



TRANSPORT AND INFRASTRUCTURE
COUNCIL

NATIONAL LAND TRANSPORT TECHNOLOGY ACTION PLAN

2020-2023



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Director - Publishing and Communications
Communications Branch
Department of Infrastructure, Transport, Cities and Regional Development
GPO Box 594
Canberra ACT 2601
Australia

Email: publishing@infrastructure.gov.au

Website: www.infrastructure.gov.au

National Land Transport Technology Action Plan

2020-2023

In August 2016, the Transport and Infrastructure Council (the Council) agreed to the *National Policy Framework for Land Transport Technology* (the Policy Framework). The Policy Framework outlines an agreed national approach to policy, regulatory and investment decision-making for technologies in the land transport sector. This national approach recognises that ongoing advances in transport technology have the potential to fundamentally improve the safety, productivity, sustainability and accessibility of Australia's transport systems.

Changes in the technological environment are occurring rapidly, making it challenging to plan beyond the horizon. The *National Land Transport Technology Action Plan* (the Action Plan), which underpins the Policy Framework, sets out short-to-medium term national priorities. The Action Plan ensures that individual actions by Australian governments are appropriately prioritised, avoid duplication and encourage greater collaboration and sharing of key learnings.

The [2016-19 Action Plan](#) delivered important foundational work in a range of key areas, including regulatory reform, trials and research on Intelligent Transport Systems (ITS), geo-positioning and security for connected vehicles. This has positioned Australia strongly in a global environment, as governments around the world prepare for the opportunities and challenges of new transport technology. Australia has been internationally recognised for its proactive approach to regulatory settings, while our competitive advantage in research and advanced manufacturing puts us at the forefront of emerging industries.

The 2020-23 Action Plan is structured around the key issues identified in the Policy Framework:

Safety, Security and Privacy
Digital and Physical Infrastructure
Data
Standards and Interoperability
Positioning for Disruption and Change

The 2020-23 Action Plan builds on the work established and underway from the 2016-19 Action Plan. New priorities in this update explore technology in the freight sector, low and zero emissions vehicles, Mobility as a Service (MaaS), and how connected and automated vehicles (CAVs) will influence future infrastructure and land use planning. The updated Action Plan also includes areas of future focus. These areas represent upcoming priorities for national coordination, depending on the outcomes of key actions in this document and in the context of a rapidly changing technological environment.

This update continues the commitment to industry and academic progress, through organisations such as the iMove consortium of industry, government and research partners that deliver collaborative R&D projects. The National Transport Commission (NTC) and Austroads also have a critical role in delivering on the key priorities outlined in this Action Plan.

The NTC is an independent advisory body tasked by Council to provide land transport reform proposals. The NTC works with Australian governments, industry and community, to develop the end-to-end regulatory framework that will support the safe deployment of automated vehicles on Australian roads. The NTC's [automated vehicle program](#) includes work to design a safety assurance regime and the development of driving law options to provide for the safe commercial deployment of automated vehicles.

Austrroads is the peak body of Australasian road transport and traffic agencies. The Austrroads board is responsible for advising Council members on technical, operational and regulatory issues. Austrroads' [connected automated and electric vehicle program](#) includes developing recommendations to address issues such as road and road-side infrastructure suitability and national consistency, road operator data access, driver education and licensing. [Austrroads' Network program](#) develops guidance that ensures the safe, efficient and shared use of the road space for the end-to-end movement of people and goods. This supports road transport agencies in managing and regulating emerging business models (for example, micromobility, on-demand transport solutions, and Mobility as a Service) and in investigating how technology and data enables next-generation transport network management to tackle traffic congestion and improve journey time and journey time reliability.

Safety, Security and Privacy

Safety, Security and Privacy

Australia is taking a safety-focused approach to technology such as automated vehicles and cooperative and intelligent transport systems. This approach aims to give the community confidence in this emerging technology and support effective deployment.

Completed and ongoing actions since 2016

- **COMPLETE: Establishment of a regulatory framework for testing automated vehicles (2016 Action Plan – item 1)**
Australian jurisdictions have committed to removing barriers and ensuring manufacturers are able to safely test automated vehicles in real-world conditions. This project concluded in 2017 with the Council agreeing to the publication of [Guidelines for Trials of Automated Vehicles in Australia](#).
- **COMPLETE: Evaluation of low-cost technologies to improve safety at level crossings (2016 Action plan – item 10)**
This project explored the merits of accelerated uptake of smart safety technology for level crossings and their incorporation in rail safety planning. This project concluded with the Transport and Infrastructure Senior Officials Committee endorsing the [National Railway Level Crossing Safety Strategy](#).
- **COMPLETE: Investigate the costs, benefits, and possible deployment models for automatic crash notification (2016 Action plan – item 13)**
This project, led by the Commonwealth, analysed a range of potential deployment models for automatic crash notification systems. These systems are designed to provide emergency services with timely and accurate location data of a vehicle in a serious crash situation. This work will inform possible future deployment arrangements.
- **ONGOING: Development of national operational guidelines to support on-road use of automated vehicles (2016 Action Plan – Item 2)**
Austroads has completed projects in support of this action, including [key road agency actions to support automated vehicles, registration and licensing issues](#) and [automated heavy vehicles in remote and regional areas](#). Further [work is underway](#) on complex issues such as road operations, pavement markings for machine vision and driver education.
- **ONGOING: Development of a national deployment plan for security management of connected and automated vehicles (2016 Action Plan – Item 6)**
The Commonwealth and state and territory governments are conducting research on and piloting systems for managing cyber security in CAVs and connected infrastructure, using international best-practice approaches. Work on this action is continuing through key priorities 1.2 and 4.1.

Key priorities over the next three years

- **NEW: 1.1 End-to-end regulation for the commercial deployment of automated vehicles**
In line with Council priorities, the National Transport Commission is working with the Commonwealth, states and territories to develop a regulatory system that supports the safe deployment and operation of automated vehicles in Australia, covering first supply, in-service and decommissioning. Key actions related to this work include:
 - a) Implementing regulatory arrangements so automated vehicles are safe at the point of first supply in Australia
Timeframe: late-2019, with further periodic changes to implement emerging international best practice approaches.
Lead partners: NTC, Commonwealth, states and territories.
 - b) Reviewing the approach to in-service safety for automated vehicles, including consideration of institutional arrangements and road traffic and driving laws.
Timeframe: mid-2020, with legislative amendments following.
Lead partners: NTC, Commonwealth, states and territories.
 - c) Reviewing state and territory based motor accident injury insurance schemes to ensure appropriate insurance arrangements are in place to deal with crashes caused by automated vehicles.
Timeframe: mid-2021.
Lead partners: NTC, Commonwealth, states and territories.
- **NEW: 1.2 Cooperative Intelligent Transport Systems (C-ITS) Security Credential Management System (SCMS) Pilot Project**
The Queensland Department of Transport and Main Roads is conducting on-road operational testing of an SCMS. The SCMS approach secures communication between C-ITS applications. The iMOVE Cooperative Research Centre will study the use of SCMS and its future role in C-ITS applications for transport authorities, including vehicle safety and security, privacy issues and system performance and governance. This pilot will inform government decision-making on a potential national deployment plan.
Timeframe: end-2021.
Lead partners: Commonwealth, Queensland.
- **NEW: 1.3 Guiding principles and approaches to facilitate safe and legal larger-scale trials of automated vehicles**
Building on the establishment of the [Guidelines for Trials of Automated Vehicles in Australia](#) in 2017, this key priority will develop guidance on conducting larger-scale trials with a view to commercial deployments.
Timeframe: end-2021.
Lead partners: Commonwealth, state and territory jurisdictions, NTC, Austroads.

■ **NEW: 1.4 Accelerate the deployment and uptake of road safety technologies and innovation**

There is a strong commitment across all levels of government to improve safety outcomes on our roads. Governments are committed to implementing the National Road Safety Strategy 2011-2020 and the associated National Road Safety Action Plan 2018–2020, including priority actions for the deployment and uptake of vehicle safety technologies. The Commonwealth will streamline the process for legislative and regulatory changes to vehicle safety standards to improve the uptake of new safety technology in the Australian new vehicle fleet, and consider aligning Australian regulations with the proposed European regulatory package to commence within a similar timeframe.

Timeframe: subject to consultation.

Lead partners: Commonwealth, states and territories.

Areas of future focus:

Ensuring safe design for in-vehicle information and communications systems

Consideration of C-ITS security applications at a national scale



Digital and Physical Infrastructure

Digital and Physical Infrastructure

New technologies will likely need new types of digital infrastructure. They may also influence the existing infrastructure that underpins the transport system today. Australian governments are investigating what digital and physical infrastructure will be needed in the future, and how it can be provided effectively.

Completed and ongoing actions since 2016

■ COMPLETE: Exploration of the merits of new safety and traffic management technologies (2016 Action Plan – Item 14)

Austrroads led an international scanning exercise on the costs and benefits of traffic management technologies. This work will help governments to understand which technologies are mature and have proven benefits when decisions are being made about investment. The [final report](#) was published in May 2018.

■ COMPLETE: Investigation of options to provide enhanced geo-positioning information to the land transport sector (2016 Action Plan – Item 7)

Australian and New Zealand governments developed a test-bed for enhanced positioning techniques, including connected and automated vehicle projects. In 2018 the Australian Government funded the development of a [Satellite-Based Augmentation System and a national ground station network](#) to enhance Australian geo-positioning.

■ ONGOING: Priority trials and research of Intelligent Transport Systems (2016 Action Plan – Item 3)

Research and trials of emerging transport technology remains a priority for all jurisdictions. A Connected and Automated Vehicle Trials and Technology working group was established across jurisdictions to monitor future trials, avoid duplication and optimise information sharing. Austrroads continues to publish information about ongoing trials on its [website](#). This research and trialing is a key exercise to inform further analysis sought through **key priority 2.1**.

Key priorities over the next three years

■ NEW: 2.1 Develop guidance on how infrastructure can be future ready for CAV technology within an integrated transport and land use planning framework

The Commonwealth will develop guidance to support policy and investment decisions on technology in the road transport sector. The guidance will consider strategic priorities for governments to harness the safety, productivity, sustainability and accessibility benefits of transport technology.

Timeframe: mid-2020.

Lead partners: Commonwealth, Austrroads.

■ NEW: 2.2 Develop program of work to address the barriers and challenges impeding the uptake of Low and Zero Emissions Vehicles (LZEVs)

Developed through the LZEV Working Group, this will support the Transport and Infrastructure Council's strategic work program to improve the environmental performance of infrastructure and transport systems, remove barriers to innovation and capitalise on new and emerging technologies. This work will also consider the development of a National Hydrogen Strategy and the future development of a National Strategy for Electric Vehicles.

Timeframe: early-2020.

Lead partners: LZEV Working Group (including Commonwealth, states and territories and Austrroads).

Areas of future focus

Investigating potential interactions between multi-modal drones and infrastructure corridors



Data

Transport systems are generating more data than ever before. This data can be used to improve services, such as real-time information for travelers, streamline government operations and guide decision-making for infrastructure investment. Investigating the potential of data and solving issues regarding access, storage and analysis is a priority for Australian governments and the transport sector.

Completed and ongoing actions since 2016

■ **COMPLETE: Exploration of how telematics and other intelligent transport systems can be used to optimise operations and planning for port precincts and intermodal terminals (2016 Action Plan – Item 11)**

This Action has been progressed as part of the [National Freight and Supply Chain Strategy](#), which is expected to be implemented from 2019. This action explored how granular telematics and Intelligent Transport Systems data can be used to improve supply chain efficiency. Industry was consulted on options for this use of data, in order to optimise port and intermodal operations, with next steps being considered in developing the Freight and Supply Chain Strategy.

■ **ONGOING: Improve the availability of open data in the transport sector (2016 Action Plan – Item 8)**

Austrroads published the [Connected and Automated Vehicles \(CAV\) Open Data Recommendations](#) report in 2018. The next stage of this project is to investigate best practices for the supply of road authority data for CAVs through **key priority 3.1**.

Key priorities over the next three years

■ **NEW: 3.1 Explore uses of C-ITS and AV data to improve network efficiency and investment**

CAV data has the potential to support governments in improving network efficiency and safety, and be used as an input to inform investment decision making. Developing learnings, potentially drawing from trials, to inform the approach to data would help guide governments and the community in effective uses of this data. The NTC will undertake a project scoping the potential uses of C-ITS and AV data by governments. There are likely to be other CAV data projects needed to align with past and planned data projects. Austrroads will undertake a project looking at the data needs for connected and automated vehicles from road agencies; for example, the location and effect of road works. This project will include national and international data consistency issues.

Timeframe: subject to consultation.

Lead partners: NTC, Austrroads, Commonwealth, states and territories.

Areas of future focus

Improved data and data sharing for EVs, including: developing data sharing and exchange standards for vehicle, charging and energy data



Standards and Interoperability

Standards and Interoperability

Enabling interoperability of equipment and services, particularly in a rapidly changing technological environment, is a difficult task. Jurisdictional differences, established patterns of use and legacy systems in information technology can be barriers. Australian governments are committed to collaboration on standards and interoperability, with a focus on adopting international standards unless unique Australian requirements are needed.

Ongoing actions since 2016

ONGOING: Development of a Cooperative ITS infrastructure road map (2016 Action Plan – Item 4)

A nationally coordinated road map will provide greater certainty to industry on potential deployment methods and timeframes, with work underway to position Australia to take advantage of opportunities in connected infrastructure. Austroads has undertaken a range of research and assessments on C-ITS through its Connected and Automated Vehicle program with **key priority 4.1** a key step to progress this work.

ONGOING: Publish a connected vehicle (Cooperative Intelligent Transport Systems) statement of intent on standards and deployment models (2016 Action Plan – Item 5)

Creating a technologically neutral statement of intent for Australia will help give guidance to industry on likely deployment models. In January 2018, the Australian Communication and Media Authority published the [Radiocommunications \(Intelligent Transport Systems\) Class Licence 2017](#), providing certainty that C-ITS applications can be used in the 5.9 MHz spectrum. C-ITS technologies and standards development continue to evolve in what is a highly complex environment, with governments and stakeholders progressing work to evaluate their adoption including through **key priority 4.1**.

Key priorities over the next three years

NEW: 4.1 Evaluate deployment models and associated costs and benefits of C-ITS vehicle technologies

Many automotive and transport sector leaders have indicated that connectivity in vehicles will help solve complex problems in emerging technology. National and international work is underway on connectivity solutions including short-range communications and cellular technologies. A greater understanding of business and assurance models for deployment in Australia and their cost-benefit for industry and government will support effective regulatory and investment decision-making.

Timeframe: early-2021, subject to implementation consultation.

Lead partners: Commonwealth.

Areas of future focus

Identify any gaps in standards in-line with international developments



Disruption and Change

Disruption and Change

Government and transport agencies are experiencing a changing environment, with potential shifts in traditional sources of revenue, infrastructure needs, insurance standards, enforcement of road rules and skills training in the sector. The policy framework will continue to support agencies' decision-making as these changes unfold. This action plan outlines Australian governments' commitment to research, partnering with industry and academia and proactively positioning the Australian transport system for the future.

Ongoing and revised actions since 2016

■ ONGOING: Explore options to increase the uptake of telematics and other technologies for regulatory and revenue collection purposes (2016 Action Plan – Item 9)

This work examined strategies for government and the private sector to accelerate deployment of telematics, and was incorporated into a review of the regulatory telematics regime. The National Transport Commission released the [Review of Regulatory Telematics](#) report in March 2018, and continues to work with key stakeholders on implementing the report's recommendations.

■ REVISED: Investigate options for interoperable public transport ticketing (2016 Action Plan – Item 12)

Transport ticketing technology is evolving and existing systems require renewal to take advantage of developments. **Key priority 5.2** will continue the intent of this action through a wider analysis of Mobility as a Service.

Key priorities over the next three years

■ NEW: 5.1 Identify and facilitate emerging technologies that improve freight outcomes

International and Australian trials and research have shown that new technologies can increase freight network efficiency, decrease risk to transport users, reduce fuel usage and emissions, and enhance traceability of supply chains. Through the National Action Plan of the National Freight and Supply Chain Strategy, jurisdictions will:

- facilitate research and trials of transport technology in the Australian freight sector;
- develop an evidence base to inform next steps on improving freight outcomes, skills, workforce and industry impacts, and future infrastructure needs; and
- promote national consistency to support interoperability.

Timeframe: end-2019 onwards.

Lead partners: Commonwealth, states and territories.

■ NEW: 5.2 Investigate the role of governments in MaaS and identify priorities and enablers to support its effective development and deployment

MaaS combines public and private transport options in a single app, providing an integrated origin to destination journey, handling payment and bookings through the same platform and providing dynamic route-planning information to users. This provides a model to improve mobility and accessibility in cities, towns and regions. The specific business models of MaaS are being explored and tested around the world, including Australia. This action will define the opportunities and challenges in an Australian context of integrating various forms of transport into a single, optimised on-demand mobility service. This includes describing the enabling roles of governments in guiding the deployment of MaaS.

Timeframe: end-2020, subject to consultation.

Lead partners: Commonwealth, states and territories.

■ NEW: 5.3 Research into the competition impacts of automated vehicles

Potential deployment scenarios for automated vehicles may influence commercial issues such as repairer access, e-commerce platforms and access to data. Research into this aspect of the technology will guide future regulatory decisions making and identify future analysis needed.

Timeframe: subject to consultation.

Lead partners: NTC, Commonwealth.

Areas of future focus

Workforce and skills considerations

Revenue implications for all levels of government of emerging transport technology

Organisational impacts of connected and automated vehicles for road transport agencies

Ethics in the use of artificial intelligence and robotics in vehicle automation

Investigate the need for a national approach to rail technology and other technologies supporting mass transit (for example, faster rail, high capacity rail signaling, trackless trams)



Related Initiatives

There is a wide range of related work to prepare Australia for the future of the transport system. This section is a snapshot of many of the initiatives undertaken or underway across governments and transport organisations.

Northern Territory

[Darwin Driverless Bus Trial](#)



New South Wales

[Cooperative Intelligent Transport Initiative \(CITI\)](#)

[Connected and Automated Vehicle Trial Program](#)

[Connected and Automated Vehicles Plan](#)

[Electric and Hybrid Vehicle Plan](#)

[MaaS Innovation Challenge](#)

[Future Transport Technology Roadmap](#)

[Research hub](#)



Australian Capital Territory

[CANdrive Automated Vehicle Trial](#)

[Wing Drone Delivery Trial](#)



Queensland

[Connected and Automated Vehicle Initiative \(CAVI\)](#)

[Managed Motorways Initiative](#)

[Queensland Electric Super Highway](#)

[Queensland Electric Vehicle Strategy](#)

[Mobility Disruptions Strategic Options Assessment](#)

[Draft Queensland Transport Strategy](#)



South Australia

[Future Mobility Lab Fund](#)

[Autonomous Vehicle Trial Exemption and Authorisation Scheme](#)

[Cohda Wireless Connected and Automated Vehicle Trials](#)

[Telstra Connected V2X trial](#)

[Flinders University FLEX AV Trial](#)

[Olli AV and Matilda Smart Bus Stop Trial](#)

[EasyMile Renmark Trial](#)



Victoria

[Smarter Journeys Program](#)

[Intelligent Transport Systems Grants Program](#)

[Automated Driving System Permit Scheme](#)

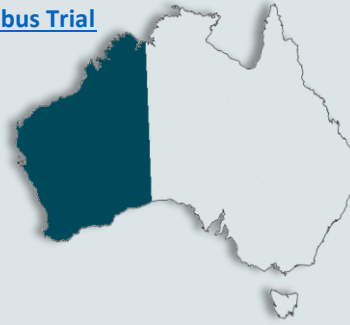


Western Australia

[Royal Automobile Club of Western Australia \(RAC WA\) Intellibus Trial](#)

[RAC WA Intellicar Trial](#)

[Curtin University Driverless Bus Trial](#)



Tasmania

[Smarter Fleets](#)



National Transport Commission

[Barriers to the safe use of innovative vehicles and mobility devices](#)

[Developing technology-neutral road rules for driver distraction](#)



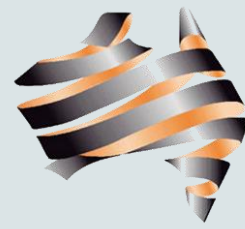
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[Infrastructure changes to support automated vehicles on rural and metropolitan highways and freeways](#)

[Pavement markings for machine vision](#)

[Integrating advanced driver assistance systems in driver education](#)

[Assessment of key road operator action to support electric vehicles](#)



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