

31 August 2018

Infrastructure Victoria  
Level 16, 530 Collins Street  
MELBOURNE VICTORIA 3000

To whom this may concern

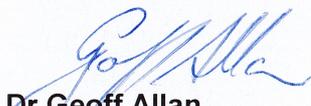
**National Transport Commission's submission to Infrastructure Victoria**

Thank you for providing the opportunity to provide a submission to Infrastructure Victoria's evidence base report.

Preparing for the future of automated vehicles is an important task for governments to ensure that Australians receive all the benefits arising from automated vehicles. Enclosed is the National Transport Commission's (NTC) submission which highlights our work and addresses the questions listed within the evidence base report.

The NTC encourages continued engagement with Infrastructure Victoria on the future of automated vehicles. Please do not hesitate in contacting me, Geoff Allan, on (03) 9236 5016 or [gallan@ntc.gov.au](mailto:gallan@ntc.gov.au) to arrange a suitable time. Alternatively, please contact Marcus Burke, Project Director on (03) 9236 5044 or [mburke@ntc.gov.au](mailto:mburke@ntc.gov.au).

Yours sincerely



**Dr Geoff Allan**  
Chief Operating Officer



# National Transport Commission

## Submission to Infrastructure Victoria

Automated and zero emissions vehicles infrastructure advice

August 2018



National Transport Commission

# Submission outline

<b>1</b>	<b>Introduction</b>	<b>3</b>
1.1	The purpose of this submission	3
	About the NTC	3
<b>2</b>	<b>NTC comments on the Evidence Base report</b>	<b>4</b>
2.1	General Comments	4
2.2	Research and Evidence	6
<b>3</b>	<b>Response to evidence base questions</b>	<b>7</b>
1.	Are our key assumptions correct? If not, why?	7
2.	Is our analysis of the findings correct? If not, why?	8
3.	What further research into automated and/or zero emissions vehicles might be required beyond what we have already completed or identified?	8
4.	What are the local or international trends government should be monitoring to help inform future decisions on automated and zero emissions vehicles?	8
5.	What key decisions need to be made about the infrastructure required for automated and zero emissions vehicles?	9
<b>4</b>	<b>Conclusions</b>	<b>10</b>
<b>5</b>	<b>References</b>	<b>11</b>

# 1 Introduction

---

## 1.1 The purpose of this submission

---

The National Transport Commission (NTC) welcomes the opportunity to respond to Infrastructure Victoria's consultation to develop advice for the Victorian Government on the infrastructure required to enable the implementation of automated and zero emission vehicles.

This submission focusses on automated vehicles (AVs). The NTC has a comprehensive national reform program, which aims to put end-to-end regulation in place to support the safe, commercial deployment and operation of AVs in Australia. Transport and Infrastructure ministers have agreed to a goal of having end to end regulation in place by 2020. This date is subject to review based on input from jurisdictions and industry.

The NTC does not intend to comment in detail on the subject of zero emission vehicles. We do publish an annual information paper on Carbon Dioxide Emissions Intensity for New Australian Light Vehicles<sup>1</sup> which includes figures on electric vehicles. As with AVs, any approaches to zero emission vehicles should aim to ensure national consistency and international alignment, whilst allowing for a range of potential future technologies.

### About the NTC

The NTC is an independent advisory body charged with improving productivity, safety, environmental outcomes and regulatory efficiency across Australia's road, rail and intermodal transport systems with an aim to achieve national transport reform. As an independent statutory body, the NTC develops and submits reform recommendations for approval to the Transport and Infrastructure Council, which comprises federal, state and territory transport, infrastructure and planning ministers.

---

<sup>1</sup> Available at [http://www.ntc.gov.au/Media/Reports/\(F4FA79EA-9A15-11F3-67D8-582BF9D39780\).pdf](http://www.ntc.gov.au/Media/Reports/(F4FA79EA-9A15-11F3-67D8-582BF9D39780).pdf)

## 2 NTC comments on the Evidence Base report

---

### 2.1 General Comments

---

Infrastructure Victoria (IV) has highlighted some specific issues around infrastructure for automated and zero emissions vehicles. Some of these areas are outside the scope of the NTC's work, but comments have been made on the specific questions raised, where appropriate.

The NTC has a comprehensive reform program, which aims to have a nationally consistent regulatory framework in place to support the safe, commercial deployment and operation of AVs. The reform program aims to ensure Australia can maximise the potential opportunities and benefits of AVs. National consistency will provide certainty to industry, reduce costs to industry and government through avoiding duplication of regulatory processes and help ensure Australians have early access to the newest technologies.

The NTC's reform program has four key pillars:

1. Safety assurance—ensuring that automated vehicles can operate safely on Australian roads from first supply to end of life
2. Driving responsibility—ensuring that there is a legal entity accountable for the automated vehicle when the automated driving system (ADS) is performing the driving task and clarifying the relevant responsibilities of various entities
3. Insurance—Ensuring that someone injured in an accident with an automated vehicle is not disadvantaged compared to someone in an accident with a conventional vehicle who is covered by compulsory third party insurance
4. Government access to data—Ensuring that privacy and surveillance protections around government access to data are appropriate for the new and increased types of data generated by automated vehicles.

The NTC recognises the importance of data use and availability for connected and AVs. Data recording and sharing forms part of the NTC's Safety Assurance System. The NTC is due to release a discussion paper regulating government access to Cooperative Intelligent Transport Systems (C-ITS) and AV data in September 2018. The paper will focus on the new privacy risks of these technologies and whether additional privacy protections are needed to protect users' data. The NTC's aim is to balance road safety and network efficiency outcomes and efficient enforcement of traffic laws with sufficient privacy protections for C-ITS and AV users.

The NTC strongly supports the work of IV in assessing the infrastructure needs for automated vehicles. In developing its advice, the NTC would encourage IV to consider:

- The importance of national consistency in the approach to infrastructure for automated vehicle to maintain Australia as one market for vehicles. Differing approaches around the country could create 'rail gauge' issues for decades to come.
- How Australia can align with international approaches to ensure that Australians can access the latest global technology.
- How infrastructure can support a variety of future applications, technologies and business models, given the uncertainties in this area.

There will likely be a need to continue to review the advice over time as the technology evolves and commercial deployments grow.

The NTC encourages IV to continue to work closely with other state agencies and Austroads to ensure a national approach. We note the recent Austroads report on the 'Implications of Traffic

Sign Recognition Systems for Road Operators'<sup>2</sup> which indicates a potential need for greater consistency in road traffic signage to support more automated systems. The Austroads report 'Future data requirements for automated vehicles'<sup>3</sup> should also be considered in assessing digital infrastructure requirements.

---

<sup>2</sup> The report may be accessed at: <https://www.onlinepublications.austroads.com.au/items/AP-R580-18>

<sup>3</sup> The report may be accessed at: <http://www.austroads.com.au/news-events/item/561-future-data-requirements-for-automated-vehicles>

## 2.2 Research and Evidence

---

Infrastructure Victoria may find the following papers, available on the NTC website <http://www.ntc.gov.au>, relevant to automated vehicles:

- National Transport Commission 2016, *Regulatory barriers to more automated road and rail vehicles: issues paper*, Melbourne.
- National Transport Commission 2016, *Regulatory options for automated vehicles: discussion paper*, Melbourne.
- National Transport Commission 2016, *Regulatory reforms for automated vehicles: policy paper*, Melbourne.
- National Transport Commission 2017, *National guidelines for automated vehicles: policy paper*, Melbourne.
- National Transport Commission 2017, *Regulatory options to assure automated vehicle safety in Australia: discussion paper*, Melbourne.
- National Transport Commission 2017, *Changing driving laws to support automated vehicles: discussion paper*, Melbourne.
- National Transport Commission 2017, *Assuring safety of automated vehicles: policy paper*, Melbourne.
- National Transport Commission 2017, *Clarifying control of automated vehicles: policy paper*, Melbourne.
- National Transport Commission 2018, *Changing driving laws to support automated vehicles: policy paper*, Melbourne.
- National Transport Commission 2018, *Safety assurance for automated driving systems Consultation Regulation Impact Statement (RIS)*, Melbourne.

## 3 Response to evidence base questions

---

### 1. Are our key assumptions correct? If not, why?

The NTC considers the key assumptions to be broadly correct. We would like to provide additional comment on the assumption that AVs will eliminate all of the estimated 94% of vehicle crashes for which human error is the main cause and are not likely to introduce any new causes of accidents.

With respect to reducing the crash rate, the NTC would like to highlight a report prepared for SIRA (Finity Consulting, 2016) which estimates that the adoption of AVs in Australia will reduce the likelihood of injuries for:

- Car driver and passenger injuries by 80%.
- Cyclist injuries by 70%.
- Motorcyclists by 40%.
- Pedestrians by 45%.

The NTC would also like to note that whilst AVs are not likely to introduce any new causes of accidents, they may present new risks. These risks are heightened due to the new and emerging nature of the technology. Software failure has been recognised as a risk for AVs (Noy, Shinar, & Horrey, 2018). Safety engineers anticipate that systemic technical errors, or failure to properly maintain and service the ADS, could become significant hazards, akin to human error (Kira, 2017, pp. 7, 17). Even with the best technology, crashes may still occur. For example, where a pedestrian steps in front of an automated vehicle, a crash may be inevitable due to physical limitations on how quickly a vehicle could stop. It is unlikely to be possible to completely eliminate crashes.

The NTC's reform to assure safety of ADSs, which is currently under development, aims to address these risks. Clear regulation, particularly on safety aims to ensure reliable technology is deployed in Australia, should increase public acceptance maximising potential safety gains.

In our current regulatory environment, when AVs become ready for deployment there are risks that:

- Automated vehicles may fail to deliver reasonable safety outcomes
- A lack of consumer confidence in the safety of AVs may reduce or delay their uptake
- Automated Driving System Entities<sup>4</sup> (ADSEs) may face inconsistent and/or uncertain regulation both at a national and international level, when supplying ADSs to the Australian market.

Submissions to the NTC support the idea that government should take a proactive role in assuring AV safety. Governments have an existing role regulating vehicle and road safety —there is a public expectation that governments take a role in safety assurance for AVs. Submissions to the NTC suggest that government should have a role in safety assurance because the technology is new, and the safety performance of these vehicles on Australian roads is subject to ongoing testing.

The NTC released a Safety Assurance for Automated Driving Systems Regulation Impact Statement (RIS) for consultation in May 2018. It outlined options to address these risks and to support the uptake and safe operation of AVs on Australian roads. The NTC is working closely with governments and industry to develop a proportionate and efficient regulatory approach to safety assurance. Our reforms are examining more performance-based approaches to regulation to consider the uncertain and evolving nature of the technology.

---

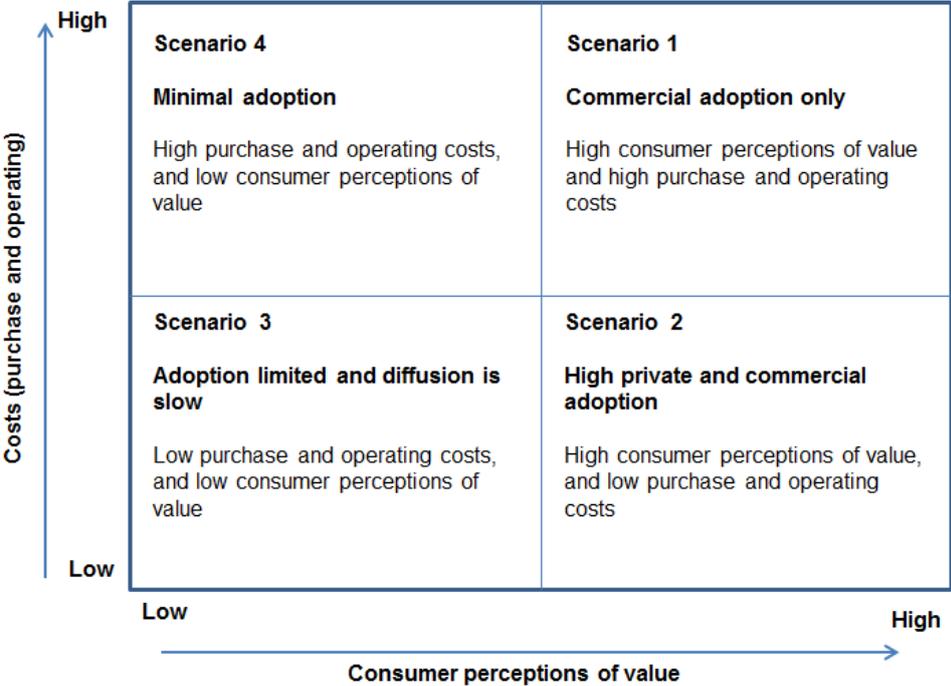
<sup>4</sup> Automated Driving System Entity refers to the legal entity responsible for the automated driving system.

## 2. Is our analysis of the findings correct? If not, why?

The NTC is broadly supportive of the analysis conducted by Infrastructure Victoria.

It is unclear how many people will use AVs. It is also unclear if private vehicle ownership will be common for AVs as is the case with conventional vehicles. Some analysts predict that shared vehicle ownership will become more common and replace private ownership. As part of developing our Regulation Impact Statement we considered four potential scenarios of adoption:

**Figure 1. Automated vehicle uptake scenarios**



The NTC provided some analysis of take up rates for automated vehicles (see Appendix H of our Regulation Impact Statement) which may be useful for comparison, although please note that this is examining a 2020 to 2030 timeframe.

## 3. What further research into automated and/or zero emissions vehicles might be required beyond what we have already completed or identified?

Because the technology is in its nascent stage, there is still more research to be done on the safety benefits and risks associated with AVs. The NTC suggests monitoring new research and developments in this area particularly the results of any trials conducted in Australia. As more trials are conducted new research will emerge. The NTC has published trial guidelines for AV trials and will be conducting a review of the guidelines in 2019.

## 4. What are the local or international trends government should be monitoring to help inform future decisions on automated and zero emissions vehicles?

The NTC believes that monitoring technological trends will be important in any scenario to ensure that policy, regulation and supporting physical and digital infrastructure is in place. Australia should continue to monitor trends on take-up rates as AV technology begins to be deployed, along with how take up impacts crash rates and travel behaviours. The NTC notes the continuing testing and development within the USA, as well as the growing regulatory developments in the EU and UK.

The Transport and Infrastructure Council have noted ‘...the importance of not getting ahead of international developments’ (Transport and Infrastructure Council, 2018). Different jurisdictions are at different stages of developing safety assurance systems for AVs. The NTC is monitoring

international regulatory development by the Global Forum for Road Traffic Safety (WP.1) and the World Forum for the harmonization of vehicle regulations (WP.29). The Commonwealth Department of Infrastructure, Regional Development and Cities (DIRDAC) continues to participate in developing new and updated United Nations vehicle standards through UN Working Party 29 on the harmonisation of vehicle regulations.

## **5. What key decisions need to be made about the infrastructure required for automated and zero emissions vehicles?**

The NTC encourages Infrastructure Victoria to work together with Austroads and infrastructure bodies nationally to ensure that consistent infrastructure standards are used to support AVs across state borders. Nationally consistency will provide certainty and clarity to industry and ensure the safety benefits of AVs are realized. Australia must also monitor the development of international infrastructure standards to ensure that Australia is able to access the global market in AVs.

## 4 Conclusions

---

The NTC appreciates the opportunity to respond to IV's consultation to develop advice for the Victorian Government on the infrastructure required to enable the implementation of automated and zero emission vehicles.

As already stated, a collaborative approach is being taken at a national level towards achieving a consistent and timely regulatory framework to support automated vehicles. The NTC continues to consult closely with governments, industry and other stakeholders as reforms are developed. The NTC is also working to align reforms with evolving technology.

The NTC is happy to provide further information to IV if required. We encourage IV to continue to consult with Austroads and state and territory counterparts to ensure we are building a nationally consistent approach to automated vehicles in Australia.

## 5 References

---

- Finity Consulting. (2016). *The impact of autonomous vehicles on CTP insurance and its regulation*.
- Kira, J. (2017). *Safety Assurance System for Automated Vehicles*. Nova Systems.
- Noy, I. Y., Shinar, D., & Horrey, W. J. (2018). Automated driving: Safety blind spots. *Safety Science*, 102, 68-78.