

Special Minister of State

Advice from Infrastructure Victoria on automated and zero emission vehicle infrastructure

Terms of Reference

I, Gavin Wayne Jennings, request under section 44 of the *Infrastructure Victoria Act 2015* that Infrastructure Victoria (IV) provides written advice to the Government on Victoria's infrastructure requirements to enable the implementation of automated and zero emission vehicles.

Background

Road vehicles stand on the verge of what could be the biggest changes since the mass market of the combustion engine. Automated and connected vehicles have the potential to make our roads safer, increase the mobility of Victorians, improve the efficiency of our road infrastructure and provide real time information on the road network. Highly automated 'driverless' vehicles of the future offer the potential for new markets and on-demand mobility services delivered privately or publically as part of a 'mobility as a service' offering.

Zero emission (electric) vehicles have the potential to eliminate greenhouse gas and noxious exhaust emissions, reduce noise pollution and deliver significant health and environmental benefits, while promoting energy security and the transition to clean energy sources. Sales of battery powered electric vehicles are expected to continue to increase as the cost of the vehicles reduces. The automated vehicles of the future are also likely to be powered by electric motors.

Infrastructure Victoria's *30-year Infrastructure Strategy* included recommendations to enable testing of both passenger and freight 'driverless' vehicles. IV recognised the potential of high levels of automation to improve traffic flow, increase operational efficiency of public transport, expand the range of available transport options and expand the capacity of our road infrastructure.

IV also noted that vehicle automation technologies present challenges to government. There is considerable uncertainty about when fully automated (driverless) vehicles will be commercially available, how they will be adopted and used by consumers, and the consequent effects on our road and public transport infrastructure.

While Victoria already has the largest electric vehicle charging network and the highest number of electric vehicle registrations in Australia, any barriers to increasing the proportion of zero emission vehicles in the Victorian fleet may delay or reduce the benefits that the community can achieve in terms of the environment, and hamper the future deployment of automated vehicles.

Infrastructure is a long-term investment, a potential enabler of new technology, or a potential barrier. The Victorian Government is facing the challenge of how to best support the deployment of these new technologies as they become available, minimising barriers and ensuring their value to the community is maximised, whilst delivering an ambitious programme of long term infrastructure investment.

Scope of the advice

The Government is seeking advice from Infrastructure Victoria on what infrastructure might be required:

- a) to enable the operation of highly automated vehicles (at SAE levels 4 and 5);
- b) in response to the ownership and market models that may emerge from the availability of highly automated vehicles and;
- c) for Zero Emission Vehicles as a high proportion of the Victorian fleet.

The Government is also seeking advice on the potential sequencing, timing and scope of infrastructure delivery.

IV's advice should address the following issues:

1. Potential future scenarios, building on the work undertaken by Transport for Victoria, setting out different uptake rates, market and ownership models for highly automated vehicles including:
 - a. predicted timelines for when highly automated vehicles may be commercially available and market penetration;
 - b. potential changes to the travel behaviours of transport users (private and public) and the implications to the transport network; and
 - c. potential benefits and risks for each scenario.
2. The infrastructure and land use planning implications for each of these scenarios including:
 - a. a base case of physical and digital infrastructure that might be needed to support the operation of highly automated vehicles and zero emission vehicles (e.g. road infrastructure, communications, traffic management systems, charging/refuelling infrastructure);
 - b. land use planning requirements and opportunities;
 - c. Infrastructure implications for the transport network, living environment (cities/rural) and other connected industries (e.g. energy generation and supply); and
 - d. the role of government and the private sector in relation to infrastructure.
3. Pathways of potential sequencing, timing and scoping of infrastructure delivery, using real options methodologies and including:
 - a. the capacity of existing infrastructure to accommodate automated and zero emission vehicles;
 - b. cost-effective ways to "future proof" near-term infrastructure investments where possible;
 - c. decision/trigger points for government investment;
 - d. options for leveraging private sector investment; and
 - e. opportunities to maximise the identified benefits and mitigate risks.

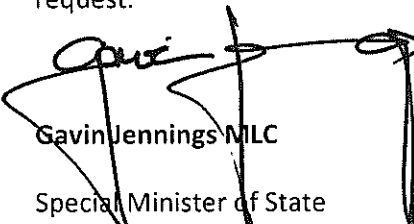
Process

Government expects that IV will undertake comprehensive engagement with industry and other key stakeholders in developing this advice, draw on international comparators and research, and develop its own modelling and analysis.

The advice should be delivered in two parts. The first part will set out the future scenarios that will form the basis of the infrastructure advice. Given the high level of uncertainty regarding potential scenarios, this work should consider Transport for Victoria's research on technology pathways and be developed with input from Transport for Victoria. This report will also set out the potential risks and benefits of the scenarios. This report is to be delivered within 6 months of this request, with the scenarios for further analysis to be confirmed by the Victorian Government.

The second part of the advice should be a detailed report to Government on the potential infrastructure requirements for the scenarios set out in the first stage of the advice. The report should analyse the current situation, recommend delivery pathways and identify key decision or trigger points for the infrastructure. It should also incorporate relevant supporting materials, such as technical reports, modelling and the results of stakeholder engagement.

The final report is to be provided to me, as Special Minister of State, within 12 months of this request.



Gavin Jennings MLC
Special Minister of State

Date: 25.10.17