

Regulatory reforms for

automated road vehicles

Policy Paper
November 2016



National Transport Commission

Report outline

Title	Regulatory reforms for automated road vehicles
Type of report	Policy paper
Purpose	Recommendations approved by the Transport and Infrastructure Council – November 2016
Abstract	This policy paper sets out transport and infrastructure recommendations for policy and regulatory reforms to support automated road vehicles in Australia.
Key words	automated vehicle, regulation, Australian Design Rules, vehicle standards, Australian Road Rules, liability, privacy, security, safety assurance
Contact	National Transport Commission Level 15/628 Bourke Street Melbourne VIC 3000 Australia Ph: +61 (03) 9236 5000 Email: enquiries@ntc.gov.au Website: www.ntc.gov.au
ISBN	978-0-9946335-4-5

Foreword

The development of technology for automated vehicles is rapidly gaining momentum. Vehicle manufacturers and technology providers are developing a wide range of automated applications, such as systems that assist the vehicle to travel in a road lane, to systems that provide complete (driverless) control of the vehicle's operation.

Automated road vehicles offer the possibility of fundamentally changing how transport is provided and the resulting effect on society. It is likely this technology can improve road safety, mobility, productivity and environmental efficiency. However, to unlock these benefits we need a regulatory framework that removes unnecessary legal barriers to automated road vehicles, supports on-road trials of the technology and yet ensures that these vehicles will operate safely in our community.

One of the challenges facing Australia is ensuring that regulations and policies are nationally-consistent. It is also imperative that we understand that the technology is developed in a global market. Consequently, the National Transport Commission's goal is to avoid a patchwork of conflicting regulatory requirements in different states and territories. Our aim is to ensure that the regulatory framework for automated vehicles is timely and responsible, and that regulations promote, not discourage, innovation and competition.

This policy paper concludes a one-year project to identify and examine potential and real regulatory barriers to automated vehicles, to consult on options, and to make recommendations to the Transport and Infrastructure Council in support of future reform. These recommendations establish a phased reform program in step with the likely commercial deployment of the technology, and the development of international standards and conventions. We want to ensure that we do not regulate too early – which could create artificial barriers to emerging technologies – or regulate too late and stop proven safety-related technologies from being deployed.

The policy findings and recommendations set out in this paper reflect extensive legislative analysis and consultation with a wide range of government and industry stakeholders, including vehicle manufacturers, motoring groups, law societies, researchers, insurers, police and road and transport agencies. We received more than 80 submissions to an issues paper and discussion paper. I would like to thank each organisation and individual who contributed to this important national reform process and encourage them to continue to work with us on the more detailed reforms to follow.



David Anderson PSM
Chairman and Commissioner

Executive summary

Automated vehicles offer the possibility of fundamentally changing the transport task and society. It is likely this technology can improve road safety, mobility, productivity and environmental outcomes. However, current regulations do not adequately support automated road vehicles and there is uncertainty about how and when current polices and regulations will be adapted. There is also a risk that, without a national and coordinated response to automated vehicle reform, Australia's complex regulatory framework will result in inconsistent regulation of automated vehicles across states and territories.

In this policy paper, the National Transport Commission (NTC) recommends that the Commonwealth and state and territory governments support on-road trials, remove unnecessary legal barriers, and provide for the safe operation of automated vehicles. These reforms should be undertaken in a phased approach, with near-term, medium-term and long-term priorities, based on an assessment of when different levels of automated vehicles are likely to be commercially available in Australia.

In November 2015 the Transport and Infrastructure Council tasked the NTC to identify any regulatory or operational barriers associated with the introduction of road and rail vehicles that are more automated. The NTC project has identified:

- There are no regulatory barriers to automated rail (including light rail) in Australia, and the NTC project will not be considering automated rail further.
- Current regulations can support vehicles that have partial or conditional automation, but control of the vehicle needs to be clarified.
- There are legal barriers to highly and fully automated road vehicles.
- A nationally consistent regulatory framework can support automated road vehicles. The regulatory framework should be underpinned by nationally agreed policy principles.

The NTC has identified regulatory barriers

The NTC has identified regulatory barriers for highly or fully automated road vehicles and a number of actions that could increase industry and consumer certainty for vehicles that are conditionally automated or still require a human driver.¹ In assessing current regulations and policy settings the NTC has identified the following issues:

1. Supporting on-road trials and demonstrations
 - There are currently no nationally-consistent guidelines or conditions for on-road trials of automated vehicle technology.
2. Supporting automated driving that requires a human driver
 - It is unclear who is in control of an automated vehicle when the human driver must monitor the automated driving system and intervene if requested.
 - The enforcement interpretation of *proper control* that requires a human driver to have at least one hand on the steering wheel is likely to become outdated.

¹ Page 23 explains the different levels of driving automation referred to in this policy paper.

3. Automated driving that does not require a human driver
 - There is no regulatory framework in place for governments to ensure the safe operation of automated vehicles that do not require a human driver.
 - Road rules and other laws, including many compulsory third-party insurance schemes, assume a human driver and would not apply in the same way to vehicles that do not have a human driver.
 - It is uncertain how government agencies would access automated vehicle data, and in what circumstances.
 - Current Australian Design Rules (ADRs) and in-service vehicle standards have vehicle standards that require a human driver. They also do not have regard to other matters that are likely to be relevant to automated vehicles, such as security and behavioural compliance with road rules.

Additional issues should continue to be monitored by governments as the technology develops. These include potentially increased safety risks related to vehicle modification, maintenance and repair, resolving complex liability scenarios, privacy protection and access to data to determine fault and civil liability.

This policy paper sets out key policy findings and eight recommendations to address these issues.

The policy findings and recommendations reflect extensive engagement with government and industry, including vehicle manufacturers, motoring groups, law societies, researchers, insurers, police and road and transport agencies.

In February 2016 the NTC published an issues paper for consultation, *Regulatory barriers to more automated road and rail vehicles*. The consultation identified key issues and project scope and confirmed that there are no regulatory barriers relating to rail vehicles that are more automated.

In May 2016 the NTC published a discussion paper for consultation, *Regulatory options for automated vehicles*. This paper discussed key issues based on a comprehensive NTC legal audit of Commonwealth and state and territory legislation, summarised stakeholder feedback to the issues paper and canvassed potential options to address the identified issues. The consultation confirmed the key issues and proposed timing and sequencing of reforms.

Who we are

The NTC is an intergovernmental agency charged with improving the productivity, safety and environmental performance of Australia's road, rail and intermodal transport systems. As an independent statutory body, the NTC develops and submits reform recommendations for approval to the Transport and Infrastructure Council, which comprises Commonwealth, state and territory transport, infrastructure and planning ministers.

Automated vehicles are an important part of our work program because they are expected to have a significant impact on transport networks. Our work in this area began in 2015 after the Transport and Infrastructure Council asked us to identify regulatory barriers to safely introducing more automated road and rail vehicles in Australia.

Why national reform is needed

Industry and consumer uncertainty that automated vehicles are legal

Vehicle manufacturers are progressively introducing increased levels of automated driving controls in their vehicles. Automated vehicles could significantly improve road safety outcomes by preventing crashes and reducing deaths and serious injuries, yet the technology cannot be fully used unless our current regulations are reformed. Lack of certainty relating to who or what is in control of an automated vehicle, and the concept of the *driver* in legislation, are the key regulatory barriers to increasingly automated vehicles.

National and international consistency of laws related to automated vehicles

The Australian Government has responsibility for design rules for new vehicles, but state and territory governments have jurisdiction over in-service vehicle standards, road rules, enforcement, registration and licensing. There is a risk that this complex regulatory framework will result in inconsistent regulation of automated vehicles across states and territories. There is also a risk that regulations will be inconsistent with relevant international standards and conventions. This would constitute a significant barrier to the introduction of automated vehicles in what is primarily a global and import-based market.

The phased timing of reforms

The reform program outlined in the recommendations reflects a considered view that the timing of reforms should be phased as near-term (commence as soon as possible), medium-term (commence reforms within two years) and long-term (commence reforms within three to five years). This categorisation has been determined based on key assumptions we have tested with industry through the consultation process. These assumptions are that:

- Demand to trial different levels of driving automation on public roads is already occurring and is expected to increase significantly in the next two to three years.
- Large-scale commercial deployment of increasingly automated vehicles that still require a human driver is expected by 2020.
- Large-scale commercial deployment of automated vehicles that do **not** require a human driver (for some, or all of the journey) is expected after 2020.

Governments seek to ensure that they do not regulate too early – which could create artificial barriers to emerging technologies – or that they regulate too late and stop proven safety-related technologies from being deployed. The NTC therefore recommends that governments adopt a phased reform program, recognising that the program must be sufficiently flexible to reprioritise and address emerging technologies and market developments as required.

Recommended actions

Table 1 presents the recommended actions approved by the Transport and Infrastructure Council. The outcomes, recommended actions and lead agency responsibility are grouped according to near-term, medium-term and long-term reforms.

Note that each recommendation is supported by **policy findings** set out at the end of each relevant chapter.

Table 1: Timing and sequence of actions approved by the Transport and Infrastructure Council

NEAR-TERM REFORMS			
Outcomes	Recommended actions	Lead agency	Timeframe
Government support of on-road trials of automated vehicles for all levels of automated driving	1. That the NTC and Austroads develop national guidelines for on-road field testing and trials of automated vehicles in Australia.	The NTC, in partnership with Austroads	Early 2017 to May 2017
	2. That state and territory road and transport agencies and the National Heavy Vehicle Regulator (NHVR) undertake a review of current exemption powers to ensure they have sufficient powers to undertake and manage on-road trials of automated vehicles, including in relation to vehicle standards, road rules and driver licensing requirements, and to review how cross-border trials could be managed.	State and territory road and transport agencies and the NHVR to undertake reviews, and the NTC to report progress to the Transport and Infrastructure Council.	Early 2017 to 2018
Certainty for industry and governments as to:	3. That the NTC develops national enforcement guidelines that clarify regulatory concepts of control and proper control for partial, conditional, highly and fully automated vehicles. The NTC should develop guidelines that have regard to international standards and best practice and in collaboration with state and territory road, transport and police agencies and public prosecutors.	The NTC	Early 2017 to November 2017
(1) who is in control of an automated vehicle			
(2) how enforcement agencies will apply the 'proper control' requirement in the road rules to all levels of driving automation	4. That Australian transport ministers agree to reaffirm the existing policy position that:	Transport and Infrastructure Council	November 2016
	4.1 The human driver remains in full legal control of a vehicle that is partially or conditionally automated, unless or until a new position is developed and agreed (in alignment with recommendation 3).		
	4.2 The human driver of a partially or conditionally automated vehicle should only undertake non-driving tasks currently permitted by the road rules and existing enforcement policies and guidelines, unless or until a new position is developed and agreed (in alignment with recommendation 3), or an exemption is provided by a road agency.		

MEDIUM-TERM REFORMS

Outcomes	Recommended actions	Lead agency	Timeframe
A complete regulatory framework to support the safe commercial operation of automated vehicles	5. That the NTC develop a national performance-based assurance regime designed to ensure the safe operation of automated vehicles, with an initial focus on vehicles with conditional automation (level 3). An initial briefing on process and technical performance requirements to be provided to ministers in May 2017.	The NTC	Early 2017 to November 2017
	6. That the NTC develops legislative reform options to clarify the application of current driver and driving laws to automated vehicles, and to establish legal obligations for automated driving system entities.	The NTC	Early 2017 to May 2018
	7. That state and territory governments undertake a review of compulsory third-party and national injury insurance schemes to identify any eligibility barriers to accessing these schemes by occupants of an automated vehicle, or those involved in a crash with an automated vehicle. That, subject to the review of insurance schemes, each state and territory government amends its compulsory third-party insurance schemes in close consultation with each other and industry, and that the resulting reforms are nationally consistent wherever possible.	States and territories to undertake reviews, and the NTC to report progress to the Transport and Infrastructure Council	Early 2017 to 2018

LONG-TERM REFORM

Outcomes	Recommended actions	Lead agency	Timeframe
A complete regulatory framework to support the safe operation of automated vehicles	The Commonwealth Government should continue with the current approach of engaging with the United Nations Working Party 29 and harmonising ADRs with international vehicle standards. No immediate actions are required by the Transport and Infrastructure Council.	Commonwealth Department of Infrastructure and Regional Development	Ongoing

CLARIFY THEN REFINE			
Outcomes	Recommended actions	Lead agency	Timeframe
Regulation of government access to automated vehicle data to achieve road safety and network efficiency outcomes, efficient enforcement of traffic laws and sufficient privacy protections for users	8. That the NTC develops options to manage government access to automated vehicle data, having regard to achieving road safety and network efficiency outcomes and efficient enforcement of traffic laws, balanced with sufficient privacy protections for automated vehicle users.	The NTC	Late 2017 to November 2018

Near-term reforms

Supporting on-road trials

Industry evaluation of the safety and technology performance of automated vehicles through on-road field testing and trials should be encouraged and supported by governments in Australia. By introducing national guidelines, state and territory governments would establish consistent exemption requirements and conditions for on-road trials of automated vehicles.

National guidelines could support trials of vehicles with any level of automated driving. However, the primary objective of the guidelines should be to establish nationally-consistent criteria to assess on-road trial applications for highly and fully automated vehicles.

To facilitate similar trials and initiatives across Australia, state and territory road and transport agencies should consider developing legislative mechanisms to mutually recognise trials in other jurisdictions. State and territory road and transport agencies could also seek to mutually recognise trial outcomes and share research findings through non-legislative mechanisms.

Each state and territory road and transport agency and the NHVR should also review its exemption powers to ensure that the current legislative framework can: (1) allow agencies to impose appropriate conditions on trial participants; and (2) support automated vehicle trials, particularly in relation to highly and fully automated vehicles that may not require a human driver at all times.

The changing meaning of *control* and *proper control*

To support the deployment of automated vehicles, Australian governments should clarify through national enforcement guidelines: (1) who is in control of an automated vehicle; and (2) how enforcement agencies will apply the *proper control* requirement in the road rules to all levels of driving automation. Definitions of *control* and *proper control* relate primarily to enforcement of Road Rule 297, and agreed enforcement guidelines should be adopted consistently in each state and territory to ensure market certainty.

To provide immediate legal certainty to human drivers in the near term, state and territory governments should agree an enforcement policy position that human drivers continue to have full control and responsibility of a road vehicle until that position is refined through the development of national enforcement guidelines. This position is consistent with the Geneva and Vienna conventions on road traffic.

Medium-term reforms

Safety assurance for vehicles that do not require a human driver

In conjunction with the removal of regulatory barriers, Australian governments should develop a national safety assurance system in close consultation with industry partners and in alignment with international practices. The safety assurance system should establish an approvals process to assess the safety performance and data handling of applications to operate automated vehicles that do not require a human driver some of the time or all of the time.

Preparatory work to develop the safety assurance system should have an initial focus on vehicles with conditional automation, and have regard to scoping:

- nationally agreed safety principles and criteria
- operational models and processes to ensure that the assurance process is nationally consistent, efficient, affordable and creates minimal administrative burden for applicants
- governance and funding options.

The changing meaning of *driver* and *driving* in legislation

Many laws require a human driver. In some highly and fully automated vehicles, there will not be a human driver some of the time or all of the time. Without a human driver, these vehicles could not currently operate legally under the Australian Road Rules and other laws.

Australian governments should clarify how current driver obligations will apply to automated vehicles. To achieve this, Australian governments should provide in-principle support for legislative reform and undertake further exploration of the potential legislative solutions, in step with international developments and maturity of the technology. The legislative approach adopted should be subject to further consultation, legal opinion and the advice of parliamentary counsel.

Priority should be given to ensuring eligibility to compulsory third-party and national injury insurance schemes is not unintentionally restricted by current definitions of *driver* and *driving* in those schemes.

Long-term reform

Vehicle standards for automated vehicles

The highest levels of driving automation are unlikely to require human driver-related features that are currently required by law in the ADRs and in-service vehicle standards.

In the longer term, continued requirements for outdated standards are likely to be a barrier to the large-scale commercial deployment of highly and fully automated vehicles. However, automated vehicles are developed in an international market, and it is important that Australia does not introduce new design rules that are capable of isolating Australia from the global automotive market.

The automotive industry should continue to rely on Commonwealth, state and territory exemptions, granted on a case-by-case basis and the safety assurance system, until international standards for highly and fully automated vehicles are developed and applied in the ADRs and in-service vehicle standards.

The Commonwealth Government should continue with the current approach of engaging with the United Nations Working Party 29 (WP.29) and harmonising ADRs with international vehicle standards. No immediate actions are required by the Transport and Infrastructure Council.

Clarify then refine

Other issues may require government intervention in the coming years, subject to the direction of the technology and the automated vehicle market, as well as the extent to which industry can minimise identified safety, security or privacy risks without increased regulation.

For these reasons, Australian governments should provide in-principle support to industry development of best practice guidance in relation to modification and in-service compliance, clearly defined liability and clearly defined rules managing commercial access to data. Therefore, except for the regulation of government access to data (recommendation 8), the NTC recommends that no immediate actions are required by the Transport and Infrastructure Council at this time in relation to the following issues.

Vehicle modification and in-service compliance

Modification, maintenance and repair of increasingly automated vehicles could become a higher safety risk compared with conventional road vehicles due to the lack of a human driver as a fall back in the event that a modification causes a vehicle failure. Regulatory oversight of modification (including over-the-air software updates) and vehicle repairs (including non-commercial private repairs) could be warranted in the longer term for highly automated vehicles that do not have human drivers. However, unless evidence emerges of a market failure or unacceptable safety risk, no changes are recommended at this time to current laws and enforcement practices relating to vehicle modification, maintenance and repair.

The national safety assurance system criteria for automated vehicle approvals (recommendation 5) should have regard to the safety impacts of vehicle modification, maintenance and repair. The development of a national safety assurance system will therefore provide Australian governments with a regulatory mechanism to manage the risks of vehicle modification, maintenance and repair in the medium-term.

Clearly defined liability

Assigning fault is likely to become more complex in crashes involving automated vehicles, and the efficient sharing of consistent and reliable data between relevant parties, including insurers, is likely to be critical. However, unless evidence emerges of a market failure that impedes the efficient and reliable assignment of fault, no changes are recommended at this time to current laws and approaches around liability for drivers, manufacturers, technology providers and road managers in regard to automated vehicles. A national safety assurance system can also clarify who is in control of an automated vehicle, and therefore help determine liability in the event of a crash or incident.

There is no evidence currently available that road manager liability provisions are a barrier to innovation or the introduction to automated vehicle technology to market. This should be monitored by road and transport agencies as the technology develops and the extent to which automated vehicles rely on road infrastructure to operate safely becomes clearer.

Clear rules managing access to data

Accessing data for enforcement and regulatory purposes

Some highly automated vehicles are expected to switch control between the human driver and the automated driving system. To ensure the effective administration of road safety laws, in the future enforcement agencies and the courts should be able to identify who is in control of the vehicle at a point in time.

As automated vehicle and data-sharing technology matures, governments should investigate options to regulate access to automated vehicle data, including the identification of suitable technical solutions to facilitate access to and use of the data for approved purposes. The regulation of data access for government purposes should have regard to achieving road safety and network efficiency outcomes and efficient enforcement of traffic laws, balanced with sufficient privacy protections for automated vehicle users.

Accessing data to determine fault and civil liability

The management of third-party access to vehicle event data will underpin the efficient and equitable process of insurance claims. This will reduce costs and increase consumer confidence that human drivers will not be unfairly blamed for crashes or incidents involving automated vehicles. Likewise, vehicle manufacturers seek to ensure that access to event data will not threaten the integrity of vehicle control systems.

The Productivity Commission is currently conducting an inquiry into data availability and use to examine options for collecting, sharing and releasing data in the public and private sectors, while the Australian Competition and Consumer Commission (ACCC) is conducting a study into the new car retailing market that will consider third-party access to vehicle data. Both of these reviews will be completed in 2017, and the Transport and Infrastructure Council should have regard to these reviews before assessing the impacts of further regulation to manage access to automated vehicle data.

The safety assurance system (recommendation 5) could also have regard to who should be able to access vehicle data to determine fault and civil liability, consistent with the Australian Privacy Principles.

Privacy

Privacy concerns represent a potential barrier to the uptake of automated vehicles. Australia should aim for a high level of privacy protection for drivers and occupants of automated vehicles. This is in keeping with emerging international standards relating to cooperative intelligent transport system (C-ITS) technologies.

Manufacturers and technology providers are already required to ensure compliance with the *Privacy Act 1988* (Cwlth) and the Australian Privacy Principles, as they do for other communications systems that have already been developed. As such, no changes are recommended at this time to privacy laws governing automated vehicles and the transmission of personal information (including location data).

The national safety assurance system (recommendation 5) should have regard to ensuring automated driving system entities provide the highest possible level of anonymity and privacy protection for drivers and occupants, and that this be a key focus for governments when considering applications to deploy automated vehicles.

In the event that individuals can be reasonably identified from the use and operation of an automated vehicle (including location data), the Transport and Infrastructure Council should have regard to legislative protections to define the circumstances under which organisations that are exempt from compliance with privacy principles, including enforcement agencies, may access this personal information. This is in keeping with previous council directions regarding the privacy impacts of C-ITS technologies.

