

**Submission
No 20**

**INQUIRY INTO HEAVY VEHICLE SAFETY AND USE
OF TECHNOLOGY TO IMPROVE ROAD SAFETY**

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Mr Greg Aplin (Chair)
Staysafe (Joint Standing Committee on Road Safety)
New South Wales Parliament House
Macquarie St
Sydney NSW 2000

Dear Mr Greg Aplin MP,

Inquiry into heavy vehicle safety and use of technology to improve road safety

Austroads commends Staysafe (Joint Standing Committee on Road Safety) on its decision to hold an inquiry into heavy vehicle safety and use of technology to improve road safety.

While much work is being progressed on identifying the potential safety and mobility benefits of emerging vehicle technologies, and on establishing the regulatory and operational arrangements required to support their introduction and use, it is well recognised that further work will be necessary to identify and address the wide range of issues that these vehicles could potentially have on our communities.

Austroads, as the association of road transport agencies across Australia and New Zealand, has a critical role to play in planning for and supporting the introduction and use of future vehicle technologies on our road networks. Austroads and its member agencies have a lead role in the design, maintenance and operational practices for approximately 900,000 kilometres of roads, and also with the vehicle registration, driver training and driver licencing practices that are necessary to manage access to and use of our road networks.

We propose to focus our submission on the Austroads Connected and Automated Vehicle work program, aligned to the Terms of Reference item:

b) The development of connected and automated vehicle technologies specific for the heavy vehicle industry and opportunities for further development in this space

However, given the level of discussion of heavy vehicle safety within New South Wales at the current time, we also draw the committee's attention to Austroads Safety program which is currently considering a Review of the National Vehicle Driver Competency Framework (NHVDCF) (the Review). The Review considered the following:

1. all aspects (policy, operational, governance and content) of heavy vehicle driver training and assessment in Australia;
2. the effectiveness of the National Heavy Vehicle Driver Competency Framework (the Framework) and all other heavy vehicle driver training models/schemes utilised in each Australian jurisdiction; and
3. the value and adequacy of the capabilities, competencies and qualifications required of heavy vehicle drivers and heavy vehicle trainers in each Australian jurisdiction.

The Review was completed in late 2017 with an internal report containing a number of consolidated recommendations and findings, addressing a number of aspects including raising standards required of heavy vehicle drivers; and national consistency in assessor and instructor eligibility. The Austroads Registration and Licensing Taskforce has been tasked with considering the recommendations and findings, determining their priorities and approaches to progressing these, including the work required. Consideration of the recommendations and findings is expected to be completed in the second half of 2018.

What are Automated, Warning and Compliance Systems?

Automated Vehicles

An 'automated vehicle' can be defined as a road vehicles that involve some automation of the primary driving controls (ie. steering, acceleration, braking). To define and categorise the level of automated driving in a vehicle, various taxonomies are often used. The most commonly used categorisation is from the Society of Automotive Engineers (SAE) J3016 standard, which includes automated driving levels ranging from level 0 (no automation) to level 6 (fully automated).

We already have vehicles with level 2 (partially automated) capabilities on our roads today. This applies to both light and heavy vehicles. These vehicles have the capability to drive themselves in certain situations, but require that the human driver is still monitoring the driving environment and is in control.

Importantly, the vehicle automation features available at this level will be the most important for addressing Australia's road trauma problem. Features including lane keeping, adaptive cruise control, speed assistance (including traffic sign recognition), adaptive cruise control and automated emergency braking address many of the extant challenges in road safety. These features address the key road trauma risks present in our current environment including driver fatigue, impairment, speed, distraction, that have been shown to contribute to many heavy vehicle crashes. They have particular benefit, as unlike warning applications they intervene directly with a vehicle's control to prevent crashes.

From our view of international developments of vehicle automation, we can expect industry to continue to develop higher levels of vehicle automation in heavy vehicles. Vehicles that are capable of automating the driving task on less complex road environments such as freeways (from entrance ramp to exit ramp) are being trialled overseas. These vehicles may be able to be driven to the motorway environment and then be driven in a 'driverless' mode until the exit ramp where they are then piloted to a final destination. A reasonably clear picture of productivity, efficiency and sustainability benefit can be made from these systems, but the road safety benefits beyond existing level 2 systems remain to be seen.

Warning applications

Warning applications are already available in a range of heavy vehicles including forward collision warnings, lane departure warning, speed zone warning and height and mass warning. As a warning system still requires intervention from a driver once alerted, warning systems are less likely to lead to road safety benefits, but have been shown to be helpful for reducing road trauma.

A range of newer warning services are also being delivered which provide forward information that are delivered across mobile or broadband services and which complement a vehicles on-board sensing. This could include availability of rest stops, curve-speed warning, speed zone changes (as warnings), other traffic hazard warnings or remote emergency warning.

Within the array of connected vehicle warning systems, cooperative-ITS enables the low-latency exchange of messages between vehicles and infrastructure. The main impetus for deploying C-ITS, from a government perspective, is to deliver advanced safety applications that will aid in reducing the number of fatality and serious injury crashes on the road network. New South Wales through the Centre for Road Safety CITI project is already a leader in Australia in this field. Austroads, and member agencies highly value the work that is being developed here which will inform other programs by better understanding issues with deploying heavy vehicle C-ITS. However, we note that warning systems based on C-ITS messages are not currently available in the market, and therefore there is less certainty around when road safety benefits might be yielded.

Compliance applications - telematics

Telematics, by comparison offers services for tolling, diagnostics and commercial fleet tracking of vehicles among other features. From a safety perspective, a range of applications including electronic work diaries, intelligent speed compliance and the intelligent access program (IAP) offer applications that assist with compliance obligations for transport operators. In a regulatory sense, Australia is

already highly advanced in the deployment of telematics for regulatory applications through Transport Certification Australia's Intelligent Access Program. We do not have further comment on telematics for this inquiry.

It is important to understand the difference between 'automated', 'warning', 'telematics' and what potential benefits they may achieve. We believe it would be wise for the inquiry to focus particularly on current market vehicle automation systems (lane keep assist, adaptive cruise control, automated emergency braking and speed assistance systems) in the short term. Further development of warning systems using data from infrastructure should also continue to be explored, however, this is likely to involve a longer term approach to achieve safety benefits.

Collaborative approach to preparing for Connected and Automated Vehicles

A collaborative approach is being taken at a national level towards achieving a consistent regulatory and operational framework to support connected and automated vehicles. It will be important, and of immense value, if initiatives such as this inquiry are appropriately linked in to and informed by the broader national program of work.

The Commonwealth Department of Infrastructure and Regional Development and Cities (DIRDAC) play a lead role with regards to national transport policy settings, and also in its role as the national motor vehicle regulator. A key policy document that was coordinated by the DIRDAC and endorsed by the ministerial Transport and Infrastructure Council (TIC) in August 2016 is the *National Policy Framework on Land Transport Technologies*, which includes policy principles and actions that are directly relevant to the deployment of automated vehicles. Further, the DIRD is Australia's representative on the United Nations Working Party 29 on international harmonisation of vehicle regulations, which will set the course for regulated vehicle standards that relate to automated vehicles.

The National Transport Commission (NTC) leads an important program of work looking at the regulatory arrangements to support the introduction and use of automated vehicles. In November 2015, the NTC was asked by the TIC to identify the potential regulatory barriers to more automated vehicles. The scope of this review included vehicle regulations, road rules, liability and privacy. The final policy paper from this work, which included 8 recommendations, was endorsed by the TIC in November 2016. This included near-term actions to develop national guidelines to support on-road trials, to develop national enforcement guidelines, and to develop a proposed model for a safety assurance system for automated vehicles. The NTC will also lead the medium-term action to ensure a regulatory framework that supports the safe introduction and operation of automated vehicles.

Austrroads and its road agency members, as highlighted earlier in this submission, has a lead role in the design, maintenance and operational practices for approximately 900,000 kilometres of roads, and also with the vehicle registration, driver training and driver licencing practices that are necessary to manage access to and use of our road networks. It also plays a key role providing input to policy, regulatory and operational decisions across the jurisdictions, with the objectives of ensuring that best practices are consistently adopted across the jurisdictions, and that potential societal outcomes can be optimised. The Austrroads program of work relating to automated vehicles is highlighted below. It is important to note, however, that the work programs of the DIRD, the NTC and Austrroads are closely linked and work collaboratively.

Current Austrroads projects on connected and automated vehicles

The Austrroads Connected and Automated Vehicles (CAV) program comprises a wide range of projects and initiatives. The program covers both connected vehicles and automated vehicles, recognising the convergence that has occurred internationally between these two domains. The following provides a summary of some of the current connected and automated vehicle projects that may be relevant to the inquiry:

- Assessment of the safety benefits of connected and automated vehicles – this project investigated the potential safety performance of internationally emerging connected and automated vehicle applications, and analysing Australian real-world crash data to estimate the local safety benefits for each application across a range of road crash scenarios. Final report was published in October 2017.
- Infrastructure to support Automated Vehicles on Rural and Metropolitan Freeways and highways – investigating potential gaps in the current road network that would be needed to be met to support existing vehicle automation features and those that are likely to emerge in forthcoming years. This project will evaluate the existing road network, against an agreed level of requirements (physical and digital infrastructure), and consider what is being invested in current

road maintenance programs, and future road construction projects. Final report is due in December 2018.

- Assessment of automated vehicle use cases – identifying and assessing new use cases and scenarios that are anticipated to occur on our roads due to the introduction of automated vehicles. Vehicle automation use-cases include heavy vehicle use cases related to motorway pilot, rural automate driving, and heavy vehicle platooning. This project will provide aim to provide advice and guidance to road operators on key changes to support each use case. A report is due in Q2, 2018
- Preparing for the proposed safety assurance system for automated vehicles – working closely with the NTC, this project will identify and assess the gaps between the proposed safety assurance system for automated vehicles and the current vehicle registration and driver licence practices across the jurisdictions. This work is ongoing as the safety assurance system is development.
- Issues with traffic sign recognition systems – feedback from vehicle manufacturers has highlighted issues with their camera systems reading and responding to traffic signs, in particular speed signs. This has the potential to be an issue for future automated vehicles. This project will investigate the issue, identify the issues, and look at possible next steps to resolve. A report will be released in Q3, 2018
- Operations of Automated Heavy Vehicles in Remote and Regional Areas – This project is considering the issues around operation of individual automated heavy vehicles, and truck platoons in remote and regional Australia. Current barriers to deployment and potential future actions that should be taken to resolve them will be investigated. A report will be release in Q3, 2018.

Further details about the Austroads CAV program, including CAV trial projects that are being undertaken and/or supported by the individual road agency members, may be accessed via the following webpage:

<http://www.austroads.com.au/drivers-vehicles/connected-and-automated-vehicles>

Future Austroads projects on connected and automated vehicles

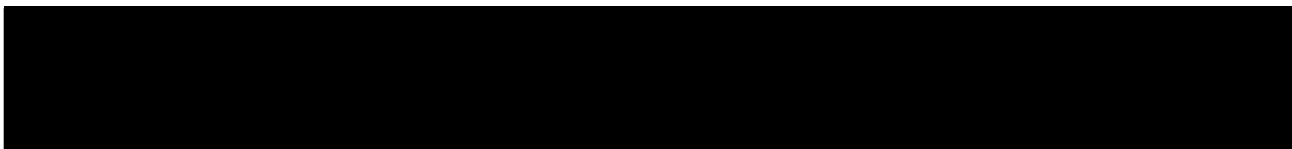
Austroads is currently developing its work program for 2018-19 onwards. While noting that the projects listed before are yet to be approved and commence, these planned projects are very likely to be relevant and of interest to the inquiry:

- Integrating ADAS into Driver Education – the introduction of advanced driver assistance systems is expected to improve road safety outcomes. However, there is already evidence of mis-use of systems and in some cases under-use. This project will look to understand what role registration and licensing authorities play in the provision of information to drivers around systems use, limitations.
- Impacts for Road Operators of Automated Steering Functions – recognition of line markings has been a key topic for the vehicle industry in early deployments of lane keeping systems which use line markings as key reference point. This issue will only become more significant at higher levels of vehicle automation as the driver is taken out of the driving task. This project will investigate the issues, and look at possible amendments to Australian Standards and Austroads guides to resolve issues. A report will be due in Q3 2019.

There will be other projects and initiatives that will progress towards an operational framework that will support the introduction of automated vehicles. Some of these will be guided by actions under the National Policy Framework for Land Transport Technology, such as on the topics of security, positioning, and road operation guidance material. Austroads will also continue to work closely with the NTC and the jurisdiction on the regulatory changes that will be required to support deployment.

Safety issues

As highlighted at the start of this submission, there is much work being progressed on establishing the regulatory and operational arrangements required to support connected and automated vehicles, and on assessing their potential uses cases and benefits. However, it is also well recognised that further work will be necessary to better understand and address the wide range of safety impacts that these vehicles could potentially have on our communities. The following provides a summarised list of potential safety issues that may be of benefit for the inquiry to consider:



- Human factors issues with vehicle connectivity and automation. This could include not just the occupants of connected and automated vehicles, but also issues like the potential degradation of driving skills for human drivers, and the implications for other road users. The implications for New South Wales driver training, education and licensing programs need to be continually reviewed and assessed with these new features,
- Driver impairment monitoring features. Driver impairment systems are emerging in vehicle that can actively warn, or intervene when drivers are impaired through fatigue, alcohol, distraction or misuse of technology. Impairment monitors can be simple and use steering wheel or lane keeping tracking to determine impairment, or complex measurements of eye-tracking. Aligned with the topic above regarding human factors, further work is required around how these systems work and their potential benefits.
- Road safety benefits estimation – Austroads has done some work on this topic, including the project mentioned earlier in this submission, but further work will be required as more becomes known about their potential to address road trauma, particularly as trials of platooning and C-ITS in heavy vehicles continues to emerge.
- Access to data around vehicle specification – while data sources are freely available for light vehicle technology uptake in new vehicle sales in the in-service vehicle fleet, similar sources of data are rarely available for heavy vehicles making planning and policy more.
- Vehicle age - while this issue is not specifically related to connected and automated vehicles, we are aware that the features discussed in this submission cannot typically be retrofitted to vehicles. Opportunities to more rapidly progress connected and automated systems through the fleet should be researched and explored. Road safety benefits will only accrue at higher levels of penetration on road.

The list above is not an exhaustive list of potential safety issues that have been highlighted during our CAV work program, but hopefully it does provide some value to the inquiry. Austroads would be happy to discuss these issues and others in further detail if requested.

Next steps

Austroads looks forward to seeing how the Committee's inquiry progresses, and stands ready to provide any additional information or support. If there is anything further Austroads can assist with, please feel free to contact me directly.

Yours sincerely



Nick Koukoulas
Chief Executive

