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Chair
Standing Committee on Industry, Innovation, Science and Resources
PO Box 6021
Parliament House
Canberra ACT 2600

Dear Ms Michelle Landry MP,

Inquiry into the social issues relating to land-based driverless vehicles in Australia

Austroads commends the Standing Committee on Industry, Innovation, Science and Resources on its decision to hold an inquiry into the social impacts of driverless vehicles. 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 social impacts 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.

What are Automated Vehicles?

An 'automated vehicle' can be defined as a road vehicle that involves some automation of the primary driving controls (i.e. steering, acceleration, braking). To define and categorise the level of automated driving in a vehicle, various taxonomies are often used. The most commonly used taxonomy is from the Society of Automotive Engineers (SAE) J3016 standard, which categorises six automated driving levels ranging from level 0 (no automation) to level 5 (fully automated).

We already have vehicles with level 2 (partially automated) capabilities on our roads today. 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. It is anticipated that vehicles with level 3 (conditional automation) capabilities could enter our market and be used on public roads before the end of the decade. These vehicles would still require a human to be present, but the human would not need to be involved with the driving task while the vehicle is in automated driving mode. These vehicles will also be referred to as 'self-driving' vehicles, but are not 'driverless' vehicles as a human must be present and able to intervene in the driving task if requested. Driverless vehicles that don't require a human to be present or intervene with the driving task will come to market in various forms. These will include the driverless shuttle buses that are currently being trialled in several jurisdictions, which have tight restrictions on where they can operate. In future it is anticipated that we will see driverless vehicles that can operate with much less restrictions on where they can operate.

It is important to understand the difference between 'self-driving' and 'driverless' vehicles, and also the mobility services that they will support. It would be wise for the inquiry to focus not just on the societal impacts of driverless vehicles, but to also give consideration to the impacts of self-driving vehicles and shared, on-demand and point-to-point mobility services.

Collaborative approach to preparing for Automated Vehicles

A collaborative approach is being taken at a national level towards achieving a consistent regulatory and operational framework to support 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 (DIRD) 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 DIRD 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 nationally consistent regulatory framework that supports the safe introduction and operation of automated vehicles.

Austroads 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. Austroads 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 Austroads 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 Austroads are closely linked and work collaboratively.

Current Austroads projects on automated vehicles

The Austroads 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 automated vehicle projects that may be relevant to the inquiry:

- <u>Assessment of the safety benefits of connected and automated vehicles</u> – investigating 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 planned for Q2 2017.

- <u>Road operator actions to support automated vehicles</u> – investigating potential implications and changes to the way road operators design, maintain and operate their roads. This will include consideration of emerging requirements for physical infrastructure (e.g. line marking, road signs, road geometry), digital infrastructure (eg. data, communications) and road operations (incl. new mobility services and interactions with road use). Final report planned for Q2 2017.

- <u>Vehicle registration, driver licencing and third party insurance issues due to automated vehicles</u> – investigating potential issues and implications to current processes for registering vehicles, assuring vehicles comply with in-service requirements, licensing drivers, training of drivers, and compulsory third party insurance schemes. Final report planned for Q1 2017.

- <u>Assessment of automated vehicle use cases</u> – identifying and assessing new use cases and scenarios that are anticipated to occur on our roads due to the introduction of automated vehicles. This could include vehicle platooning, automated driving through complex signalised intersections, changes to drop-off/pick-up locations, new point-to-point mobility and delivery services, etc. This project has only recently commenced.

- Preparing for the proposed safety assurance system – 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 project has only recently commenced.

Further details about the Austroads CAV program, including a list of 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 automated vehicles

Austroads is currently developing its work program for 2017-18 onwards. While noting that the projects listed below are yet to be approved and commence, these planned projects are very likely to be relevant and of interest to the inquiry:

- Impacts to current revenue streams – the introduction of automated vehicles, along with electric vehicles, connectivity and shared mobility services, is anticipated to have an impact on the current revenue streams that support our transport systems. This project will look to identify, analyse and better understand these issues, review relevant actions and initiatives across the jurisdictions, and recommend possible actions to address the identified issues.

- Issues with speed 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 identify and investigate the issues, and look at possible next steps to resolve.

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 jurisdictions on the regulatory changes that will be required to support deployment.

Social 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 automated vehicles, and on assessing their potential use cases and benefits. However, it is also well recognised that further work will be necessary to better understand and address the wide range of social impacts that these vehicles could potentially have on our communities. While Austroads may not have done any specific projects on societal impacts, there are certainly a range of potential issues that have been highlighted as our CAV program has progressed. The following provides a summarised list of potential societal issues that may be of benefit for the inquiry to consider:

- Road safety – Austroads has done quite a bit of work on this topic, including the project mentioned earlier in this submission, but further work will be required as more becomes known about how the technologies will work and how they will be used. This could include not just the occupants of automated vehicles, but also issues like the potential degradation of driving skills for human drivers of other vehicles, and the possible safety implications for other road users.

- Mobility access – automated vehicles have the potential to provide mobility services to those who may not have such access today, such as the elderly, young, disabled, etc.

- Shared mobility services – while such services are already available, the introduction of automated vehicles could introduce a new dynamic to these services. Issues such as public safety and access should be considered, as well as the cost of service for certain user groups.

- Coverage of supporting services – many automated vehicle developments appear to rely on a certain level of physical infrastructure, communications coverage and consumer demand. This could potentially see services focussed on urban areas, with limited access or support in rural areas.

- Privacy – the data captured by automated vehicles, and/or by connected and shared mobility services, could potentially be personally identifiable information. Austroads recently commissioned a Privacy Impact Assessment on connected vehicle data which may be of interest.

- Employment – for automated vehicles that do not require a driver (ie. driverless), this could affect the need for professional drivers. Another employment issue is that driverless vehicles could provide the ability for people with mobility restrictions to be able to travel to places of employment that they otherwise would struggle to do.

- Public transport – if the cost and access to automated vehicles becomes more attractive than mass transit, then we could end up with more passenger vehicles on our roads and less patronage on our mass transit systems.

- Active transport – such as walking and cycling, has health benefits for people. If the cost and access to automated vehicles becomes more attractive than active transport, there could potentially be a detrimental health outcome.

- Land use – many road agencies have been adopting the concept of 'movement and place', which recognises that some streets should be more focussed on being a place where people go to and interact, and less about movement of vehicles. If the deployment of automated vehicles is not appropriately influenced, it could become more challenging to manage streets as a place, and to balance competing needs for land use.

- Environment – consideration should also be given to how automated vehicles, particularly if they are electric, platooning and shared use, could potentially contribute to reduced vehicle emissions. This should consider the health benefits from improved air quality.

The list above is not an exhaustive list of potential societal issues, but hopefully it does provide some value to the inquiry. Austroads would be happy to discuss these issues, and others that have been identified by the Austroads CAV program, 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