REGULATORY OPTIONS TO ASSURE AUTOMATED VEHICLE SAFETY IN AUSTRALIA

AUSTRALIAN TRUCKING ASSOCIATION SUBMISSION
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1. About the Australian Trucking Association

The Australian Trucking Association (ATA) is the peak body representing trucking operators. Its members include state and sector associations, some of Australia's major logistics companies and businesses with leading expertise in truck technology. Through its members, the ATA represents many thousands of trucking businesses, ranging from owner drivers to large fleets.

2. Introduction and summary

Although automated vehicles pose opportunities for improved road safety and productivity, these vehicles also present significant safety risks and uncertainty to the general community.

The National Transport Commission (NTC) is seeking feedback regarding the need for explicit regulation of automated vehicle safety.

The ATA agrees that government has a key role to play in the safety assurance of automated vehicles. However, the ATA opposes any regulatory model that, threatens trucking businesses or impedes continued innovation or transition to automated and high productivity vehicles.

A high priority must also be given to the introduction of independent, no-blame, safety investigations by the Australian Transport Safety Bureau (ATSB) for crashes involving automated vehicles. The best way to understand the causes of crashes involving automated vehicles and generate recommendations to prevent their recurrence would be for crashes to be investigated through a no-blame accident investigation process.

Importantly, any legislative model must be nationally consistent and recognise the unique Australian road and road user context.

3. Answers to NTC questions

Question 1. Should government have a role in assessing the safety of automated vehicles or can industry and the existing regulatory framework manage this? What do you think the role of government should be in the safety assurance of automated vehicles?

The ATA agrees that government should have a strong role in assessing the safety of automated vehicles but strongly opposes accreditation (option 4), because it would impose an intolerable compliance burden on small trucking businesses.

The ATA's recommended approach is set out further in our response to questions 6-9.

Question 2. Should governments be aiming for a safety outcome that is as safe as, or significantly safer than, conventional vehicles and drivers? If so, what metrics or approach should be used?

The ultimate outcome of the introduction of automated vehicles should be a safer road system. Therefore, government should be aiming for a safety outcome that is significantly safer than conventional vehicles and drivers.

High automation is qualitatively different to partial and conditional automation where the system adds to the drivers skills. As demonstrated through the heavy vehicle study completed by Curtin Monash Accident Research Centre (C-MARC) drivers exhibit variable levels of driving skills.

For example the C-MARC study showed that drivers with less than 10 years driving experience were found to have more than three times the risk of crashing than more experienced drivers[1]. Additionally, other variables such as the time of day the driver is on the road and the driver's health can also increase (or decrease) levels of crash risk.

If automated vehicles are to increase the safety of the road network, a highly automated system must prove to be safer than any human vehicle drivers.

Question 3. Should the onus be placed on the automated driving system entity, to demonstrate the methods they have adopted to identify and mitigate safety risks?

Question 4. Are the proposed assessment criteria sufficient to decide on the best safety assurance option? If not, what other assessment criteria should be used for the design of the safety assurance system?

The proposed criteria should be suitably constructed to ensure that the choice of the regulatory option itself does not affect the structure of the trucking industry or discriminate against small business.

Any regulatory requirements affecting small business should be reasonably achievable by all levels of businesses within the industry.

The ATA recommends that:

Criteria 1. Safety: Should recognise that a heavy vehicle is likely to have multiple owners and operate in markedly different conditions during its full life span. Thus, when considering the ongoing safety of a vehicle, it must be clear who is responsible for vehicle maintenance, in-particular the more technical aspects of automation such as software upgrades.

Criteria 2. Innovation, flexibility and responsiveness: Should support the selection of a regulatory model that promotes continued innovation in high productivity vehicle combinations and recognises that the heavy vehicle space in Australia poses unique regulatory opportunities and challenges.

[1] http://c-marc.curtin.edu.au/local/docs/CMARC_HeavyVehicleStudy.pdf

One of the key risks associated with in-service safety is the high number of heavy vehicles that undergo modifications. Automated vehicle modification could include:

- commercial modifications undertaken by a licensed third-party repairer
- non-commercial modifications – such as a 'backyard' modification by the vehicle owner
- modifications directly undertaken by the manufacturer – such as software updates that modify the performance of the vehicle.

Australian operating conditions also have unique aspects with regard to autonomous vehicle programming, for example:

- Volvo's Large Animal Detection system is already in use overseas and effectively detects deer, elk, caribou and moose. Volvo has recently further tested the system on Australian roads. They have found that the random jumping movements of kangaroos confuse the computers. Because the computers use the ground as a reference point, it is unable to determine how far away a hopping kangaroo is.

- The Defence Science and Technology Organisation (DSTO) experienced similar issues when it adapted overseas helicopter simulation software to Australian conditions. Naturally, DSTO decided to include kangaroos in the simulation, and implemented them as reskinned opposing force combatants. But the DSTO engineers forgot to turn off the combatants' default weaponry, with the result that the kangaroos fired back at the helicopter pilots using the simulation.

Criteria 4. Regulatory efficiency & 7. Other policy objectives: As well as minimising structural and organisational change in order to implement a regulatory option, the model chosen should likewise not affect the structure of the freight industry or discriminate against small business.

Question 5. Should governments adopt a transitional approach to the development of a safety assurance system? If so, how would this work

Question 6. Is continuing the current approach to regulating vehicle safety the best option for the safety assurance of automated vehicle functions? If so, why?

Question 7. Is self-certification the best approach to regulating automated vehicle safety? If so, should this approach be voluntary or mandatory? Should self-certification be supported by a primary safety duty to ensure automated vehicle safety?

Question 8. Is pre-market approval the best approach to regulating automated vehicle safety? If so, what regulatory option would be the most effective to support pre-market approval?

Question 9. Is accreditation the best approach to regulating automated vehicle safety? If so, why?

In an accreditation model, automated driving system entities (the entity legally responsible for the driving system) would be accredited by an accreditation agency to operate an automated driving system on a case-by-case basis.

The threshold for requiring accreditation would be that an automated driving system entity takes responsibility for the safe operation of the vehicle and for the actions of the vehicle while the automated driving system is engaged[2]. The accreditation applicant could be a vehicle manufacturer, technology provider or any other party seeking to operate an automated driving system. Consequently, accreditation would apply to operators of specified automated driving systems or highly and fully automated vehicles.

An accreditation model would be complex and cost prohibitive for most businesses in the trucking industry and would have a significant impact on, particularly, small business or owner operator vehicle ownership.

Approximately 70% of all trucking operators in Australia only have one truck in their fleet and approximately 24% have two to four trucks. Less than 0.5% of all operators have fleets with more than 100 trucks[3].

Small-to-medium freight enterprises are usually small businesses. Owner/operator businesses are generally independently owned, and in most cases the business owner is the person responsible for driving and maintaining the vehicle as well as managing the business.

Accreditation would involve a major reform of safety regulation and is not internationally consistent. Approaches being taken elsewhere in the world are more aligned to self-certification and pre-market approval models and not accreditation.

Question 10. Based on the option for safety assurance of automated vehicle functions, what institutional arrangements should support this option? Why?

The NTC discussion paper[4] lists five institutional options for managing automated vehicle safety assurance. These are:

Option 1: The Commonwealth manages automated vehicle safety assurance.

Option 2: A national entity manages automated vehicle safety assurance.

Option 3: One state or territory manages the safety assurance system for all states and territories.

Option 4: States and territories manage automated vehicle safety assurance individually.

Option 5: A fully commercial, quasi-governmental entity manages automated vehicle safety assurance.

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[2]National Transport Comission (NTC), Regulatory options to assure automated vehicle safety in Australia. Discussion paper, June 2017

[3] www.nti.com.au/document/nti-guide-to-the-trucking-industry-2016.pdf

[4] National Transport Comission (NTC), Regulatory options to assure automated vehicle safety in Australia. Discussion paper, June 2017, (pages 44 to 51).

Of these, the ATA supports a modified option 1 – the Commonwealth would manage new approvals with the states/National Heavy Vehicle Regulator (NHVR) responsible for in-service compliance.

As stated in the NTC discussion paper, this option may require amendments to the MVSA to broaden its application to assess safety where there are no Australian Design Rules (ADRs).

This is the only option capable of providing a national approach and builds on the existing capabilities of the Department of Infrastructure and Regional Development (DIRD) vehicle standards branch.

There is no case for establishing another national agency in this space. The ATA would be particularly opposed to assurance functions being carried out by a commercial or quasi-commercial entity.

Question 11. How should governments manage access to the road network by automated vehicles? Do you agree with a national approach that does not require additional approval by a registration authority or road manager?

The current, proof of concept Heavy Vehicle Infrastructure Ratings (HVIR) are based on three components important to heavy vehicle operators: access, ride quality and safety components.

Automated vehicle access requires a road rating that integrates with this current HVIR system so that automated vehicles can be certified for use (in automated mode) on roads achieving a specified rating. When not on an automated vehicle certified road the system will hand back to the driver.

Austroads - *Assessment of Key Road Operator Actions to Support Automated Vehicles* research report discusses road certification for automated vehicles. The report says that modifying all existing road infrastructure would be prohibitively expensive. Road certification would work by evaluating and defining roads that are suitable for specific vehicles and use cases[5].

For roads to be certified as suitable for automated heavy vehicles, bridge loadings may need to be reviewed to support heavy vehicle platooning, more consistent road marking and machine readable signage may be required, and the mobile (cellular) black spots on designated routes must be addressed.

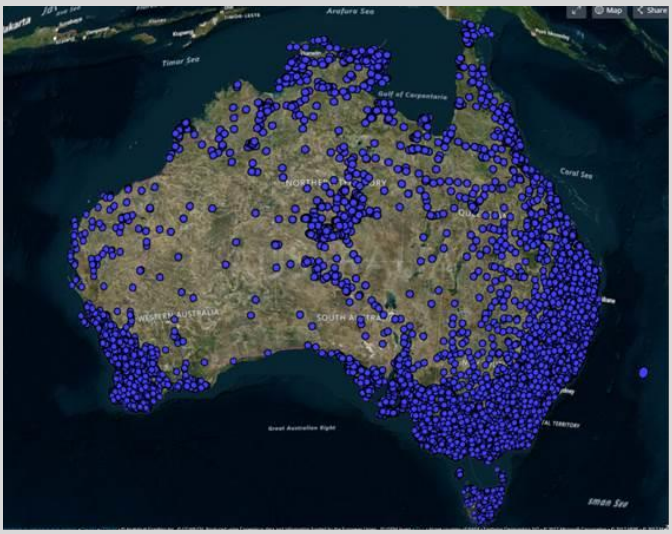
[5] Austroads, Assessment of Key Road Operator Actions to Support Automated Vehicles. Research report AP-R543-17, May 2017.

Case Study: Upgrading the supply chain for digital disruption

Fixing mobile black spots will be a requirement before a road can be specified within the road service levels as ready for vehicles with higher levels of automation, and levels of mobile connectivity should be included more broadly.

We cannot predict how technology will change and the things that people will do with it. Ultimately what's important is not trying to predict the future or focus on introducing a particular form of technology. Instead, we must deliver policies which deliver the right settings, outcomes and platforms from which businesses and the community can maximise the benefits of technological change to achieve gains in safety, connectivity, and economic growth.

A common feature of technological change is connectivity – access to mobile data, and through that access to information and technologies of the wider world. Australia is unique, covering a large geographical area, where mobile data connectivity is not universal. Publically reported blackspots for mobile phone reception are significant, as represented in the below map.



The Australian Government has committed $220 million to the Mobile Black Spot Program to invest in telecommunications infrastructure to improve mobile phone coverage along major regional transport routes, in small communities and in locations prone to natural disasters.[6]

Whilst this investment is welcome, ultimately there are still significant transport routes without mobile phone data connectivity, limiting the ability to take advantage of technological change, and presenting a clear safety risk for emergency situations. Providing mobile data connectivity on transport routes is a minimum first step before Australian road freight companies can take advantage of the technological change and disruption of the future.

[6] Department of Communications and the Arts, Mobile Black Spot Program, website accessed on 19 July 2017.

Question 12. How should governments ensure compliance with the safety assurance system?

The ATA agrees that ensuring that automated driving system entities, and other parties responsible for automated vehicle safety, meet their safety obligations is a key issue.

The ATA recommends that governments should ensure compliance by amending the *Motor Vehicle Standards Act* (MVSA) and state legislation for in service vehicles.

However, HVNL changes would be necessary to support in-service requirements.

4. Accident Investigation

Successful regulation of automated vehicle safety will require reform to safety investigations of road crashes.

Presently road crashes are investigated by police and/or the coronial system. This existing system is not suitable to the need to investigate the causes of the crash with relevant experts, including where technology and software needs investigation.

In contrast, the Australian Transport Safety Bureau (ATSB) conducts independent investigation of transport accidents and other safety occurrences in the aviation, marine and rail modes of transport. The ATSB also seeks to improve safety and public confidence in those transport modes by pursuing excellence in safety data and research and fostering safety awareness, in addition to independent investigation of crashes.

The ATSB is an independent statutory agency that is separated from transport regulators, policy makers and service providers. It is not a function of the ATSB to apportion blame or to provide a means for determining liability.

The ATSB's role should be extended to include road crashes involving automated vehicles. The best way to understand the causes of crashes involving automated vehicles and generate recommendations to prevent their recurrence would be for those crashes to be investigated through a no-blame accident investigation process, including the ability to access data from the vehicles involved.

By also extending ATSB safety investigations to road accidents involving heavy vehicles, the reform can be implemented and improve road safety in the short term, and demonstrate to the community in advance of the widespread introduction of automated vehicles the improved safety investigation framework for accidents involving automated vehicles.