach." The FCAI considers that an "integrated approach" includes:

- Vehicle Technology – Improve the performance of new light vehicles (passenger cars, SUVs and light commercial vehicles) including the introduction of more automated vehicles.
- Infrastructure Measures – Improve traffic flow and avoid wasteful congestion. Use of connected and automated vehicle technology to enable vehicle-to-infrastructure (V2I) connectivity (i.e. the 'connected vehicle') has the potential to deliver significant reductions in traffic congestion. For example, CBD traffic management – managing inner city traffic congestion utilising V2I connectivity with road alerts, parking and public transport infrastructure.
- Price signals – Influence consumer choice on transport options and encourage changes in driving behaviour (when using a light vehicle).
- Average fleet age – Incentives to increase the uptake of newer light vehicles and reduce the average age of the in-service fleet delivering new technology such as connected and automated vehicles into the in-service fleet.

A significant government policy initiative that supports additional improvements to communities and social amenity with the introduction of CAV is in the area of vehicle emissions. The Federal Government is considering measures to reduce vehicle emissions (both CO2 and pollutant emissions) and improve fuel quality to contribute to the governments objectives of:

- Reduction in greenhouse gas emissions by 26-28 per cent below 2005 levels by 2030.[1]
- Reductions in noxious emissions (including oxides of nitrogen and sulfur (NOx and SOx), particulate matter (PM), hydrocarbons (HC) and carbon monoxide (CO) to improve air quality and reduce harmful health effects.[2]

Improvements in both vehicle technology and fuel standards are required to deliver reductions in both CO2 and pollutant emissions (see Appendix D for a summary of the vehicle engine and emission technology along with the fuel standards requirements). When the vehicle emission technology improvements are combined with both connectivity of vehicles and increasing levels of automation, along with the necessary infrastructure, the community will receive additional benefits expected through reduced congestion and subsequently reduction in fuel usage.

In 2016 the NSW government announced a trial of V2I on urban freight routes in Sydney.[3] The research behind this trial predicts a reduction in travel time for the urban freight delivery vehicles in

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[1] Australian Government Department of Infrastructure and Regional Development, *Improving the efficiency of new light vehicles*, Draft Regulation Impact Statement, Ministerial Forum on Vehicle Emissions, December 2016.

[2] Australian Government Department of Infrastructure and Regional Development, *Vehicle emissions standards for cleaner air*, Draft Regulation Impact Statement, Ministerial Forum on Vehicle Emissions, December 2016

this trial of more than 25 per cent using 'green wave' technology.[4] In addition to the immediate benefit to the urban freight delivery company, it is expected there will be flow-on benefits to the rest of the urban road network with reduced congestion, reduced travel times and a corresponding reduction in fuel usage for drivers of light vehicles.

Similarly, CAV technology offers the prospect of delivering significant safety benefits to consumers and road users. During the 2016 Australasian Road Safety Conference[5] (held in Canberra 6 to 8 September 2016), many speakers highlighted the safety benefits currently being delivered by vehicles with increasing levels of automation and the expectation of increased safety benefits with increasing levels of automation.

Improvements in safety are being delivered by the next generation of collision avoidance systems including Autonomous Emergency Braking (AEB), Lane Departure Warning and Lane Keep Assist. Cooperative Intelligent Transport Systems (C-ITS), including Vehicle to Vehicle (V2V) and Vehicle to Infrastructure (V2I) communications, are designed to mitigate the consequences of driver error. V2V systems offers significant road safety benefits (e.g. for a reduction in the number and severity of side impact crashes, particularly at intersections) and need to be encouraged by government support through appropriate regulatory measures and raising consumer awareness and acceptance of these systems and their benefits.

2.2 Vehicle Systems Inter-Operability

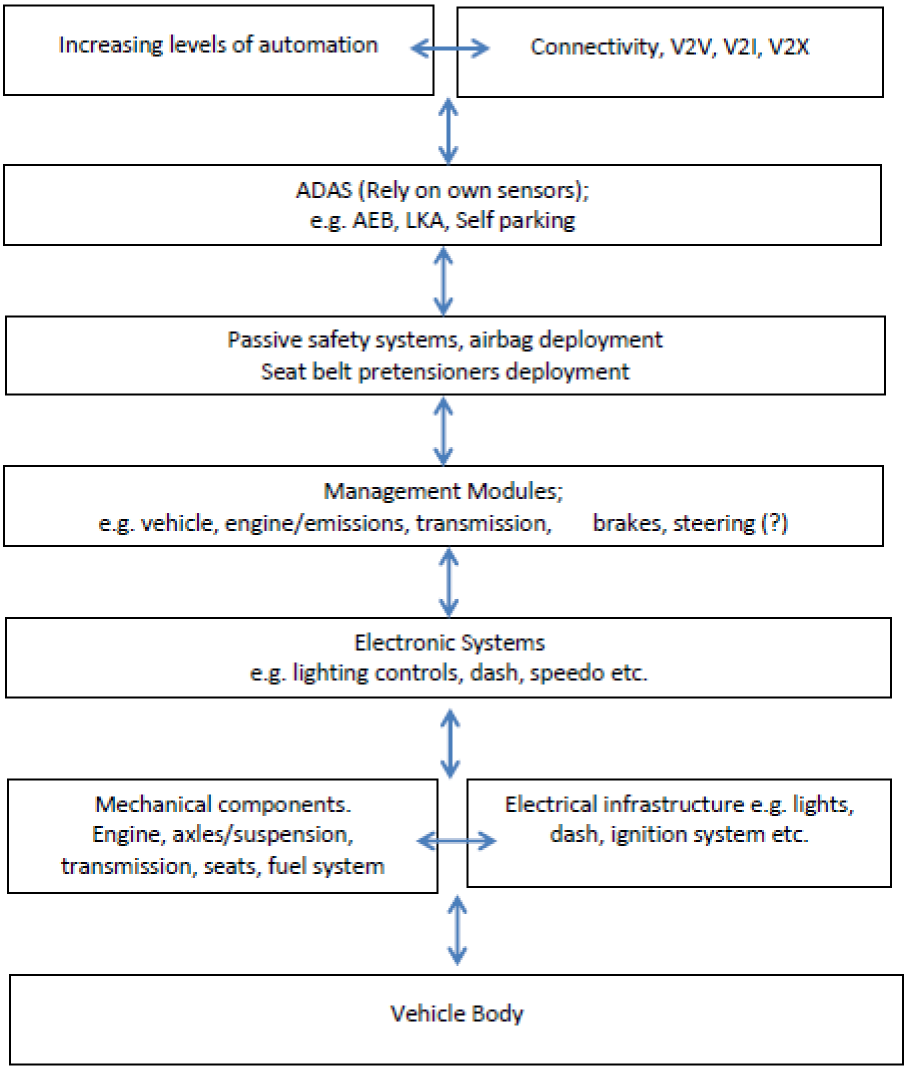
Modern vehicles are very complex with a range of sophisticated mechanical and electrical components and electronic modules that are integrated to deliver the performance, safety and emissions expected by customers and government. Figure 2.1 (below) represents how the various systems are integrated and need to be inter-operable to operate correctly.

[3] Announced by Minister Gay on 19 April 2016 as part of NSW Premier's Innovation Initiative; http://www.rms.nsw.gov.au/about/news-events/news/ministerial/2016/160419-future-transport-trucks-talk-to-traffic-lights.pdf

[4] Green wave refers to the vehicle to infrastructure communications to produce coordinated application of successive green lights to allow the continuous flow of traffic over several intersections, in the one direction.

[5] Australasian Road Safety Conference 2016, http://australasianroadsafetyconference.com.au/

Figure 2.1 Block Diagram showing Inter-operability of Vehicle Systems



Many billions of dollars are being spent on developing automated and connected vehicles in other parts of the world where actual and potential markets are significantly greater than in Australia. For Australia to receive the benefits from the significant international investment in the development of increasing levels of vehicle automation and connectivity, Australia needs to look carefully at the regulatory environment these vehicles will be entering.

Australia is a small automotive market in global terms with annual sales representing less than 1.5 per cent of global production. Therefore, it would be pragmatic for Australia to align any vehicle standard with either the international United Nations Regulations (UN Regulations) or another major market (e.g. Europe) to receive the benefits from new and emerging technology at the lowest cost. Introducing a unique Australian standard would both delay introduction and increase cost to create a ‘boutique’ Australian approach.

It is the FCAI and its members view that as a small player in a large global market, any technology related regulation Australia develops in relation to CAV must be consistent with European regulations and standards so as not to impede the introduction and correct operation of these new technologies. Consequently, vehicle-related regulatory or policy responses (e.g. introduction of standards, guidelines or codes) must be harmonized with the corresponding European regulations, standards, guidelines or codes. The FCAI recognizes that some of the non-vehicle related regulations, standards, guidelines and codes (e.g. privacy principles and some road rules) will need to be different due to the prevailing operating and legal environment within Australia.

The Australian government has a policy of harmonizing Australia's vehicle safety and emission standards (the Australian Design Rules (ADRs)) with the UN Regulations. The UN Regulations have also been adopted by the European Union. ACMA's proposal to refer to the European Standard for C-ITS, ETSI EN 302 571, aligns with the broader government recognition of the benefits of aligning Australia's vehicle standards regulations with another major market.

2.3 Current actions by the Australian Government

In 2016 the Australian Communications and Media Authority (ACMA) released a consultation paper that outlined the proposed regulatory arrangements to support the introduction of CAV in the 5.9 GHz band (5.855-5.925 GHz) in Australia. ACMA proposed to align with the relevant European standards through issuing a "class license" for V2V and V2I technology.

The FCAI and member companies support ACMA's proposed regulatory approach, i.e. allocation of the 5.9 GHz band and harmonization with the European standards to cater for:

- Vehicle based "on-board units" (OBUs) – radio transceivers that are built into vehicles, either as standard equipment or installed as an aftermarket device, to support V2V and V2I applications.
- "Portable units" (PUs) - PUs are transceivers carried by pedestrians or cyclists (possibly integrated into mobile phones) rather than installed as part of a vehicle.
- Road infrastructure based "road side units" (RSUs) – radio transceivers installed into roadside infrastructure at fixed locations (e.g. traffic signals) or with temporary roadside infrastructure (e.g. roadworks signage or portable traffic signals). RSUs may also be integrated into road traffic management systems and support V2I applications.

The FCAI understands that ACMA intend to finalise its regulatory arrangements to support the introduction of CAV in the 5.9 GHz band, and align with the relevant European standards in the first quarter of 2017.

2.4 Additional Action Required by the Australian Government

In addition to ACMA's proposal to issue a class license, there are additional actions that need to be undertaken by the Australian Government for the longer term development of the connected and automated vehicle network:

- Ensure currency of the class license.
- Ensure consistency across Australia.
- Ensure vehicles entering Australia meet the standards

2.4.1 Ensure currency of the class license

Developments in CAV technology is continuing and the FCAI recommends that ACMA continues to monitor the activities within the 3GPP and consider if any new standards developed would be suitable for inclusion in the class license.

2.4.2 Ensure consistency of standards across Australia

In addition to a consistent approach between Australia and other countries there also has to be consistency within Australia, i.e. between the States, Territories and Federal Governments. State and Territory Governments have responsibility for regulating road rules and setting standards for road infrastructure, while the Federal Government has responsibility for regulating vehicle standards. Both are relevant for automated and connected vehicles.

The road rules in each of the States and Territories (notwithstanding that they all are based on a common set of model road laws) have some subtle differences. It is important that the inconsistencies between States and Territories are eliminated. If they are not, overseas-based manufacturers are likely to take the "lowest common denominator" and treat this as the Australian default standard, potentially leading to lack of inter-operability.

The National Policy Framework for Land Transport Technology[6] (released in September 2016) recognised the need for consistent application of road infrastructure standards across Australia to deliver the benefits of automated and connected vehicles. The accompanying Action Plan includes development of nationally consistent guidelines and regulatory frameworks as priority actions.

2.4.3 Ensure vehicles entering Australia meet the standards

Different markets are using different standards for CAV. For example, the USA have begun their regulatory process to mandate V2V technology on all new light vehicles (see Appendix C) and will utilise the 5.9 GHz band., However, the US will utilise a different standard (ASTM E2213-03) which is not inter-operable with European standard ACMA propose to be introduced into Australia (ETSI EN 302 571). In addition, Japan and South Korea are progressing CAV in both the 5.8 GHz and 700 MHz bands.

There is a substantial risk that the full benefits of CAV will not be delivered, and/or interference with other radiocommunications activities, if vehicles produced for the Japanese domestic market are introduced into Australia. This has been recognised by ACMA, in their 2016 Consultation Paper and ACMA have advised it will not consider harmonizing with Japanese CAV arrangements in the 700 MHz band.[7]

An appropriate regulatory system is required to ensure vehicles fitted with CAV technology entering Australia comply with the standards introduced into Australia via the ACMA regulatory arrangements (i.e. Class License) and as such are inter-operable with Australia's CAV system (i.e. other OBUs, PUs and RSUs). The most appropriate method is to use the existing vehicle regulation and certification system set up under the *Motor Vehicles Standards Act 1989* and administered by the Federal Government's Department of Infrastructure and Regional Development (DIRD). This would eliminate the need to develop another certification system and impose additional administrative burdens and costs onto both vehicle brands and government.

The FCAI propose that *Australian Design Rule 42 "General Safety Requirements"* (ADR 42) include a base list of standards that any vehicle fitted with CAV technology would be required to meet. At a minimum ADR 42 should include *ETSI Standard EN 302 571 Intelligent Transport Systems (ITS); Radiocommunications equipment operating in the 5 855 MHz to 5 952 MHz frequency band; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.*

Additionally, ADR 42 could include the ETSI standards for transmitter behaviour & safety channel position (i.e. some or all of the following):

- Specification of Cooperative Awareness Basic Service (ETSI EN 302 637-2)

[6] Transport and Infrastructure Council, National Policy Framework for Land Transport Technology, Action Plan: 2016-2019
[7] AMCA, Proposed regulatory measures for the introduction of C-ITS in Australia, Consultation Paper, p.13

- European channel usage in the ITS G5A & G5B bands including multi-channel operation support profile based on IEEE 802.11 (ETSI TS 102 724)
- M5 communication module noting that management will be undertaken in accordance with IEEE 802.11 (ISO 21215)

2.5 Managing Access to Data

Management of access and ownership of data is an important issue that needs to be considered as part of any connected and automated vehicle system.

The initial step in developing options to manage access to vehicle data is to have a common or agreed (among all stakeholders) understanding of the types of data that is generated, stored or transmitted with the operation of vehicles. This is required before any consideration of “ownership,” “control of,” or “access to” data can be undertaken.

The FCAI proposes that vehicle data or information can be put into three broad levels:

1. **Traffic information**: currently collected and collated by infrastructure owners for traffic management. This information is aggregated and de-identified.

2. **Vehicle owner/driver information**: data created by use of the vehicle. This information could be generated and recorded by either on-board systems provided by the vehicle OEM or a 3rd party system (e.g. fleet management) and could include:
    a. Positioning/location information.
    b. Vehicle operational/performance characteristics (e.g. speed, time of use, load).

3. **Vehicle systems operation**: data contained within the vehicle management modules to control how the vehicle operates and various performance requirements. This is OEM intellectual property and includes:
    a. Environmental legislative requirements (e.g. in-service compliance with vehicle pollutant emission regulations).
    b. Safety performance requirements (e.g. crash pulse triggering of safety systems including seat belt pre-tensioners and airbags, operation of advanced driver assistance systems including Emergency Stability Control, Autonomous Emergency Braking, Lane Keep Assist etc.).
    c. Security information to meet both legislative (e.g. immobilizer) and non-legislative Original Equipment security systems including key security coding.
    d. Engine operation and performance requirements.
    e. Comfort and infotainment systems.

This approach is proposed as a starting point for discussion and the FCAI recognises that there will be some examples where the data/information generated could fall into more than a single level as defined above.

3.0 CONCLUSION

The FCAI and member companies recognise the potential for connected and automated vehicles to provide significant safety, environmental and social benefits to Australia through reductions in crashes and congestion. New light vehicles (passenger cars, SUVs and LCVs) being introduced into Australia today are being fitted with increasing levels of automation, and models introduced from late 2017 or early 2018 are expected to include features that will facilitate connectivity – vehicle to vehicle (V2V) and vehicle to infrastructure (V2I) communications – commonly referred to as connected and automated vehicles (CAV).

The FCAI supports the ACMA proposal to issue a new class license under section 132 of the Radiocommunications Act 1992, for C-ITS transceivers in vehicles, roadside infrastructure and carried by people, that will refer to the relevant European standard, ETSI Standard EN 302 571.

While this is a significant and positive step towards a CAV system in Australia there remains a risk to delivering the full benefits of CAV, and/or interference with other radiocommunications activities, if vehicles produced for either the US or Japanese domestic markets are introduced into Australia.

An appropriate regulatory system is required to ensure vehicles that are fitted with CAV technology entering Australia comply with the regulatory standards introduced by ACMA (i.e. the Class License) and as such are inter-operable with Australia's CAV system. The most appropriate method is to use the existing vehicle regulation and certification administered by the Federal Government's Department of Infrastructure and Regional Development (DIRD).

APPENDIX A THE AUSTRALIAN AUTOMOTIVE INDUSTRY

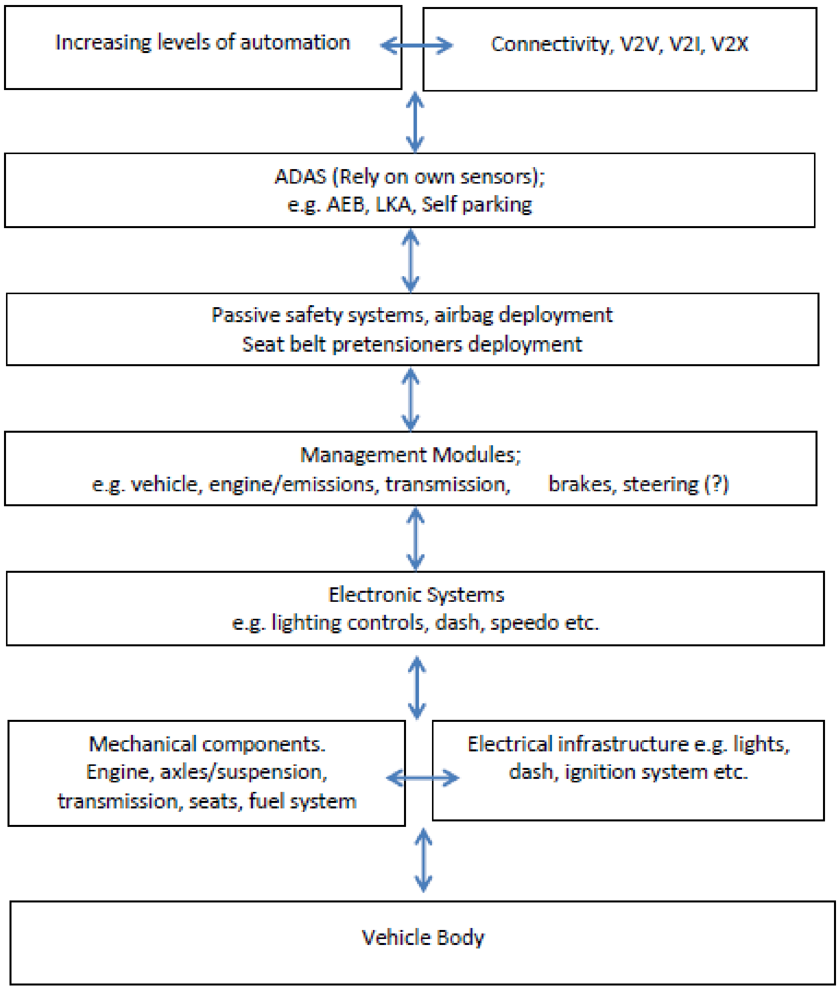
See attachment.

APPENDIX B AUTOMATED AND CONNECTED VEHICLES

B.1 Introduction

Modern vehicles are very complex with a range of sophisticated mechanical and electrical components and electronic modules that are integrated to deliver the performance, safety and emissions expected by customers and government. Figure 2.1 (below) represents how the various systems are integrated and need to be inter-operable to operate correctly. Adopting standards from different markets would require additional resources/development to achieve the required system inter-operability.

Figure B.1 Block Diagram showing Inter-operability of Vehicle Systems



Improvements in safety are being delivered by the next generation of collision avoidance systems including Autonomous Emergency Braking (AEB), Lane Departure Warning and Lane Keep Assist. Cooperative Intelligent Transport Systems (C-ITS), including Vehicle to Vehicle (V2V) and Vehicle to Infrastructure (V2I) communications, are designed to mitigate the consequences of driver error. V2V systems offers significant road safety benefits (e.g. for a reduction in the number and severity of side impact crashes, particularly at intersections) and need to be encouraged by government support through appropriate regulatory measures and raising consumer awareness and acceptance of these systems and their benefits.

The importance of harmonising with the relevant overseas market standards was recognised at an Austroads workshop held on 28 January 2016 to consider what standards to adopt and how to ensure compliance with those standards. The workshop participants (comprising federal and state governments, both private and government infrastructure owners as well as industry) all agreed that Australia should adopt the European standards.

B.2 Increasing levels of automation in vehicles

Competition is one of the main drivers of development and introduction of new technology. In response to consumer demand, FCAI member brands introduce new safety systems and technology with new models in a similar timeframe to other advanced markets. Each brand develops strategies for the introduction of new safety technologies/systems to meet consumer expectations (and/or government regulations) in their main markets.

B.2.1 Autonomous Emergency Braking (AEB)

Autonomous Emergency Braking (AEB) are systems which can alert the driver to an imminent crash and can help to use the maximum braking capacity of the car, and which can also apply the brakes independently of the driver if the situation becomes critical. The most basic form of AEB (and the most common) can only detect other vehicles at low speeds (typically in a speed range from about 5 km/h to 30-50 km/h). The more sophisticated AEB systems detect other vehicles over a much wider speed range than the basic AEB systems (i.e. can detect other vehicles at much higher speeds than the basic AEB systems).

Research conducted by Euro NCAP and ANCAP (funded by the Australian government) showed a "38 per cent reduction in real-world, rear-end crashes for vehicles fitted with low speed AEB." [8]

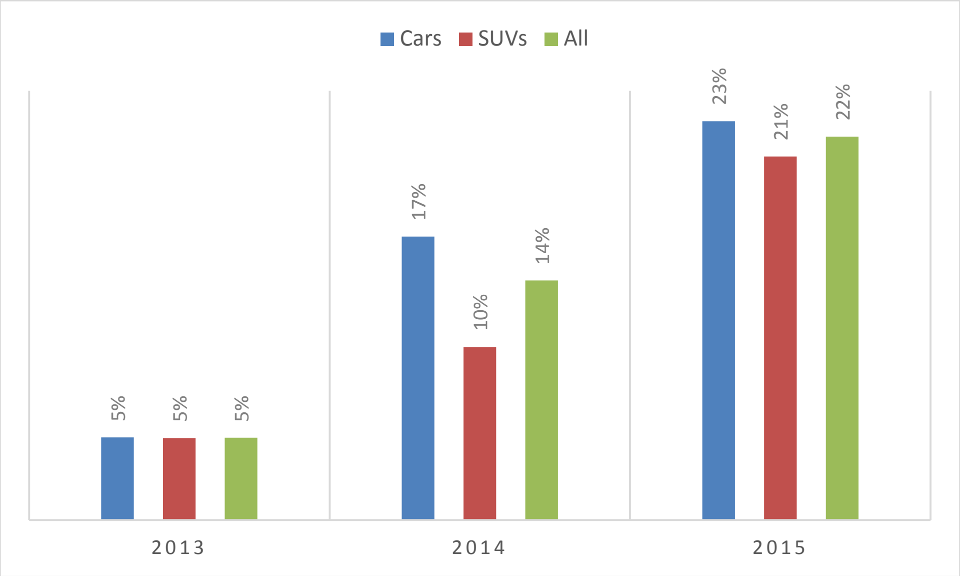
Again the industry has taken the lead, in the absence of any regulation, and begun fitting AEB as new models are introduced. Data from IHS Polk shows that AEB fitting rates in Australia in 2015 (Figure 2.2):[9]

- Passenger cars – 23% (up from 17% in 2014 and 5% in 2013);
- SUVs – 21% (up from 10% in 2014 and 5% in 2013).

Australia's AEB fitting rate is consistent with many European countries as shown in the Euro NCAP 2013 AEB Fitment Survey[10] and also Thatcham Research's January 2016 estimate that around 17 per cent of new vehicles available for sale in the UK have AEB as standard.[11]

[8] Fildes, B. et al, 2015, Effectiveness of low speed autonomous emergency braking in real-world rear-end crashes, *Accident Analysis and Prevention,* vol. 81 (2015) pp. 24-29
[9] Data supplied by IHS Polk. Same data is supplied to Transport for NSW and Vicroads
[10] EuroNCAP, EuroNCAP's AEB Fitment Survey 2012, www.euroncap.com, [accessed 11 March 2016]
[11] Thatcham Research, Autonomous Emergency Braking (AEB), January 2016 Q&A. www.thatcham.org [accessed 11 March 2016]

Figure B.2 AEB Fitting Rates for New Car and SUV Sales



B.2.2 Emerging Automated Systems

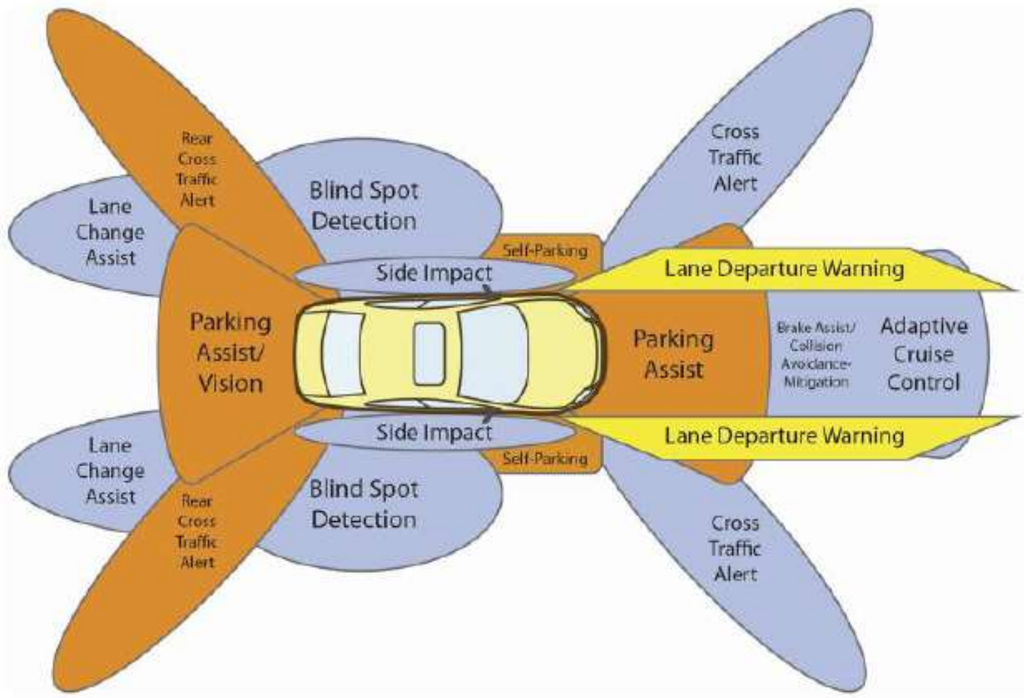
Autonomous emergency braking (AEB) is just one of a range of emerging automated systems, commonly referred to as advanced driver assistance systems (ADAS) that are entering the market with the arrival of new models. ADAS assist the driver with warnings or automatic braking to help avoid or mitigate accidents.[12]

ADAS systems that are currently being delivered to the market in Australia include:

- blind spot monitoring,
- adaptive cruise control,
- safe following distance warning,
- lane keep assist,
- lane departure warning,
- self-parking (included in Issues Paper),
- adaptive headlights,
- fatigue warning, and
- traffic-jam assist.
- Voice activated, hands free controls.

[12] Insurance Institute for Highway Safety, Crash avoidance technologies, www.iihs.org [accessed 6 October 2015]

Figure B.3 ADAS Systems[13]



B.3 Connected Vehicles or Cooperative – Intelligent Transport Systems (C-ITS)

It has been widely acknowledged that connected vehicles, or cooperative intelligent transport systems, have significant potential to deliver safety benefits. Cooperative Intelligent Transport Systems (C-ITS) enables communication and real-time information sharing between vehicles (V2V) and roadside infrastructure (V2I) as well as to pedestrian and cyclists via wireless consumer devices, in order to improve safety, productivity, efficiency and environmental outcomes.

The C-ITS environment offers a fundamental, long term economic and environmentally sustainable solution to improve road safety during the transport of people and freight. Implementation of C-ITS will provide benefits in terms of:

- Reduced traffic accidents with reductions in injuries and fatalities
- Reduced traffic congestion
- Reduction in energy consumption (i.e. less CO_2 and pollutant emissions) in road transport
- Reduction in transport costs with economic benefits
- Improved inter-modal transport with reduction in transport costs and traveler benefits.

In their Notice of Proposed Rule Making[14] (NPRM), the United States government estimated that the safety applications enabled by V2V and V2I could eliminate or mitigate the severity of up to 80 percent of non-impaired crashes, including crashes at intersection or while changing lanes.

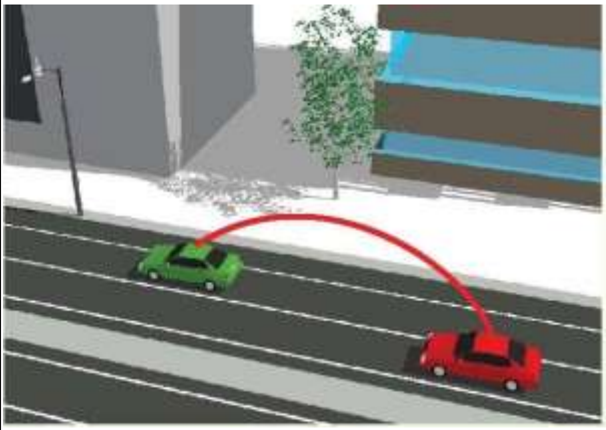
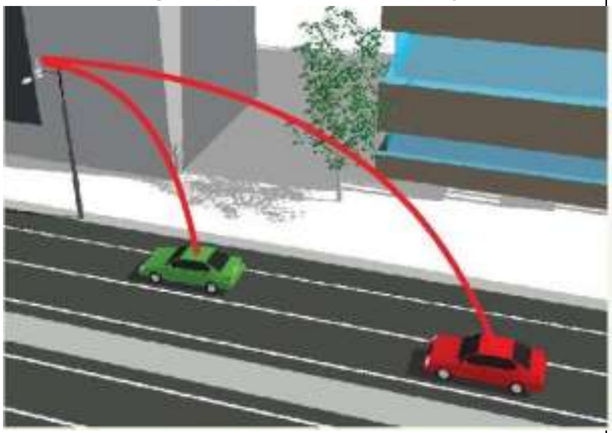
Over the next few years, FCAI member brands will introduce vehicles with car-to-car (V2V) and car-to-infrastructure (V2I) communications technology. For example, GM will introduce C-ITS on their

[13] Lund, A.K., 2015, Insurance Institute for Highway Safety and Highway Loss Data Institute, "Vehicle Safety: Where It's Been and Where It's Heading" Washington, D.C. 15 January 2015. www.iihs.org [accessed 5 August 2015]

[14] US NHTSA 43-16, 13 December 2016, *Proposed rule would mandate vehicle-to-vehicle communication no light vehicles, allowing cars to 'talk' to each other to avoid crashes*, www.nhtsa.gov [accessed 14 December 2016]

2017 model Cadillac CTS using software developed by South Australian-based company, Cohda Wireless.[15]

Figure 2.4 Examples of C-ITS

Fig 2.4(a) - V2V connectivity	Fig 2.4(b) - V2I connectivity
	
Supports safety applications; • Forward Collision Warning • Intersection Collision Warning • Emergency Electronic Brake Light • Do Not Pass Warning • Intersection Movement Assist	Supports safety and mobility applications: • Curve Speed Warning • Red Light Violation Warning • Security Certificate Updates • Traffic Probe Snapshot • Traveler Information Messages

To facilitate the introduction of vehicles with C-ITS, and to inform governments on the standards for road infrastructure, the FCAI has advised various levels of government of its view on spectrum allocation, the standards required and has offered to work with government to develop an appropriate regulatory model.

The FCAI has requested that ACMA allocate the 5.9 GHz spectrum with the European channel allocations by 1 January 2017.[16]

All vehicle brands are working to develop this technology at a global level and for Australia to receive the safety (plus environmental and traffic management) benefits, its introduction must be managed at a national level. Unfortunately, not all markets are using the same frequency bands for C-ITS. For example the next generation V2V and V2I safety systems fitted to vehicles produced for the Japanese domestic market will not work in Australia, and moreover, the radio transmitters in these vehicles will cause harmful interference to other licensed spectrum users were they to be imported into Australia.

The Japanese DSRC (Dedicated Short Range Communications) systems operate in the 5.8GHz band. This is used in Japan for toll collection as well as vehicle to infrastructure communication for traffic congestion, parking, etc. These systems may interfere with Australia's freeway toll collection systems if not turned off (which is problematic for a number of reasons) or otherwise addressed.

[15] Cohda Wireless press release, 17 September 2014, Cohda applauds news of GM's first 'connected car', www.cohdawireless.com.au , [accessed 7 July 2015]
[16] FCAI wrote to ACMA on 22 June 2015

Japanese C-ITS systems operating in the 700 MHz band will most likely interfere with new services in the "Digital Dividend" band. The Japanese V2V band (715 – 725 MHz) occupies part of the band that Telstra purchased from the Australian Communications and Media Authority (ACMA) for $1.3 billion for next generation mobile telecommunication applications. The effect of a vehicle equipped with Japanese domestic C-ITS systems (ie, a grey import) would be that it would never be able to communicate with other vehicles and may in fact disrupt existing telecommunications applications and services as it passes through traffic.

The United States also uses the 5.9 GHz band but specifies different channel allocations within the band. Therefore vehicles manufactured for the US market will not be able to communicate with vehicles complying with the European specification, negating the safety benefits of V2V technology.

As a vehicle's electronic safety sensors and management systems are integrated to maximise the safety benefit, trying to modify an existing vehicle to operate within another market's C-ITS network is not possible and the full safety and traffic management benefits would not be realised.

The requirements that need to be met for vehicles to operate in an Australian automated and connected environment where the Australian community derives the optimal benefits are:

- A standardised interface harmonised with European standards as Australian vehicle safety and environmental regulatory standards are harmonised with the European standards.
- A regulatory model that ensures vehicles fitted with C-ITS being delivered to Australia meet the European standards and will operate within the specified spectrum.
- The 5.9 GHz spectrum to be allocated to automotive C-ITS.

APPENDIX C US FACT SHEET: VEHICLE-TO-VEHICLE COMMUNICATION TECHNOLOGY

See attachment.

APPENDIX D ENGINE AND EMISSIONS SYSTEM INFOGRAPHIC

See attachment.