

Submission to the National Transport Commission:

Regulatory Barriers to More Automated Road and Rail Vehicles Issues Paper

April 2016

ANCAP is committed to continuing to raise the bar on vehicle safety - providing consumers with the best technology and safest cars available.



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ANCAP Submission:

National Transport Commission (NTC) - Regulatory Barriers to More Automated Road and Rail Vehicles Issues Paper

April 2016

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Executive Summary

The Australasian New Car Assessment Program (ANCAP) welcomes the opportunity to provide feedback on this National Transport Commission (NTC) issues paper and considers that the discussion points identify the key regulatory issues facing automation in new vehicles.

ANCAP is the leading, independent vehicle safety advocate in Australasia. ANCAP provides consumers with transparent advice and information on the level of occupant and pedestrian protection provided by different vehicle models in the most common types of crashes, as well as their ability – through technology – to avoid a crash.

ANCAP is supported by all Australian and New Zealand motoring clubs, the Australian Government, the New Zealand Government, Australian state and territory governments, the Victorian Transport Accident Commission, NRMA Insurance and the FIA Foundation.

ANCAP has a key role in educating consumers about new vehicle technology, promoting the benefits of new technologies and building community confidence in those technologies.

Key points on the introduction of autonomous vehicle technology:

- ANCAP supports and will actively encourage the introduction of autonomous vehicle technology to assist the driver and improve road safety
- ANCAP has a key role in educating consumers and building community confidence in autonomous technology
- ANCAP supports Federal, state and territory governments working with the vehicle industry and other stakeholders to overcome any regulatory concerns limiting the introduction or use of autonomous technology
- ANCAP supports comprehensive on and off road trials of autonomous technology
- ANCAP recommends that safety should remain a top priority in all discussions on autonomous technology or driverless vehicles.

The future of improving vehicle safety lies with autonomous technologies with human error believed to be a factor in over 90 per cent of road crashes¹. In less than two years time ANCAP will update its rating program and begin local testing and assessments of autonomous technologies. The technologies being tested include Autonomous Emergency Braking (AEB) in various scenarios, including vulnerable road users; speed assist systems, including traffic sign recognition and digital map data management; and lane support systems.

As technology develops, new tests and assessments will be developed in collaboration with international partners to continue to reward and promote those systems considered to offer the highest levels of safety.

While additional testing and assessments of technology will be introduced, ANCAP will retain and update the crash-testing component of its ratings. With the Australian vehicle fleet having an average age of 10.1 years², vehicles featuring levels of

¹ 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>

² Australian Bureau of Statistics (July 2015), '9309.0 - Motor Vehicle Census, Australia, 31 Jan 2015' accessed at <http://www.abs.gov.au/ausstats/abs@.nsf/mf/9309.0>

autonomous technology will continue to mix with older vehicles for many years to come, and high levels of occupant protection must continue to be required for new vehicles.

ANCAP acknowledges the difficulty in speculating on the future operation and usage of vehicles featuring high levels of automation. ANCAP's focus is currently on encouraging autonomous technologies that do not replace the driver, but rather support the driver. These technologies would be considered partially or conditionally automated under the proposed definitions of the levels of automation. ANCAP would like to emphasise that these levels of automation are available today, however at lower levels in Australasia than in other regions such as Europe³.

The Issues Paper suggests partial automation should not be considered further in this project. With automation technologies at relatively low injection rates in Australia, ANCAP considers that the encouragement of these technologies is critical to set the foundation for vehicles with higher levels of automation.

Fully automated vehicles will comprise of these subsystems which feature in vehicles available today. ANCAP considers the widespread real-world use of these subsystems, typically operating as driver-support technologies, critical before the roll-out of the fully automated vehicle. However, it seems there are barriers to the increased uptake of some of these driver-support systems in Australia.

The Issues Paper discusses various aspects of autonomous vehicle technology from definitions to regulations and liability. Automation is present in sectors other than road transport, and autonomous vehicle technology is an international topic of discussion. ANCAP recommends, where possible, the adoption of internationally consistent practice.

³ Royal Automobile Club of Victoria (December 2014), 'Emerging Vehicle Safety Technology' accessed at https://www.racv.com.au/wps/wcm/connect/racv/internet/auxiliary/news+_events/research+and+reports/research-and-reports

Question 1 - What are automated vehicles?

Do you support the use of the Society of Automotive Engineers (SAE) International Standard to classify automated road vehicle functions? Do you have any issues with using the SAE International Standard?

ANCAP is familiar with the levels of automation defined by the National Highway Transport Safety Administration (NHTSA) in the United States⁴. This system specifies five levels of automation (Level 0 - Level 4). There are not any clear benefits at present for either system, however ANCAP recommends internationally consistent definitions be used.

The purpose for defining levels of automation in the issues paper is not clear. The paper implies the purpose is to classify a vehicle, however also stating that a vehicle can be classified as multiple levels of automation depending on the driving scenario or environment. The wording used is 'to classify automated road vehicle functions'. Potentially, particular roads or zones that may be capable of supporting various levels of automation may then also be classified under these definitions.

Question 2 - Role of government

What do you think the regulatory role of governments should be to support the introduction of automated vehicles in Australia?

The introduction of the automated vehicle has already begun and to support higher levels of automation there needs to be reliability and, in turn, confidence in the technologies.

Several manufacturers have demonstrated that vehicles available today are capable of higher levels of autonomy, however are de-tuned via software for sale to the general public. A local example of this was seen in November 2015 at the International Driverless Cars Conference held in Adelaide⁵ when Volvo demonstrated the levels of autonomy its vehicles are capable of with only software modifications.

ANCAP considers the immediate role for governments is to provide manufacturers with regulatory confidence in automated technology in Australia by defining 'control of the vehicle' and providing the infrastructure to support the technologies.

The introduction of autonomous vehicles will be assisted by governments agreeing to national consistency on infrastructure such as speed signs, traffic signs and signals, and line and lane markings to support these technologies.

ANCAP has a role in assisting governments with ANCAP Safety Ratings having a significant influence over market demand for vehicle safety. With the inclusion of autonomous systems as part of the rating it is expected that this will again influence the market demand for these safety systems.

⁴ National Highway Traffic Safety Administration (May 2013), 'U.S Department of Transport Releases Policy on Automated Vehicle Development', accessed at <http://www.nhtsa.gov/About+NHTSA/Press+Releases/U.S.+Department+of+Transportation+Releases+Policy+on+Automated+Vehicle+Development>

⁵ Australian Driverless Vehicle Initiative (November 2015), 'Requirements for Demonstration of Volvo XC 90 Vehicle in Autonomous Mode' accessed at <https://www.arrb.com.au/Journey/Self-Driving-Vehicles/ADVI-Media-and-News.aspx?preview=true>

Question 3 - Issues with regulating the driver

Have we identified the key issues relating to the Australian Road Rules and state and territory road safety and traffic laws? Are there other issues that should be assessed as part of the NTC review?

Autonomous technology is available today and will increase in the future, and with this it may be necessary to alter the definition of the 'driver'.

In the short-term, where lower levels of autonomy that support the driver become widely available to the general public, ANCAP considers aviation as an appropriate example for discussion - where there is a licensed pilot responsible for the aircraft even when in autonomous mode. This supports the proposed amendment to Article 8 of the Vienna Convention and the words of the Explanatory Note, 'the systems are not intended to overrule the decision taken by sane, accountable drivers'⁶.

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 (which are intended to form part of a national scheme to provide uniform road laws throughout Australia⁷) 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.

Question 4 - Issues with regulating the road vehicle

Have we identified the key issues relating to the Australian Design Rules and other vehicle standards? Are there other issues that should be assessed as part of the NTC review?

While much of the focus is on regulation for those autonomous systems, the paper does mention the continued applicability for current regulations. In 2015, the Australian vehicle fleet consisted of 18.0 million registered motor vehicles, with an average vehicle age of 10.1 years⁸. With this fleet size and age, autonomous vehicles will mix with the current fleet for many years and the risk of being involved in serious crashes will remain. For this reason, ANCAP believes it is crucial ADRs relating to occupant protection continue to apply to these vehicles.

The paper makes the point that all current design rules could continue to be relevant to those highly automated vehicles that enable a human driver to take back control of the vehicle. ANCAP would expect this to be the case with the intent of the ADRs continuing to apply. In order to not overly restrict innovation or the type of technology used, it may be necessary to slightly amend some existing ADRs for highly automated vehicles, or allow alternate standards be met for qualifying vehicles. This can also be achieved through harmonisation with UN regulation.

Potential new ADRs are touched on in the paper, with mapping location updates given as an example. New ADRs can aid in building consumer confidence in the

⁶ Report of the 70th session of the Working Party on Road Traffic Safety, 2015, Amendments to Article 8 and Article 22 of the Convention on Road Traffic (1949).

⁷ National Transport Commission (February 2012), 'Australian Road Rules, February 2012 version'.

⁸ Australian Bureau of Statistics (July 2015), '9309.0 - Motor Vehicle Census, Australia, 31 Jan 2015' accessed at <http://www.abs.gov.au/ausstats/abs@.nsf/mf/9309.0>

technologies, with mapping location updates being an example in providing confidence that the speed zone recognition system of a vehicle is not grossly out-dated. Another example mentioned in the paper is the data recording of critical incidents.

The paper seeks views on whether parallel ADRs for automated vehicles are the best solution, or whether alternative approaches, such as a set of ADRs sufficient to cover all vehicles, are appropriate. The question at the core of this is how to classify levels of autonomy within vehicle categories, which can then determine ADR applicability. The classification of autonomy into level categories mentioned previously may be intended for this purpose.

Question 5 - Issues with regulating heavy vehicles

Have we identified the key issues relating to heavy vehicles? Are there other issues that should be assessed as part of the NTC review?

ANCAP is not in a position to submit comments relating to heavy vehicles as it is not within our scope of research or expertise. However the principle of requiring the highest possible safety standards for autonomous vehicles should also apply to heavy vehicles.

Question 6 - Liability

Have we identified the key issues relating to the liability of drivers, manufacturers, service providers and road managers? Are there other issues that should be assessed as part of the NTC review?

ANCAP believes the issue of liability has a significant influence on industry and consumer confidence in the provision and take-up of autonomous vehicle technologies.

With automation present in other sectors and liability discussions occurring internationally, ANCAP recommends consistent practice. ANCAP recommends the NTC look further to other sectors such as aviation and shipping in order to understand how autonomy has been managed.

Question 7 - Privacy and access to data

Have we identified the key issues relating to privacy and access to data by government agencies? Are there other issues that should be assessed as part of the NTC review?

ANCAP supports the position of the Australian Automobile Association⁹ in recommending *motorists should not be prevented from accessing the data generated by their vehicles or prevented from choosing providers of ancillary services.*

⁹ Australian Automobile Association (March 2016), 'AAA Submission: Regulatory barriers to more automated road and rail vehicles', page 10.

Question 8 - Supporting on-road trials

Have we identified the key issues relating to on-road trials of automated road vehicles? Are there other issues that should be assessed as part of the NTC review?

ANCAP supports comprehensive on and off road trials of autonomous technology to build consumer confidence in the technology.

Fully automated vehicles will comprise of vehicle subsystems which feature in new vehicles today. ANCAP considers the injection of these subsystems, typically operating as driver-support technologies, critical before the roll-out of the fully automated vehicle. While these technologies are available today, their level of availability in Australia is lower than that of other countries such as those in Europe and Asia¹⁰.

As part of ANCAP's emphasis on vehicle technology, intelligent speed assistance systems are promoted. Generally these technologies rely on systems capable of determining the speed limit at a vehicle's current location. These technologies are seeing increased availability in Europe, however at present there is very low availability of these technologies in Australia. Traffic sign conformity is typically referenced as a factor preventing these technologies featuring in local vehicle specification. This is an example of the need for local validation of technologies that are already available and will be critical components of the highly automated vehicle.

ANCAP recommends the commissioning of local, comprehensive on and off road trials as soon as possible in order to determine whether there are any potential requirements unique or specific to Australia that trials in other regions may not expose.

Question 9 - More automated rail

Have we identified the key issues relating to more automated rail operations? Are there other issues that should be assessed as part of the NTC review?

ANCAP cannot submit any comments on this question as it is outside our scope of research or expertise.

Question 10 - Other issues

Are there additional issues or risks that should be considered in the NTC's assessment of regulatory barriers to more automated vehicles?

Human factors and the issue of safety are raised in the paper and the question 'how safe is safe enough?' is posed. The introduction of fully automated vehicles and the increased uptake of autonomous technology will drive a road safety revolution.

The future of improving vehicle safety lies with autonomous vehicle technologies with human error believed to be a factor in over 90 per cent of road crashes¹¹. Many safety features already available on vehicles aim to reduce the effect of human error on our roads, including technologies such as autonomous emergency braking (AEB), lane keep assist, fatigue detection, as well technologies that have been available for

¹⁰ Royal Automobile Club of Victoria (December 2014), 'Emerging Vehicle Safety Technology' accessed at https://www.racv.com.au/wps/wcm/connect/racv/internet/auxiliary/news+_events/research+and+reports/research-and-reports

¹¹ 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>

many years, such as electronic stability control. With these technologies in our cars today, our vehicles are already safer than the human driver.

Vehicles considered partially or conditionally automated under the proposed definitions of automation will require a sequence of events in scenarios where the vehicle hands control back to the driver. Managing human error in this handover process will be critical to safety, and ANCAP considers this an issue requiring attention.

ANCAP will also play a role in influencing the safety of the automated car through its testing and assessment of driver support technologies, and the development of more tests and assessments as technology advances. The testing and rewarding of safety technologies that demonstrate good safety performance will encourage best practice and build consumer confidence, ensuring that the development and roll-out of autonomous vehicle technologies continues.