Submission No 14

DRIVERLESS VEHICLES AND ROAD SAFETY

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Joint Standing Committee on Road Safety (Staysafe)
Parliament House
Macquarie Street
SYDNEY NSW 2000

Dear Committee Chair

Driverless Vehicles and Road Safety (Inquiry)

IAG welcomes the opportunity to comment on the Joint Standing Committee on Road Safety's Inquiry into Driverless Vehicles and Road Safety. Please find attached IAG's response to the Terms of Reference outlined as part of the Inquiry.

As one of the largest motor vehicle insurers in the Asia-Pacific, IAG develops, underwrites, sells and manages claims for general insurance products that are sold to customers and businesses. IAG insures over 10 million vehicles and sells around 2.4 million Compulsory Third Party (CTP) personal injury insurance policies in NSW and ACT each year. IAG will also commence selling CTP in South Australia from July 2016.

Our purpose is to "help make your world a safer place" which means we are working to create a safer, stronger and more confident tomorrow for our customers, partners, communities, shareholders and our people throughout the Asia Pacific. For generations, our extensive range of general insurance products and services has helped people and communities recover and rebuild from the impact of loss and natural disasters. Our scale, experience and network allow us to be there for our customers when they need us now, and to see further ahead to anticipate the challenges of tomorrow.

The potential for Automated Vehicles (AVs) to change the way we use transport will be far reaching. It has been reported that, in theory, almost all of the negative impacts of transport such as congestion, emissions and crashes could be avoided[1].

Given the technology and hardware for more automated cars is under development, and the way in which the technology and human behaviour will interact is still being tested, much of the long term safety benefits are yet to be confirmed, but the potential is considerable.

[1] Mainroads Western Australia: Automated Vehicles: Are we Ready?: January 2015

Key points for the Committee to consider as part of this Inquiry are summarised below:

- Automation of vehicles is occurring and this is already contributing to a decline in collisions and fatalities in Australia (and across other jurisdictions). In NSW there has been a 12 percent decrease in road fatalities since 2008 – 2014[2].

- While there is potential for improved road safety, IAG recommends that analysis is read cautiously, as a great deal more on-road testing is required to understand the grey areas where varying levels of automation intersect with human intervention. This is particularly true for the levels 3 and 4 automation (as identified by the SAE International Standard J3016).[3]

- Many factors will influence how rapidly AVs enter the fleet, some of these include; the perfection of failsafe technology; safety and licensing; legal issues and liability; privacy and security issues; cost and equity; infrastructure implementation.[4]

- The transition to more automated vehicles is impacting a wide range of industries creating both opportunities and disruption – it will be led by consumer demand.

- Government should encourage both a market and regulatory approach. It is important that regulators seek to find the balance between implementing safety critical regulation/legislation while also building in flexibility so as not to stifle innovation.

- A principle based nationally consistent approach to road rules and to statutory personal injury schemes will enable a safer system, while also helping to establish commercial advantage for Australia - the United States do not have a nationally consistent approach and this makes the system onerous and costly to navigate.

- Automation is a key element to reducing road trauma, while we can expect to see a decline in vehicle occupant fatalities, personal injury will continue.

Overall, it is important for Australia's economic future to ensure the regulatory settings are right to harness the fiscal, road safety and environmental benefits of this technology. Australia, with NSW leading the fore, has the professional, technical and trades orientated skill base, large geographical area for testing, the technological capability and much of the ITC infrastructure in development to leverage this as an alternative source of income generation.

NSW Government should support on-road testing of AVs, consider ongoing investment in intelligent infrastructure development, research innovative technologies, and facilitate contemporary training/education packages to help boost NSW's productivity and prosperity for the long term.

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[2] [2] http://roadsafety.transport.nsw.gov.au/statistics/index.html; http://www.nrma.com.au/ctpexplained

[3] SAE International and J3016 are acknowledged as the sources and must be reproduced AS-IS.

[4] FP Think – Effects of Next Generation Vehicles on Travel Demand and Highway Capacity, January 2014.

IAG commends the establishment of the first Smart Innovation Centre and the NSW Government's dedication to new research and development for emerging transport and road technology.

Should you wish to discuss this submission or make further enquiries, please contact the following:

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Yours sincerely

[redacted]

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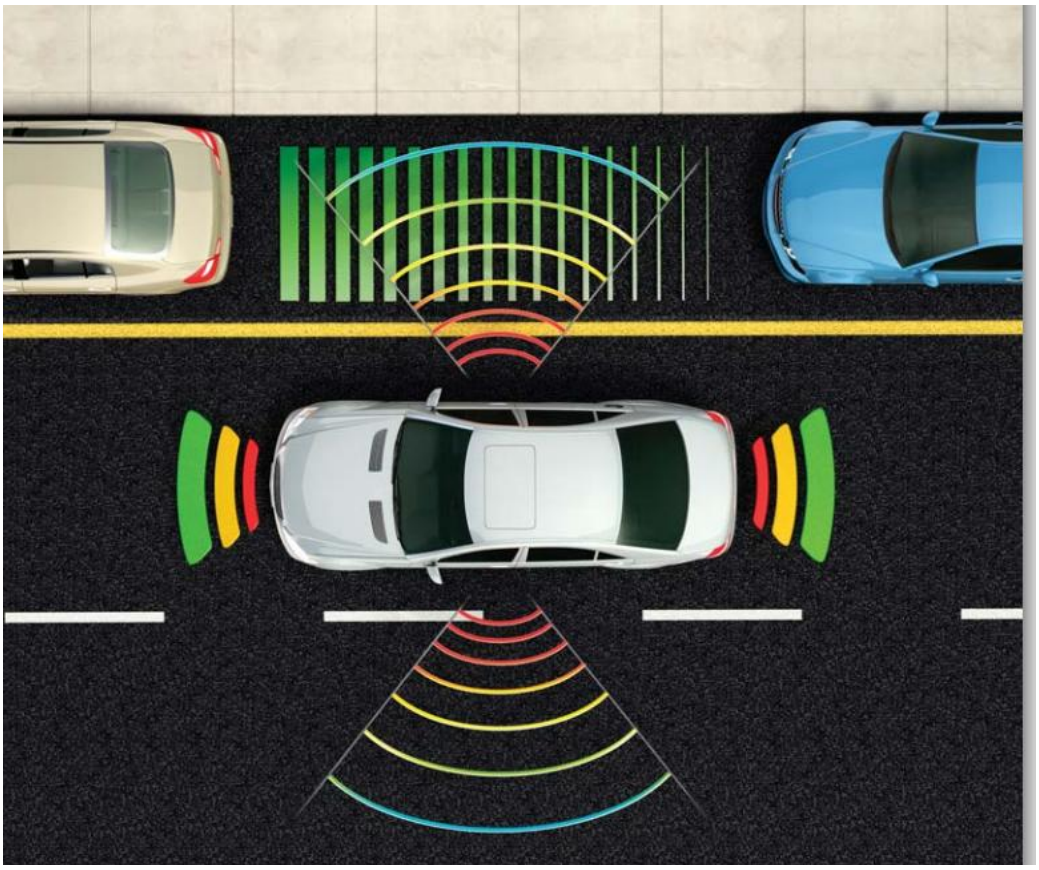
April 2016



NSW DRIVERLESS VEHICLES AND ROAD SAFETY INQUIRY

NSW JOINT STANDING COMMITTEE ON ROAD SAFETY (STAYSAFE)

Australia

New Zealand

Asia

Contents

Executive Summary....3

IAG - who we are....6

IAG's interest in the Inquiry....7

Response to the Terms of Reference....9

1.The capacity of driverless vehicle technology to deliver improved road safety outcomes including a lower road toll, and fewer accidents and injuries to drivers, pedestrians and other road users....9

2. The extent to which current road safety policies and regulations in NSW anticipate the introduction of driverless vehicle technology, including driverless heavy vehicles, and any regulatory and policy changes which will be required....14

3. The preparedness of NSW road safety regulators to meet the challenges extended by driverless vehicle technology....16

4. The experience of other jurisdictions in Australia and overseas in adopting and adapting to driverless vehicle technology....17

5. Other related matters....19

Conclusion....20

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Executive Summary

IAG welcomes the opportunity to comment on the Joint Standing Committee on Road Safety's Inquiry into Driverless Vehicles and Road Safety. IAG will address each of the Terms of Reference outlined as part of the Inquiry.

IAG is involved across the automotive industry in NSW and Australia. Through the IAG Research Centre, our business is involved in the design, performance and testing of vehicles, our supply chain network is made up of industry specialists who repair hundreds of thousands of vehicles for our customers each year. We also work closely with vehicle manufacturers and Original Equipment Manufacturers (OEM's), and underwrite commercial vehicle fleets, and agricultural machinery through our Commercial Insurance lines.

According to the National Transport Commission's Issues Paper released February 2016, "automated road vehicles have some level of automation which does not require a human driver for at least part of the driving task"[1]. Different levels of automation are being built into new cars – some manufacturers are focused on conditional automation – requiring the human driver to monitor and intervene if required. Others are focused on developing highly automated vehicles that don't require a human driver. For the purposes of this submission, the generic term "Autonomous Vehicles" or "AVs" is used.

These different technologies raise issues for business, industry and government. As the transition to vehicles with more automated features is made, it will be critical that Australia's regulatory framework can support a mixed fleet which includes:

- vehicles with varying levels of automation; and
- conventional vehicles with human drivers.

In the first instance, a nationally consistent approach to defining 'control of the vehicle' will be critical to provide business with regulatory confidence. Providing common infrastructure across State and Territory borders will also help facilitate the development and take up of automated vehicle technologies. Participation in a national approach to road signs, signals, lane markings and roundabouts, which have historically been developed at a State level, is an additional and crucial consideration for the NSW Government, particularly if Australia is to gain economic advantage.

In order to continue the work of other Australian jurisdictions and to carve out a competitive position for Australia on the world stage when it comes to AVs, issues such as the interaction between road transport and consumer protection laws, as well as liability, insurance and common law requirements should be addressed.

Road Safety benefits

The potential for AVs to change the way we use transport will be far reaching. It has been reported that, in theory, almost all of the negative impacts of transport such as congestion, emissions and crashes could be avoided[2] .

Given the technology and hardware for more automated cars is under development, and the way in which the technology and human behaviour will interact is still being tested, much of the long term safety benefits are yet to be confirmed, but the potential is considerable. This is because at the point of full automation or when vehicles indeed become 'driverless' the behavioural factors that influence poor driving will be removed.

Removing human error such as; poor judgment, slow reaction time, lack of visibility, inattention, sleepiness and fatigue; influences of alcohol or drugs and driver distraction means that in many ways the future of improving

[1] Regulatory Barriers to more automated road and rail vehicles Issues Paper, National Transport Commission, February 2016
[2] Mainroads Western Australia: Automated Vehicles: Are we Ready?: January 2015

vehicle safety lies with autonomous technologies[3] . However, while people are in charge of the vehicle in any capacity, even in semi-autonomous vehicles, these issues will remain.

The true extent of road safety benefits are difficult to predict. Even though much of the research and commentary projects a 90 percent reduction of collisions[4], this is speculative, and still needs to be tested in 'real world' conditions.

While there is potential for improved road safety, IAG recommends that analysis is read cautiously, as a great deal more on-road testing is required to understand the grey areas where varying levels of automation intersect with human intervention. This is particularly true for the levels 3 and 4 automation (as identified by the SAE International Standard J3016)[5]. This is where the human driver is passively monitoring and will only intervene if something goes wrong, or when the human driver doesn't intervene, the car will come to a stop aiming for minimal risk.

Needless to say, there remains a strong societal as well economic argument for the NSW Government to dedicate resources towards this technology and infrastructure needed to support it. But Government need not bear the brunt of the costs, as this is a prime opportunity for industry along with the public and private sector to work collaboratively for significant gain.

Some key points for the committee to consider in this situation include:

- Automation of vehicles is occurring and this is already contributing to a decline in collisions and fatalities in Australia (and across other jurisdictions). In NSW there has been a 12 percent decrease in road fatalities since 2008 – 2014[6].
- Many factors will influence how rapidly AVs enter the fleet, some of these include, the perfection of failsafe technology; safety and licensing; legal issues and liability; privacy and security issues; cost and equity; infrastructure implementation[7].
- The transition to more automated vehicles is impacting a wide range of industries creating both opportunities and disruption – it will be led by consumer demand.
- Government should encourage both a market and regulatory approach. It is important that regulators seek to find the balance between implementing safety critical regulation/legislation while also building in flexibility so as not to stifle innovation.
- A principle based nationally consistent approach to road rules and to statutory personal injury schemes will enable a safer system, while also helping to establish commercial advantage for Australia - the United States does not have a nationally consistent approach and this makes it more onerous and costly to navigate.
- Automation is a key element to reducing road trauma, while we can expect to see a decline in vehicle occupant fatalities, personal injury will continue.

IAG notes that the Transport and Infrastructure Council[8] (reporting to COAG) agreed in November 2015 it is "important to share learnings across all jurisdictions; have a view on future challenges; and work towards harmonised standards and regulation to ensure that Australia is well positioned to adopt new technologies".

[3] FleetAlert (April 2011), 'Human error accounts for 90% of road accidents' accessed at http://www.alertdriving.com/home/fleet-alert-magazine/international/human-error-accounts-90-road-accidents
[4] McKinsey, Ten ways autonomous driving could redefine the automotive world; Michele Bertoncello and Dominik Wee
[5] SAE International and J3016 are acknowledged as the sources and must be reproduced AS-IS
[6] http://roadsafety.transport.nsw.gov.au/statistics/index.html; http://www.nrma.com.au/ctpexplained
[7] FP Think – Effects of Next Generation Vehicles on Travel Demand and Highway Capacity, January 2014.
[8] **The Council is made up of the Transport, Infrastructure and Planning Ministers from the Commonwealth States and Territories, New Zealand and the Australian Local Government Association. It reports to the Council of Australian Governments.**

IAG therefore recommends that while identifying and working towards specific State and Territory centric objectives, it will be important to have a coordinated, national approach.

Perhaps we can learn from our history, and seek to avoid the dis-unified approach that occurred in the 1850s as the national rail network was being introduced. Despite initial attempts to work together for a uniform approach, the colonies were under pressure to develop their own systems.

When train lines were expanded to travel between states, the lines, equipment and operating practices were incompatible. Passengers and freight would often have to be transferred from one train to another at state borders. In 1917, a person wanting to travel from Perth to Brisbane on an east-to-west crossing of the continent had to change trains six times. The benefit of hindsight can help us ensure efficiencies are achieved from the outset by ensuring a collaborative and national approach to developing the AV network in Australia[9].

IAG recognises the National Transport Commission's role in leading the public discussion on this issue and recommends that the NSW Government continue supporting this work.

Economic benefits

Overall, it is important for Australia's economic future to ensure the regulatory settings are right to harness the fiscal, road safety and environmental benefits of this technology. Australia, with NSW leading the fore, has the professional, technical and trades orientated skill base, large geographical area for testing, the technological capability and much of the ITC infrastructure in place to leverage this as an alternative source of income generation.

The automotive industry is a globally integrated industry with many product lines sharing platforms and major components. However Australian consumption represents less than 1.5 percent of global vehicle production. Vehicles sold in Australia are mostly (but not always) designed, developed and built in countries such as Japan, Korea, Europe, Thailand, India and the United States[10]. Vehicles are designed in accordance with the OEM's global standards. To support rather than impede the roll out of new technology for AVs, it will be important for Australia where possible to take a harmonised response to European regulation, but to ensure that our unique local conditions are factored into the regulatory settings.

NSW Government should support on-road testing of AVs, consider ongoing investment in intelligent infrastructure development, research innovative technologies, and facilitate contemporary training/education packages to help boost NSW's productivity and prosperity for the long term.

IAG commends the establishment of the first Smart Innovation Centre and the NSW Government's dedication to new research and development for emerging transport and road technology.

[9] http://www.australia.gov.au/about-australia/australian-story/railways-in-australia
[10] http://www.fcai.com.au/

IAG - Who we are

IAG is the largest general insurer in Australia and New Zealand, with a growing presence in Asia. Our purpose is to "help make your world a safer place" which means we are working to create a safer, stronger and more confident tomorrow for our customers, partners, communities, shareholders and our people throughout the Asia Pacific.

IAG develops, underwrites, sells and manages claims for general insurance products that are sold to customers and businesses. We insure over 10 million motor vehicles and sell around 2 million Compulsory Third Party (CTP) personal injury insurance policies in NSW and ACT each year. IAG will also commence selling CTP in South Australia from July 2016.

IAG has built a strong reputation on understanding the unique needs of Australians, and being a steadfast supporter of the community. Today, we are one of the leading insurance providers in Australia, providing support and services in every state and territory. We pride ourselves on helping our customers understand insurance and to make uncomplicated choices to protect the things they value.

For generations, our extensive range of general insurance products and services has helped people and communities recover and rebuild from the impact of loss and natural disasters. Our scale, experience and network allow us to be there for our customers when they need us, and to see further ahead to anticipate the challenges of tomorrow.

Last year, IAG insured over $2 trillion worth of assets, collected $11.4 billion in premiums and paid out almost $9 billion in claims. We employ over 15,000 people throughout the Asia Pacific, providing career opportunities, and a diverse and inclusive workplace.

We have leading customer brands in the IAG network which include: NRMA Insurance, CGU, SGIO, SGIC, WFI, and Swann Insurance (Australia); NZI, State, AMI and Lumley Insurance (New Zealand); Safety and NZI (Thailand); AAA Assurance (Vietnam); and Asuransi Parolamas (Indonesia). IAG also has general insurance joint ventures in Malaysia and India. IAG, through its brand CGU, is also a 50% shareholder of National Transport Insurance (NTI). NTI has over 40 years experience and is a market leader in the heavy vehicle motor insurance industry.

IAG's operating brands have a long history of motor accident prevention and mitigation with a view to assisting the broader Australian community, from our NRMA heritage as a motoring organisation to the development of our own Research Centre where physical research is undertaken for the purposes of improving car and driver safety and reducing repair costs.

IAG is the only insurer to be invited to be a member of ANCAP, the ANCAP Technical Committee and ANCAP Council. In addition, IAG is the only Australian insurer to be part of RCAR, a global association of insurance research centres dedicated to improving vehicle safety, damageability, repairability and security. In 2011, NRMA Insurance launched a unique National Repair Quality Framework ensuring high quality and safe repairs on all NRMA insured vehicles.

IAG is also a core partner of the Australian Autonomous Vehicle Initiative (ADVI) which is a co-operative of partners from government, academia and industry. The key aim of ADVI is to explore the impacts and requirements of this new automation technology in a truly Australian context and make recommendations on ways to safely and successfully bring autonomous vehicles to Australian roads.

IAG's Interest in the Inquiry

While the future of autonomous vehicles in the Australian context is in its very early stages, IAG acknowledges there are significant opportunities for business, industry and government. IAG is dedicated to embracing this change for the benefit of our customers, shareholders and for the community at large.

Overall, we see the rapid advancement of technology as a huge opportunity to evolve our products and services to better serve our customers before, during and after an accident or disaster. IAG is pursuing digital and design innovation, while identifying and harnessing disruptive technology.

Innovation is a core part of our culture and we are an industry leader in leveraging emerging digital technologies and offering enhanced protection for our customers.

The context – digitalisation and disruption

The combined impacts of globalisation; shifting consumer preferences and behaviour; rapid application of technology; and automotive systems integration; mean that insurers, vehicle manufacturers, distributors and associated supply chains are experiencing a period of unprecedented change and are dramatically impacting traditional business models[11] . AVs and associated smart infrastructure create both exciting opportunity and disruption.

Traditional businesses like IAG need to adapt to the rapidly changing commercial landscape. IAG's approach to disruption is to stay relevant and customer-centric in a fast-changing and increasingly competitive environment.

In some cases regulation hasn't yet caught up with advancements in technology and growing consumer demand, however, IAG has recently evolved some of our coverage options to cover our customers who use their private vehicle occasionally for Uber services. This provided certainty in relation to the liability of Uber. Similarly, we developed a product to assist our customers to manage risks associated with the sharing economy, ensuring their homes and contents are covered by insurance when their home is rented to others through recognised platforms such as AirBnB or Stayz.

Our customers - their travel and mobility needs

Exciting for IAG customers and the community more broadly, is that in decades to come, AVs with full automation are likely to offer a form of "mobility freedom" not previously possible. AVs may offer mobility for people that would otherwise not be able to drive, this could be for children, the elderly, and people with disabilities and others who don't drive or whom are unlicensed to drive in the current system. Additionally, the vehicle may become a platform for passengers to use their time in transit differently – they may be able to conduct work, consume media and/or services or dedicate this new found free time to other personal activities[12].

IAG is aware that there is a rapid uptake of technology and that consumers' expectations are continually changing based on the availability of new technology and services. The role of IAG (and insurers generally) will continue to change as we become more and more a part of the digital and shared economies. IAG is committed to identifying customers' evolving needs and offering products and coverage to meet those needs.

Road Safety

As the largest motor vehicle insurer in the Asia-Pacific, IAG develops, underwrites, sells and manages claims for general insurance products that are sold directly and indirectly to customers and businesses. IAG through its NRMA Insurance brands underwrites around 1.9 million Compulsory Third Party personal insurance NSW and 170,000 in the ACT each year. IAG will also commence underwriting CTP in South Australia from July 2016.

[11] http://www.mtaa.com.au/publications; An Industry at Crossroads, Automotive 2018, Australian Motor Industry Federation
[12] Disruptive trends that will transform the auto industry, Gao, Kass, Mohr, Wee, January 2016.

IAG's Interest in the Inquiry

Continued.

In today's system, CTP, also known as a 'Green Slip' in NSW, was originally designed to protect motor drivers from the financial cost of injuring someone on the road and to enable the injured person easier access to medical treatment and compensation (where needed) rather than having to pursue damages through the Court. In the past year alone, NRMA Insurance has helped over 5,000 people and paid more than $500 million in claims.

The emergence of AVs presents many legal questions on how liability should be addressed and apportioned. This future means we will in many cases need to move from apportioning liability to a (human) driver, towards uncertainties around 'who' or 'what' had control of the vehicle and at what point this occurred. Statutory and regulatory treatment of autonomous vehicles will play a large role in shaping the future of this technology.

Protecting and repairing assets

IAG insures around 3.2 million passenger vehicles across the country representing over $2.5 billion in Gross Written Premium. It is our role to help customers manage their personal risk and encourage risk mitigation. Traditionally, after our customers' vehicles are damaged, we give them peace of mind by covering the cost of repairing their vehicle and or the other party's vehicle, as well as ensuring the vehicle is repaired efficiently, safely and to the manufacturer's standard.

IAG, along with our supply chain network including , paint and panel repairers, automotive mechanics, Original Equipment Manufacturers (OEM) Service Departments, mechanics, paintless dent repairers, windscreen suppliers and fitters, are being impacted by the overarching adjustment of the automotive sector.

Rapid advances in technology and the increasing complexity of motor vehicles 'as evidenced through the merging of electronic and mechanical technologies, intelligent transport systems, navigation, tracking systems and the embedded network of computerised controls that manage these technologies is placing greater demands on the skills base of this workforce' .

Globally we are seeing the automotive industry experiencing fundamental change. Disruptive change has always been a fact of life for business, and is arguably a symptom of healthy competition driving market dynamics.

1. The capacity of driverless vehicle technology to deliver improved road safety outcomes including a lower road toll, and fewer accidents and injuries to drivers, pedestrians and other road users

IAG's view on road safety

IAG has a long history of advocating for road safety, we are the only insurer to own and operate a research centre looking at the effects of automotive design and engineering on the safety, security and repair costs of motor vehicles including motorcycles.

Given we insure such a large number of vehicles across Australia; road safety needs to be our focus. A road safety culture, implemented at all levels of our society will help keep drivers, passengers and pedestrians/road-users safe, will reduce collisions, injuries and damage to vehicles. This can lead to a reduction of claims and frequency which is ultimately in the best interest of our community, our customers and our business.

IAG actively supports the National Road Safety Strategy and views road safety as a whole of society issue. The social costs of road trauma are immeasurable and devastating for our community. The social and economic cost to Australia is estimated at $27 billion dollars per annum[13]. Despite almost all road crashes being preventable, we continue to see fatalities, serious injuries and car damage occurring every day on our roads.

In line with the OECD "Towards Zero" ambition for road safety, IAG believes no death or injury on Australian roads is acceptable. IAG recognises we have a share in the responsibility for improving community road safety and it is ultimately in the best interest of the community and our customers and business to help keep drivers safe reduce collisions and injuries and reduce damage to vehicles.

We anticipate that the advent of AVs will contribute towards improving road safety in the long term for NSW motorists by helping to reduce the number of collisions, so properly harnessing this technology to help manage risks and operate a safe system will be critical.

Automated Vehicles and their contribution to road safety

According to ANCAP, approximately 90% of crashes involve some form of human error. IAG considers that automation, which is already occurring, is a key element in achieving a reduction of road trauma. Many vehicles already have automated safety features including:

- Electronic Stability Control
- Autonomous Emergency Braking (AEB)
- Active Cruise Control (ACC)
- Lane Keep Assist
- Intelligent Speed Assist (ISA)
- Parking Assistance[14]

As a result of improved vehicle technology (along with Government commitment to road safety) we are already seeing a reduction in the number of fatal collisions. The National Road Safety Strategy Implementation Status

[13] https://infrastructure.gov.au/roads/safety/
[14] ANCAP, Safety In Automation, Wendy Machin, November 2015

Report and noted the strong results to date in reducing road deaths, with the total in 2014 (1,155) reduced by 19.0 per cent under the National Road Safety Strategy 2011–2020[15].

The future of road safety is complex, on one hand it is driven by the rapid advances of automated vehicle technology, but on the other, the way in which humans utilise or operate these features is still being tested – there may be some cases that these forces can work in opposition to each other. Much work is to be done to understand this better.

Many fatal crashes on motorways can be sleep or fatigue related. Research has concluded that 25 percent of fatalities on highways and major roads in the UK were sleep related[16], in Victoria; around 20 percent of all fatal road accidents involve driver fatigue (TAC). For Western Australia is 30 per cent according to the WA Road Safety Commission. In comparison, automated systems do not fall asleep nor experience fatigue. However, we anticipate humans will be sleepier in highly automated vehicles, and this could hinder their ability to quickly intervene if required[17].

ANCAP predicts that the number of people killed or seriously injured will be reduced by 34 percent by 2020. This will be due to the number of 5-star safety rated vehicles on the roads[18]. However, the full potential of AVs (SAE levels 4 and 5) in reducing road trauma may only be reached once they are connected to the Cooperative Intelligent Transport Systems (C-ITS), which will allow vehicle to vehicle communication, along with vehicles that connect with roadside infrastructure, or other devices. These systems will use wireless communication to share real-time information about the road environment – such as hazards or potential incidents – with an increased awareness of time and distance superior to what current vehicle technology and human drivers can achieve.

Clearly much will need to be done to update NSW roads with the relevant intelligent technology to facilitate this higher level of AVs. This means a gradual transition will occur as the rate of adoption depends on many different factors. Some of these will include the uptake and maturity of technology, commitment of Government resources to develop suitable infrastructure, the regulatory framework, consumer acceptance of new technologies, level of connectivity and the speed with which manufacturers can produce vehicles[19].

The Institution of Electrical and Electronics Engineers (IEEE) believes that by 2025 around 60 percent of vehicles will be connected. In the short term, IAG has identified some areas that should be strengthened within the current road safety strategy. This will help to prepare our road system for greater numbers of AVs. Road Safety strategies should therefore incorporate the below listed items:-

- A stronger focus on injury prevention, not just fatality prevention
- Reducing the costs of current and proposed injury schemes by focusing on prevention separate strategies that are tailored to protect vulnerable road users
- A stronger emphasis on data collection and sharing – a national database to collate injuries from collisions to more accurately monitor road traffic injuries, deaths and crashes
- More sharing of road safety resources and media campaigns across States and Territories
- Increased harmonisation of the Australian Design rules with UN regulations to ensure consumer protection and safe roads
- Nationally consistent approach to Road Rules

[15] www.roadsafety.gov.au.
[16] Flatley et al – from: Institute for Transport Studies, Driver Behaviour in Highly Automated Vehicles: Safety Prediction, Oliver Carsten, Institute for Transport Studies, University of Leeds, UK, 2015
[17] Institute for Transport Studies, Driver Behaviour in Highly Automated Vehicles: Safety Prediction, Oliver Carsten, Institute for Transport Studies, University of Leeds, UK, 2015
[18] ANCAP, Safety In Automation, Wendy Machin, November 2015
[19] Automated Vehicles: Are we ready? Internal Report on potential implications for main roads WA, January 2015

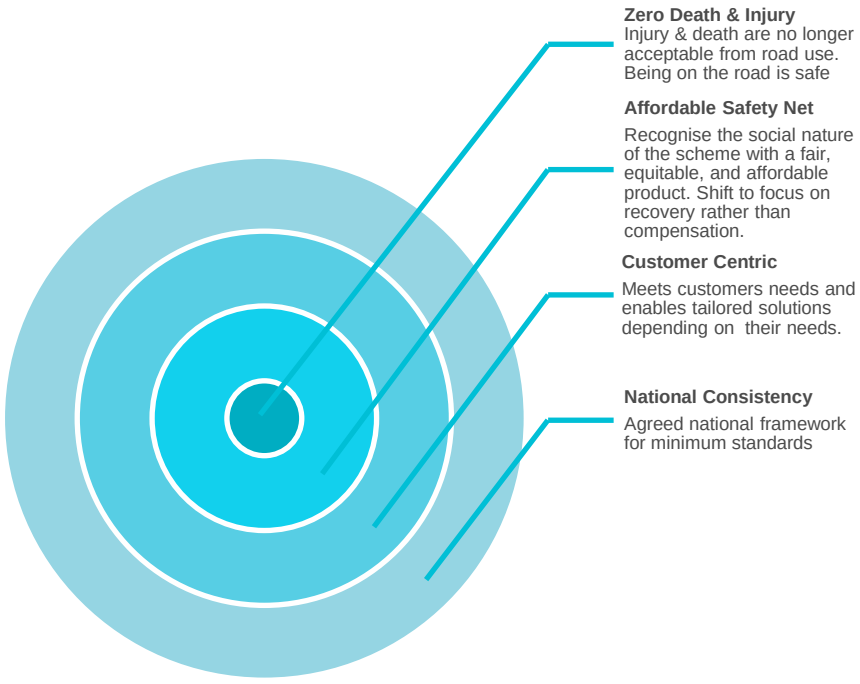
- A separate rural and regional road safety action plan is needed to attract separate funding in order to keep regional roads maintained at the same level as urban roads
- Coordinated and focused government investment and appropriate regulatory response to enable on-road trials of AVs

Implications for personal injury and death – design schemes for a zero tolerance

The Austroad's review of the National Road Safety Strategy found that whilst deaths have declined since 2001, serious injuries have not. They found serious injuries even rose by 10 per cent from 2001 levels before returning to it. The costs associated with these injuries have therefore remained over the past decade and thousands of lives have been impacted by injury, accidents or trauma that is essentially preventable.

The introduction of more automated vehicles allows further public discussion on the approach to personal injury schemes. Regulation of automated vehicles should also cover statutory insurance (personal injury) as much as transport legislation and both must be considered with equal priority. The below diagram shows IAG's four key principles for best practice motor vehicle personal injury compensation scheme design:

Figure 1: IAG Best Practice Principles for Scheme Design



We believe that there needs to be a priority placed on aligning the various state and territory Compulsory Third Party insurance (CTP) schemes as part of the consideration of who has proper control and operation of vehicles.

This is a considerable undertaking, however is necessary given that CTP schemes across Australia are different in their approach to 'fault' and 'no fault' and do not offer the same benefits to those injured in a motor crash.

Aligning CTP schemes across the states through a set of minimum standards can be achieved in a similar way to the agreement across states to implement the National Injury Insurance Scheme (NIIS). This will ensure consumers can access the same level of personal injury cover regardless of which state or territory the incident occurs and enables a clear national liability framework to be understood by manufacturers, insurers and other parties.

We also need to ensure that the regulatory settings make it easy for consumers to access appropriate compensation or treatment without needing to go to the courts. It is worth considering why CTP was introduced in the decades following the introduction of the motor car. The principle purpose of CTP was to protect the motor driver from financial loss due to being sued for damages in court, and to ensure an injured third party was able to access the appropriate medical treatment and compensation in event of injury. Since the early years of these schemes there has been an evolution with some state schemes operating a 'no fault' model which means benefits can be accessed without needing to prove fault, whilst others operate 'fault' based models.

While automated vehicles have the potential to reduce death and injury on our roads, we must ensure the entire system can respond in event of catastrophic failure arising from environmental, product, infrastructure, software, or security interference.

Levels of automation

Table 1: SAE Levels and Regulatory Considerations

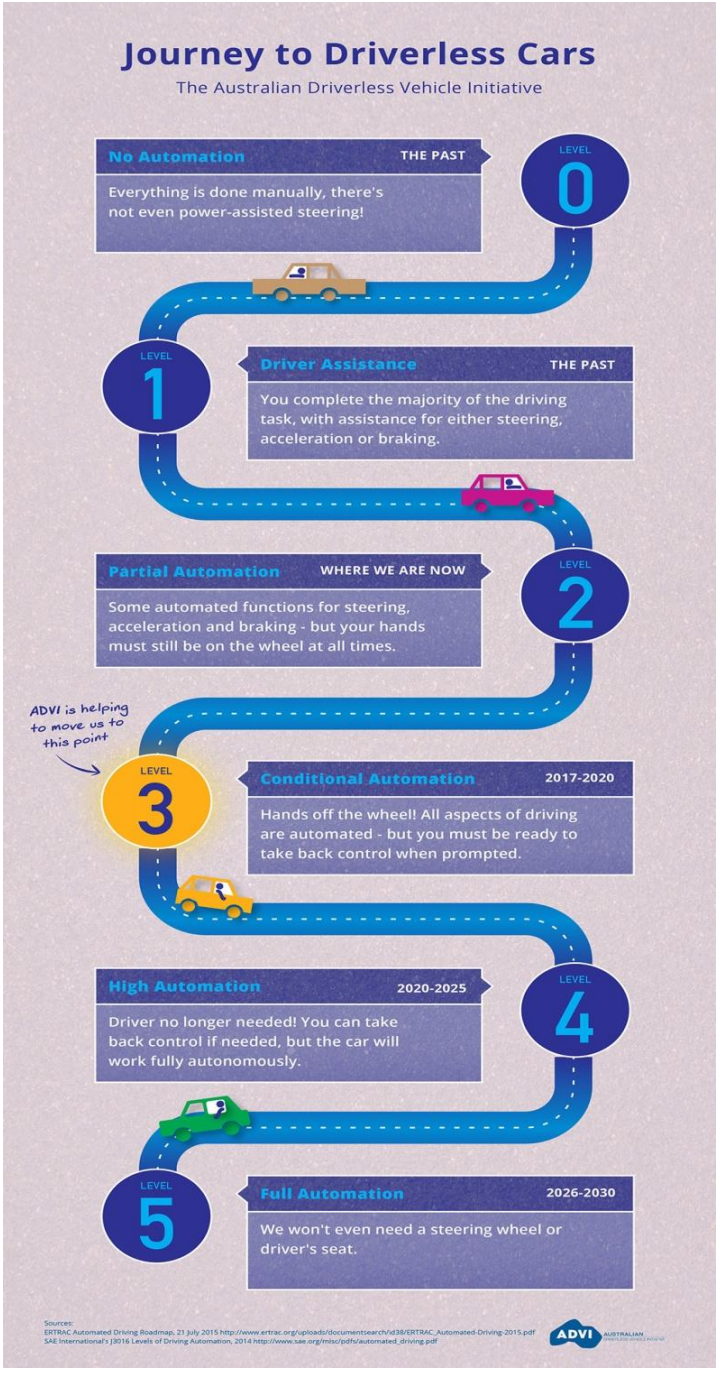
	Level		Steering, acceleration deceleration	Who Monitors the Environment	Who is on back-up if something goes wrong	What driving modes	Simple View Responsibility (liability)	Technology driven role of Driver
Current	0	No automation	Human	Human	Human	n/a	Human	Traditional driving
Current	1	Driver assistance	Human	Human	Human	Some	Human	Traditional driving
Current	2	Partial automation	System	Human	Human	Some	Human	Traditional driving
	For levels 3 – 5, the current regulatory framework will likely need to expand (3) or be overhauled (5)							
Emerging	3	Conditional automation	System	System	Human	Some	Human	Passive Monitoring with active intervention only if something goes wrong
	4	High automation	System	System	System	Some	Manufacturer (Some human)	Passive monitoring in case called on to intervene by the system – however, if no human intervention, the car will come to a stop aiming for minimal risk
	5	Full automation	System	System	System	All	Manufacturer	Passenger – no driving task

The emergence of AVs present many legal questions on how liability should be addressed and apportioned. The introduction of AVs e.g. where safety critical control functions such as steering or braking occurs without direct driver input – but may require human intervention to override in an emergency- is likely to create uncertainty about the intersection of human versus machine in the eyes of the law. This is currently being tested in the United States where a Google vehicle collided with a bus which was clearly not at fault in the situation.

IAG supports the use of the SAE International Standard to classify automated road vehicle functions as it provides a simple framework for understanding the issues relating to the different levels of automation, which become increasingly complex as the level of vehicle automation increases and the level of human control decreases.

Finding a way to embed a common way of describing the level of vehicle automation is critical for consumers, law makers, insurers, manufacturers and those underwriting statutory personal injury schemes. There will need to be a detailed understanding of how this framework will be applied particularly in a mixed fleet scenario, where there will be multiple levels on the road at the same time. It will be critical to work with a broad set of stakeholders on this to ensure proper consideration of the complex liability issues which will arise.

Figure 2: ADVI Automation Levels



IAG also suggests that a simpler, consumer-friendly version of the Standard be developed and utilised to facilitate a greater understanding of automated vehicles across the broader Australian community. The Australian Driverless Vehicle Initiative (ADVI) has developed the roadmap to automation extracted below.

AVs will need to be able to assess and respond to various traffic and environmental cues, and operate under adverse conditions with a high level of precision. Understanding the complex and dynamic road environment is critical to ensure road safety and reliability. The development of sophisticated sensory technology that is fused with data sources (e.g. Satellite navigation) will play a major role as vehicles with varying automation enter the road. This may require a regulatory response possibly through the Australian Design rules, to ensure the highest level of safety for our roads.

It is worth noting that in the future, the Australian road fleet will include a mix of autonomous vehicles (with varying levels of automation) as well as conventional vehicles with human drivers on the road. According to ERTRAC[20], we are likely to see:

- truck platooning – specific lanes dedicated to a number of trucks that follow a lead vehicle with a fixed distance, time or speed;
- a form of highway chauffeuring (drivers activating automated driving on higher speed roads, enabling them to undertake other activities (reading, watching mobile devices, talking on the phone etc while the vehicle drives for them);
- traffic jam chauffeuring (the vehicle can handle traffic jam conditions on behalf of the driver)
- cyber cars – small automated vehicles for individual or collective transportation of people or goods

[20] ERTRAC Automated Driving Roadmap, Connectively and Automated Driving, 2015

- high tech buses – buses that operate more like trams carrying a number of people
- personal rapid transport – small, fully automatic vehicles operating on exclusive infrastructure with minimal stopping.

Providing common infrastructure to support the AVs will help make the transition efficient across State and Territory boarders. For example, national consistency on defining the different levels of automation, combined with a national approach to road signs, signals, lane markings and roundabouts supporting AVs to read the road accurately will be vital to their success.

The National Transport Commission's Issues paper identifies on-road trials as integral to ensure AVs can operate safely on Australian roads. Considering that AVs are developed overseas, it is crucial to test that AVs can respond to the Australian environment. Uniquely Australian features such as fauna (kangaroos), road markings, weather (dust and storms) satellite positioning services and communications coverage e.g. can our broadband infrastructure adequately manage the required data speeds for AVs to run en masse.

2. The extent to which current road safety policies and regulations in NSW anticipate the introduction of driverless vehicle technology, including driverless heavy vehicles, and any regulatory and policy changes which will be required

The National Transport Commission's Issues Paper outlines the current regulatory framework that needs to be considered as part of managing AVs. IAG recommends that while identifying and working towards specific State and Territory centric objectives, it will be important to have a coordinated, national approach. IAG recognises the National Transport Commission's role in coordinating a national regulatory framework on this issue and recommends that the NSW Government proactively takes part in this existing dialogue.

Figure 3: Overview of the current regulatory framework for consideration from the National Transport Commission's Issues Paper:

SAFE ROADS	SAFE VEHICLES	SAFE SPEEDS	SAFE PEOPLE
Infractstruture investment and maintenance: *Commonwealth funding, state, territory, local government and commercial road managers*	International conventions	Australian road rules: *state and territory laws*	International conventions
Road manager liability	Australian design rules: *Commonwealth*	Speed zones established by state and territory law	Australian road rules: *state and territory laws*
	Consumer protection laws: *Commonwealth*	State and territory crimminal codes	Driver licensing: *state and territory laws*
	In service vehicle standards: *state and territory laws*	Driver licensing restrictions: *state and territory laws*	
	Vehicle registration: *state and territory laws*	Vehicle restrictions: *state and territory laws and the Heavy Vehicle National law*	

IAG notes that the Transport and Infrastructure Council[21] (reporting to COAG) agreed in November 2015 it is "important to share learnings across all jurisdictions; have a view on future challenges; and work towards harmonised standards and regulation to ensure that Australia is well positioned to adopt new technologies".

The issue of variations in traffic laws between the states and territories is highlighted as a potential barrier to high levels of automation. The influence these differences may have on driver acceptance and confidence in levels of automation in various states should be considered. Amendments to the Australian Road Rules may go some way to providing both clarity and confidence, however consistent implementation of those rules across the states and territories must also be achieved.

IAG considers that "proper control" should be defined to include "monitoring" and "intervention" to allow for the use and operation of partially automated vehicles which do not require the driver to physically control the vehicle at all times.

IAG also supports the proposition that the term 'driver' in the Australian Road Rules should be defined to include automated vehicle systems to allow for the safe introduction of level 3, 4 and 5 automated vehicles. It is noted that the United States' National Highway Traffic Administration (NHTSA) has confirmed it will consider the Google Artificial Intelligence (AI) system a driver:

"If no human occupant of the vehicle can actually drive the vehicle, it is more reasonable to identify the 'driver' as whatever (as opposed to whomever) is doing the driving."

However, while this helps to address some concerns about assigning liability, it is difficult to imagine how an AI driver would pass appropriate licence and training tests. These issues must be worked through in detail, and we may need to ensure the regulatory approach is flexible enough to respond to emerging issues, yet firm enough to enable the management of the whole system.

When defining the driver of an automated vehicle, consideration should also be give to the roles of the owner, the registered operator and the person operating the vehicle and under what circumstances these individuals may be considered the driver of vehicle.

As well as clarity of the definition of driver, there must also be technology available to identify responsibility (or the driver) for the vehicle at any one time. This clarity of driver and responsibility is essential to avoid costly and lengthy legal disputes between manufacturers and consumers or between manufacturers and insurers.

Liability

One of the biggest impacts of autonomous vehicles will be the shift from personal liability to manufacturer's liability (according to the World Economic Forum). However, this is a broad view and there are complexities which mean other parties will share liability, and there will still be issues for consumers to grapple with.

Consumers require and deserve to have certainty in relation to the safe operation of a vehicle, and in event of a crash, certainty on liability and remedy for any losses incurred. Where there is misadventure, consumers must have a clear path to compensation without the need for legal proceedings. Similarly, vehicle owners should expect to have the peace of mind that insurance offers – for their own negligence and for any fault of their vehicle.

[21] **The Council is made up of the Transport, Infrastructure and Planning Ministers from the Commonwealth States and Territories, New Zealand and the Australian Local Government Association. It reports to the Council of Australian Governments.**

As is noted in the National Transport Commission Issues Paper, liability concerns may mean that automated vehicles need to log actions in significant detail to enable the tracing of causation and to make clear whether the driver or the system was in control at a particular time (inclusion of “black box” technology).

Until full automation (level 5) is achieved and while control of the vehicle is shared between a human driver and the automated driving system, there will continue to be a need for both personal insurance (CTP and property damage) and manufacturers’ liability insurance. In these circumstances, “black box” technology is essential determine fault and liability.

Additionally, liability for loss, injury or damage may also be borne by parties responsible for the infrastructure which supports automated vehicles, for example, telecommunication providers and road authorities.

Further to that, consideration must also be given to who is responsible for any incidences of cyber attack or hacking of automated driving systems and how these events are to be remedied and consumers be compensated in the event of any resulting loss, injury or damage. This is particularly important in a global and digitised world.

Finally, consideration must also be given to liability for vehicles which may be fitted with automated driving features after their manufacture (“retro-fitted”).

3. The preparedness of NSW road safety regulators to meet the challenges extended by driverless vehicle technology

Requirement to facilitate on-road trials

IAG supports Australia taking an active lead in developing on-road trials of automated vehicles as there are many countries now seeking to take advantage of the economic, social and environmental benefits this technology promises.

There is an international race to harness the economic value of these technologies and Australia has the opportunity to be a leader in the field of testing and innovation given our unique geographic distances, ability to generate nationally consistent regulations and different climatic conditions to the northern hemisphere where much of this activity is underway.

Trials and demonstrations are a means to test and further develop technology and to promote awareness and understanding of automated vehicles in the community; and, they should all be undertaken with a keen focus on appropriate controls to ensure the safety of all involved and the general public.

IAG supports the development of a national Code to Practice endorsed by all states and territories. This Code could be similar to those developed by NHTSA in the United States and the Department for Transport in the United Kingdom with safety as a primary focus.

This Code of Practice should be used in conjunction with the existing powers of the Commonwealth and the states and territories to exempt automated vehicles from legislative restrictions for the purposes of on-road trials.

Economic opportunities

More automated vehicles and eventually driverless vehicles – are leading to fundamental change in our transport system. We anticipate that these vehicles will require new standards in road safety, but will also require broad based review of areas such as; road planning and design, traffic engineering, roads and infrastructure development, information technology communications systems.

Additionally, as the technology develops, the way in which vehicles are designed, distributed, insured, not to mention how they will be serviced, repaired and maintained will be vastly different to the way these things are done today. Indeed the entire automotive industry is undergoing significant transformation which offers Australia great opportunities.

It will be important for Australia's economic future to ensure the regulatory settings are right to harness the fiscal, road safety and environmental benefits of this technology. Australia, with NSW leading the fore, has the professional, technical and trades orientated skill base, large geographical area for testing, the technological capability and much of the ITC infrastructure in place to leverage this as an alternative source of income generation.

The disruption vehicle technology is bringing to the motor industry means there may also be the opportunity for the upskilling or skills transfer of the existing motor trades qualified workforce. Auto Skills Australia[22] has found that employment in the automotive industry across Australia is in the vicinity of 383, 806 people, but is dropping. Yet at the same time, the industry has significant shortages of an estimated 19,000 (13% of total people employed in repair sector) of skilled mechanics.

The take out based on these numbers is that the demand for automotive tradespeople and specialists is increasing to reflect the rapid advances in vehicle technology. Governments continued support and collaboration with industry and enterprise in promoting the correct training packages is another way to help boost the State's productivity and healthy economic future for the long term.

The economic impact of AVs can be realised through economic growth, new jobs across the automotive value chain, and wider economic impacts such as increased productivity, reduced time in congestion, reduced number of severe accidents (reduced number of fatalities), efficiency gains in the transport system (i.e. increased capacity and reduced fuel consumption), etc. There is major opportunity for the Australian automotive sector to evolve and adapt at a fast pace to lead rather than to follow the global trend towards AVs and all the spin-off industries they are generating.

4. The experience of other jurisdictions in Australia and overseas in adopting and adapting to driverless vehicle technology

South Australia's Leading Role

Until now, South Australia has been the jurisdiction that is leading the consideration of driverless vehicles in Australia.

In March 2016 the South Australian Government passed the nation's first laws to allow on-road trials of driverless vehicles. Under these laws, bodies wishing to trial driverless vehicle technologies are able to submit a trial proposal. The proposal is assessed by relevant agencies including the SA Police Department and Transport Department, and must demonstrate sufficient insurance coverage to protect the public.

The Minister for Transport and Infrastructure cited an estimated $90 billion dollars within a 15 year period of the driverless vehicle industry along with a desire to develop more new opportunities for business and the economy as reasons for passing these laws.

[22] Auto Skills Australia Automotive Environmental Scan, as at June 2014

Western Australia – self driving trucks and buses

Western Australia has been utilising gigantic self-driving trucks known as “Autonomous Haulage Systems”, for mining purposes in the Pilbara region. There is in excess of 100 autonomous self-driving trucks in use that are programmed to drive and navigate themselves with the help of sensors, GPS and radar guidance technology being supervised by the controller station in Perth.

The State is also set to test a driverless, electric bus in Perth. The staged trial on private and public roads will help the Government understand the legislative and practical challenges posed by vehicles without drivers. The Government is considering how regulation will work, how the vehicle will work operationally, and also how Western Australians will embrace and use the technology.

ACT

The ACT Government is supportive of AVs and is positioning itself as a location to trial autonomous vehicles due to its diverse road network and dispersed population. In order to bring investment and research into the area, the government has begun engagement with technology companies.

Given the geographical convenience, there is room for collaboration, particularly around how different jurisdictions work together to undertake on-road testing and trials. This may help increase the appeal of the region to international technology companies, promoting Australia as suitable for the development of autonomous car technology.

International Jurisdictions

Foreign jurisdictions have taken a variety of approaches to driverless vehicle regulation, with mixed outcomes.

The UK in 2015 has recognised the road safety, social inclusion, and congestion benefits of driverless vehicle proliferation and has therefore adopted a national regulatory framework and action plan outlined in ‘The Pathway to Driverless Cars’ report. It provides clarity and consistency across the entire country; thereby making it easier for driverless vehicle manufacturers and related industries such as insurers to plan for the future and contribute to an effective regulatory regime.

Singapore’s approach should also be considered, not only has it adopted a national regulatory framework to accommodate foreign driverless vehicle manufacturers, but it has also invested in domestic technological capabilities in the area.

While the US boasts the highest saturation of driverless vehicles, it has failed to adopt a clear national regulatory regime, with each state adopting different laws, which is likely to result in an increasingly confused and opaque environment that may handicap the potential growth of the future market. Australia should avoid this outcome, and instead adopt a similar approach to that taken by the UK and Singapore.

Promisingly, positive steps have been made in this direction for Australia through the work of the National Transport and Infrastructure Council.

5. Other related matters

Data

The greater collection and use of data that will inevitably accompany the eventual widespread adoption of driverless vehicle technology in Australia will pose both opportunities and challenges.

Data has the potential to create powerfully accurate road safety information, and can be leveraged to improve congestion in our cities' roads. On the other hand, there will be challenges that emerge out of this, such as question surrounding data ownership and privacy.

The development of automated vehicle technology means that cloud-based computing and telecommunication systems are as much a part of infrastructure as the bitumen and white lane markings which form a road. IAG submits that this complex issue of vehicle and consumer data management, ownership and privacy will have implications beyond state boarders, given the global context of vehicle manufacturing. Issues such as privacy, access and control of data will become increasingly critical.

It is also submitted that any regulation of data ownership and access must be nationally consistent to prevent any complication and difficulty arising data access when a vehicle travels interstate.

Conclusion

AVs have the ability to revolutionise transport in this country, Australia has the capability to be at the forefront of this paradigm shift. The next 3 – 5 years represent a critical transition period for the country and governments have a key role to play in getting the broader policy settings right and encouraging industry to innovate and lift productivity.

Given the extent of impact that increasing vehicle automation is likely to have not only to legislation but to industries and consumers, we must be forward thinking, and consult extensively.

IAG would be pleased to discuss aspects of this submission in greater detail and look forward to participating in the next phase of discussion on the national framework for automated vehicles.