

大成 DENTONS

Self-Driving

# Global Guide to Autonomous Vehicles 2020



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# Executive Summary

## Introduction

As consumers and businesses eagerly anticipate a future in which next-generation autonomous vehicles (AVs) change the definition of mobility as we know it, global automakers and technology companies are investing heavily in AV research and development. Simultaneously, the laws and regulations governing the technology and its deployment are rapidly evolving and becoming increasingly complex, leaving unanswered questions around safety, liability, privacy and security.

Drawing on the knowledge and resources of its global, multidisciplinary [Autonomous Vehicles](#) practice, [Dentons](#)' "Global Guide to Autonomous Vehicles 2020" dissects the front-burner policy issues, legislative and regulatory changes, new legal precedents and leading global trends shaping the sector.

In particular, the guide focuses on the following seven countries whose governments or automotive and technology industries have taken unique approaches to supporting the nascent autonomous vehicles industry:

- Australia
- Canada
- China
- Germany
- New Zealand
- United Kingdom
- United States

For each country, the report examines five key areas: **regulatory landscape; driverless vehicle testing and deployment; liability; data privacy and security; and telecommunications and 5G.**

## Key findings

Governments around the globe, both large and small, must answer the complex technical, legal and regulatory questions plaguing full autonomy. Some of the key findings across the globe include:

- Australia requires significant investment to upgrade its infrastructure, including communications and data access. Some municipalities are actively working toward this effort with defined plans of action and budget estimates.
- Ontario leads testing and development of AV technology in Canada, while the federal government has focused on ensuring consistency across all jurisdictions.
- The Chinese government has taken multiple steps to prepare national infrastructure for autonomous vehicles, including defining action plans, publicly soliciting opinions on strategy, promoting relevant research and preparing the streets for autonomous transit.
- Germany has established a national strategy for AVs but its federated structure may threaten consistency at the country level.
- The New Zealand government encourages the testing of semi and fully autonomous vehicles, as well as other transport technologies and innovations in order to facilitate early adoption of beneficial technology.
- Recognizing a communications framework will be essential for AVs, the U.K. has developed a focused strategy to become a global leader in 5G technology, including spectrum allocation.

- In the United States, there is no federal regulatory framework currently in place to address autonomous vehicle testing and deployment. As a result, testing and deployment is regulated by a patchwork of state-centric laws. Forty states and the District of Columbia have either passed autonomous vehicle legislation or are operating under executive orders.

We hope that Dentons' Global Guide to Autonomous Vehicles provides you with a closer look at the developing political and legal landscape for autonomous vehicles, and the specific opportunities and challenges across key areas that will define the global mobility revolution.

For more updates to help you stay connected, click [here](#) to subscribe and to our autonomous vehicles blog, [The Driverless Commute](#), to get the latest developments sent straight to your inbox.

Please also be on the lookout for our **Global Testing and Deployment Guide to Autonomous Vehicles**, coming soon. This interactive online tool will provide effortless access to key self-driving regulations worldwide and even allows users to create custom comparison charts across multiple jurisdictions.

This guide is provided for informational purposes only, and does not constitute advice or guidance. If you have questions regarding any of the covered countries, the guide includes the names and contact details of local lawyers and professionals who are able to assist. If you have questions of a more general nature, about the guide or the sector overall, please feel free to contact our Autonomous Vehicles practice leader via email at [eric.tanenblatt@dentons.com](mailto:eric.tanenblatt@dentons.com).



# Overview



## Australia

At present the National Transport Commission (NTC) is working towards creating an end to end regulatory system that will allow for the safe, commercial deployment of automated vehicles in Australia. As part of that effort, the NTC is currently analyzing options and issues in relation to changing driving laws to support automated vehicles.



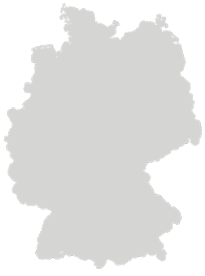
## Canada

In Canada, autonomous vehicles are subject to regulation at all three levels of government: (i) federal; (ii) provincial and territorial; and (iii) municipal. At present most of the regulatory activity is concentrated at the federal level; in the provinces of British Columbia, Ontario and Quebec; and in a few municipalities. Overall, the government of Canada remains optimistic about the future of autonomous transport while also operating cautiously to ensure its rollout is safe and widely beneficial.



## China

The Ministry of Industry and Information Technology, Ministry of Public Security and Ministry of Transport on April 3, 2018, promulgated the Regulations on the Administration of Road Testing of Autonomous Vehicles (for Trial Implementation) to advance the transformation, upgrading and innovation of transportation, and to regulate the administration of road testing of autonomous vehicles.



## Germany

Overall, the German federal government welcomes further developments in the field of autonomous driving. Its aim is to strengthen the German economic position in this sector. In its “Strategy for Automated and Connected Driving,” which was formulated in 2015, Germany has set the goal of ensuring that Germany remains the “lead supplier for automated and connected vehicles” and becomes the “lead market.” The introduction of autonomous vehicles into public road traffic is to be facilitated in particular, by adapting the legal situation.



## New Zealand

Neither the Land Transport Act 1998 (LTA) nor any of the Land Transport Rules specifically regulate the use of autonomous vehicles.

In addition, nothing in either the LTA or any of the Land Transport Rules expressly prohibits or restricts the use of autonomous vehicles once they are registered and licensed. However, broadly speaking, autonomous vehicles must comply with the requirements of both.



## United Kingdom

The government believes that connected and automated vehicles can change the way people travel, making transport safer, smoother and more accessible to those with mobility issues. By working closely with industry, academia and regulators, the government aims to make the UK a premier development location for connected and automated vehicles.



## United States

The United States does not have a federal regulatory framework currently in place to address autonomous vehicle testing and deployment. As a result, testing and deployment is regulated by a patchwork of state-centric laws. That patchwork is made up of 40 states and DC that have either passed autonomous vehicle legislation or are operating under executive orders.

# Australia





# Regulatory overview

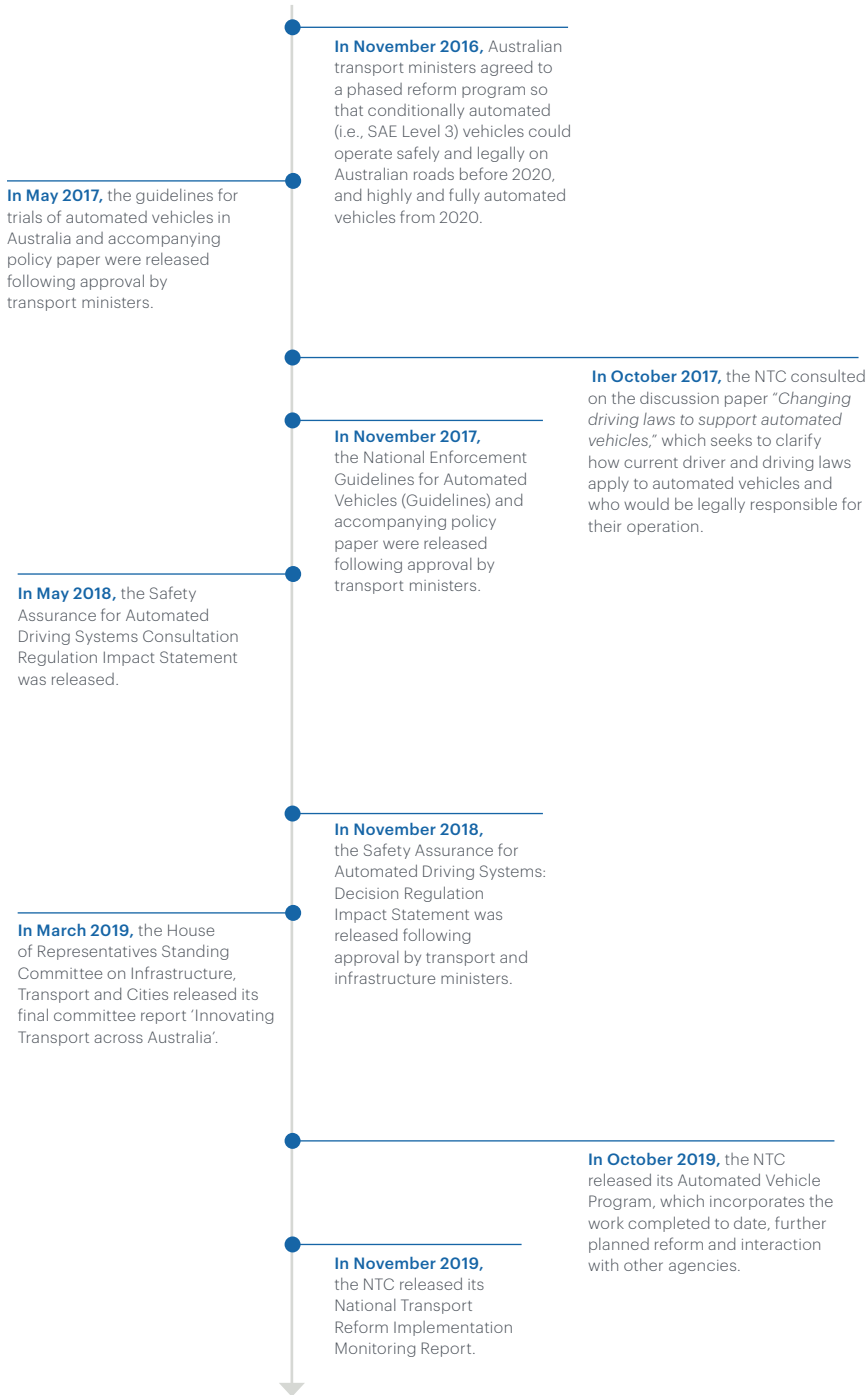
In Australia, each state and territory has enacted its own road safety laws. That is, road safety is not regulated by a harmonized federal (i.e., Australia-wide) law. Moreover, each region has separate regulatory agencies/authorities as seen below.

Region	Agency
Australian Capital Territory (ATC)	Road Transport Information Management
	Transport Canberra
New South Wales (NSW)	Transport for NSW
	Roads and Maritime Services
Northern Territory (NT)	Department of Lands, Planning and the Environment
	Northern Territory Department of Transport
Queensland	Department of Transport and Main Roads
South Australia (SA)	Department of Planning, Transport and Infrastructure
Tasmania	Department of State Growth
Victoria (VIC)	Transport for Victoria
	VicRoads
Western Australia (WA)	Department of Transport
	Main Roads Western Australia

In order to address the inconsistencies between the various states and territories, the National Transport Commission (NTC)<sup>1</sup> introduced the Australian Road Rules (ARRs) to unify the nation’s road safety laws. The ARR’s are model laws which have been implemented in each state and territory.

<sup>1</sup> The NTC is an independent advisory body responsible for the productivity, safety and environmental performance of Australia’s road, rail and intermodal transport systems.

The NTC has implemented a regulatory roadmap in phases to ensure different levels of automation may be commercially deployed. Relevantly:



At present the NTC is working towards creating an end to end regulatory system that will allow for the safe, commercial deployment of automated vehicles in Australia. As part of that effort, the NTC is currently analyzing options and issues in relation to changing driving laws to support automated vehicles.

While a handful of political leaders have taken in interest in autonomous transit, Hon Michael McCormack MP (Deputy Prime Minister)<sup>2</sup> and Paul Fletcher (Minister for Communications, Cyber Safety and the Arts)<sup>3</sup> have been particularly outspoken about preparing Australia for the autonomous revolution.



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**Hon Michael McCormack**

Party leader of the National Party of Australia

"Getting Australians home sooner and safer is a core focus of our government, and the emergence of automated vehicles represents a significant opportunity to realize safety and productivity benefits while supporting Australian industry and innovation."

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**Paul Fletcher**

Minister for Communications, Cyber Safety and the Arts

"This is an important time for industry and government collaboration, as we need to ensure a clear path for network deployment and allocation of spectrum is developed to enable an effective 5G future that will benefit Australian business and society while keeping Australia at the forefront of next generation mobile telecommunications."

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Additionally, Australia's transport ministers, through the COAG Transport and Infrastructure Council, have agreed on the strategic priority of preparing for the deployment of automated vehicles and other innovative transport technologies. The Council has agreed to a program of national work, which is being implemented collaboratively by the Australian, state, and territory governments, as well as intergovernmental organizations such as Austroads and the National Transport Commission.<sup>4</sup>

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2 <https://www.afr.com/news/politics/driverless-cars-get-10m-federal-boost-20181004-h167fz>

3 <https://www.afr.com/business/telecommunications/new-comms-minister-eyes-5g-industry-opportunities-20190527-p51rgu>

4 <https://www.infrastructure.gov.au/transport/automatedvehicles/preparing-for-automated-vehicles.aspx>

That being said, significant investment needs to be made to upgrade infrastructure, including communications and access to data.

Municipalities have taken a leading role in that effort.

For example: NSW has implemented a “Connected and Automated Vehicles Plan”<sup>5</sup>; and VIC has released advice indicating that while Victoria is well placed for the roll out of new vehicles, significant investment will be required to fully maximize their potential.<sup>6</sup> This includes:

- Up to \$1.7 billion to upgrade mobile networks
- Around \$250 million for improved line markings on roads
- At least \$2.2 billion for energy network upgrades.

## Driverless vehicle testing and deployment

Trialing of driverless vehicles is permitted in Australia upon grant of a relevant permit from each relevant state/territory. Generally, “trial permits” are granted on a case-by-case basis.

Certain states (such as Victoria) require the application for a trial permit to prepare a safety management plan that complies with NTC guidelines. Regardless of jurisdiction, appropriate safety hardware/software must be established in a safety management plan that complies with NTC guidelines. Whether or not vehicles must have the capability to be remotely operated is dependent on the safety management plan. Typically, Australian road rules require a person to be seated in the driver’s seat. Certain states, such as NSW and SA require the trialing organization to have third-party policy and/or public liability insurance.

A human driver will be required in the vehicle unless a specific exemption or permit has been granted. As such it is possible that vehicles trialed in Australia will not have human drivers. In this case trialing organizations simply need to demonstrate how they have addressed the relevant safety risks of not having the backup of a

human driver. Where there is a human driver, associated human factor risks will also need to be considered, including such behavioral requirements as alertness and ability to resume the entire driving task if requested or if there is an evident vehicle system failure.

To that end, while not driving, the human driver must not engage in activities that prevent him or her from responding to takeover demands. Activities not in line with the intended use of the automated driving function or prohibited by law include:

- Reading or viewing a device or thing unrelated to navigation or driving (ARR, Rule 299)
- Using a laptop (ARR, Rule 299)
- Using a mobile phone, except in permitted circumstances (ARR, Rule 300)

Throughout vehicle testing, record keeping requirements apply. Generally speaking, trialing organizations should comply with all relevant crash reporting requirements, and report on incidents involving the automated driving system to authorities.

### Spotlight

#### Integration of autonomous technology into public transportation systems

New South Wales is trialing an automated shuttle bus at Sydney Olympic Park. Partners in the project, announced in 2017, include HMI Technologies, NRMA, Telstra, IAG and Sydney Olympic Park Authority. South Australia is conducting similar bus and shuttle trials.

5 <https://future.transport.nsw.gov.au/plans/connected-and-automated-vehicles-plan>

6 <http://www.infrastructurevictoria.com.au/project/automated-and-zero-emission-vehicle-infrastructure/>

As it relates to commercial deployment, Australia is currently trialing driverless vehicles. As such, consumers have not been permitted to use driverless vehicles for personal use.

## Liability

In the event of a crash involving an autonomous vehicle:

- The Australian Consumer Law (ACL) provides a regulatory system of obligations and warranties in order for manufacturers to meet quality and safety standards; and
- Each state and territory has its own Civil Liability Act for personal injuries caused by motor vehicle accidents.

While the usual negligence principles apply, there will be additional issues regarding liability for compensation. For example, there will be issues as to who will bear responsibility for harm with respect to higher levels of automation. Under the ACL, manufacturers and suppliers (such as sellers and resellers) may be held liable.

In October 2017, the NTC released a discussion paper titled “Changing driving laws to support automated vehicles” (Discussion Paper).<sup>7</sup> The Discussion Paper provides in-depth analysis of the need to legally recognize an ADS in Australia. It explains that an Automated Driving System (ADS) is a system—not a person—so it cannot be held responsible for its actions. An entity needs to be responsible for the actions of an ADS to ensure they can operate safely.

In its Automated Vehicle Program<sup>8</sup> released in October 2019, the NTC confirmed it will consider data from insurers to assess and manage liability for road traffic law breaches and crashes.

## Data privacy and security

The *Privacy Act 1988* (Privacy Act) (and its accompanying Australian Privacy Principles (APPs)) regulates the management, storage, access and correction of personal information about individuals. This includes the collection of information from use of autonomous vehicles.

An autonomous vehicle will also likely collect information about its users for the purpose of access (for example, facial recognition information) as well as location information (where a person goes, how long a person was at a location for, the next destinations) and preferences (for example, air conditioning temperature, music etc.). Some of this information about users will likely be classified as personal information and as such, any collection and use will be subject to the *Privacy Act 1988* requirements.

Data is only allowed to be stored and transmitted if:

- Collection of personal information is relevant to the functions and activities of the vehicle;
- A person is aware of personal information collection and how that information is used through an up-to-date privacy policy and collection notices provided at the time information is collected;
- Use and disclosure of personal information is consistent with the purpose for which it is collected, has the individual’s consent, and is for limited other purposes; and
- Personal information is secure.

Consumers have the right to alter and correct their own personal information. An APP entity must take reasonable steps to destroy personal information or ensure it is de-identified if it no longer needs the information for any purpose for which it may be used or disclosed under the APPs. However, in Australia, we do not have the equivalent “right to be forgotten” under the GDPR.

7 [https://www.ntc.gov.au/Media/Reports/\(E5695ACE-993C-618F-46E1-A876391B8CD9\).pdf](https://www.ntc.gov.au/Media/Reports/(E5695ACE-993C-618F-46E1-A876391B8CD9).pdf)

8 <https://www.ntc.gov.au/transport-reform/automated-vehicle-program>

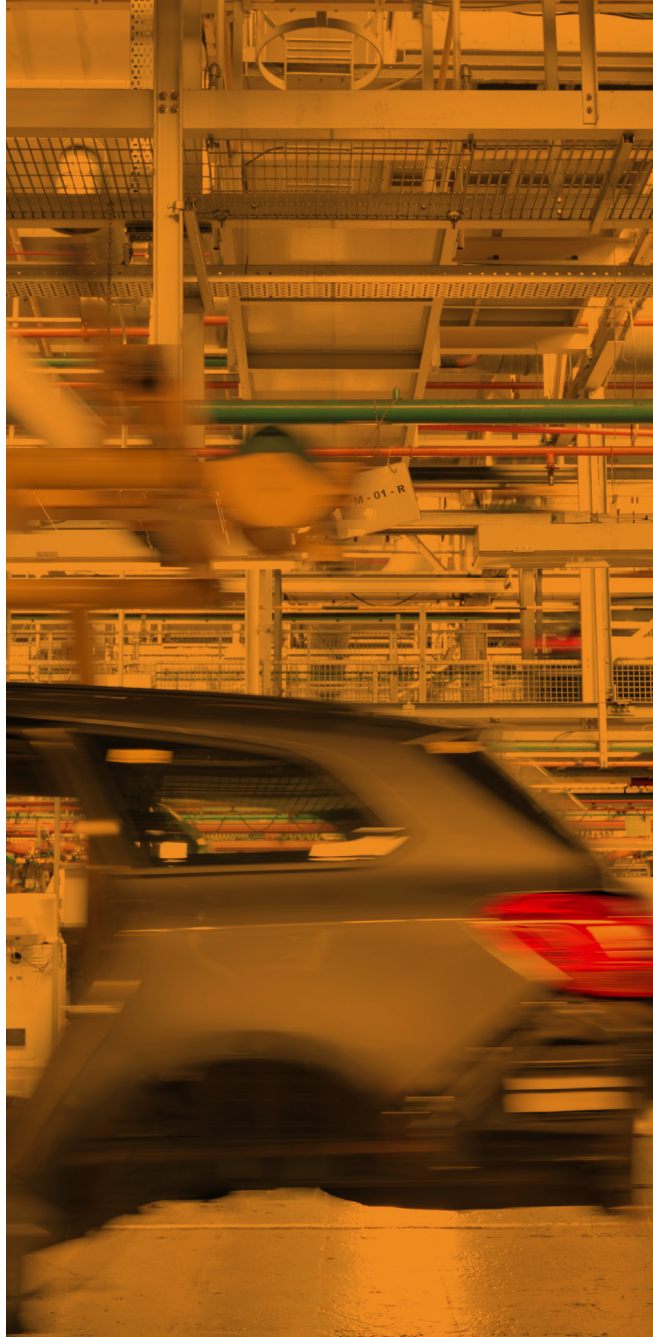
Cybersecurity is regulated by the Privacy and its APPs. For example, the APPs prescribe that:

- Organizations must take reasonable steps to protect personal information that they hold from misuse, interference, loss and unauthorised access, modification or disclosure;
- Organizations must also take reasonable steps to destroy or de-identify personal information they hold if it is no longer needed to any purpose for which it may be used or disclosed, it is not contained in a Commonwealth record, and the entity is not required by or under an Australian law or a court or tribunal order to retain it.

More recently, the Australian federal government introduced the Notifiable Data Breaches Scheme to manage cybersecurity accountability.

## Telecommunications and 5G

Following industry consultation, the Australian Communications and Media Authority introduced the Radio communications (Intelligent Transport Systems) Class License 2017, which will support the use of complying wireless technologies and devices. The regulations allow the 5.9 GHz band to be used for ITS in Australia, and are consistent with the ITS arrangements in major vehicle markets such as the US and EU.<sup>9</sup> In the Australian context, short-range 5.9 GHz radios accommodate 4G C- V2X technology.



### Spotlight

#### South Australia

- Future Mobility Lab Fund: a \$10 million program spanning over three years for development, testing and demonstrations of CAV technology, connected V2V and V2I pilots and demonstrations, and research and development

#### Victoria

- ITS Grants Program: includes project trialing CAVs in highway scenarios, C-ITS to support tram priority, and in-vehicle connected vehicle services using cellular communications

<sup>9</sup> <https://www.acma.gov.au/Industry/Spectrum/Spectrum-planning/About-spectrum-planning/acma-introduces-new-regulations-to-support-intelligent-transport-systems>



# Canada





# Regulatory overview

In Canada, autonomous vehicles are subject to regulation at all three levels of government: (i) federal; (ii) provincial and territorial; and (iii) municipal. At present most of the regulatory activity is concentrated at the federal level; in the provinces of British Columbia, Ontario and Quebec; and in a few municipalities. Overall, the government of Canada remains optimistic about the future of autonomous transport while also operating cautiously to ensure its rollout is safe and widely beneficial.

The federal government is responsible for manufacturing and infrastructure as it relates to vehicles. The provinces and territories are responsible for the licensing of drivers, vehicle registration and insurance, and laws and regulations regarding the safe operation of vehicles on public roads. The regulatory agencies in the most relevant jurisdictions are as follows:

Region	Agency
Federal	<i>Transport Canada</i> : Sets and enforces compliance with safety standards for manufactured and imported vehicles.
	<i>Innovation, Science and Economic Development Canada (ISED)</i> : Sets and enforces compliance with technical standards relating to wireless technology integrated in vehicles and roadside infrastructure.
British Columbia	<i>Ministry of Transportation and Infrastructure</i> : Plans transportation networks, provides transport infrastructure, develops transportation policies and enforces related acts and regulations.
Ontario	<i>Ministry of Transportation (MTO)</i> : Oversees licensing of drivers, vehicle registration and insurance, and regulates the safe operation of vehicles on public roads.
Quebec	<i>Societe de l'assurance du Quebec (SAAQ)</i> : Enforces the Highway Safety Code, which covers the use of vehicles, pedestrian traffic and road safety in the province.

The federal government has not introduced an overarching policy for autonomous vehicles (AVs). However, the Canadian Senate has provided guidance to federal agencies to take a policy leadership role and to guide provinces in facilitating trials.

Specifically, the Standing Senate Committee on Transport and Communications provided guidance through 16 recommendations to Transport Canada and ISED to build a coordinated national strategy on automated and connected vehicles. Those recommendations include, among other things, that the ISED allocate spectrum for connected vehicles uses, and in cooperation with Transport Canada, create a policy unit to coordinate federal efforts on automated and connected vehicles. It is also recommended that Transport Canada engage with provincial governments through the Canadian Council of Motor Transport Administrators (CCMTA) to develop a model provincial policy for the use of automated and connected vehicles.<sup>10</sup>

At present, Transport Canada and the CCMTA set testing guidelines for the provinces for levels 3, 4 and 5 driving automation systems. Any trial organization must ensure that the highly automated vehicle (HAV) conforms to the federal Motor Vehicle Safety Act (MVSA), and if wireless technologies are involved, ensure compliance with ISED certification and licensing requirements.<sup>11</sup> Additionally, the trial organization must comply with each of the provinces' licensing, registration and insurance requirements. The CCMTA's *Canadian Jurisdictional Guidelines for the Safe Testing and Deployment of Highly Automated Vehicles* (HAV Testing Guidelines) supplements the testing guidelines and provides additional guidance on how to prepare and roll out AVs and maintain road safety.<sup>12</sup>

10 [https://sencanada.ca/content/sen/committee/421/TRCM/Reports/COM\\_RPT\\_TRCM\\_AutomatedVehicles\\_e.pdf](https://sencanada.ca/content/sen/committee/421/TRCM/Reports/COM_RPT_TRCM_AutomatedVehicles_e.pdf)

11 <https://www.tc.gc.ca/en/services/road/safety-standards-vehicles-tires-child-car-seats/testing-highly-automated-vehicles-canada.html>

12 <https://www.ccmta.ca/images/publications/pdf/CCMTA-AVGuidelines-sm.pdf>

Moreover, Transport Canada provided policy guidance on safety in its report, *Safety Assessment for Automated Driving Systems in Canada*, to assist ADS developers. Safety in the context of ADS primarily relates to:

- The design and validation of the vehicle;
- Safety systems within the vehicle for driver accessibility; and
- Cybersecurity and data management.<sup>13</sup>

Canada’s *Safety Framework for Automated and Connected Vehicles* not only provides guidance for the safe deployment of automated and connected vehicles on public roads, but also sets out a flexible approach by utilizing non-regulatory tools to support safe testing of ADS.<sup>14</sup>

In addition to *Testing Highly Automated Vehicles in Canada*, the federal government’s testing guidelines for provinces, adopted on May 15, 2018, there are a few other ongoing regulatory projects of note:<sup>15</sup>

British Columbia	Ontario	Quebec
The Ministry of Transportation and Infrastructure has an AV Working Group that monitors progress within the AV field, but there is no timetable for testing policies. Nothing related to developing the AV industry was included in the 2019 BC budget.	The MTO launched a 10-year pilot program in 2016 to test AVs. In 2019, the program was updated. Now the pilot only applies to levels 4 and 5 automation (as defined by the SAE). Levels 1 through 3 are permitted on Ontario’s public roads. <sup>16</sup>	SAAQ has opened the door to the implementation of pilot projects to test AVs. The Highway Safety Code (HSC) was amended in 2018 to introduce an autonomous vehicle definition and create an avenue for a pilot project approval. <sup>17</sup>

13 [https://www.tc.gc.ca/en/services/road/documents/tc\\_safety\\_assessment\\_for\\_ads-s.pdf](https://www.tc.gc.ca/en/services/road/documents/tc_safety_assessment_for_ads-s.pdf)

14 [https://www.tc.gc.ca/en/services/road/documents/tc\\_safety\\_framework\\_for\\_acv-s.pdf](https://www.tc.gc.ca/en/services/road/documents/tc_safety_framework_for_acv-s.pdf)

15 <https://www.tc.gc.ca/en/services/road/safety-standards-vehicles-tires-child-car-seats/testing-highly-automated-vehicles-canada.html>

16 <http://www.mto.gov.on.ca/english/vehicles/automated-vehicles.shtml>

17 <https://saaq.gouv.qc.ca/en/road-safety/modes-transportation/autonomous-vehicles/>



# Driverless vehicle testing and deployment

Notably, the regulation of public roads falls under provincial and territorial authority. Provincial regulations do not require a backup driver for test vehicles. There are no provincial or territorial vehicle safety rules that permit or restrict AVs from operation.

Region	Agency
Federal	At the federal level, MVSA section 7(1)(a) permits testing. In addition, it is important to note section 7(1)(a)—an exception that allows people or companies to temporarily import a vehicle that does not comply with the <i>Canadian Motor Vehicle Safety Standards</i> , if the vehicle is for testing, demonstration or evaluation. <sup>18</sup> The Transport Canada’s Innovation Centre also permits testing of AV truck platooning.
British Columbia	British Columbia does not have any AV testing regulations. The province will likely follow the CCMTA’s HAV Testing Guidelines when implementing testing regulations but at present the vehicle must comply with MVSA regulations. Additionally, the company will likely have to make a declaration that they have addressed any safety concerns associated with the trial AVs.
Ontario	The MTO’s Automated Vehicle Pilot Program permits companies to apply to test driverless vehicles on public roads. The program prohibits the use of AVs (levels 4 and 5) except as permitted by the pilot project. If the vehicle was originally manufactured as an AV, the owner must be the original manufacturer and be a company as defined by the MSVA. If the vehicle was converted into an AV, the owner must be the person who converted the vehicle, and must be a tech company, research institution or AV manufacturer. The Registrar must be satisfied that the owner has expertise to properly convert vehicles into AVs. In addition, the vehicle must have a disengagement/engagement mechanism, failure alert, and mechanism enabling the driver to take over all dynamic driving tasks. Finally, companies must obtain approval from the MTO in order to test AVs (levels 4 and 5) and have a minimum CA\$5 million in liability insurance (CA\$8 million for vehicles with a seating capacity of eight or more passengers).  Pilot project applications must be evaluated and accepted by the Minister.
Quebec	Quebec’s HSC allows for AV testing applications but does not specify terms for AV testing if the application is approved. The CCMTA’s HAV Testing Guidelines will likely be followed when the province implements testing regulations. The vehicle must comply with MVSA regulations and the company will likely have to make a declaration that they have addressed any safety concerns associated with the trial AVs.
Other Canadian jurisdictions	The CCMTA recommends any testing regulations be at least as strict as those implemented in Ontario, therefore, a disengagement/engagement mechanism, failure alert, and mechanism enabling the driver to take over all dynamic driving tasks, are all likely to be required for AVs that are operated with a driver. Additionally, companies will need to obtain a test permit pursuant to an approved application to test on public roads and have a minimum of CA\$5M in liability insurance coverage and beyond CA\$5M when testing larger vehicles (8 or more passenger capacity). Moreover, employees of the company testing the AV will likely be required to complete training (provided by the company) with respect to the capabilities and limitations of the test vehicle. The training logs must be submitted to the applicable provincial agency.

In sum, the federal government has taken on a leadership role to ensure consistency across all jurisdictions by providing guidance on the future of the AV industry. The current regulatory environment is supportive of the development and use of AVs and Ontario is the leader for testing and developing AV technology in Canada.

In regard to vehicle deployment, licensing and registration in Canada falls under the provincial jurisdiction. While there are no specific regulations on deployment in British Columbia, in Ontario, Regulation 517/18 under the

18 <https://laws-lois.justice.gc.ca/eng/acts/m-10.01/FullText.html>

Highway Traffic Act prohibits individual consumers from putting an AV (SAE levels 4 and 5) on public roads.<sup>19</sup> Similarly, in Quebec, *An Act to amend the Highway Safety Code and other provisions* prohibits consumers from having an AV (SAE levels 3–5) on public roads.

The provincial statutes do not directly address consumers taking rides from autonomous vehicles operating through companies, and interestingly, in Quebec, an AV shuttle pilot in Candiac is allowed to charge customers. Additionally, an electric AV shuttle project in Calgary is allowed to charge customers.

Regardless, companies have to obtain consent for transporting consumers in autonomous vehicles. In Ontario, companies must obtain consent pursuant to Ontario’s AV Pilot Project regulations in order to put an AV (SAE level 4–5) on the road. In Quebec companies must obtain consent pursuant to An Act to amend the Highway Safety Code and other provisions to put an AV (SAE level 3–5) on the road and in other jurisdictions companies must obtain the Registrar’s consent.<sup>20</sup>

## Spotlight

### **Toronto is teaming up with the Toronto Transit Commission (TTC) and Metrolinx to pilot an autonomous shuttle program, set to run on public roads, as soon as September 2020.**

The City of Toronto, TTC and Metrolinx put out a public request for information, calling on those in the tech industry working on automated shuttles to share information on potential suppliers, related software, and solution providers so the city can understand what’s available on the market, and any limitations.<sup>21</sup>

Toronto would likely have a vehicle that runs along a single route within the city. There will either be one or two vehicles on the route, depending on what the request for information research and allocated funding allows for. Toronto’s City Council has committed to review the potential of automated public transit within its municipal transit system.

Toronto is the first city to devote full-time staff to AVs, and is in the midst of a Three-Year Automated Vehicles Work Plan which will direct further investigations into the role that AVs will play within its transportation system and wider city planning.<sup>22</sup>

19 <https://www.ontario.ca/laws/regulation/R18517>

20 <https://www.cbc.ca/news/canada/calgary/calgary-autonomous-shuttle-zoo-spark-1.4803460>

21 [https://www.ttc.ca/About\\_the\\_TTC/Commission\\_reports\\_and\\_information/Commission\\_meetings/2019/June\\_12/Reports/18\\_Automated\\_Transit\\_Shuttle\\_Pilot\\_Project.pdf](https://www.ttc.ca/About_the_TTC/Commission_reports_and_information/Commission_meetings/2019/June_12/Reports/18_Automated_Transit_Shuttle_Pilot_Project.pdf)

22 <http://www.mondaq.com/canada/x/705898/cycling+rail+road>

The+Connected+City+Autonomous+And+Connected+Vehicles+And+The+Future+Of+Living

# Liability

Canada has not defined what particular liability regimes apply to AVs in the event of an accident. However, it is reasonable to presume that anyone who causes or contributes to an accident may be liable. Accordingly, relevant liability regimes will depend on a variety of factors, including the degree of the vehicle's autonomy, and the nature of the accident. The degree of autonomy in particular will likely cause a policy-driven shift that legislators will need to consider.

The extent of liability, including who may be responsible, will largely depend on the vehicle's degree of autonomy, and an analysis of the various inputs to the AV's system. The range of potentially liable persons is expansive, and includes drivers, manufacturers and anyone who could be responsible at law for creating a dangerous situation.

Generally, discussion of liability in the AV context explores (i) traditional negligence, (ii) no fault liability, (iii) strict liability, (iv) product liability, (v) negligence per se and (vi) criminal liability, as potentially applicable regimes.

**i. Traditional negligence:** Drivers have a duty to take reasonable care in the operation of their vehicle. Drivers are liable for damages they cause in violation of this duty of reasonable care.<sup>23</sup> In traditional rules of negligence, the wrongdoer must compensate the victim for the harm suffered. This liability regime may be an appropriate fit for discerning liability in the context of AV accidents, because its basis in "reasonableness" offers the requisite flexibility for responding to society's evolving understanding of AV technology and capabilities. Contemporary resolutions are highly influenced by a mandatory-insurance regime that distributes liability according to the particulars of each accident, as outlined by corresponding statutory guidelines.

**ii. No-fault liability:** Traditionally, a no-fault liability regime prohibits accident victims from suing other drivers, unless their injuries reach a certain degree of severity. In the context of AV accidents, the no-fault regime may be extended to preclude claims against other drivers altogether, on the basis that relief from an accident flows directly from the manufacturer or their insurance company. As responsibility for the accident shifts away from the driver, no-fault systems may become more prevalent. Also, it will become increasingly difficult to attribute liability to the driver in circumstances where the driver has become a passenger.<sup>24</sup> Changes to provincial motor vehicle legislation defining who the "operator" of an AV is may come into play.

**iii. Strict liability:** Strict liability could be an alternative to negligence-based liability. This would be particularly relevant in the event that AVs were deemed non-compliant with MVSA standards. Strict liability holds the defendant, in this case the manufacturer or the driver, legally responsible for the accident, regardless of whether a negligent or intentional act was committed.<sup>25</sup> This theory may be especially applicable to drivers of early market autonomous vehicles because they will likely be more knowledgeable of the risks that driving AVs entails, and may consequently bear the associated costs from accidents regardless of whether they are legally at fault.<sup>26</sup> However, if the auto-pilot feature of a vehicle is engaged, and the driver's use of that feature was proper, it may be difficult to argue that the driver was at fault.

**iv. Product liability:** Liability in the event of an accident will inevitably shift towards the manufacturer as the particular technology retains greater control over the vehicle. Product liability claims are based in negligence. In Ontario, there are three main types of negligence establishing tort liability for damages or injuries caused by defective products: (a) negligent manufacture, (b) negligent

23 James M Anderson et al, *Autonomous Vehicle Technology: A Guide for Policymakers* (2016), Rand Corporation, at 112. [Autonomous Vehicle Technology: A Guide for Policy Makers]

24 Ibid at 118.

25 CED (online) Torts, Principles of Liability (II.1.(c))

26 *Autonomous Vehicle Technology: A Guide for Policy Makers* supra note 1 at 114.

design, and (c) failure to warn.<sup>27</sup> It is the obligation of the plaintiff in product liability litigation to demonstrate that negligence exists. The defendant can rebut the presumption of negligence by producing evidence that demonstrates how they are not responsible.

While this liability regime seems applicable in theory, it may be unsuitable for victims of AV accidents in practice. The development of an AV transportation system involves inputs from various design and system authorities. The systems authority would ensure that, when these groups are brought together, the result is a functional and safe system.<sup>28</sup> The rollout of a continent wide transportation system would require collaboration amongst all of these parties, possibly contributing to ambiguity about overall responsibility for vehicle safety. Accordingly, diagnosing a specific product defect will be very difficult, as will be determining who should be responsible for the defect. The requisite due diligence associated with the discovery process will require substantial expertise and time; it will likely be too expensive for individual claimants.

**v. Negligence per se:** In the AV context, a negligence per se regime would inevitably require a statute to be passed or regulations to be established providing the requisite rules to which manufacturers and design and system authorities must adhere. Liability would be found when a party failed to abide by the established rules.

This liability regime may be more advantageous than traditional negligence or strict liability standards because it allows injured parties to recover damages, while still promoting the development of safe autonomous vehicles.

**vi. Criminal liability:** Traditionally, criminal liability applies to any vehicular crime that has a mens rea requirement. However, the autonomous element of

AVs raises a number of issues for traditional criminal applications; these issues proliferate as control of the vehicle shifts from driver to operator. For example, legislators will have to consider whether to place criminal responsibility in the event of a hack, technological malfunction, terrorist attacks, drug trafficking and other criminal activity that could utilize AVs.<sup>29</sup>

In sum, whether the fleet operator, seller, re-seller or parts manufacturer could be liable in the event of an accident depends on the nature of the legal relationship with the plaintiff. It will also depend on the nature of the specific AV accident, although, for sellers and resellers, in particular, liability will likely hinge on whether they are involved in the manufacture or operation of the AV. Further, whether the test driver or negligent hiring standards are to blame will depend on the circumstances of the case. While no such case exists in Canada, it is more likely that enforcement will turn to the manufacturer, before attributing liability to the test driver or negligent hiring standards.

As previously stated, there is no current federal law regulating automated driving. Legislative power for laws on automated driving will principally arise in federal, provincial, and territorial jurisdictions as the technology continues to evolve.<sup>30</sup> Responsibilities for AVs will be shared between federal and provincial powers, owing to Canada's constitutional framework. That being said there are a few preexisting laws and guidelines of note that may address liability on a case-by-case basis. Including:

- The MVSA safety standards for vehicles.
- The federal Criminal Code requirements for the safe operation of a motor vehicle which prohibit dangerous and careless driving.
- Transport Canada guidelines, released April 12, 2019, that direct the safe conduct of automated vehicle trials in Canada, agreed upon by federal, provincial and territorial representatives of the

27 Peter Vlaar, "From Motorist to Manufacturer: Adjusting to AV Litigation" (2018) McCague Borlack (online).

28 Roger Kemp, *Autonomous Vehicles-Who Will Be Liable for Accidents*, (2018) 15 *Digital Evidence & Electric Signature* LR 33 at 37.

29 Frank Douma & Sarah Palodichuk, *Criminal Liability Issues Created by Autonomous Vehicles* (2012) 52 *Santa Clara LR* 4 at 1163. [*Criminal Liability Issues Created by Autonomous Vehicles*]

30 Jonathan Cocker "Global Driverless Vehicle Survey" (2017) Baker McKenzie Report.

Canadian Council for Motor Transport Administrators (CCMTA).<sup>31</sup> The guidelines are intended to cover temporary trials of AVs, not their permanent market deployment.

Provincial policy statements also shed light on liability issues in certain circumstances:

- The Ministry of Ontario has mandated that drivers will still need to be in full care and control of vehicles with SAE level 3 technology and all existing laws (such as distracted, careless and impaired driving laws) will continue to apply to drivers of these vehicles. Drivers are responsible for the safe operation of these vehicles at all times.<sup>32</sup>
- Ontario has adopted the Ontario Regulation 306/15 Pilot Project – Autonomous Vehicles, Highway Traffic Act, R.S.O. 1990, c. H.8 (Ontario Pilot Project), which accepts the autonomous vehicle definitions set out in SAE J3016. These guidelines establish standardized language and principles for the AV industry, but do not create guidelines to discern liability.<sup>33</sup>

In conclusion, liability concerns that stem from autonomous vehicles is, for the most part, uncharted territory. As the legal structure develops so will our understanding of potential exposure to liability.

## Data privacy and security

Canada's national and provincial data protection laws are principles-based and provide a pragmatic and flexible framework that attempts to balance the right of an individual to control the collection, use, disclosure and retention of their personal data with the legitimate business interests of organizations that seek to use that personal data. In Canada, there are separate laws regarding the collection, use and disclosure of personal data in the private sector, the public sector as well as the healthcare sector.

The federal Personal Information Protection and Electronic Documents Act (SC 2000, c 5), commonly known as PIPEDA, applies to the collection, use and disclosure of personal data (referred to as "personal information" in Canadian legislation) by private sector organizations in the course of commercial activities.

British Columbia, Alberta and Quebec have enacted private sector statutes substantially similar to PIPEDA. Where an activity involving personal data takes place wholly within a province, provincial privacy legislation will apply. Where no provincial privacy legislation exists, or where personal data crosses provincial or international borders, PIPEDA will apply. Original equipment manufacturers, technology companies and other private sector organizations involved in autonomous vehicles will be subject to PIPEDA and/or one of the provincial statutes.

Every jurisdiction in Canada has enacted public sector privacy legislation. Federally, the Privacy Act (RSC 1985, c P-21) governs the collection, use and storage of personal data by federal public sector organizations. This legislation applies to government ministries, institutions and agencies of the federal government, such as Transport Canada. Each province has similar legislation governing the collection, storage and use of personal data in the provincial public sector, which includes municipalities. Public sector entities responsible for the infrastructure around autonomous vehicles will be subject to public sector statute.

In the case of public-private partnerships or other consortium-based activities, the individual participating entities will each be governed by different privacy legislation.

Private sector privacy laws are consent-based, meaning that subject to limited exceptions, private sector organizations must obtain consent (implied or express, depending on a number of factors) from individuals for the collection, use and disclosure of their personal information. In order for consent to be valid, it must be

31 Ibid.

32 Ministry of Transportation, "Ontario's Automated Vehicle Pilot Program" online: <http://www.mto.gov.on.ca/english/vehicles/automated-vehicles.shtml>. SAE Level 3 is "conditional automation", where the driver is a necessity, but not required to monitor the environment.

33 SAE International, "Taxonomy and Definitions for Terms Related to Driving Autonomous Systems for On-Road Motor Vehicles J3016" (2018) online: [https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13069a-ads2.0\\_090617\\_v9a\\_tag.pdf](https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13069a-ads2.0_090617_v9a_tag.pdf) at 4.

reasonable to expect that individuals would understand the nature, purpose and consequences of the collection, use or disclosure of the personal information to which they are consenting. In other words, even if an organization obtained consent, organizations may collect, use and disclose personal information only for purposes that a reasonable person would consider is appropriate given the circumstances. For example, collecting the number of passengers in an autonomous vehicle for the purpose of safety measures would be reasonable; whereas collecting passenger ethnicity for the purposes of serving advertisements via the infotainment system may be found unreasonable.

For public sector bodies, all jurisdictions in Canada link the collection of personal information to a purpose. Public sector institutions may not collect personal information unless the purpose for such collection is one enumerated in the organization's applicable statute. For the most part, the permissible purposes for collection fall into three general categories:

- The information collection activity is expressly authorized by the statute;
- The information relates directly to and is necessary for the operating program or activity of that public body; and
- The information is collected for law enforcement.

As a result, public bodies such as municipalities or electricity distributors may only collect the personal information necessary in order to provide the autonomous vehicle services.

Privacy laws do not prescribe how often information can be accessed. Generally, control of access is regarded as a safeguard measure, where access is limited to authorized individuals who require access in order to perform their obligations. This is generally stipulated in internal policies and procedures, as well as set out in contractual arrangements between parties, including between a public sector body and privacy sector organization.

PIPEDA and provincial private sector statutes require organizations to implement safeguards that are appropriate to the sensitivity of the personal information. Safeguards should include physical, technical and administrative controls to prevent loss or unauthorized access to or modification or disclosure

of personal information. These safeguards should contemplate the secure transmission and storage of personal information.

Under public sector legislation, many jurisdictions have formal requirements whereby the public body is to establish and maintain appropriate safeguards against such risks as accidental loss or alteration, and unauthorized access, collection, use, disclosure or disposal.

Personal information collected by an institution that is subject to the provincial public sector privacy law in British Columbia or Nova Scotia may not transfer that personal information outside Canada or otherwise allow access to that personal information from outside Canada, subject to certain exceptions. Therefore, a private sector company, such as a cloud-based service or vehicle manufacturer working with the public sector in British Columbia or Nova Scotia may be prohibited from storing personal information outside of Canada. Additionally, many provincial and federal public sector bodies have formal policies requiring data localization of personal information and in some cases, information generally.

Under private sector and public sector data protection legislation, individuals have a right to access the information held about them. The maximum period that organizations have to respond varies. Under PIPEDA, responses to such requests must be within 30 days. This timeline can be extended in certain cases. All access provisions contain exceptions. For example, under PIPEDA, access may be refused if providing access would reveal confidential commercial information, or providing access could reasonably be expected to threaten the life or security of another individual, or if data was generated in the course of a formal dispute process.

Canadian legislation does not contain an express right to erasure; however, an individual may withdraw their consent to the processing of his or her personal data under Canadian private sector legislation. If there is no further legitimate purpose for which the personal data can be lawfully retained, this may involve the requirement to delete the personal information.

Further, individuals have the right to correct their personal information under most Canadian privacy statutes. The right to correction may also include the



right to have incorrect data deleted or noted as being in dispute. The rights are subject to any statutory requirements that may impose retention periods, preventing a request for delete. Notably, data that has been aggregated or anonymized does not need to be deleted.

There are no specific Internet of things (IoT) statutes that govern consumer data. The data collected by IoT would be governed by either the private sector regime or public sector regime, or both, depending on the organizations involved, the data and the purpose.

Canada has not yet enacted cybersecurity legislation. However, the Government of Canada has been active in promoting cybersecurity. Public Safety Canada is mandated to keep Canadians safe from a range of risks and manages the Canadian Cyber Incident Response Centre. Many government agencies are responsible for enforcing cybersecurity rules within their jurisdiction, including, but not limited to, law enforcement, Public Safety Canada, the Communications Security Establishment, the Royal Canadian Mounted Police, the Canadian Security Intelligence Service and the Office of the Privacy Commissioner of Canada.

Finally, Transport Canada included cybersecurity and data management policy guidance in its report *Safety Assessment for Automated Driving Systems in Canada* to assist developers of automated driving systems.

## Telecommunications and 5G

The government of Canada recognizes that the development and deployment of 5G is essential to Canada becoming a global center for wireless innovation and for ensuring that Canada is at the forefront of digital development and that Canadians have access to world-leading wireless infrastructure. The Government of Canada has incentivized 5G technology by releasing wireless spectrum for 5G<sup>34</sup> and making strategic investments in 5G technologies and infrastructure.<sup>35</sup>

That being said, as it relates to vehicle communication, ISED has not taken a position on whether it prefers dedicated short-range communication (DSRC) or cellular vehicle-to-everything (C-V2X).



34 ISED, “Decision on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Decisions on Changes to the 3800 MHz Band” (June 2019) SLPB-001-19, online: <[https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-00119EN.pdf/\\$file/SLPB-001-19EN.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-00119EN.pdf/$file/SLPB-001-19EN.pdf)>; ISED, “Consultation on Revisions to 3500 MHz Band to Accommodate Flexible Use and Preliminary Consultation on Changes to the 3800 MHz Band” (June 2018) SLPB-004-28 at 1-6, online: <[https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/3500-Consultation02-2018-EN.pdf/\\$file/3500-Consultation02-2018-EN.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/3500-Consultation02-2018-EN.pdf/$file/3500-Consultation02-2018-EN.pdf)>; ISED, “Technical, Policy and Licensing Framework for Spectrum in the 600 MHz Band” (March 2018) SLPB-002-18 at 6, online: <[https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-002-18-600MHz-decision-e.pdf/\\$FILE/SLPB-002-18-600MHz-decision-e.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-002-18-600MHz-decision-e.pdf/$FILE/SLPB-002-18-600MHz-decision-e.pdf)>; ISED, “Consultation on Releasing Millimetre Wave Spectrum to Support 5G” (June 2017) SLPB-001-17, online: <[https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/slpb-001-17-5G.pdf/\\$file/slpb-001-17-5G.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/slpb-001-17-5G.pdf/$file/slpb-001-17-5G.pdf)>; ISED, “Addendum to the Consultation on Releasing Millimetre Wave Spectrum to Support 5G” (June 2018) SLPB-005-18, online: <[https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/Addendum-2018-EN.pdf/\\$FILE/Addendum-2018-EN.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/Addendum-2018-EN.pdf/$FILE/Addendum-2018-EN.pdf)>; ISED, “Decision on Releasing Millimetre Wave Spectrum to Support 5G” (June 2019) SLPB-003-19, online: <[https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-003-19EN.pdf/\\$file/SLPB-003-19EN.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-003-19EN.pdf/$file/SLPB-003-19EN.pdf)>.

35 Government of Canada, “Government of Canada invests in research and development for technologies behind 5G networks” (25 January 2019), online: <<https://www.canada.ca/en/innovation-science-economic-development/news/2019/01/government-of-canada-invests-in-research-and-development-for-technologies-behind-5g-networks.html>> [Nokia Investment in 5G]; ISED, “Building a Nation of Innovators” (2019) at 55, online: <[https://www.ic.gc.ca/eic/site/062.nsf/vwapj/ISED\\_19-044\\_INNOVATION-SKILLS\\_E\\_web.pdf/\\$file/ISED\\_19-044\\_INNOVATION-SKILLS\\_E\\_web.pdf](https://www.ic.gc.ca/eic/site/062.nsf/vwapj/ISED_19-044_INNOVATION-SKILLS_E_web.pdf/$file/ISED_19-044_INNOVATION-SKILLS_E_web.pdf)> [“Building a Nation of Innovators”].

The 5850-5925 MHz band has been specifically designated for use by DSRC for developmental purposes<sup>36</sup> in support of ITS.<sup>37</sup> While the band has not been designated for use by C-V2X, ISED recognizes that C-V2X is gaining traction internationally and has indicated that it would be possible to use C-V2X in the 5850-5925 MHz band.<sup>38</sup>

Equipment in the band operates on a license-exempt basis. ISED has elected to wait to make any changes in the 5GHz band until the future international approach to the band and ITS becomes more clear.<sup>39</sup> Should additional 5GHz bands be made available at WRC-19, ISED will consider if they should be made available in Canada at that time.

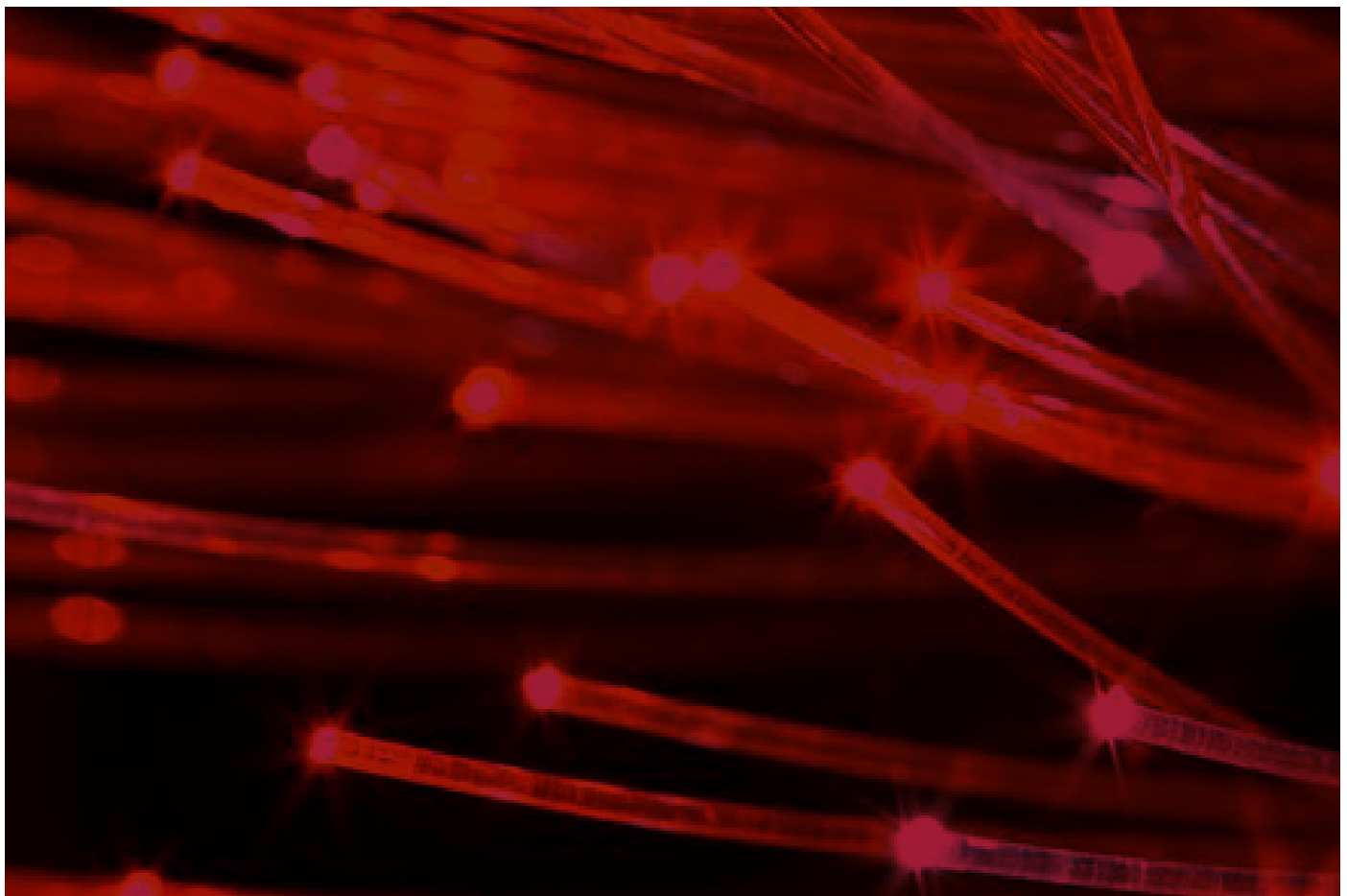
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36 ISED expects this designation will be made permanent in a future spectrum allocation decision, the date of which is presently unknown.

37 ISED, SAB-001-17 – Displacement of Existing Fixed Service Assignments in the Frequency Band 5850-5925 MHz, February 2017, <<https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11264.html>>.

38 Testing of C-V2X has also been done with cellular providers using cellular bands.

39 ISED, Spectrum Outlook 2018-2022, at 31, online: <[https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/Outlook-2018-EN.pdf/\\$file/Outlook-2018-EN.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/Outlook-2018-EN.pdf/$file/Outlook-2018-EN.pdf)>





# China



# Regulatory overview

In China, an autonomous vehicle is usually referred to as an “intelligent connected vehicle” or a “driverless vehicle.” China enacted road safety laws and regulations to cover driverless vehicles, which are applicable nationwide. Local governments have also enacted their own regulations.

The regulatory agencies/authorities with oversight include the Ministry of Transport, National Development and Reform Commission, Ministry of Public Security, Ministry of Industry and Information Technology, and local traffic control departments.

On the national level, the Ministry of Industry and Information Technology, Ministry of Public Security and Ministry of Transport on April 3, 2018, promulgated the Regulations on the Administration of Road Testing of Autonomous Vehicles (for Trial Implementation) to advance the transformation, upgrading and innovation of transportation, and to regulate the administration of road testing of autonomous vehicles.

These regulations are part of a broader effort on the part of the Chinese government to develop the autonomous driving industry as a part of the country’s overall plan to reorient its economy towards a more high-tech industrial model that includes autonomous vehicles and related technology.



In 2015, the State Council published a document entitled “Made in China 2025,” in which it detailed not only the reasoning behind this goal, but also the specific time frame in which they hope to achieve it. In this document, the State Council names 10 specific industries in which the People’s Republic of China (PRC) wants to take the lead. Three of them—robotics, new-generation information technology and new-energy vehicles—point toward the autonomous vehicle industry.



In regard to the vast amount of data collected by autonomous vehicles, certain types of consumer data could be deemed “important data” according to the Cybersecurity Law of the People’s Republic of China (CSL). Important data refers to the kind of data that, if divulged, could directly affect national security, economic security, social stability and public health and security, such as geography and mineral resources, etc. Important data cannot be transmitted abroad unless reviewed and approved by authorities. Also, there are special requirements for storage and protection of important data.

However, currently, there are no specific Internet of things (IoT) statutes in place that govern consumer data. Depending on how one defines “IoT statute,” the CSL, which governs consumer data, functions like a IoT statute in many respects.

In sum, the Chinese government has taken several steps to prepare the national infrastructure for autonomous vehicles. On December 25, 2018, the Ministry of Industry and Information Technology issued Action Plan on Car Networking (Autonomous Vehicle) Industry Development, proposing cooperation and co-construction, and promoting the infrastructure of the car networking industry. The plan proposed several aspects to improve the national infrastructure, including improving the construction of the communication network, the building and management of the big data and cloud platform and building the intelligent road infrastructure.<sup>40</sup>

- On January 5, 2018, the National Development and Reform Commission publicly solicited opinions on “The Innovative Development Strategy of Intelligent Vehicle” (draft for comments). According to the draft, the following will be established by 2020: technical innovation, industrial ecology, road network facilities, regulatory standards, product supervision and information security system framework of China’s standard intelligent vehicles.
- On March 26-29, 2019, Miao Wei, Minister of the Ministry of Industry and Information Technology, said at Bo’ao Forum for Asia that Ministry of Industry and

Information and Ministry of Transport had reached a consensus that the government would devote itself to promoting the research on vehicle networking, and speeding up the intelligent and digital revolution on the highways in China.

- Finally, China is preparing the streets themselves for autonomous transit. For example, on May 24, 2019, Wei Lai Road street office in Zhengzhou, Henan Province, set up a strategic-cooperation relation with China United Network Communications Group Co., Ltd., aiming to push forward the construction of “Smart Street” in Henan Province.<sup>41</sup>

## Spotlight

### Baidu

Among the companies competing in the autonomous vehicles space, Baidu is widely regarded as one of the biggest players. Its open-source software development platform, Apollo, was launched in 2017. Not only has it gathered numerous partners, but it is also leading the race on autonomous vehicle commercialization.

One of Baidu’s commercialized products is the Abolong L4 Autonomous Bus, developed in collaboration with King Long. These small autonomous buses are now operating commercially in enclosed campuses across 24 Chinese cities. The first batch of 100 vehicles rolled off the production line in July of 2018. As of July 2019, the buses have already served more than 40,000 passengers.

40 <http://www.miit.gov.cn/n1146295/n1652858/n1652930/n4509650/c6482536/content.html>

41 <http://dy.163.com/v2/article/detail/EFTINVRG0514TTJV.html>

# Driverless vehicle testing and deployment

At present, in China, there are applicable regulations that permit companies to test driverless vehicles on public roads. “The Regulations on the Administration of Road Testing of Autonomous Vehicles (for Trial Implementation)” permit the road testing of autonomous vehicles within the territory of the People’s Republic of China.

There are also some applicable municipal regulations such as “The Regulations on the Administration of Road Testing and exemplary application of Autonomous Vehicles in Shanghai (for Trial Implementation).”

According to the “Regulations on the Administration of Road Testing of Autonomous Vehicles (for Trial Implementation),” a test vehicle including passenger vehicles and vehicles for commercial uses but excluding low-speed automobiles and motorcycles shall meet the following conditions:

1. It has not undergone the registration for motor vehicles.
2. It satisfies all statutory testing requirements, except endurance, for the corresponding type of vehicles; if a particular statutory testing requirement is not met due to the self-driving function, the testing subject has to prove that the safety performance of the vehicle has not been jeopardized.
3. It can be steered manually and automatically and could switch between the self-driving mode and the manual driving mode in a safe, rapid and easy manner, accompanied with a warning sound, in order to ensure the vehicle could be switched to the manual driving mode immediately under any circumstance.
4. It has functions of recording, saving and monitoring online its status and is able to transfer real-time information listed in Item 1 through Item 3 and to automatically record and save the following information (for a period of at least 90 seconds prior to the accident or malfunction, which shall be stored for at least three years):
  - a. Control mode of the vehicle
  - b. Location of the vehicle
  - c. Vehicle’s state of motion, such as speed and accelerated speed
  - d. Perception of and response to environment
  - e. Real-time status of the vehicle’s lighting and signaling systems
  - f. External 360-degree video surveillance of the vehicle
  - g. In-car video and audio monitoring records that reflect the status of the test driver and the human-computer interaction
  - h. Remote control instructions (if any) received by the vehicle
  - i. Malfunction (if any) of the vehicle.

5. The test vehicle shall be used to conduct actual tests in certain areas, such as the closed road or venue, in compliance with the applicable industry standards of the State, testing requirements issued by provincial and municipal governments and testing evaluation rules of the testing subject, and fulfill conditions for road testing:
6. The self-driving function of the test vehicle shall be tested and verified by a third-party testing institute recognized by the State or local province or municipality to engage in automobile-related business.

Additionally, according to “The Regulations on the Administration of Road Testing of Autonomous Vehicles (for Trial Implementation),” appropriate safety hardware/software must be established in a safety management plan and a test driver must sit in the cab of the test vehicle from the beginning to the end.

The driver must keep a close eye on the running status of the test vehicle and the surrounding environment throughout the test, and be ready to take control of the vehicle at any time. In practice, both L3 and L4 autonomous driving shall have a driver sitting beside the wheel. Where the test driver finds it improper for the vehicle to run automatically or the system warns of the need to have manual operations, the driver shall take control of the vehicle immediately.



A test driver, the driver authorized by a testing subject to take charge of the testing process and take emergency measures against the test vehicle when an emergency arises, shall have the following requirements fulfilled:

1. Inked an employment contract or a labor service contract with the testing subject
2. Obtained the driving license for steering the corresponding type of vehicles and having been experienced in driving for more than three years
3. Have fewer than twelve points under the demerit point system in any of latest consecutive three demerit point periods
4. Not been involved in any serious traffic violations in the latest year, such as driving at a speed 50 percent higher than the upper limit or running a traffic light
5. Not been involved in driving after drinking alcohol or drunk-driving or taking psychotropic or narcotic drugs that are under control of the State
6. Not been involved in any traffic accidents that resulted in death or serious personal injuries;
7. Received self-driving training offered by the testing subject; familiarized himself or herself with testing rules for self-driving; mastered how to make operations during self-driving tests; and capable of responding to an emergency
8. Other conditions specified in laws, regulations and rules

Prior to running any tests, testing organizations shall file an application for permission to carry out road tests with the competent authority of provincial and municipal governments and should specify where the sections of roads selected for the scheduled tests are located. Each organization must buy the compulsory liability insurance for traffic accidents, worth of at least CNY5 million (about US\$705,500) or provide, for each vehicle, a letter of guarantee on compensation of equivalent amount for accidents arising in road tests of self-driving functions.

According to "The Regulations on the Administration of Road Testing of Autonomous Vehicles (for Trial Implementation)," besides the requirements for the test driver and the test vehicle, the testing organization shall also meet the following conditions:

- a. Be an independent legal person registered within the territory of the PRC.
- b. Have relevant business capabilities concerning intelligent connected vehicles, such as the manufacturing of automobiles and spare parts thereof, research and development of technologies, or experiments and tests.
- c. Be financially able to make civil compensation for likely damages caused by intelligent connected vehicles to individuals and property during the test.
- d. Have in place the evaluation rules for the test of self-driving functions of intelligent connected vehicles.
- e. Be able to conduct real-time remote monitoring of test vehicles.
- f. Be able to record, analyze and reproduce events performed with test vehicles.

During an ongoing test, the self-driving mode shall not be adopted, except when the test vehicle is running on the sections of roads selected for the testing purpose on the testing notice; the test vehicle shall be driven manually from the parking lot to the section of road selected for the testing purpose. Finally, during an ongoing test, a test vehicle shall not carry any persons or freights irrelevant to the test.

As it relates to vehicle deployment, there are currently no regulations permitting consumers to use, or prohibiting consumers from using, driverless vehicles for personal use. However, at present, all of the autonomous driving is experimental only.

However, even experimentally, autonomous vehicles will be available to ordinary taxi passengers. On September 16, 2019, Shanghai city issued the first batch of exemplary application licenses of autonomous driving to SAIC Motor, BMW and Didi Chuxing, allowing the companies to put their licensed autonomous vehicles into daily ordinary uses for normal passengers. For the first batch, each company can have 50 licenses maximum, with that amount to increase after six months of good performance.

## Spotlight

### Test driving in Beijing

- On October 31, 2018, Ford and Baidu announced the launch of a two-year joint test project on L4 autonomous driving. The test will be conducted on the designated roads under “Requirements for Beijing Autonomous Vehicles Test Roads.”<sup>42</sup>
- By the end of July 8, 2019, Beijing had opened 44 testing road lines, 123km in total, becoming the city possessing the longest testing roads. 11 enterprises totaling 65 vehicles have been granted autonomous vehicle test licenses by Beijing agencies. The safety test driving distance has exceeded 400,000 km.<sup>43</sup>
- On July 1, 2019, the Beijing Automotive Driving Test Management Joint-Committee issued Beijing’s first batch of L4 automobile road-test driving licenses—five in total, all obtained by Baidu, making it the first, and so far only, company in the country to have obtained this license.

## Liability

In the event of a crash there are several liability regimes that may come into play including:

- “Product Quality Law of the People’s Republic of China” provides a regulatory system of obligations and warranties in order for manufacturers to meet quality and safety standards.
- “Law of the People’s Republic of China on Road Traffic Safety” regulates the liability of the parties concerned under the traffic accidents.

- “Tort Law of the People’s Republic of China” regulates the motor vehicle traffic accident liability.
- “Implementing Regulations on the Law of the People’s Republic of China on Road Traffic Safety.”
- “The Regulations on the Administration of Road Testing of Intelligent Connected Vehicles (for Trial Implementation)” regulates the handling of traffic violations and accidents.

Current road traffic safety laws are applicable to autonomous driving about who or what may be liable for accidents involving autonomous vehicles. In the current road traffic safety law, negligence principles apply. As such, it is conceivable that sellers, re-sellers, manufacturers and/or test drivers could be held liable.

The confusion surrounding liability in these cases may be replaced by some clarity in the near future. The National Development and Reform Commission is set to enact regulations to address the division of liabilities between the autonomous driving system and the driver.

## Data privacy and security

There is not one unified code governing data privacy in PRC. Instead, there are many laws, regulations and department rules.

1. Article 29 of “The Law of the People’s Republic of China on the Protection of Rights and Interests of Consumers” (CSL) stipulates that companies’ seeking to collect and use personal information must acquire the consent of the data subjects beforehand, and that companies shall be held liable for the safety and integrity of the private data or personal information.
2. Article 22 of the CSL has the same requirements.
3. Article 41 of the CSL forbids the company to use the collected privacy data or personal information for objects irrelevant to the services provided by the companies.
4. Article 43 provides that the data subjects have the right of correction and deletion of personal information.

42 <https://mp.weixin.qq.com/s/pPvrZeGY9N9FzOr4O1s9Aw>

43 <http://finance.ifeng.com/c/7o8VbzINIII>

5. Advanced laws and regulations include, but are not limited to:

- a. "Personal Information Protection Law."
- b. "Data Security Law."
- c. "Notice of the Cyberspace Administration of China on Seeking Public Comments on the Measures for Security Assessment for Cross-border Transfer of Personal Information" (draft for comment).
- d. "Notice of the Cyberspace Administration of China on Soliciting Public Comments on the Administrative Measures on Data Security" (exposure draft).

All aforementioned privacy data and personal information include collection of information from use of autonomous vehicles.

Usually, consumer data would be deemed as personal information or privacy data in PRC, like vehicle information, location information, driving habits and so on.

There is no limitation on the types of personal information or privacy data one may collect, store, transmit or use, provided you have obtained the consent of the data subjects to engage in such data process activities.

Data generally is only allowed to be stored and transmitted if:

1. The process activities are relevant to the gatherer's functions and activities.
2. The process activities do not violate any laws or administrative regulations and do not breach any agreements with the data subject.
3. Process activities, including storage and transmission, have the prior consent of the data subject.
4. The personal information is secure.

In PRC, the data subjects, including consumers, have the right to delete the personal information if the collection, storage, use and disclosure of such information violate any laws and administrative regulations or breach the bilateral agreement. Data subjects also have the right to ask the company to

correct their personal information if the collected or used information is incorrect. Like Australia, there is no historical equivalent to "right to be forgotten" in China, while there are relevant suits.

Cybersecurity in the Internet of things is mainly regulated by the CSL, especially classified protection of cybersecurity, which takes cybersecurity in the IoT into the supervision requirement. For example, recommended national standard regulates the expanded requirements based on the common requirements of cybersecurity in GBT22239-2019 "Basic Requirements for Graded System for Cybersecurity Protection of Information Security Technology."

Other recommended national standards regulate the IoT. For example:

- GB/T 37044-2018: "Information Security Technology--Security Reference Model and Generic Requirements for Internet of Things."
- GB/T 36951-2018: "Information Security Technology--Security Technical Requirements for Applying Perception Terminals in Internet of Things."
- GB/T 37024-2018: "Information Security Technology--Security Technology Requirements of Gateway in Sensing Layer of the Internet of Things."
- GB/T 37025-2018: "Information Security Technology--Security Requirements of Data Transmission for Internet of Things."
- GB/T 37093-2018: "Information Security Technology—Security Requirements for IoT Sensing Layer Access to Communication Network."

While the standards do not mention autonomous driving specifically, the guidance or standards mentioned above describe best practices regarding cybersecurity. Some of them were issued by governmental agencies; some are issued by industrial associations (which are quasi-governmental agencies in China).

Finally, the Ministry of Industry and Information Technology issued "Guidance to the Standard System Construction of National Connected Vehicle Industry (Autonomous Vehicles)," which calls for an expedited process for the construction of autonomous vehicles standard system including both functional security of vehicles and key system units and information security.

# Telecommunications and 5G

The Chinese government has made a widespread rollout of 5G a priority. On March 26-29, 2019, Miao Wei, Minister of the Ministry of Industry and Information Technology, addressed at Bo’ao Forum for Asia that the application of 5G should be divided into “two eight”; that is, the communication between people takes 20 percent and the communication between things takes 80 percent. Among them, one of the biggest markets of mobile IoT is vehicle networking, which represents the application of 5G technology, especially by autonomous vehicles.

As it relates to spectrum, on December 1, 2018, the “Temporary Administrative Regulations on the Direct Connected Communication Use of 5905-5925MHz Spectrum on Car Networking (Autonomous Vehicles),” issued by Ministry of Industry and Information Technology, came into effect. The Chinese government has chosen cellular vehicle-to-everything (V2X) communication as the primary means for vehicle to vehicle remote interaction.

In June 2019, Ministry of Industry and Information Technology formally granted commercial licenses to China Telecom Group Co. Ltd., China Mobile Communications Group Co. Ltd., China United Network Communications Group Co. Ltd., and China Broadcasting Network Corporation Ltd.

In November 2019, the first “5G + intelligent agricultural machinery” innovation demonstration scene in China was initiated in Shanghai. 5G driverless harvesters automatically planned, turned, advanced and retreated and completed the harvest of rice fields one by one precisely.

In December 2019, the first 5G autonomous driving traffic management system in the world that integrates vehicles, roads, and smart cities officially landed in Shanghai and has opened to the public. Zhangjiang Hi-Tech Park and Human Horizons jointly demonstrated the future urban travel plan of “zero accident, zero emission and zero congestion.”

The initiative is part of a larger Human Horizons project called “3 Smart” which focuses on creating an ecosystem of smart vehicles, roads and traffic management systems.





# Germany



# Regulatory overview

## A. TRANSPORT AUTHORITIES

Germany, home to several leading automotive companies, is a leader in autonomous transportation. Among the institutions leading the effort to welcome autonomous vehicles is the Federal Ministry of Transport and Digital Infrastructure (BMVI), a supreme federal authority of Germany. The Ministry, together with its subordinate authorities, carries out departmental tasks in the fields of mobility of persons, goods and data. This responsibility extends to the federal transport infrastructure (federal trunk roads, railway networks, waterways and air traffic routes).

The highest state authorities in the field of transport are the Ministry of the Interior, Sport and Integration and the Ministry of Housing, Construction and Transport. In addition, there are several road traffic authorities that engage the Road Traffic Regulations (StVO), the Holiday Travel Ordinance and the Federal Emission Control Act. They are the:

- Municipalities belonging to the district (local road traffic authorities).
- District authorities and municipalities in their own right (lower road traffic authorities).
- Governments (higher road authorities).
- State Ministry of the Interior, for Sport and Integration (Supreme Road Administration).

By way of background, the Federal Motor Transport Authority (KBA) was established by law on August 4, 1951, as the federal authority for road traffic. It belongs to the division of the Federal Ministry of Transport and Digital Infrastructure and sees itself as a service provider for motor vehicles and their users. In Germany, the KBA is the only type approval authority. Type approvals confirm that the legal safety and environmental standards as they relate to transportation are fulfilled. In addition there are other type approvals required via the European Economic Area (EEA) and ECE regulations. The KBA informs other contracting states and national official monitoring organizations (sections 19 and 29 Road Traffic Licensing Regulations (StVZO)) of type approvals granted.

With the type approval, the authority confirms that the serially manufactured approved product meets legal standards. Type approvals stand for safe and environmentally friendly technology on the roads.

- Vehicle type approvals can be granted in accordance with national regulations (section 20 StVZO) or EC regulations (Directives 2002/24/EC, 2003/37/EC or 2007/46/EC).
- Component type approvals can be granted in accordance with national regulations (§§ 22 or 22a StVZO), EU regulations (EC directives and regulations, EU regulations) and UNECE regulations (ECE regulations).
- Type approvals for systems can be granted in accordance with EU regulations (EC directives and regulations, EU regulations) and UNECE regulations (ECE regulations).

In Germany, the Road Traffic Authority is the administrative authority, determined by state law in accordance with section 44 Road Traffic Regulations (StVO), responsible for monitoring and implementing the Road Traffic Regulations. The Road Transport Authority is not an independent organizational unit, but is part of the local municipal administration (city administration or, in municipalities with a smaller population, the district administration).

Finally, in Germany, the motor vehicle registration office (and the driving license authority) may be assigned to the office that also assumes the task of the road traffic authority, but this does not necessarily have to be the case.

Each of the aforementioned institutions plays a role in approving and regulating autonomous vehicle testing and deployment.

**Germany is a high-tech country with a strong automotive and IT/telecommunications sector. It is also one of the leading export nations and an important transit country. Modern mobility is a key to prosperity.**

The federal government has set itself the task of promoting this prosperity even in the digital age. The Federal Ministry of Transport and Digital Infrastructure

(BMVI) ensures that key players from industry, research, associations, administration and politics work together. This is intended to pave the way for solutions that are viable for society as a whole.

The coalition agreement for the (current) 19th legislative period provides for various measures to create modern, barrier-free, sustainable and affordable mobility. In the new legislative period, the BMVI will therefore continue to advocate for the creation of optimal framework conditions for the introduction of automated and connected driving systems (ACD) into the regular operation of road traffic.

Since 2013, the BMVI has established the Automated Driving Round Table (RTAF) as an advisory body. It facilitates a close exchange among actors from industry, science, associations and administration. The necessary know-how is bundled in such a way that a broad social consensus can be reached on all relevant aspects of ACD. The RTAF meets twice a year and has developed the necessary cornerstones for a successful introduction of ACD, which formed the basis for the federal government's "Strategy for automated and connected driving-remain the lead provider, become the lead market, initiate regular operation." (ACD strategy).

For the further development of mobility, the objectives of the ACD strategy will continue. The strategy was adopted by the German government in 2015. The objectives have been implemented with targeted measures in the fields of infrastructure, law, promotion of innovation, connectivity, cybersecurity and data protection, and social dialogue.

The economy is still sceptical. German politicians and the German auto industry do not think far enough ahead. The autonomous car is not only about driverless mobility, but also about an energy and traffic revolution. So far, Silicon Valley has understood this better than Germany— and threatens to move ahead of Germany in the space. For example, in an effort to improve the safety of cars driving autonomously, chip manufacturer Qualcomm is calling for clear political guidelines for carmakers and suppliers. This involves the use of technologies so that vehicles from different manufacturers can communicate with each other. "The role of the regulatory authorities is central here," technology head Matthew Grob told the German Press

Agency. "They have to announce by what date how many percent of autonomous cars must have this technology." In the same way, safety belts and airbags have also been made compulsory for all manufacturers.

Germany has a national strategy for AVs and plans for using them ethically but its federated structure, which can spur innovation in regions, may threaten consistency at the country level.

So far, the main results of the implementation of the strategy by the federal government have been:

- Adaptation of the national legal framework, in particular the amendment of the Road Transport Act.
- Adoption of an action plan to establish ethical rules for driving computers.
- Establishment and coordination of test fields for automated and connected driving in real traffic.
- Supporting the research and development of ACD solutions from basic to applied research.
- Active design of regulations and standards in committees at European and international level.

Germany has thus achieved an international pioneering role in creating the framework conditions for automated and connected driving (ACD), and these must be maintained and further expanded.



On an international level, much has been done and actively led by Germany, most notably:



## Spotlight

**Several of Germany's powerful states are also working on AVs. Some examples are:**

- North Rhine Westphalia, which includes Cologne and Düsseldorf, has established a Zukunftsnetz Mobilität (future of mobility) network to support municipalities, many with the promotion of AVs among its tasks.
- Berlin and Brandenburg (the state surrounding the capital) are both analyzing the market for research and development work on AVs.
- Public transport providers in Berlin, Hamburg and Frankfurt, as well as the national railway company Deutsche Bahn, are testing autonomous buses in a range of settings, and there are more than 20 AV test sites nationwide. Some say that the highly devolved nature of government—with more than 11,000 municipalities—makes it difficult to set national standards and strategy.

## B. INTERNATIONAL LAW

In understanding rules for autonomous vehicle deployment a brief overview is required. Road traffic makes it possible to get from one place to another quickly and comfortably. In principle, the road network is not limited to the national area, but enables cross-border traffic. Furthermore, vehicles are not only produced in the state in which they will later operate, rather the automotive industry is characterized by imports and exports on a global market. Therefore, it is not surprising that international agreements were concluded with the intention of creating uniform traffic and registration rules for motor vehicles in order to guarantee the safety of road traffic across national borders.

One of these agreements is the "Vienna Convention on Road Traffic" (WÜ) of 08.11.1968, which is an international treaty obliging the contracting parties to adopt uniform traffic and licensing rules. Compliance with these provisions is a prerequisite for admission to international traffic (cf. Art. 3 para. 3 WÜ).

According to Art. 4 para. 2 of Directive 2007/46/EC, member states may only grant approval for vehicles, systems, components or separate technical units if these comply with the requirements of this directive. With regard to these approval requirements, Art. 35 (1) Directive 2007/46/EC refers inter alia to the UNECE regulations listed in Annex IV, Part II and declares them to be equivalent components of secondary community law. The abbreviation "ECE" is derived from the United Nations Economic Commission for Europe (UNECE).

On the basis of the Vehicle Parts Convention (ECE Regulations) (FTÜ), the contracting parties crafted ECE regulations for wheeled vehicles, equipment and parts that can be fitted to wheeled vehicles (cf. Art. 1 para. 1 p. 1 FTÜ) by means of an administrative committee to which all contracting parties belong, in accordance with the procedural rules set out in Annex 1. This includes, for example, brake systems, steering systems or headlights. The contracting parties involved are the EU and, in addition to Germany, 46 other states. These ECE regulations, agreed based on the FTÜ, constitute a set of instruments designed to harmonize the international technical requirements for motor vehicles in order to remove barriers to trade in motor vehicles and their accessories. All contracting parties

to the FTÜ may accept the individual provisions, but are not obligated to do so. Where a contracting party has accepted a regulation, it shall be bound by international law, and shall undertake to register vehicles or parts approved, in accordance with the regulation in its own country.

For Germany, this recognition is standardized in section 21a Abs. 1 StVZO. In order to make the ECE regulations binding at a national level, they must be transposed into national law. In the case of countries of the EU, this is regularly done by approving the regulation in accordance with the requirements of Directive 2007/46/EC, which can be viewed in Annex IV, Part II, p. 2.

The ECE regulations now comprise more than 130 technical regulations which, in addition to systems and components for active and passive safety, also deal with environmentally relevant regulations. Both the EU and Germany have accepted most of these regulations.

These technical regulations have yet to be developed for autonomous and automated driving beyond assistance systems. However, this does not mean that such modern driving systems cannot be approved. Rather, they are permitted by way of exemptions, also for series production, and can then be offered on the market.

## C. ROAD TRAFFIC LAW

As part of administrative law, traffic law is concerned with regulating traffic on public roads in Germany in such a way that no road user is harmed, endangered, obstructed or exasperated. It is not summarized in a single set of laws, but consists of several laws and ordinances, which are passed at the federal level and thus apply throughout Germany.

The Road Traffic Act (StVG) is overarching: it contains rules on penalties and fines and lays down the basis for driving licenses and the registration of vehicles. Otherwise, it authorizes the Federal Ministry of Transport and Digital Infrastructure (BMVI) to implement these general provisions more precisely by means of ordinances.

The Road Traffic Act (StVO) is probably the most familiar aspect of traffic law and made up the majority of driving lessons for German students. In short, it includes all the traffic rules that must be observed on German roads.

In addition to the StVO, The Road Traffic Licensing Regulations (StVZO) define the conditions under which motor vehicles and trailers can be registered for road traffic. It sets out in detail how these vehicles must be constructed and how they may be operated. The StVZO is to be gradually replaced by the Vehicle Registration Ordinance (FZV). Up till now, the FZV has regulated exactly how the approval procedure should look, under which circumstances license plates are awarded, and which insurance cover vehicles must have.

Finally, the driving license regulation (FeV) prescribes the conditions an individual must fulfill in order to obtain a driving license, and the circumstances under which this license may be withdrawn.

As it relates to regulations that address autonomous vehicles specifically, currently for example, there are different regulations in the individual US states and also in the EU member states; thus also for Germany.

At the international level, there are several agreements that provide the legal framework for national road transport legislation. One of the most important is the aforementioned Vienna Convention on Road Traffic of 1968. Automated systems were unknown in 1968 and therefore not regulated. Regulations at that time were based on a vehicle control by the human driver. Since the last change in March 2016, automated systems have been allowed. However, fully autonomous (level 5) driving is not yet possible, as the agreement still provides for a driver.

According to section 1a of the Road Traffic Act, there are no legal restrictions against highly and fully automated driving—at least for level 3 (highly automated driving) and 4 (fully automated driving). However, the experts cannot achieve an unequivocal result with regard to the specific obligations, as laid out in section 1b StVG. This does not apply to fully autonomous driving (level 5), which is why the legal experts assume that it is “still fundamentally inadmissible.” The absence of the possibility that a person in the vehicle could, if necessary, take over the control of the vehicle is not provided for in the text of the law. As such, level 5 autonomy is not yet permitted and is inadmissible.

In fact, the latest implemented right to enable levels 3 and 4 (except driverless/level 5 vehicles) is already in force. Sections 1a and b StVG regulates the interaction between the vehicle with the highly or fully automated driving function and the driver. The new law provides for the use and concept of highly and fully automated driving functions.

In Germany, vehicles with a highly automated or fully automated system may be used in traffic in such a way that the driver can hand over the vehicle control to the system in certain situations. The system takes over the longitudinal and lateral guidance of the vehicle as well as acceleration and deceleration for defined applications, or for a limited time period. The driver no longer has to monitor the system permanently. Oftentimes, the system alerts the driver visually and acoustically when the vehicle needs to be checked again manually.

The operation of vehicles by means of highly and fully automated driving function systems is only permitted within the framework of normal use, whereby the intended purpose depends on the design. If an automated driving function is only intended for use on motorways, the system must not be used for traffic on other roads. The binding system description of the vehicle by the driver manufacturer must provide the driver with unmistakable information on the scope of the intended use.

During operation of a highly or fully automated driving system, the driver is allowed to turn away from the traffic situation. Within the scope of the mandatory system description, the driver may take his hands off the steering wheel, look away from the road and carry out other activities, such as processing e-mails in the infotainment system. The driver no longer has to monitor the system permanently. However, he must remain vigilant. The driver is obliged to resume the vehicle control immediately if he recognizes or should recognize due to obvious circumstances that the conditions for an intended use of the highly or fully automated driving functions no longer exist. The driver is obliged to continue to be aware in such a way that he can at any time fulfill his obligation to resume control of the vehicle immediately. The driver must remain so perceptive that he can grasp the situations regulated by law and then resume control of the vehicle.

However, the new law does not regulate fully autonomous driving where there are only passengers (i.e., level 5). There is still a legal need for regulatory action at national and international levels, and a possible need for technological development, as it relates to level 5 autonomy.

Overall, the German federal government welcomes further developments in the field of autonomous driving. Its aim is to strengthen the German economic position in this sector. In its "Strategy for Automated and Connected Driving," which was formulated in 2015, Germany has set the goal of ensuring that Germany remains the "lead supplier for automated and connected vehicles" and becomes the "lead market." The introduction of autonomous vehicles into public road traffic is to be facilitated in particular, by adapting the legal situation.

In 2016, the federal government set up an ethics committee to deal with legal and ethical issues in autonomous driving. The panel consisted of 14 scientists and experts. In June 2017, the Ethics Committee adopted a final report with a total of 20 ethical rules. Among other things, it was stated here that the protection of man always has priority. The Ethics Committee has also rightly made high demands when it comes to data protection. These are being used today in the development of automated and autonomous systems. In total, three clear principles apply: transparency, self-determination and data security.

At present, as previously mentioned, high and fully automated driving in the sense of levels 3 and 4 is largely permissible in Germany.



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**Angela Merkel**  
Chancellor of Germany

Insists that we should not lose sight of the social market economy during digitization. "Prosperity for all—that must also be the melody of the future in the age of digitalization."

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**Andreas Scheuer**  
Federal Minister of Transport

"We are now bringing autonomous driving onto the road as well. At the moment we are working on a law to allow autonomous shuttles." Independent driving, which Scheuer sees as a great opportunity for road safety, is already being tested. "This will soon enable us to avoid thousands of accidents and make 'Vision Zero' tangible."

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**Peter Altmaier**  
Federal Minister for Economic Affairs and Energy

Pleaded for a merger of European companies in artificial intelligence—a kind of "Airbus of the AI." A "single European company—no matter how large it may be—will not be able to compete alone against the big American players," Altmaier said, adding that the idea is the most ambitious industrial policy project "that we have initiated in recent decades."

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# Driverless vehicle testing and deployment

As it relates specifically to the testing of autonomous vehicles in Germany, vehicles may only be operated on public roads according to section 3 Abs.1 S.1 FZV (Fahrzeugzulassungsverordnung) and only if they are registered. According to the Vienna Convention (WÜ), every vehicle must have a driver (Art. 8 para. 1 WÜ) who must be able to intervene on request. From a liability perspective, the use of a so-called safety driver in testing vehicles and vehicle systems makes sense and is common practice. Test drivers must possess a valid driving license otherwise, no additional training is necessary, but possible and useful.

The approval of prototypes for testing on public roads by means of a special permit is governed by sections 19 ff. of the German Road Traffic Act. StVZO. The granting of permits must be obtained from the responsible Langratsamt and is based on section 20 StVZO for type approval and section 21 StVZO for individual approval. Until now, up to level 3 is possible for the individual approval of test vehicles.

The vehicle is tested for their suitability and safety for public road traffic within the framework of the approval procedure (i.e., it is checked whether the vehicle, its design or its equipment meets the construction and operating requirements of section 30 StVZO). With regard to safety, the focus is on whether, based on general life experience or scientific findings, it is sufficiently likely that public road traffic and other road users may be endangered.

If the requirements of sections 30-62 StVZO are fulfilled, the administrative authority grants approval and the vehicle is registered as a test vehicle. If the vehicle does not correspond to the regulations, an exception permission can be given over section 70 StVZO by the highest national authority under certain conditions. The companies may test these on the intended test tracks during a possibly limited time-period. In general, all test vehicles must be tested on the designated test tracks (e.g., A9 Munich-Nuremberg).

Permission is also required for testing on the private premises, provided that these are accessible to everyone.

There are no special insurance requirements for autonomous vehicles which go beyond the motor vehicle liability insurance prescribed in section 4 PflVG (Pflichtversicherungsgesetz). However, it might be useful for the manufacturer to insure the test vehicle comprehensively in order to avoid possible liability issues, since the strong connectivity can also lead to new risks (e.g., cyber-attacks).

There are a few safety requirements that are important to note. As a minimum requirement for functional safety, hardware and software systems must separate vehicle functions from infotainment, telematics and navigation applications. The control systems must contain sufficient redundancy. For example, safe holding must be ensured even in the event of a failure of the main control system. Suitable protection against external (cyber) attacks must be provided, as well as against manipulation of security-relevant elements.

At every stage of development, the vehicle must navigate at least as safely as if a human being controlled it. However, the possibilities of automated and autonomous driving must not be used to limit the autonomy of the road user elsewhere. An example could be a general speed limit that is “enforced” by the vehicle driving in strict compliance with the regulations. Data collection must not be used to establish new restrictions and controls throughout the country (e.g., for recording driving times). Technological development as such will make traffic safer and reduce risks such as those posed by overtired drivers.

Finally, in regard to autonomous trucking, while the Hamburg Truck Pilot Project of Hamburger Hafen & Logistik AG and MAN Truck & Bus, for example, is currently underway to test the automated connection of truck columns and fully automated approach on the A7 motorway and independent loading and unloading in container terminals, no more specific legal regulations have yet been passed for this area of automation.

As it relates to AV deployment, in principle, there are no provisions that restrict consumers from riding in autonomous vehicles. The operators, however, must observe a few points. Experience with automated shuttles was gathered in a series of pilot tests over the last few years. The experiments have so far taken place in “protected areas” both in large cities and in small towns.

All pilot projects must be applied for on a case-by-case basis. As soon as the automated vehicle (shuttle) is to be driven on public roads, it needs, in addition to the obligatory liability insurance, an "approval on the basis of an exemption permit" in accordance with section 70 of the Road Traffic Licensing Regulations (StVZO).

As soon as revenues are generated from the trial operation, an operating permit in accordance with the Passenger Transport Act is required.

Finally, in regard to autonomous taxi like services, an operating permit in accordance with the Passenger Transport Act is required, just as it is for a bus company or a taxi company.

## Liability

A significant question facing automated and autonomous driving is that of liability in the event of an accident. In Germany and in some other countries, the legal situation is clear because there is a three-pillar model consisting of driver, owner and manufacturer liability. The driver is responsible for the driving task and must always monitor the vehicle and intervene in the event of an emergency, for example in the case of semi-automated driving functions. If he fails to comply with his duties of care and thereby causes an accident, he shall be liable, in addition to the owner, for the damage thereby incurred. Additionally, the manufacturer may be liable under product and producer liability for damage caused by a product defect. This combination of driver, owner and manufacturer liability offers a balanced distribution of risk, ensures victim protection, and has proven itself in practice. The liability model is also a good basis for new systems and the next steps in automated driving.

Given car manufacturers could be held responsible, the car industry would do its best to defend itself against this. In sum, potentially liable are the driver, the owner, the car manufacturer and the producers of the individual vehicle parts.

The insurance industry, which has been dealing with liability issues for robotic cars for months, has a different view. According to insurers, the owner would have to be liable— even if he did not make a mistake. This corresponds to the current legal regulation. However, the insurance company may seek recourse from the manufacturer if the latter is liable for a failure of the driving system.

In the case of semi-autonomous vehicles, the driver is in any event an integral part of the liability regime. According to German law, he must be guilty of intent, negligence, or any other misconduct for liability.

As of late discussions have taken place about updating the liability regime to cover autonomous vehicles more specifically, however, the previous liability regime of German civil law is regarded as sufficient.



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### Alexander Dobrindt

German politician of the Christian Social Union of Bavaria. Former Federal Minister of Transport and Digital Infrastructure in the government of Chancellor Angela Merkel.

When CSU politician Alexander Dobrindt was still Transport Minister, he had a simple solution to this complex problem: In the event of an accident with autonomous cars, he said, "the moment the computer takes over, liability passes to the manufacturer."

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# Data privacy and security

The data collected by autonomous vehicles (location data, sensor data, etc.) is considered “personal data” as defined by the EU and Federal Data Protection Act (now BDSG) and as of May 2018, the EU Data Protection Regulation (GDPR). Such data can be traced back to the owner, driver or passenger, and identified as information about personal or actual circumstances of a person. Most of the data collected by modern cars is assigned to the vehicle identification number (VIN).

The collection, storage and use of personal data is permitted under data protection law if there is a justification for doing so or if the data subject has given his effective consent. Limiting requirements (data economy, scoring in accordance with section 31 BDSG 2018) must be observed for both mass collection and automated processing of personal data. Further restrictions apply to particularly sensitive data (e.g., information on health or ethnic origin, cf. Art. 9 EU-DSGVO). More than four decades ago, the Federal Constitutional Court put a stop to the creation of total personality profiles (profiling).

The DSGVO proposes two major documentation concepts, which must be presented at all costs, if only to prove legal conformity in the event of possible complaints:

- **The list of processing activities for customer data (formerly: procedure directory).** This list should be the central document in the company. It covers all typical processing steps (e.g., e-mail marketing, CRM, customer analysis, etc.) but also your payroll accounting or merchandise management system and the like, and helps you to comply with your obligations.
- **Documentation of processing security (technical and organizational measures).** Customer and user data can be sensitive, which is why the legislature stipulates here that they must be well secured. It must document extensively which measures are in place to ensure that the data is safe in the enterprise and remain there.

Before collecting the data, the organization should make sure that all data is necessary and proportionate to the purpose for which it was collected.

The passing on or even the sale of user and customer data is not possible without further consideration of the following scenarios:

- Transfer/sale in the context of a complete company sale (since the responsible person does not change, there are no issues here).
- Disclosure/sale within the framework of an asset deal (consent of the affected parties may be necessary, further information can be found).
- Transfer of data within the scope of order processing (AV contract is necessary).
- Passing on data in third countries (e.g., Google Analytics, guarantees must be available).
- Transfer/sale for the purpose of address trading (as a rule, new consent necessary, insofar as not done in the collection of data).

Excluded from this are already publicly available data.

As is already the case under previous legislation, there is a right to information on the processing of personal data. Upon request, companies must provide information on data processing in a precise, transparent, comprehensible and easily accessible form in clear and simple language. This includes, for example, the storage period, the purpose for which the data are processed, which categories of personal data are processed, information on the origin of the data and possible recipients of the data.

A new feature is the right to a copy of the data. You can specifically request information about which personal data are processed by the responsible person (e.g., surname, first name, address, date of birth, profession, medical findings) and receive this in the form of a copy provided by the company.

Under certain circumstances, companies must delete data. This is the case, for example, when the data are processed unlawfully or are no longer needed for the original purpose for which they were collected.

Individuals may also request, under certain circumstances, that your data not be further processed. The data is therefore not deleted, but the data processor must block the data and cannot continue to use it as usual.

In an effort to address data security, the Act to Increase the Security of Information Technology Systems (IT Security Act), came into force in July 2015. Through this Act, the federal government intends to make Germany's IT systems and digital infrastructures the most secure in the world.

In addition, The Federal Office for Information Security (BSI), which is responsible for security in information technology in Germany, has numerous references to the correct protection of data on its homepage.

The IT Security Act requires that operators of critical infrastructures in certain areas will have to comply with a minimum standard of IT security and report significant IT security incidents to the BSI. For the information technology and telecommunications sector, which is also highly relevant for automated and autonomous driving, the Ordinance on the Determination of Critical Infrastructures under the BSI Act (BSI-KritisV) already defines the scope of application.

The transport and traffic sectors also fall within the scope of the IT Security Act. The first regulation amending the KRITIS Regulation of 21.6.2017 (BGBl. I, p. 1903) determines exactly which annexes are included. Part 3, plant categories and threshold values, point 1.4, lists the traffic control and guidance system for the federal motorway network, as well as the traffic control and guidance system for municipal road traffic for cities with more than 500,000 inhabitants.

Even if this regulation is not yet directly aimed at (highly) automated or autonomous driving, it is already clear that a corresponding IT infrastructure will fall under the increased requirements of the IT Security Act.

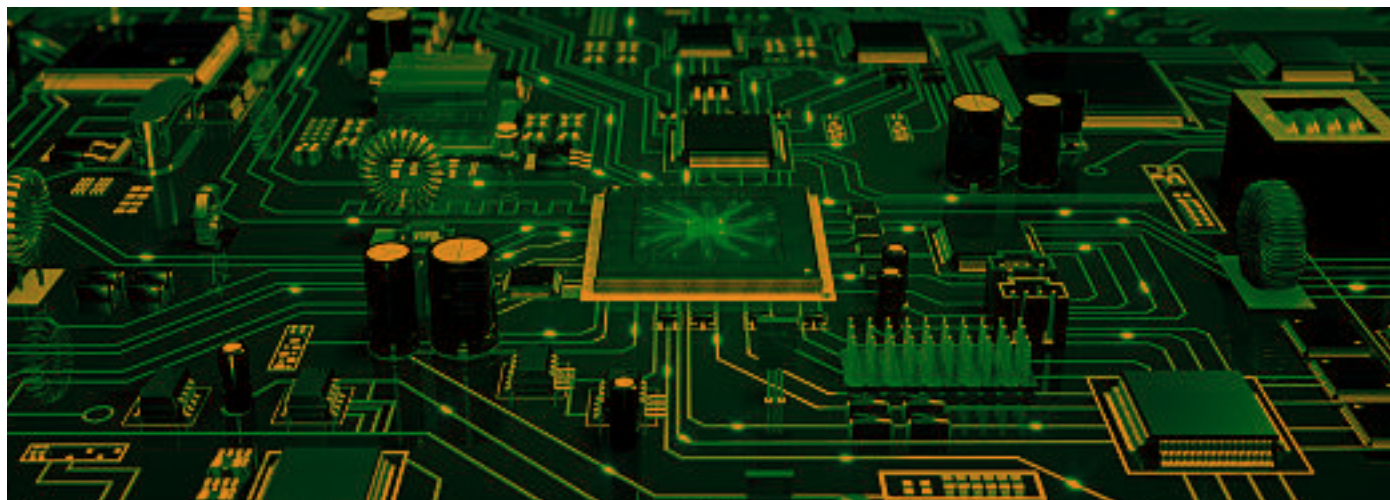
## Telecommunications and 5G

The auction of the 5G frequencies in the 3.6 gigahertz range by the Federal Network Agency began on March 19, 2019. Some 2 GHz frequencies are also earmarked for 5G use, but will only be available between 2020 and 2025.

Right from the start, 60 5G antennas have been transmitting in more than 20 cities and communities. At present about 150 cities and communities are connected and by end of the year Germany expects to operate around 300. These include Cologne, Düsseldorf, Hamburg, Dortmund and Munich.

It is unknown if the government has taken a position between using 5G networks for cellular vehicle-to-everything communication or dedicated short-range communication. DSRC technology is already being used in Germany for the digital truck tolling system. From a technical point of view, this communication is desirable, but not necessary for the current sensor acquisition of the data by operating level 3 vehicles.

Notably, spectrum is unregulated in Germany, unlike in Great Britain or France.







# New Zealand



# Regulatory overview

Before exploring the laws and regulations that apply to autonomous vehicles it is important to understand the government structure of New Zealand and the relevant regulatory agencies. New Zealand has a unicameral national parliament with no state or regional assemblies. The two government agencies with regulatory oversight are the Ministry of Transport and the New Zealand Transport Agency (NZTA). Additionally, the New Zealand Police are responsible for the day-to-day enforcement of land transport-related offenses.

New Zealand's Parliament is responsible for setting legislation to regulate land transport matters, including legislation applicable to the regulation of autonomous vehicles. That legislation may grant rule-making powers to arms of the Executive, such as the Ministry of Transport or NZTA.

The primary legislation regulating vehicles and road transport (including autonomous vehicles) is the Land Transport Act 1998 (LTA).<sup>44</sup> NZTA has been granted authority under the LTA to develop the Land Transport Rules,<sup>45</sup> which contain more detailed requirements and processes for carrying out the general objectives and principles of the LTA.

These include Land Transport Rules to regulate:

- Road user behavior.
- Driver licensing.
- Vehicle standards and certification.

Neither the LTA nor any of the Land Transport Rules specifically regulate the use of autonomous vehicles. In addition, nothing in either the LTA or any of the Land Transport Rules expressly prohibits or restricts the use of autonomous vehicles once they are registered and licensed. However, broadly speaking, autonomous vehicles must comply with the requirements of both.

Notably, neither the LTA nor any of the Land Transport Rules specifically requires a "driver" to be physically present in a vehicle for it to be operated legally.

However, both the LTA and the Land Transport Rules impose duties in relation to the operation of all vehicles in a safe manner.<sup>46</sup> Not to mention that, at the international level, New Zealand has ratified the Geneva Convention on Road Traffic 1949, which requires every vehicle to have a "driver" (although does not expressly require the driver to be physically present within the vehicle). As a signatory to the Convention, New Zealand is obliged to give effect to the Convention through domestic legislation.

Overall, the current government is generally supportive of the testing and adoption of autonomous vehicles in New Zealand, although it is not highlighted as a specific priority.

An information document published by the Ministry of Transport in 2016 (under a previous government) states:

**The Government encourages the testing of semi and fully autonomous vehicles, as well as other transport technologies and innovations in New Zealand in order to facilitate our early adoption of beneficial technology.**

The document notes that New Zealand is a good location to carry out testing because of its range of road conditions, supportive legislation and the ability to test on public roads.<sup>47</sup>

The previous Government (2008-17) indicated that it did not intend to engage in legislative reform until autonomous vehicles are closer to being commercially available.<sup>48</sup> The current government has not said or done anything to suggest that it is departing from this position.

Any policy development or regulatory change would be led by the Minister of Transport (currently the Honourable Phil Twyford).

44 <http://www.legislation.govt.nz/act/public/1998/0110/latest/DLM433613.html>

45 <https://www.nzta.govt.nz/resources/rules>

46 Land Transport Act 1998, sections 6-8.

47 <https://www.transport.govt.nz/assets/Uploads/Our-Work/Images/T-Technology/69bb8d97ac/Testing-Autonomous-Vehicles-in-New-Zealand.pdf>

48 <https://www.transport.govt.nz/multi-modal/technology/specific-transport-technologies/road-vehicle/autonomous-vehicles/>



**Phil Twyford**  
Minister for Transport of New Zealand

Mr Twyford is a member of the New Zealand Labour Party, which leads the government (as the largest party) in coalition with the New Zealand First Party, with the support (in the form of confidence and supply) of the Green Party of Aotearoa New Zealand.

**March 19, 2018:** Mr Twyford announced the establishment of the Future Technology Leadership Group.



**Shane Jones**  
New Zealand First Party Member of Parliament (MP)  
Associate Minister for Transport



**Julie Anne Genter**  
Green Party Member of Parliament (MP)  
Associate Minister for Transport

## Driverless vehicle testing and deployment

New Zealand currently has an autonomous vehicle testing process in place. Each applicant is allocated a customer support manager to guide them through both obtaining the necessary approvals to test vehicles and the testing itself.<sup>49</sup>

Testing companies are permitted to test driverless vehicles on public roads provided that those vehicles comply with the Land Transport Rules (or are exempted from doing so) and the testing company has followed the approved testing process required by the NZTA. Generally speaking, a vehicle will meet the requirements of the Land Transport Rules if it has been manufactured to the applicable standards in Europe, Japan, the US or Australia.

Testing companies must ensure that their activities do not impede traffic or reduce the transport network's efficiency in any way. The Ministry of Transport expects that before autonomous vehicles are tested on public roads, the testing company will already have undertaken testing in a private location and resolved any outstanding performance issues.<sup>50</sup>

Notably, neither the Land Transport Act nor any of the Land Transport Rules explicitly state that a vehicle must have a driver in control while it is in operation. If the vehicle is one in which the operator is able to substantially disengage from the driving task, the vehicle should provide adequate warning, such as visual and audible

49 <https://www.nzta.govt.nz/vehicles/vehicle-types/automated-and-autonomous-vehicles/testing-autonomous-vehicles-in-new-zealand/>

50 <https://www.transport.govt.nz/multi-modal/technology/specific-transport-technologies/road-vehicle/autonomous-vehicles/testing-autonomous-vehicles-in-nz/>

indicators, to allow the operator to re-engage in the driving task before any automated system becomes ineffective.<sup>51</sup>

The test driver (where there is one present in the vehicle) must have the full license required for the class of vehicle to which the test vehicle belongs, or an equivalent license from a different jurisdiction. This rule applies regardless of whether the test driver is physically in the vehicle at the time of testing or not. The driver must be unimpaired while the vehicle is in operation.<sup>52</sup> Overseas driver licenses issued by an eligible jurisdiction (generally pursuant to a reciprocal arrangement) will be recognized in New Zealand for a period of 12 months, after which time the holder of the license must apply to convert the overseas license into a New Zealand license.

If testing is of a fully automated vehicle (that is, there is no driver present in the vehicle), there should be a means to immediately override all automated systems and bring the vehicle to a controlled stop.<sup>53</sup>

If the vehicle contains automation technologies that were built in at the time of manufacture, the testing company must provide a statement of compliance from an authorized representative of the vehicle manufacturer which lists the vehicle standards contained in the Land Transport Rules to which the vehicle was certified when it was manufactured. If the vehicle contains automation technologies that were added after manufacture, the testing company must satisfy the NZTA that any modifications to the vehicle are compliant with the Land Transport Rules. The modifications must also be certified.

If the vehicle does not meet the requirements of the Land Transport Rules, the testing company must apply for an exemption from the Land Transport Rules from the NZTA. Exemptions are governed by section 166 of the Land Transport Act and will only be granted if

the NZTA is satisfied that the risk to safety will not be significantly increased by the granting of the exemption and that:

- The requirement has been substantially complied with and that further compliance is unnecessary; or
- The action taken or provision made in respect of the matter to which the requirement relates is as effective or more effective than actual compliance with the requirement; or
- The prescribed requirements are clearly unreasonable or inappropriate in the particular case; or
- The events have occurred that make the prescribed requirements unnecessary or inappropriate in the particular case.

The government has indicated that exemptions relating to autonomous vehicles are likely to fall within the latter two bullet points above. The government has not published any information about how many exemptions have been granted to autonomous vehicles. The number of exemptions granted in relation to each Rule is published in the *New Zealand Gazette*, the official newspaper of the government,<sup>54</sup> at least every three months. However, the Gazette does not provide any further details about those exemptions.

The company wishing to carry out autonomous vehicle testing must follow the process set out on the NZTA website if that testing is to take place on public roads. The Ministry of Transport recommends that the testing company submit a safety management plan to the NZTA during that process that demonstrates how safety will be ensured during testing and includes the following information:

- A description of the technologies being tested.
- A description of testing already undertaken and test performance.

51 <https://www.transport.govt.nz/multi-modal/technology/specific-transport-technologies/road-vehicle/autonomous-vehicles/testing-autonomous-vehicles-in-nz/>

52 <https://www.transport.govt.nz/assets/Uploads/Our-Work/Images/T-Technology/69bb8d97ac/Testing-Autonomous-Vehicles-in-New-Zealand.pdf>

53 <https://www.transport.govt.nz/multi-modal/technology/specific-transport-technologies/road-vehicle/autonomous-vehicles/testing-autonomous-vehicles-in-nz/>

54 <https://gazette.govt.nz>

- The testing plan, testing schedule and testing methodologies.
- Safety management accountabilities, lines of responsibility and fail-safes.
- Risk and hazard identification, and planned management actions and treatments.
- Completed and planned staff safety training and drills.
- Incident registration and exception reporting methodologies.

New Zealand is unusual in that it does not require the owner or operator of a vehicle used on public roads to hold insurance. However, the Ministry of Transport recommends that any person undertaking testing should hold “appropriate levels of public liability and professional indemnity insurance to protect against the risks associated with testing.”<sup>55</sup>

In sum, there are no vehicle safety rules that restrict autonomous vehicles from operating, except to the extent that an autonomous vehicle is not compliant with one or more of the Land Transport Rules for any reason and is unable to obtain an exemption from the particular Land Transport Rules. Moreover, regulations do not prohibit autonomous trucking/platooning. In fact, platooning in the form of adaptive cruise control (where a driver retains full control of the vehicle) is permitted under existing regulations.

Going forward, significant infrastructure investment is required to prepare roads for fully automated vehicles. At this stage the government of New Zealand hasn’t taken any concrete steps to prepare the national infrastructure for autonomous vehicles. The KPMG Autonomous Vehicles Readiness Index Report has identified improvements to infrastructure as a key way in which New Zealand can become more ready for autonomous vehicle testing and use.<sup>56</sup>

What is clear is that New Zealand infrastructure, and particularly its roading, is not prepared for a mass rollout of autonomous vehicles.

Autonomous vehicles require roads to be sealed and in good condition with clear and consistent road markings. Many New Zealand roads, particularly in residential areas and outside city centers, do not meet these requirements. If autonomous vehicles are to operate in separate lanes to other traffic, many roads (including large parts of state highways) will need to be widened.

Accordingly, a mass rollout would require significant upgrades of the majority of New Zealand’s roads. New Zealand is not densely populated outside its main centers, and its geography presents challenging terrain for road builders, which means that these upgrades are unlikely to be economically viable, other than in major cities and/or in the context of specific projects.

Finally, as it relates to deployment, there is no express prohibition on consumers using driverless vehicles for personal use on public roads. However, the vehicle must meet the requirements of the Land Transport Rules and must be able to legally be driven in New Zealand. In practice, this means that only quasi-automated technology (such as adaptive cruise control) is available for consumer use.

In addition to ensuring that the autonomous vehicles and the manner in which they are operated comply with the Land Transport Rules, an operator of a “passenger service” must comply with the Land Transport Rules applicable to the operation of a passenger service (and must, if applicable, obtain an appropriate license to operate such a service).

## Liability

In the event of a crash involving an autonomous vehicle, usual negligence principles will apply, except in relation to personal injury which is covered by the Accident Compensation Corporation (ACC).

Liability will depend in particular on a plaintiff’s ability to prove the existence of a duty of care, and to meet the remoteness and causation requirements of the tort. The less direct the prospective defendant’s involvement

55 <https://www.transport.govt.nz/assets/Uploads/Our-Work/Images/T-Technology/69bb8d97ac/Testing-Autonomous-Vehicles-in-New-Zealand.pdf>  
 56 [https://assets.kpmg/content/dam/kpmg/nz/pdf/February/Autonomous\\_Vehicles\\_Report\\_2018.pdf](https://assets.kpmg/content/dam/kpmg/nz/pdf/February/Autonomous_Vehicles_Report_2018.pdf)

in the accident, the more difficult this will be. This issue will become more complex as vehicle autonomy increases. This issue is not unique to New Zealand and it is likely that New Zealand case law will follow a similar approach to the law of negligence developed in other common law jurisdictions (in particular the UK and Australia).

It is also important to know that certain rules and regulations apply to autonomous vehicles as defined by criminal offenses under the Land Transport Act.

The circumstances of a crash may give rise to a breach of sections 6 to 8 of the LTA. Breaches of these sections is an offense that may result in criminal liability and convictions. The punishments will depend on the offense and the consequences (that is, whether the crash resulted in any injury or death). The maximum punishments are:

- Fines of up to NZD20,000.
- Up to ten years' imprisonment.
- Disqualification from holding or obtaining a driver license (in some cases the minimum disqualification period is specified in the LTA, while in others it is at the court's discretion).<sup>57</sup>

All other offenses, including those relating to driving under the influence of alcohol or drugs, are listed in Parts 5 and 6 of the LTA.

While no one has been convicted to date of an offense in relation to autonomous vehicles, laws will likely apply in much the same way as they would to traditional (completely driver-controlled) vehicles. It is particularly important to note that the offenses do not require the person to be "driving" the vehicle in order to be liable; they need only "operate" the vehicle or "cause" the vehicle to be driven. To "operate" a vehicle means "to drive or use the vehicle on a road, or to cause or permit the vehicle to be on a road or to be driven on a road, whether or not the person is present with the vehicle."

**Health and Safety at Work Act 2015:** Workplace health and safety is overseen by WorkSafe New Zealand, which administers the Health and Safety at

Work Act 2015 (HSWA).<sup>58</sup> Under the HSWA, persons conducting a business or undertaking (known as PCBUs) can be held liable for any accidents involving workers (or other people) in the place where an autonomous vehicle was being tested or used if they have failed to take all reasonably practicable steps to minimize or eliminate the risks associated with the autonomous vehicle. The definition of "worker" contained in the HSWA is broad and applies to employees, independent contractors, labour hire workers, volunteers, and various other classes of person.

The maximum penalties available under the HSWA differ depending on the person or company being prosecuted, but can be up to NZD3 million or five years' imprisonment for directors or officers of a PCBU.

**Liability for personal injury:** Personal injury caused by accidents, including vehicular accidents, is covered by the Accident Compensation Corporation (ACC).<sup>59</sup> ACC is a no-fault government scheme which heavily subsidizes medical and rehabilitation costs arising from injuries sustained in accidents. It applies in respect to accidents involving any person present in New Zealand (including visitors).

If an injury is covered by ACC, section 317 of the Accident Compensation Act 2001 creates a statutory bar to issuing proceedings in the New Zealand courts for damages in respect of the injury. However:

- The injured person may still issue proceedings for exemplary damages, which are intended to punish the defendant rather than to compensate the injured person.
- The statutory bar does not extend to damage to property.
- If an injury is not covered by ACC, the injured person may issue proceedings for damages in respect of the injury as if the ACC scheme did not exist.

**Liability for property damage or other financial loss:** ACC only applies to liability arising in connection

57 Land Transport Act 1998, sections 34-39.

58 <https://worksafe.govt.nz/managing-health-and-safety/getting-started/health-and-safety-at-work-quick-reference-guide/>

59 <https://www.acc.co.nz/>

with personal injury (including loss of income), and does not cover liability for property damage or other financial loss. A person who suffers such loss as the result of the operation of an autonomous vehicle may sue to recover damages. Depending on the circumstances and the parties involved, most claims are likely to be for either negligence or breach of contract.

**Conduct in trade:** As the commercial availability of autonomous vehicles increases, accidents arising from defects in the vehicle itself could be covered by the Fair Trading Act 1986, which prohibits businesses in trade from engaging in “misleading or deceptive conduct.” Liability under the Fair Trading Act could arise where, for example, the seller of an autonomous vehicle has made inaccurate representations about its safety, or failed to disclose known defects in the vehicle, which result in an accident. Breaches of the Fair Trading Act are investigated and prosecuted by the Commerce Commission, the consumer and competition law watchdog in New Zealand.<sup>60</sup>

Defects in a vehicle may mean that the vehicle is not of acceptable quality under the Consumer Guarantees Act 1993, which entitles the consumer/owner (but not any third parties) to redress from the seller or manufacturer.

In sum, manufacturers and technology providers could, in theory, be subject to liability concerns in particular to causation and remoteness issues. Additionally, responsibility for property damage or other financial loss may be able to be attributed to the test driver if their actions or omissions caused the accident.

Going forward, the Ministry of Transport and the NZTA indicated in 2016 that they intended to undertake a review of transport legislation, which would—among other things—address liability in relation to testing of autonomous vehicles, but not liability in relation to general use. However, they do not anticipate initiating that review until the commercial availability of autonomous vehicles has increased substantially.

## Data privacy and security

The primary legislation governing data privacy in New Zealand is the Privacy Act 1993, which sets out information privacy principles (IPPs) relating to the collection, storage and use of personal information. The obligations apply broadly to any person or entity defined as an “agency.”

“Personal information” means information about an identifiable individual. Even if the information does not include details of the individual’s name, the individual may still be identifiable from that information and, accordingly, such information will be personal information for the purposes of the Privacy Act.

In New Zealand, information is categorized as “personal information” as soon as the information contains an identifier about an individual, even if the identifier cannot be used to identify a specific individual. In other words, an individual does not have to be able to be identified from the information for the information to be deemed “personal information.” It is sufficient that an individual can be identified by a link, whether that link comes from that entity’s knowledge obtained from other sources or by other means (such as context, identification numbers and so on).

The IPPs relate to the:

- Collection of personal information.
- Storage and security, and retention, of personal information.
- Rights of an individual in relation to their personal information, including rights of access and correction.
- Circumstances in which personal information may be used and disclosed.
- Use of unique identifiers.

If any agency breaches the IPPs, then the affected person may complain to the Privacy Commissioner, who will try to facilitate a settlement between the parties. If this fails, then the matter can go to the Human Rights Review Tribunal, which can require

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60 <https://comcom.govt.nz/>



remedial action and award damages of up to \$350,000.

New Zealand's privacy law is currently being updated, with a new regime proposed by the Privacy Bill being expected to come into force in 2020. This will bring New Zealand's privacy law a step closer towards reflecting the vast changes in technology that have occurred during recent decades and to better align New Zealand law with developments in international privacy and data protection regulation, including the EU's General Data Protection Regulation (GDPR).

To the extent that the technology involved in driving autonomous vehicles relies on the collection and use of personal information, such collection and use will be governed by the Privacy Act. Examples of information collected in the context of the use of an autonomous vehicle that might constitute "personal information" under New Zealand law include:

**Owner and passenger information:** Autonomous vehicles may collect identifying information about the owner or passenger of the vehicle for purposes such as to authenticate authorized use, or to customise comfort, safety or entertainment settings.

**Location tracking:** Location data collected and used in autonomous vehicles for navigation purposes (e.g., information about the destination, route, speed and time travelled that relate to the individual) and for real-time traffic data and routing preference may constitute personal information to the extent that data is about an identifiable individual.

**Sensor data:** Sensors (including cameras, voice recognition and control systems and other devices) may collect identifying data about the vehicle's operation and its surroundings that may constitute personal information.

Consumer data (personal information) can be collected by an agency for a lawful purpose connected with a function or activity of the agency, where the collection of the information is necessary for that purpose. The information must not be used for any other purpose unless authorized by the individual, with certain other exceptions.

The information must usually be collected directly from the individual. The collection must not be collected by unlawful means or by means that are unfair or intrude unreasonably upon the personal affairs of the individual.

Certain exceptions apply to the collection and use of personal information, including where collection, use or disclosure is necessary for the maintenance of law by a public agency, or where the information is anonymized or is for statistical and research purposes and will not be published in a form that could identify the individual.

The information must be protected by such security safeguards as it is reasonable in the circumstances to take against loss, unauthorized access, use, modification or disclosure, and other misuse. The agency must not store the personal information for longer than is required for the purposes for which the information may be lawfully used.

Save for in certain limited circumstances prescribed by the Privacy Act, the information must not be disclosed to a third party unless such disclosure is authorized by the individual or the disclosure is one of the purposes for which the information was obtained (or is directly related to the purposes in connection with which the information was obtained).

Individuals can request confirmation as to whether an agency holds personal information about the individual, and access to that information. Individuals can request correction of the information held by an agency. There is no explicit right for an individual to request deletion of personal information.

There is no specific regulatory regime governing cybersecurity in the Internet of things (IoT) in New Zealand.

But, the government did release its latest New Zealand Cyber Security Strategy in July 2019.<sup>61</sup> The Government established CERT NZ (a national computer emergency response team) to support businesses, organizations and individuals who are affected (or may be affected) by cybersecurity incidents. CERT NZ is a key component

61 <https://dpmc.govt.nz/publications/new-zealands-cyber-security-strategy-2019>

of New Zealand’s Cyber Security Strategy. CERT NZ has issued guides on cybersecurity for individuals,<sup>62</sup> businesses<sup>63</sup> and IT specialists,<sup>64</sup> as well as critical controls and advisories for IT specialists.<sup>65</sup>

Finally, the Crimes Act 1961 establishes certain criminal offences involving “computers.” These include the crimes of accessing a computer system for dishonest purpose; damaging or interfering with a computer system; making, selling or distributing or possessing software for committing crime; and accessing a computer system without authorization.

## Telecommunications and 5G

While the government is not directly investing in 5G, private telecommunications companies Spark and Vodafone are currently preparing to launch 5G in New Zealand. The government has allocated a 3.5Ghz band for use by the 5G network from November 2020.

Additionally, the government does regulate spectrum. Currently, road transport and traffic telematics use a band between 5725 and 5875. New Zealand has not yet allocated a band to be used for Intelligent Transport Systems (ITS) but the government has indicated that its preferred option is to use the 5.9Hhz band and that, where feasible, New Zealand standards will align with joint EU/US standards. It is intended that the 5.9Hhz band will accommodate ITS generally. New Zealand does not have a specific position on DSRC vs. C-V2X at this stage.

### Spotlight

#### HMI Technologies LTD.

In June 2019, HMI Technologies Ltd. (and its subsidiary Ohmio Automotion Ltd.) began testing a driverless shuttle at Christchurch Airport. The shuttle is designed to transport passengers and their luggage from the carpark to the airport terminal, and around the airport itself. The testing appears to be ongoing, and Christchurch Airport has since purchased a 15-person Ohmio Lift shuttle. The KPMG Autonomous Vehicles Readiness Index Report records this as “the world’s first fully AV trial at an international airport.”<sup>66</sup>

Ohmio also partnered with Spark New Zealand to test New Zealand’s first 5G-connected driverless car in Auckland in March 2019.<sup>67</sup>

62 <https://www.cert.govt.nz/individuals/guides/>

63 <https://www.cert.govt.nz/business/guides/>

64 <https://www.cert.govt.nz/it-specialists/guides/>

65 <https://www.cert.govt.nz/it-specialists/>

66 [https://assets.kpmg/content/dam/kpmg/nz/pdf/February/Autonomous\\_Vehicles\\_Report\\_2018.pdf](https://assets.kpmg/content/dam/kpmg/nz/pdf/February/Autonomous_Vehicles_Report_2018.pdf)

67 <http://www.scoop.co.nz/stories/BU1903/S00315/new-zealands-first-5g-connected-driverless-car-tested.htm>

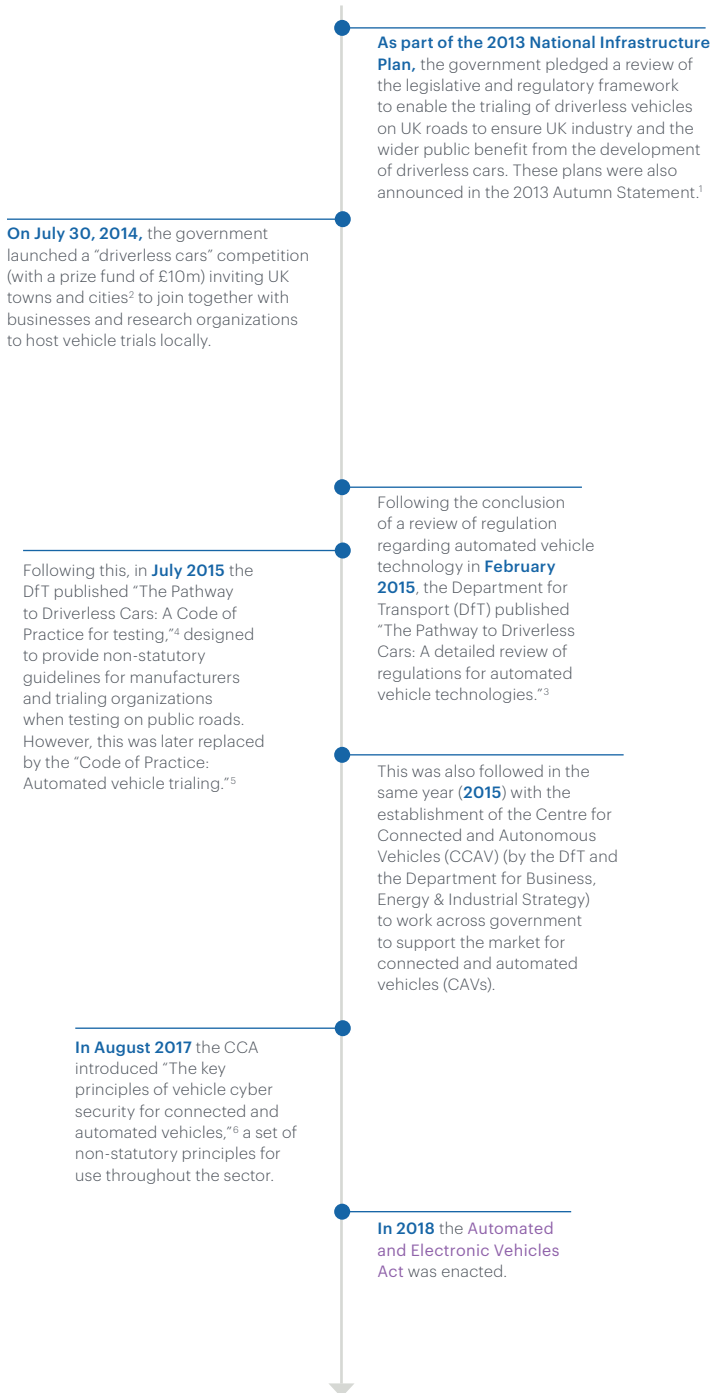


# United Kingdom



# Regulatory overview

The UK government recognizes the significant benefits that driverless and automated vehicles could bring and is working towards the widespread adoption of autonomous cars on the roads by 2021.<sup>68</sup> To this end the government has worked on a number of initiatives to support the development of autonomous vehicles, namely:



The government believes that connected and automated vehicles (CAVs) can change the way people travel, making transport safer, smoother and more accessible to those with mobility issues. By working closely with industry, academia and regulators, the government aims to make the UK a premier development location for connected and automated vehicles.

Going forward, steps need to be taken to redesign current road networks to enable them to support a mass rollout, for example, mobile parking and charging stations, all need to be in place before a mass rollout (and the government has already been taking some steps to address these gaps).

Some towns and cities that won the government grant to see trialing of autonomous vehicles locally (such as Milton Keynes), have already begun to take steps to prepare city streets. One of the initial areas of focus has been seeking the best ways of developing effective parking/drop off zones and charging points for CAVs (charging point infrastructure is also supported through the AEVA 2018).

In terms of regulations, in the United Kingdom, the Department for Transport (DfT) has authority over driverless vehicle testing and deployment.

68 <https://edition.cnn.com/2019/02/06/uk/driverless-cars-scli-gbr-intl/index.html>  
 69 <https://www.gov.uk/government/publications/autumn-statement-2013-documents>  
 70 Various trials are already under way in parts of the UK, which includes Bristol, Coventry, London, Greenwich and Milton Keynes  
 71 <https://www.gov.uk/government/publications/driverless-cars-in-the-uk-a-regulatory-review>  
 72 <https://www.gov.uk/government/publications/automated-vehicle-technologies-testing-code-of-practice>  
 73 <https://www.gov.uk/government/publications/trialling-automated-vehicle-technologies-in-public>  
 74 <https://www.gov.uk/government/publications/principles-of-cyber-security-for-connected-and-automated-vehicles/the-key-principles-of-vehicle-cyber-security-for-connected-and-automated-vehicles>

Several leaders have made autonomous transportation a priority including George Freeman, Minister of State overseeing the CCAV, and Grant Shapps, Secretary of State for Transport. A new test faculty for self-driving vehicles was opened by Freeman in September 2019.

In 2018 the government passed the Automated and Electronic Vehicles Act 2018 (AEVA 2018) which seeks to align insurance law to the developments of ‘intelligence’ led vehicles, and to provide a framework that permits the growth of electric vehicles or ultra-low emission vehicles. In addition there is a Code of Practice<sup>75</sup> (first issued in July 2015 and updated in February 2019) which should be used by trialing organizations in addition to complying with all relevant UK law. In addition to this specific legislation and Code of Practice, this is a converged area with many other applicable laws depending on the use case, for example, existing road safety legislation and data protection laws.

The United Kingdom currently anticipates leaving the European Union in 2020. As such, there is uncertainty as to the future approach to EU law that currently applies directly to the UK.

## Driverless vehicle testing and deployment

When conducting vehicle tests, trialing organizations should consider several factors. First, regulation 104<sup>76</sup> (or regulation 120<sup>77</sup> in regulations for Northern Ireland) of the Construction and Use Regulations which for Great Britain are detailed in the Road Vehicles (Construction and Use) Regulation 1986 and for Northern Ireland the Motor Vehicles (Construction and Use) Regulations (Northern Ireland 1999) is applicable

to the use of prototype vehicles on public roads. This regulation states the following:

No person shall drive or cause or permit any other person to drive, a motor vehicle on a road if he is in such a position that he cannot have proper control of the vehicle or have a full view of the road and traffic ahead.

In addition to the Construction and Use Regulations, the Road Traffic Act 1998 and the Highway Code have relevant provisions governing the safe use of UK roads.

Note: The Construction and Use Regulations do not apply to the testing of autonomous vehicles in locations other than public roads.

For autonomous vehicle trials on public roads, a suitably licensed and trained safety driver or safety operator should supervise the vehicle at all times, ensuring the vehicle is observing traffic laws, and should be ready and able to override automated operation if required. The safety driver may be outside the vehicle as long as he or she has the ability to intervene and resume manual control if necessary.<sup>78</sup>

Trialing organizations will also need to ensure that:

- The vehicle is roadworthy;
- Appropriate insurance is in place;
- A suitably licensed and trained test driver or test operator is on hand to supervise the vehicle at all times and is ready and able to over-ride automated operation if necessary;<sup>79</sup>
- The organization is in compliance with data protection regulations, including requirements that the personal data is used fairly and lawfully, kept secure and for no longer than necessary;<sup>80</sup>
- Applicable local council rules for testing are followed

75 [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/776511/code-of-practice-automated-vehicle-trialling.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/776511/code-of-practice-automated-vehicle-trialling.pdf)

76 <http://www.legislation.gov.uk/uksi/1986/1078/regulation/104/made>

77 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A42010X0930%2804%29>

78 The pathway to driverless cars: a detailed review of regulations for automated vehicle technologies <https://www.gov.uk/government/publications/driverless-cars-in-the-uk-a-regulatory-review>

79 Details of licensing are in section 4.7 – 4.14 of The Pathway to Driverless Cars: A Code of Practice for testing

80 <https://ico.org.uk/for-organisations/guide-to-data-protection/>. See also the section on Data Protection below.

(e.g., Transport for London, the local government body responsible for the transport system in Greater London, requires that trialing organizations be open and transparent with the public to promote public understanding (see the Connected And Autonomous Vehicles: guidance for London trials)).

**General vehicle requirements:** In accordance with the Department for Transport’s (DfT’s) Code of Practice the vehicle must be roadworthy and must, if used on a public road, meet the relevant national in-service requirements as detailed in the Construction and Use Regulations.

**Remote-control operated:** According to the Code of Practice, remote-controlled trials should have appropriate redundancies in place to handle any failures or disengagements, including warning systems and the ability to allow the safety operator to take control of the vehicle at all times. Those looking to undertake remote-controlled trials of an automated vehicle on public roads or other public place will need to ensure that the remote-control system is able to deliver the same level of safety as having a driver inside of the vehicle (as per the Code of Practice).

Companies do not have to obtain a special license or permission from a government agency. However, trialing organizations must inform the Centre for Connected and Autonomous Vehicles (CCAV) and the local council (see section 3 of the Code of Practice).

Note that for some future trials on public roads, the DfT and emergency services may need to be informed. The updated Code of Practice for Testing indicates that the DfT’s motoring agencies will introduce and operate a process to support advanced trials on public roads. As of now, the advice given is that those planning trials on public roads should contact CCAV as far in advance as possible.

**Behavioral safety requirements:** Additional behavioral safety requirements include restricting use of alcohol and drugs to help prevent driver or operator

judgement and ability to perform their role from being impaired, avoiding anything that prohibits a driver from viewing a display screen when driving, remaining conscious of appearance to other road users and preventing distraction to other drivers i.e. considering the potential negative impact on other road users seeing a vehicle being remotely operated.<sup>81</sup>

**Insurance requirements:** Under UK law,<sup>82</sup> the use of non-autonomous motor vehicles must be insured (with the insurance attaching to an individual) so as to cover third-party risks. Failure to do so is an offense. The Automated Electric Vehicles Acts (AEVA) 2018 introduced a statutory insurance regime for autonomous vehicles which provides that, where an accident is caused by an insured autonomous vehicle, the insurer is liable for damage suffered by a person (covering death, personal injury and property, with limited exceptions<sup>83</sup>). Where there is no insurance in place, the owner of the vehicle is liable for the damage.

The AEVA 2018 prohibits exclusions and limitations from the policy, except where the accident is caused directly by software alterations made by or with the knowledge of the insured person or where the insured person failed to install safety-critical software updates they ought reasonably to have been aware of. The insurer is entitled under the AEVA 2018 to recover amounts it has paid out as a result from that person.<sup>84</sup>

**Autonomous truck platooning:** Autonomous truck platooning is permitted in the UK and trials are under way. Organizations wishing to trial automated vehicles for freight services must comply with the current regulatory regimes and are encouraged to engage with the DfT and CCAV early on in the process so that they can get the necessary assistance.<sup>85</sup> In addition the “Code of Practice: Automated Vehicle Trialing” also applies to heavy duty vehicles.<sup>86</sup>

81 Section 4.19 – 4.22 of the Code of Practice: Automated Vehicle Trialling. <https://www.gov.uk/government/publications/trialling-automated-vehicle-technologies-in-public>

82 Road Traffic Act 1998 - <http://www.legislation.gov.uk/ukpga/1988/52/contents>

83 AEVA Section 2

84 See the section on liability below.

85 See sections 3 – 6 in the Heavy vehicle platoons on UK roads feasibility study

86 <https://www.gov.uk/government/publications/trialling-automated-vehicle-technologies-in-public>

## NAVIGATING NATIONAL AND LOCAL LAW

Going forward, the UK must address the fact that the legal requirements regarding roads are not governed by any one government entity. As such, requests to run trials require market entrants to navigate regulations at national and local levels and to negotiate with different entities (e.g. Highways England and an individual local council). Additionally, it is important that regulations address potential deficiencies in applicable UK driving laws and regulations (for example, current UK laws are centered around a driver owing a duty of care to other road users).<sup>87</sup>

While the UK is currently trialing driverless vehicles, consumers have not been permitted to use driverless vehicles for personal use. However, development of a service for the movement of passengers or freight is possible. Organizations seeking to trial the use of automated vehicles technologies for passenger or freight services must comply with the current regulatory regimes. Those looking to run such services are encouraged to engage with the CCAV at the earliest opportunity.<sup>88</sup>

## Liability

During testing, if the vehicle is in manual mode, the test driver would be as potentially culpable for a collision as would the driver of a non-autonomous vehicle. But even if the vehicle is in an automatic mode, it is anticipated that the test driver's exposure will remain the same because he or she ought to be continually monitoring the vehicle and able to assume active control of its movement and direction at any moment.<sup>89</sup>

The AEVA 2018 provides that payment is to be made by the insurer regardless of fault.<sup>90</sup> When the true fault is later established, the insurer can recover from the responsible party, e.g., an original equipment manufacturer (OEM). Under section 5(1), once the insurer or vehicle owner has settled the victim's claim

it may recoup the money from "any other person liable to the injured party in respect of the accident." This allows recovery from not only an OEM, but also a seller and/or re-seller and an operator or test driver. If the accident is caused by a vehicle defect, the recovery of damages will be under product liability against the vehicle manufacturer.

## Data privacy and security

### THE GENERAL DATA PROTECTION REGULATION AND DATA PROTECTION ACT 2018

The EU General Data Protection Regulation<sup>91</sup> ("GDPR") is the principal privacy legislation applicable in the UK. The Data Protection Act 2018 ("DPA 2018") is UK legislation which supplements the GDPR for specific matters (for example in respect to processing of personal data for law enforcement purposes). This data privacy legislation may be subject to further developments when the UK leaves the EU (however, if a withdrawal agreement is ratified by the UK prior to the end of January 2020 then GDPR will continue to have effect until at least the end of the transition period specified in the withdrawal agreement (currently proposed to be December 31, 2020)). Failure to comply with GDPR can lead to a variety of sanctions, including, in certain circumstances, fines of up to 4 percent of worldwide annual revenue.

Selected privacy considerations are set out below:

### Is the data "personal data?"<sup>92</sup>

The amount of data collected and processed by connected autonomous vehicles is vast and potentially has huge value for automotive companies, mobile operators, insurers and content providers. The specific categories of data will depend on the functionality of the CAV and level of automation – it will be generated by in-built systems and applications, as well as the vast array of remote platforms which provide connectivity,

87 <https://www.lawcom.gov.uk/law-commissions-analysis-of-responses-to-automated-vehicle-consultation-points-to-the-way-forward/>

88 Section 2.10 of the Code of Practice: Automated Vehicle Trialling. <https://www.gov.uk/government/publications/trialling-automated-vehicle-technologies-in-public>

89 The Code of practice: automated vehicle trialling. <https://www.gov.uk/government/publications/trialling-automated-vehicle-technologies-in-public>

90 Section 2 AEVA

91 Regulation (EU) 2016/679

92 Article 4, GDPR



navigation and integration to the vehicle. Some of this will relate to the performance and status of the CAV, while some will relate to a driver's driving habits, music choices and other personal preferences.

A key "gateway question" therefore is the extent to which CAV data is "personal data" for GDPR purposes. This will require a careful assessment of the extent to which a particular category relates to a living individual, a question that has been subject of much academic debate. Some categories are clearly personal data – for example driving habits, entertainment preferences and driver location. However what about machine-to-machine data relating to the status of a particular component? This can be a complex assessment. A case-by-case legal assessment will be required.

### Exploitation of data

A further important step is to identify the various businesses who wish to collect or exploit any personal data generated by CAVs. Each of these entities may be data controllers in their own right for GDPR purposes and, accordingly, will need to consider the extent to which: (1) it has brought its proposed use of any personal data to the attention of the driver and any other data subject (through privacy notices, policies, in-car rubric or otherwise)<sup>93</sup>; and (2) the relevant GDPR lawful basis on which it will rely to process the data<sup>94</sup> (GDPR-compliant consent can be difficult to achieve in the context of CAVs and so other lawful bases, such as "legitimate interests" or "performance of a contract" may also need to be considered). The assessment of these considerations is beyond the scope of this note and will require careful legal analysis to ensure compliance.

In addition to a privacy assessment, a business will also need to consider whether any other relevant "rights" exist in the data asset. These might arise automatically (for example as rights in confidential information, or potentially other intellectual property rights) or be set out in contract (for example restrictions on data use). Some of these rights may vest in a different party

in the CAV ecosystem, depending on how the data is generated and where it is stored, and so, again, a careful legal assessment will also be required in this area.

**Design considerations:** GDPR imposes enhanced accountability standards in relation to the processing of personal data. In the context of CAVs an important principle is the need for proactive consideration of privacy risks when designing new products and functionality.<sup>95</sup> For OEMs, this "privacy by design" process should be embedded in their CAV design roadmaps and key privacy stakeholders – for example any Data Protection Officer – should be part of the oversight team.

**Storage considerations:** As CAV data will be an important business asset an organization should ensure that it has comprehensive and robust data retention and data handling policies in place – within its own business as well as its data supply chain. A core principle of GDPR is to ensure that personal data is not retained for longer than is necessary for the purposes that it was collected.<sup>96</sup> Careful assessment of retention periods for each category of retained data is necessary as well as a consideration as to the extent data can be aggregated or anonymized.

**International transfers:** Given the complexity of the CAV data ecosystem, it is likely that personal data may be transmitted from the UK to other locations. Should the UK ratify the EU withdrawal agreement by January 31, 2020 there can be continued flows of personal data from EU 27 to/from the UK. For transfers from the UK additional legal measures may need to be implemented, depending on the destination of the data:

- Transfers to an "adequate country"<sup>97</sup> (Article 45) (e.g. Argentina, Guernsey, Israel, etc.) can freely occur. For transfers to the US, organizations should also consider relying on the US Privacy Shield arrangement Privacy Shield.
- If there is no adequacy decision for a particular

93 Articles 13 and 14, GDPR

94 Article 6, GDPR. Other lawful bases apply if special category data is processed – see Article 9, GDPR

95 Article 25, GDPR

96 Article 5(1), GDPR

97 <https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr/international-transfers/>

country then the next step is to consider putting in place “appropriate safeguards”(Article 46). The most common form are EU-approved standard contractual clauses.

- If “appropriate safeguards” are not in place then the transfer can only proceed if an exception applies (Article 49), however these “derogations” are narrow in scope and are unlikely to be available for most business as usual (BAU) data flows.

**User rights:** Organizations should be aware that data subjects have a variety of rights under GDPR in respect to their personal data.<sup>98</sup> These rights include:

- The right to be informed;
- The right of access;
- The right to rectification;
- The right to erasure;
- The right to restrict processing;
- The right to data portability;
- The right to object;
- Rights in relation to automated decision making and profiling.

**Data security:** Information security is at the heart of GDPR. The legislation is principle-led, meaning that it is for the relevant data controller to assure itself that it has appropriate technical and organizational measures in place to ensure security that is appropriate to the risk. The GDPR does not mandate although it references the need to consider security techniques such as encryption and pseudonymization.<sup>99</sup>

In addition, the UK government has compiled the key principles regarding vehicle cyber security for connected and automated vehicles.<sup>100</sup> These principles are intended for use across the automotive sector and will be pertinent for automated vehicle businesses. Organizations that propose to collect sensitive categories of data or apply higher risk or potentially intrusive technologies to CAV data (such as data

analytics tools) should be mindful of the need to carry out a Data Protection Impact Assessment (DPIA).<sup>101</sup> To assess the level of risk, organizations must consider both the likelihood and the severity of any impact on individuals. High risk can constitute either a high probability of some harm or a lower possibility of serious harm. It is considered to be good practice to carry out a DPIA for any major projects that require the processing of personal data.

A DPIA must:

- Describe the nature, scope, context and purposes of the processing;
- Assess necessity, proportionality and compliance measures;
- Identify and assess risks to individuals; and
- Identify any additional measures to mitigate those risks.

### **e-Privacy Regulation**

The draft e-Privacy Regulation is intended to replace the current Privacy and Electronic Communications Directive (2002/58/EC) (e-Privacy Directive). This draft regulation currently includes rules on cookies, over-the-top services and machine-to-machine communications as well as extra-territorial scope. Accordingly organizations in the CAV ecosystem should also keep these legal developments under review.

98 Data subject rights under GDPR 2018: <https://gdpr-info.eu/chapter-3/>

99 Article 32, GDPR

100 <https://www.gov.uk/government/publications/principles-of-cyber-security-for-connected-and-automated-vehicles/the-key-principles-of-vehicle-cyber-security-for-connected-and-automated-vehicles>

101 Article 35, GDPR

# Telecommunications and 5G

The UK government has developed a focused strategy to enable the UK to be a global leader in 5G technology.<sup>102</sup> The government recognizes that its communications framework will be essential for automated vehicles because the type of information that can be transmitted is expected to have a high impact on the industry. Benefits of success will include (i) increased vehicle safety (ii) an ability to provide a range of new services and (iii) reduction of traffic jams, for example, through improved fleet routing.

Ofcom manages the UK's airwaves - or spectrum – a finite resource that is essential for wireless services including mobile phones. In order to improve mobile services and enable more people and businesses to access 5G networks, Ofcom are planning to release more mobile airwaves through an auction in spring 2020.

In the UK, Ofcom has allocated spectrum in the 3.4 GHz band and 3.6-3.8 GHz, as well as 3.8-4.2 GHz bands later. These airwaves are part of the primary band for 5G and are capable of carrying high volumes of data-hungry connections in concentrated areas. All four of the biggest mobile companies have launched 5G and releasing these airwaves will help increase the capacity and quality of mobile data services.

The UK government has been consulting widely on its 5G strategy which aims to help maximize benefits.

102 <https://www.gov.uk/government/publications/next-generation-mobile-technologies-a-5g-strategy-for-the-uk>



# United States



## Regulatory overview

The United States does not have a federal regulatory framework currently in place to address autonomous vehicle testing and deployment. As a result, testing and deployment is regulated by a patchwork of state-centric laws. That patchwork is made up of 40 states and DC that have either passed autonomous vehicle legislation or are operating under executive orders. Currently, six states have passed legislation and are also operating under an executive order (WA, WI, IL, ME, MN, HI).

There are three main state level strategies for fostering autonomous vehicle testing. The first is a nonregulatory approach, as adopted in Arizona and Colorado. In Arizona, Governor Doug Ducey has signed two executive orders pertaining to autonomous vehicles.



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**Doug Ducey**  
Governor of Arizona (R)

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The first directed all state transportation officials to **“undertake any necessary steps to support the testing and operation of self-driving vehicles on public roads within Arizona.”** The second outlined a process to notify the state of vehicle testing, but did not impose any additional regulations. Notably, Arizona has seen significant investment from the autonomous vehicle industry —almost every large autonomous vehicle company has tested or is still testing in the state.

Colorado has also adopted a non-regulatory approach to autonomous vehicles. The state’s autonomous vehicle law, signed by then Governor Hickenlooper, permits testing as long as the vehicle follows all existing laws, i.e. the vehicle itself meets federal motor vehicle safety standards and adheres to basic state traffic laws while in operation. If vehicles are able to adhere to those two requirements, companies do not have to alert the state that tests are being conducted, nor does a human driver have to be in the vehicle.



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**John Hickenlooper**  
Former Governor of Colorado (D)

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**“It’s hard to get the right balance between regulation and avoiding the red tape that sometimes stifles innovation.”**

John Hickenlooper  
*The Denver Post*, June 1, 2017

Other states, such as California, have taken a more supervisory approach towards autonomous vehicles. At the outset, the state passed legislation directing the California Department of Motor Vehicles to create pilot programs. The resulting set of regulations established three different application and oversight processes — one for testing with a back-up driver, one for testing without a back-up driver and one for deployment.

Finally, nine states have taken no action on autonomous vehicles at all, but that does not mean there are no autonomous vehicles operating in those states. A lack of legislation does not mean operating autonomous vehicles is illegal, but rather that they are not explicitly authorized. In those environments, autonomous vehicles may operate, as long as they adhere to all existing state and federal laws.

Before addressing federal legislation and regulation, it is important to note that there is a tension between the regulatory environment of a state and the public perception of its openness to the technology. Oftentimes, states that are highly regulatory, such as California, receive publicity for seemingly “welcoming” autonomous vehicles into their states. This is because the state created a new legal regime when, in fact, states that do very little are the most permissive testing environments.

Therefore, it is incumbent upon companies that want to test in specific states to do their regulatory due diligence. Conversely from a state perspective, some Governors and State Legislatures have taken to

## Spotlight

### Self-driving shuttle in Denver

A self-driving EasyMile shuttle [began](#) serving passengers between a commuter rail station and several small office complexes in Denver in January 2019. The shuttle carries up to six passengers, travels up to fifteen miles an hour, operates without any human controls and is open to the public. It is intended to help Denver's Regional Transportation District (RTD) and startup company EasyMile learn how to effectively deploy autonomous technology for public transportation.

asserting their passivity. By releasing an executive order, or passing legislation similar to Arizona and Colorado which essentially says, "we are affirming your right to operate in accordance with current law," companies will be alerted that the state is actively promoting itself as a testing ground. While there is little difference, statutorily, between Colorado and a state with no autonomous vehicle law, there is a difference from a public relations standpoint.

"Therefore, it is incumbent upon companies that want to test in specific states to do their regulatory due diligence... While there is little difference, statutorily, between Colorado and a state with no autonomous vehicle law, there is a difference from a public relations standpoint."

That being said, in the long term, every state treating the technology differently is not ideal. Companies have expressed to both state and federal lawmakers that they do not want to navigate a new set of regulations every time their vehicles cross state lines. Adding to the complexity is the fact that the regulations which govern vehicle construction, are written and enforced on the federal level by the National Highway Traffic Safety Administration. The National Highway Traffic Safety Administration controls the Federal Motor Vehicle

Safety Standards, which require several components within vehicles, tied to human drivers. For example, all vehicles must have a steering wheel, foot pedals, rear view mirrors, etc., all of which are useless for fully autonomous cars. In sum, to create a consistent regulatory environment throughout the country, the federal government must pass a law to address vehicle construction, safety, cybersecurity, data and liability.

After a prolonged silence on the issue, federal autonomous vehicle legislation has been revived. Over the past few months the Republican and Democratic staffs of the House Energy and Commerce and Senate Commerce Committees have been holding meetings to hash out bits and pieces of what could, ultimately, form a comprehensive autonomous driving bill. Notably, the bipartisan-bicameral approach has focused, up to this point, on the issues where there is the most consensus: exemptions, testing, evaluation and the establishment of an Automated Vehicles Advisory Council. The bipartisan working group released discussion drafts for each subsection and have been soliciting feedback from various stakeholders.



**Roger Wicker**  
United States Senator (R-Miss)

Chairman Roger Wicker (R-Miss) noted during a hearing in November that the Senate Commerce Committee "already received more than 100 letters from industry, state and local governments, and consumer and disability advocates."

While exemptions and testing have always been part of the conversation, the Advisory Council, as least as it is presented in the working draft, is a new wrinkle. It would be tasked with developing and presenting to the Secretary of Transportation "technical advice, best practices and recommendations" regarding a host of issues surrounding the autonomous vehicle industry. These include, but are not limited to, equitable access, education, cybersecurity, labor and employment, environmental impact, and safety. Notably, the last public working draft for vehicle exemptions is littered with brackets that denote un-finalized

language, highlighting the long road ahead before lawmakers settle on a final compromise. Moreover, sections concerning cybersecurity protections have yet to be circulated in any formal fashion. In fact, a spokesperson for the House Energy and Commerce Committee commented that there is no timetable for the introduction of legislation. One potential point of conflict that could derail the new bill is safety. The draft text gives the US Department of Transportation ten years to produce a plan for safety standards, a period of time that some believe is too long. Notably, the current draft legislation does contain language to require autonomous vehicle companies to submit individual, company specific safety reports to USDOT. However, it does not contain any specifics on the content or metrics the reports would need to include.

Of course, this is only the latest of several efforts to pass federal driverless vehicle legislation. Previously, Congress was close to passing such a law, but ultimately fell short. The SELF Drive Act unanimously passed the US House of Representatives in September 2017 and a few months later a sister bill in the Senate, the AV START Act, was approved by the Senate Committee on Commerce, Science and Transportation. However, the bill was not brought to the floor in 2018. In the lame duck session, after Democrats had gained a majority in the House of Representatives, there was a sliver of hope as the bill began to gain momentum, and for a brief moment it seemed it would pass. Ultimately, however, safety and cybersecurity concerns raised by Sens. Ed Markey (D-MA), Richard Blumenthal (D-CT), Dianne Feinstein (D-CA), Kirsten Gillibrand (D-NY) and Tom Udall (D-NM) coupled with tepid on-again, off-again support from the American Association for Justice, doomed the legislation.

“We are concerned that the bill indefinitely preempts state and local safety regulations even if federal safety standards are never developed,” the senators wrote. The senators continued: “Until new safety standards are put in place, the interim framework must provide the same level of safety as current standards. Self-driving cars should be no more likely to crash than cars currently do, and should provide no less protection to occupants or pedestrians in the event of a crash.”



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**Sen. Richard Blumenthal (D-CT)**

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**Sen. Dianne Feinstein (D-CA)**

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**Sen. Kirsten Gillibrand (D-NY)**

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**Sen. Ed Markey (D-MA)**

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**Sen. Tom Udall (D-NM)**

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The trial lawyers association remains highly interested in any bill dealing with driverless vehicles and as such, the organization will remain involved in the developing conversations going forward. In fact, according to Politico, leaving out any arbitration language was the cost of entry for Democrats' participation in the current negotiation process. Many of the principles of the previous bill will, inevitably, be resuscitated so it's important to understand what it would have done. First it would have increased the number of National Highway Traffic Safety exemptions. Safety exemptions are given to autonomous vehicle companies so they can test vehicles that do not meet the federal standards; vehicles that, for example, do not have a steering wheel. In addition, it would spur an update of the federal standards to render waivers obsolete, institute new cybersecurity protections, define data ownership and settle liability concerns. Notably, any federal legislation would preempt state laws, ensuring that, as it relates to vehicle design and safety, technology legal in one state, is not rendered useless in another.

## Spotlight

### Las Vegas, Nevada

When riders hail a Lyft in Las Vegas, Nevada, they might be picked up in a car with a driver whose hands are off the wheel. The company says its fleet has completed over 55,000 autonomous trips through a partnership with autonomous vehicle company Aptiv. By most metrics the testing has largely been successful. The average rating for the vehicles is 4.97 stars, and 92 percent of riders indicated they felt safe during their trips.

Although, given several hot button issues have been thus far left out of the conversation entirely, it is still unclear how closely any new legislation will resemble prior efforts. Chairman Wicker said it was "a good question" how much they would borrow from prior efforts. Suffice to say, the form and function of any forthcoming federal law on autonomous vehicles is murky at best.

Regardless of Congress, the Department of Transportation (DOT) is moving forward with guidance promulgation, rule-making and incentives for research and development including \$60 million in federal grants to eight autonomous vehicle projects in Texas, Iowa, Virginia, Ohio, Pennsylvania, Michigan and California. Moreover, on Wednesday January 8 Transportation Secretary Elaine Chao announced the release of DOT's fourth generation Autonomous Vehicle guidance.



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**Elaine Chao**  
United States Secretary of Transportation (R)

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**“Integrating the autonomous vehicle technology into our transportation system has the potential to increase productivity, facilitate freight movement and create new types of jobs.”**

Elaine Chao  
*Transport Topics*, October 4, 2018

This newest version of the guidance, which is strictly voluntary, expands upon version 2.0 which focused on safety and version 3.0 that consolidated the DOT position into "one DOT approach." This newest version provides a unified position from the entire federal government and includes, for the first time, input from the White House. In sum, the report enumerates a policy approach for the 38 federal agencies, commissions and White House offices that engage with the technology in some form or fashion. Similar to previous reports, version 4.0 does not include any binding requirements and instead asks manufacturers to submit voluntary safety assessments. Looking ahead, to further bolster autonomous vehicle expertise, the federal government spending bill signed into



law on December 20, 2019, includes \$5 million for the Department of Transportation to create a “Highly Automated Systems Safety Center of Excellence.”

Additionally, both the National Highway Traffic Safety Administration (NHTSA) and Federal Motor Carrier Safety Administration recently concluded public comment periods aimed at determining whether the rules and regulations currently in place are, collectively, obstacles to the effective rollout of autonomous vehicles. The National Highway Traffic Safety Administration requested comments on challenges concerning testing and compliance with Federal Motor Vehicle Safety Standards (FMVSS), in vehicles that lack human controls. Similarly, the Federal Motor Carrier Safety Administration asked for comments on any Federal Motor Carrier Safety Regulation sections that may need to be “amended, revised, or eliminated” to facilitate the public deployment of commercial motor vehicles.

Without a new law or a significant rule making push, automakers will continue to be constrained by the FMVSS. These prescriptive standards define how nearly every component of a vehicle is designed and constructed. They address everything from the position of rearview mirrors to the need for power-operated windows. A significant number of the standards assume the presence of a human operator in the vehicle. For example, FMVSS specifies how components must react to a driver turning the wheel, pressing the brake pedal and engaging a turn signal, just three of the estimated 30-plus driver-specific vehicle requirements.

As vehicles become more advanced, many of the human controls will be unnecessary. In 2015 Waymo requested an interpretation from NHTSA as to how the agency would treat a vehicle without human controls. NHTSA responded that it would accept the vehicle as the driver, but it could not interpret the lack of human controls as compliant with FMVSS. As such, Waymo and other automakers have, for the most part, halted the construction of new utilitarian vehicles devoid of human controls, in favor of manufacturing traditional vehicles with autonomous technologies. Those vehicles can operate freely, regardless of its level of autonomy, as long as the vehicle is compliant with FMVSS and state law.

## Spotlight

### Autonomous grocery delivery in Houston, Texas

Nuro, a self-driving startup founded by two ex-Google engineers, [has been experimenting with autonomous grocery](#) delivery in Houston, Texas. Thanks to a partnership with Kroger and more recently Wal-Mart, groceries will be delivered via Nuro’s fleet of self-driving Toyota Prius vehicles, and each car will have a safety driver behind the wheel. Eventually, the company plans on deploying its custom-built R1 driverless delivery vehicles. The R1 vehicle is about half as wide as a compact sedan, shorter than most cars, and it has no room inside for human passengers or drivers.

In addition to vehicle construction, safety is top of mind for lawmakers and regulators, alike. In an attempt to balance safety will technological progress the NHTSA put out voluntary guidelines for AV companies to submit a safety self-assessment. Chairman Robert Sumwalt of the National Transportation Safety Board (NTSB), an independent government investigative agency responsible for civil transportation, called for NHTSA to make the safety assessments a requirement, a suggestion that has been incorporated into the draft bill. Sumwalt noted that only a handful of the companies testing autonomous vehicles had actually done the self-assessment. Ranking member of the Senate Committee on Commerce, Science and Transportation, Maria Cantwell (D-WA), agrees with Chairman Sumwalt and is pressing the NHTSA to establish a minimum standard of safety.

In response, acting NHTSA administrator James Owens noted that the agency is attempting to balance regulation with innovation. He said “If we establish standards too quickly we run the risk of stymieing innovation. We want to step back, we want to let the innovation occur and competition occur.” He went on to say that consumer education is also an important step to ensure the technology is being utilized responsibly.

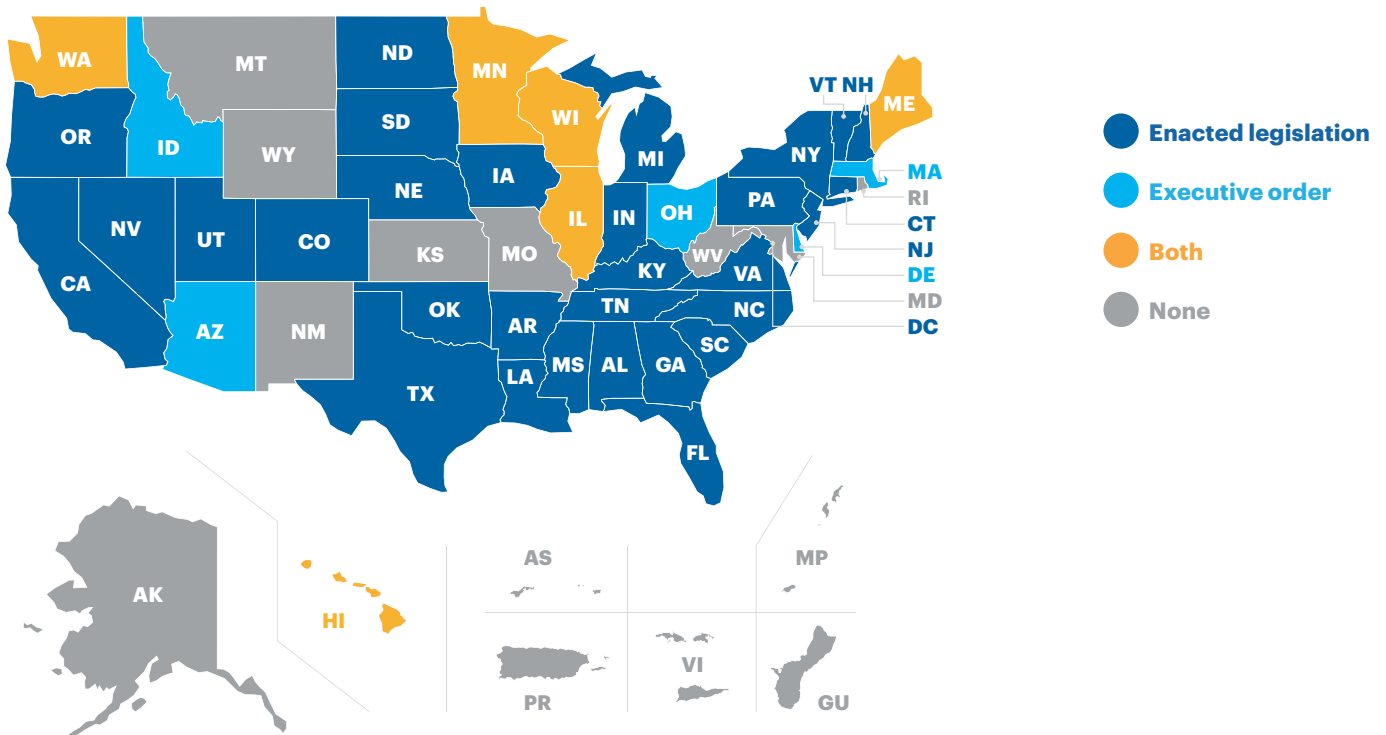
At this point, it is clear that until a law is passed by the United States Congress, rule-making, guidance promulgation and state pre-eminence will define the autonomous vehicle industry’s relationship with government in the United States.

**“If we establish standards too quickly we run the risk of stymieing innovation. We want to step back, we want to let the innovation occur and competition occur.”**

James Owens  
Acting NJTSA administrator

## Driverless vehicle testing and deployment

### STATE ROUNDUP



Source: <http://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx>

### Alabama

Alabama has passed regulations on commercial autonomous vehicles to operate in the state. Vehicles can operate either with or without a physical driver as long as a remote driver is capable of operating the vehicle. The Department of Transportation has sole and exclusive jurisdiction over automated driving systems, autonomous vehicles, and teleoperations systems. The state has also passed legislation concerning autonomous truck platooning. Finally, in 2017, the state Senate created a Legislative Committee on Self-Driving Vehicles which was reauthorized this past year.

Bills Passed in 2019: Senate Bill 47, Senate Joint Resolution 21

## Arizona

Arizona has one of the most permissive AV frameworks in the country, thanks to a series of executive orders signed by Gov. Doug Ducey. Automakers need only to notify the Arizona Department of Transportation before testing, as long as their vehicles comply with state and federal laws governing motor vehicles. The welcoming nature of Arizona's regulatory structure has solidified its standing as a hotbed of AV innovation. Waymo has been testing in the state for years and recently expanded the service through a partnership with ridesharing company Lyft.

## Arkansas

Arkansas permits the operation of autonomous vehicles and fully autonomous vehicles on public streets and highways through an autonomous vehicle pilot program overseen by the State Highway Commission. The state imposed certain requirements for the autonomous vehicles pilot program and has granted authority to the Commission to adopt rules necessary for its implementation. Notably, the law authorizes the operation of up to three vehicles void of certain standard safety equipment at any given time. The state already allowed Driver Assistive Truck Platooning (DATP) under legislation that took effect in 2017.

Bills Passed in 2019: House Bill 1822, House Bill 1561

## California

California has taken a comprehensive approach to regulating autonomous vehicles, enacting several laws that lay out procedures for the testing and deployment of driverless cars. The state expanded its program from requiring backup drivers in all test vehicles, to also allowing self-driving car tests without backup drivers. Operators must meet specific requirements and go through a DMV-administered application process. Over 50 companies currently hold permits to test in California.

The Contra Costa Transportation Authority was awarded a portion of the \$60 million in federal grant funding allocated for automated driving systems research for its Contra Costa Transportation Authority's ADS Demonstration Program.

## Colorado

Companies seeking to test and operate autonomous vehicles in Colorado are greeted by a welcoming regulatory environment. Legislation enacted in 2017 allows driverless vehicles to be operated in the state as long as they are capable of complying with existing state and federal law. Additionally, legislation passed this year requires the State Department of Transportation to convene a working group to examine the impact of technology, including autonomy, on transportation business models. The group is required to make a recommendation to the legislature.

Colorado's Department of Transportation is partnering with Ford, Panasonic and Qualcomm to deploy Cellular Vehicle-to-Everything (C-V2X) technology along the heavily traveled Interstate 70 corridor. Although the state does not currently have any large-scale robo-taxi fleets, tech company EasyMile began testing a 15-passenger autonomous shuttle near the Denver Airport this year.

Bills Passed in 2019: Senate Bill 239

## Connecticut

Of the states that have passed autonomous vehicle laws, Connecticut has one of the strictest regulatory structures. Operators must go through a multistage approval process, and testing will only be allowed in select municipalities, to be designated by the commissioner of the State Department of Transportation. Several municipalities working with manufacturers such as French company Navya, have applied, or said they plan to apply, for a spot in the Fully Autonomous Vehicle Testing Pilot Program. Connecticut did loosen the reigns this past year, if only nominally, by removing the requirement that test drivers must be seated in the driver's seat while testing the vehicle. Instead, it states that the operator must be physically inside the AV in order to engage the system. The state has also established a task force to study fully autonomous vehicles.

## Delaware

Governor John Carney signed an executive order to establish an Advisory Council on Connected and Autonomous Vehicles. The Advisory Council was tasked with developing recommendations for innovative tools and strategies that can be used to prepare Delaware's

transportation network for connected and autonomous vehicles. The Advisory Council's final report was submitted in September 2018. The report has not spurred any successful legislation to this point.

## Florida

In June, Florida passed House Bill 311 to further relax its autonomous vehicle regulations. Under the new law, any driverless vehicle is allowed to operate in the state as long as it is capable of complying with existing state and federal laws, and has liability insurance of \$1 million. It also removed the requirement that a person is required to possess a valid drivers license to operate a fully autonomous vehicle and provides that the automated driving system, rather than a person, is deemed the operator of an autonomous vehicle when operating with the automated driving system engaged. Autonomous or fully autonomous vehicles equipped with a teleoperation system may operate without a human operator in the vehicle when the teleoperation system is engaged and certain requirements are met.

Moreover, Florida now permits on-demand autonomous vehicle networks to operate pursuant to state laws with the same insurance requirements applicable to a transportation network company. Finally, the law authorizes the Florida Turnpike Enterprise to enter into one or more agreements (including with private entities) to fund, construct, and operate facilities for the advancement of autonomous and connected innovative transportation technologies, for the purposes of improving safety and decreasing congestion.

San Francisco-based, Starsky Robotics was among the first companies to take advantage of the new law by testing a fully unmanned truck on a nine-mile stretch of the Florida Turnpike. The company plans to use autonomous technology to operate its trucks on Florida highways, relying on remote operators in Jacksonville to guide the trucks from the beginning to the end of their journey. Florida has made inroads in other segments of the AV industry, as well, with microelectronics company, BRIDG, AV-testing company Suntrax and LiDAR manufacturer Luminar all recently announcing plans to set up operations in the state.

The State of Florida has also taken steps to incentivize and fund innovative research. The State appropriated \$2.5 million for the Tampa Bay Regional Transit

Authority, with \$1 million dedicated to the study and development of innovative options for transit, as well as established the Multi-use Corridors of Regional Economic Significance Program within the department of transportation.

Bills Passed in 2019: House Bill 311, Senate Bill 2500, Senate Bill 7068

## Georgia

Georgia allows the operation of both autonomous vehicles and trucks under legislation passed in 2017. Driverless vehicles are free to operate in the state as long as they are fully insured and registered with the Department of Motor Vehicles. At present, no robo-taxi services are operating in the state, however, several autonomous shuttle projects are in their infancy, including an Olli autonomous shuttle that traverses a 1.5 mile track in the Peachtree Corners Curiosity Lab.

## Hawai'i

Executive Order 17-07, signed by Gov. David Ige, signals that the state is "open for business for testing and deploying new driverless vehicles," and directs several state departments to work with any companies wishing to test autonomous vehicles in Hawai'i. Yet despite the state's mild weather conditions, and the University of Hawai'i opening a dedicated research lab, there has not been widespread testing or deployment of driverless vehicles in the state. The state established an Autonomous Vehicle Task Force to make further recommendations to the state legislature. Dentons Partner [William Kaneko](#) is a member of the task force.

Bills Passed in 2016: House Concurrent Resolution 220

## Idaho

Idaho Governor C.L. "Butch" Otter signed Executive Order 2018-01 on January 2, 2018 to create the Autonomous and Connected Vehicle Testing and Deployment Committee to identify relevant state agencies to support the testing and deployment of autonomous and connected vehicles.

The Committee submitted its report in November 2018. The report has not yet spurred any successful legislation to this point.

## Illinois

While Illinois has no legislation directly regulating autonomous vehicles, an executive order signed by former Gov. Bruce Rauner allows their operation in the state. The order establishes the Autonomous Illinois Testing Program, overseen by the state Department of Transportation. Vehicles can only be operated with an employee of the manufacturer behind the wheel.

## Indiana

Indiana currently has no laws or regulations concerning autonomous vehicles; however truck platooning is regulated under 2017 legislation. There have been efforts in the past to create an autonomous task force with the power to approve operation of fully driverless vehicles in the state, but all have failed to garner enough support to pass into law.

## Iowa

Iowa allows driverless vehicles to operate on the public highways without a conventional human driver physically in the vehicle if it meets a set of conditions, including that the vehicle is capable of achieving a minimal risk condition in the event of a malfunction and that the vehicle is capable of operating in compliance with the applicable traffic and motor vehicle safety laws and regulations.

Iowa also authorizes on-demand driverless-capable vehicle networks, to facilitate the transportation of persons or goods, including transportation for hire.

The University of Iowa was awarded a portion of the \$60 million in federal grant funding allocated for automated driving systems research for its ADS for Rural America project.

Bills Passed in 2019: Senate File 302

## Kentucky

Kentucky has set forth rules for commercial vehicle platooning including exempting any vehicles engaged in a platoon from "following too closely" laws. Former Governor Bevin, at the urging of the Kentucky Aerospace Industry Consortium, verbally supported the launch of "Elevate Kentucky," an initiative to establish Kentucky as an autonomous vehicle testing hotbed. That being said, no legislative efforts have come to pass on autonomous passenger vehicles.

## Louisiana

Louisiana law allows for the operation of both autonomous vehicles and autonomous truck platoons and specifically authorizes autonomous commercial motor vehicles to operate without a conventional driver physically present in the vehicle if the autonomous commercial motor vehicle meets a set of criteria including that the vehicle is capable of operating in compliance with applicable law and is capable of achieving a minimal risk condition in the event of an emergency.

The Department of Transportation and Development is the sole agency with jurisdiction over autonomous commercial motor vehicles and automated driving systems. Operators must submit verifications and other documents to the Department of Transportation prior to operation.

Bills Passed in 2019: House Bill 455

## Maine

Maine does not currently have any laws or regulations pertaining to autonomous vehicles. However, 2018 legislation authorized the creation of a Commission on Autonomous Vehicles to coordinate efforts among state agencies and knowledgeable stakeholders to develop a process for testing automated driving systems on public roads. The law requires that the Commission issue a final report containing findings and recommendations, including suggested legislation.

In addition Governor Paul LePage signed an executive order creating the Maine Highly Automated Vehicles (HAV) Advisory Committee to oversee the introduction of highly automated vehicles. The committee is tasked with making recommendations regarding proposed HAV Pilot Projects and handling applications for permits to operate pilot vehicles on public roadways in Maine.

## Maryland

While Maryland doesn't have any laws explicitly governing autonomous vehicles, the state Department of Transportation has adopted regulations for their operation, including an approval process requiring operator self-certification and insurance coverage of \$5 million.

## Massachusetts

A 2017 executive order issued by Gov. Charlie Baker enumerated extensive requirements for the operation of autonomous vehicles in the state, including setting maximum speeds and confining them to geo-fenced areas determined during the application process. Boston-based nuTonomy and Optimus Ride have already been piloting their vehicles in Boston for over a year, and over 15 municipalities have signed agreements with the state allowing for testing.

A previous executive order established a working group on AVs which is expected to work with experts on vehicle safety and automation and members of the legislature on proposed legislation.

## Michigan

As the home of the nation's auto manufacturing industry, it's no surprise that Michigan is one of the nation's AV testing hubs. In 2016, the state approved legislation allowing for pilot testing. Waymo recently announced plans to locate the nation's first factory dedicated to the manufacture of autonomous vehicles in Detroit. The state is also home to several large testing facilities including the University of Michigan-owned Mcity, a 32-acre mock city and proving ground built for the testing of driverless cars that contains over four miles of roadway fitted with connected-vehicle infrastructure.

Michigan has also passed several laws dealing with liability in relation to autonomous vehicles.

The City of Detroit was awarded a portion of the \$60 million in federal grant funding allocated for automated driving systems research for its Michigan Mobility Collaborative - ADS Demonstration project.

## Minnesota

Minnesota has no laws or regulations specifically addressing autonomous vehicles. According to the state's Department of Transportation, any automated vehicles operating in the state must adhere to "current statute and laws." However in 2018, Gov. Mark Dayton signed an executive order creating a Governor's Advisory Council on Connected and Automated Vehicles to recommend a path forward. Its resulting 66-page report delivered a rosy outlook on automated cars and included draft legislation setting up a permit

system and giving the state DOT wide latitude to decide whether to allow a business to test based on its history with self-driving technology. The Minnesota Legislature has yet to decide the issue.

Minnesota has passed legislation regarding platooning on freeways and expressways. A platooning system may only be used if a plan has been approved by the Commissioner of Transportation, who must consult with the Commissioner of Public Safety prior to approving the plan.

Bills Passed in 2019: House Bill 6

## Mississippi

Mississippi has yet to pass legislation concerning autonomous passenger vehicles. However, the state does permit platooning as long as the operator receives approval from the Department of Transportation and the Department of Public Safety.

## Nebraska

In April 2018, Nebraska lawmakers cleared the way for companies to test self-driving vehicles as long as the vehicle is capable of operating in compliance with traffic and motor vehicle safety laws. The AV may or may not contain a human driver, but if a human driver is present, he or she must be a licensed driver and covered by insurance. The law also authorizes the operation of an on-demand AV network for the transport of persons or goods, including for-hire transportation or public transportation.

## Nevada

Ever since Nevada passed AV legislation in 2012, the state has been at the forefront of driverless vehicle innovation. State law permits the operation of fully autonomous vehicles without a human operator in the vehicle and specifies that the original manufacturer is not liable for damages if a vehicle has been modified by an unauthorized third party. A publicly available robo-taxi network—a partnership between AV company Aptiv and ridesharing company Lyft—is currently operating in the state.

## New Hampshire

After previously vetoing a bill to permit autonomous vehicle testing in New Hampshire, Gov. Chris Sununu signed into law a bill that creates an automated vehicle

testing pilot program in New Hampshire. The new law creates an autonomous vehicle advisory commission, a testing pilot program and sets requirements for vehicle deployment. The new pilot program permits testing on public roads.

Bills Passed in 2019: Senate Bill 216

### **New Jersey**

New Jersey established an 11-member tasked force called the New Jersey Advanced Autonomous Vehicle Task Force to study autonomous vehicles and recommend laws, rules and regulations that New Jersey may enact to integrate autonomous transportation into the state's transportation system.

Bills Passed in 2019: Assembly Joint Resolution 164

### **New York**

New York has highly restrictive regulations on AV testing. Under legislation approved in 2017, any testing must be approved by the commissioner of the Department of Motor Vehicles and supervised by the New York State Police. While more relaxed requirements were proposed in previous legislative sessions, they failed to pass. Additionally, the New York Bar Association established The Task Force on Autonomous Vehicles and the Law to investigate how the law should adapt to the rise of autonomous vehicles. Dentons Senior Counsel [Ronald Hedges](#) is a member of the task force.

### **North Carolina**

Autonomous vehicles in North Carolina face few restrictions. A 2017 law established regulations for the operation of fully autonomous motor vehicles on public highways of the state. It also established the Fully Autonomous Vehicle Committee to study the issue. Notably, the North Carolina Turnpike Authority (NCTA) has touted Triangle Expressway near Raleigh as one of the most advanced roads in the country, with a fiber-optic network along its entire length to facilitate connected infrastructure. The NCTA has tested several driverless vehicles along the corridor.

### **North Dakota**

North Dakota permits autonomous vehicle operation as long as the vehicle is capable of operating in compliance with all applicable federal and state law.

State law does not require a human driver to operate on the public highway if the autonomous vehicle is capable of achieving a minimal risk condition in case a system failure. The law permits on-demand autonomous vehicle networks to provide transportation of persons or goods.

North Dakota also allows for truck platooning subject to the Department of Transportation, in coordination with the state highway patrol superintendent, developing an operational plan that provides guidelines for operation. The plan must include operational information that must be provided by a platoon technology provider or commercial motor vehicle operator.

Bills Passed in 2019: House Bill 199, House Bill 1418

### **Ohio**

A 2018 executive order (EO) signed by former Gov. John Kasich positioned Ohio as a leader in the driverless vehicle space. To attract AV researchers, developers and manufacturers, the EO created DriveOhio, a new division of the state Department of Transportation that allows any company to test AVs in the state as long as they register with DriveOhio and have a backup driver behind the wheel. Four cities—Columbus, Dublin, Athens and Marysville—have already signed agreements with DriveOhio to test AVs on their streets, and the state has designated a 35-mile stretch of US Route 33 a "Smart Mobility Corridor" for the deployment of connected vehicle technologies. A \$45 million SMART Testing center opened in Logan County. Funded by a partnership between Ohio State University and the state of Ohio, the center will include an indoor highway track capable of simulating ice and snow year-round.

The Ohio Department of Transportation was awarded a portion of the \$60 million in federal grant funding allocated for automated driving systems research for its D.A.T.A In Ohio: Deploying Automated Technology Anywhere project.

### **Oklahoma**

Oklahoma hasn't passed legislation to establish specific autonomous vehicle regulations but has asserted that only the State may enact laws or regulations on autonomous driving systems. The state has also exempted platoons from certain traffic laws.

Bills Passed in 2019: Senate Bill 189, Senate Bill 365

### **Oregon**

Oregon has no current regulations in place concerning autonomous vehicles. However, House Bill 4063, signed by Gov. Kate Brown on April 10, 2018, named the Oregon Department of Transportation (ODOT) the state's lead agency on automated vehicle policy and directed ODOT to facilitate a task force on automated vehicles. The Task Force submitted its first report to the legislature on Sept. 10, 2018 and its second on Sept. 9, 2019. The task force voted to continue meeting on an ad hoc basis in response to significant developments in automated vehicle technology and policy. The task force will dissolve on January 2, 2021.

### **Pennsylvania**

Pennsylvania law does not explicitly regulate autonomous vehicle testing, but the state Department of Transportation has created a voluntary registration process. Additionally, Pennsylvania has established regulations on truck platooning and created the Highly Automated Vehicle Advisory Committee within the Pennsylvania Department of Transportation. The Committee is required to submit a report annually.

Pittsburgh, thanks to a friendly regulatory climate and local government incentives, has become a hotbed of AV testing. Currently Aptiv, Argo AI, Aurora Innovation and Uber are testing in the city, and Argo recently announced a five-year, \$15 million research partnership with Carnegie Mellon University to develop autonomous technology.

The Pennsylvania Department of Transportation was awarded a portion of the \$60 million in federal grant funding allocated for automated driving systems research for its Safe Integration of Automated Vehicles (AV) in Work Zones project.

### **South Carolina**

South Carolina has yet to pass legislation on autonomous passenger vehicles but it has exempted platoons from certain traffic laws.

### **South Dakota**

South Dakota has directed the Transportation Commission to promulgate rules to authorize the testing and operation of platooning at electronically

coordinated speeds and distance intervals that are closer than otherwise allowed under the "following too closely" laws in the state.

Bills Passed in 2019: House Bill 1068

### **Tennessee**

Legislation passed in 2017 allows certified autonomous vehicles to operate in the state, provided they contain automatic crash recording and notification technology. The law also preempts local regulation of ADS-operated vehicles and specifies that the ADS shall be considered a driver for liability purposes when it is fully engaged and operated properly. The TennSmart consortium, made up of government agencies, universities, and companies with ties to the state, hopes to encourage collaboration and innovation in the AV area.

### **Texas**

Texas's AV-friendly regulatory environment has made the state a magnet for autonomous vehicle testing. State law allows an automated motor vehicle to operate in the state regardless of whether a human operator is present in the vehicle, as long as certain requirements are met. Texas also preempts local regulation of automated motor vehicles and automated driving systems. The Texas A&M Engineering Experiment Station was awarded a portion of the \$60 million in federal grant funding allocated for automated driving systems research for its Automated Vehicle for All project.

### **Utah**

Driverless vehicles are now regulated on Utah roads under legislation approved in 2019. While any properly insured autonomous vehicles are allowed to operate, autonomous networks must be registered with the state. Vehicles must be operated in compliance with all applicable traffic and safety laws and must be able to achieve a minimal risk condition or make a request to intervene if a system failure occurs. Finally, Utah permits the Department of Transportation to obtain, collect and utilize anonymized location data of connected vehicles.

Bills Passed in 2019: Senate Bill 72, House Bill 101



## Virginia

In a state where AV testing is actively occurring, Virginia has no laws or regulations specifically pertaining to autonomous vehicles. However, the state has taken an active role in encouraging testing and deployment. Seventy miles of Virginia highways have been designated “automated corridors” and outfitted with high-definition mapping and data acquisition systems to support automated-vehicle testing. Virginia is a prime example of the fact that autonomous vehicles can operate in any state, regardless of whether the state has a regulatory framework, as long as the operator adheres to state and federal law.

Virginia Tech Transportation Institute was awarded a portion of the \$60 million in federal grant funding allocated for automated driving systems research for both its Safely Operating ADS in Challenging Dynamic Scenarios: An Optimized Automated Driving Corridor Demonstration project and its Trucking Fleet CONOPS for Managing Mixed Fleets project.

## Vermont

Vermont has established an automated vehicle testing program and granted authority to the Agency of Transportation to adopt specific rules. State law requires that during a test an operator is seated in the driver’s seat of the automated vehicle monitoring the operation of the vehicle and is capable of taking immediate control if necessary. The Traffic Committee has sole authority to approve test permit applications and is directed to hold a public hearing before approving a permit application. The committee may approve automated vehicle tests only if municipalities have preapproved such tests. The legislature has directed the Agency of Transportation to publish an Agency of Transportation’s Automated Vehicle Testing Guide, by January 1, 2021, that includes a list of municipalities that have preapproved testing of automated vehicles on certain highways within their geographic boundaries.

Bills Passed in 2019: Senate Bill 149

## Washington

Governor Jay Inslee signed an executive order in June 2017 to require that state agencies with pertinent regulatory jurisdiction “support the safe testing and operation of autonomous vehicles on Washington’s

public roads.” The executive order establishes an interagency workgroup and enables pilot programs throughout the state. The order specifies certain requirements for vehicles operated with human operators present in the vehicle and for vehicles operated without human operators in the vehicle.

In addition, the State Legislature passed HB 2970 in the 2018 Legislative session which directs the Transportation Commission to “...convene an executive and legislative work group to develop policy recommendations to address the operation of autonomous vehicles on public roadways in the state...”

The Autonomous Vehicle (AV) Work Group submitted recommendations including possible policies, laws, and rules to support the operation of AV’s in the state. The Work Group will remain in place through 2023.

## Washington, DC

In 2012 the District of Columbia became one of the first jurisdictions to pass legislation regarding the testing of autonomous vehicles. All vehicles tested in the city must have backup drivers and be capable of following the city’s traffic laws. An Autonomous Vehicle Working Group, established by Mayor Bowser in February 2018, (Mayor’s Order 2018-018), has been exploring the implications of autonomous vehicles, including workforce and employment, urban planning, parking, and a range of other issues.

## Wisconsin

Former Governor Scott Walker signed an executive order in May 2017 creating the Governor’s Steering Committee on Autonomous and Connected Vehicle Testing and Deployment within the state Department of Transportation. The committee was tasked with advising the governor “on how best to advance the testing and operation of autonomous and connected vehicles in the State of Wisconsin.” The Committee submitted their report in 2018 and made several recommendations, including requiring municipal oversight, an application process and backup drivers. While these have yet to be enacted, the committee also noted that it believes current state law “does not prohibit the operation of autonomous vehicles.” Much like Virginia, Wisconsin is another example of a state that has no autonomous-specific regulations but still plays host to autonomous testing.

# Liability

Traditional liability laws rely on the assumption that a human driver is in control of the vehicle. The inevitable deployment of driverless transportation will systematically change the way liability laws are applied. Current legal frameworks are ill-equipped to determine who is at fault—the owner, operator, passenger, manufacturer or coder — and will be increasingly strained in determining who or what is in control of the vehicle. Federal regulators have offered little guidance on the matter, with the Department of Transportation's guidance stating that compliance with federal safety standards **“does not automatically exempt any person from liability at common law, including tort liability for harm caused by negligent conduct.”** Thus, dealing with this issue will primarily be the responsibility of state legislatures and courts to determine liability rules for autonomous vehicles.

Currently, most states have both tort liability laws holding drivers responsible for any accidents they cause as well as manufacturing liability laws detailing manufacturers' liability for any defects in their products. Uncertainty over which of these laws apply to companies that manufacture or design software for autonomous vehicles will lead to widespread confusion and increased legal costs in the absence of new legislation clarifying liability. Some states, such as Michigan and Nevada, have limited manufacturer liability by stating that manufacturers cannot be held liable for any unauthorized third-party modifications to their vehicles. Other states have implemented varying definitions of “operator” for liability laws. For example, under Texas law the owner of the vehicle is responsible for accidents and traffic violations, whereas in Tennessee the manufacturer assumes liability for any instances where their automated driving system is in control.

Even in cases where a test driver is present, it is foreseeable that the company could be held liable for the safety driver's actions, or inactions, under theories of negligent hiring and negligent supervision, as well as under respondeat superior. Critical liability factors are likely to include the content and extent of the training the company requires the safety driver to undergo before putting him on the road as part of an

autonomous vehicle test, the instructions the company gives about what the driver should do when he is behind the wheel, and how he or she should respond in certain situations. What instructions will be deemed reasonable and sufficient to enable companies to limit or avoid liability in the event of an accident has yet to be determined.

In addition to changes in the law, industry disruptions are on the horizon. Specifically, autonomous technology will significantly alter traditional auto insurance. Autonomous technology promises to make cars increasingly safer, which will significantly reduce accident frequency and, potentially, accident severity. KPMG estimated in a 2017 white paper that the industry's aggregate losses—the amount paid for all automobile accidents—could fall by roughly \$137 billion in nominal dollars by 2050.

As fleets of roadworthy vehicles transition from the non-autonomous status quo to partial driver substitution technology to a state of near-complete autonomy, the culpability arising from accidents will most likely move from the consumer to the auto manufacturer. Thus, the role of companies that manufacture or design software for autonomous vehicles in the insurance industry will likely disrupt the marketplace in three key ways.

First, we can expect a shift to manufacturers of driving risk and associated liability as more driving decisions are made by a vehicle's proprietary algorithmic “brain.” In 2015, Volvo Car Group was one of the first car makers in the world to announce that they would accept responsibility and liability should an accident occur due to their autonomous technology. Since then, multiple other car makers have made similar statements.

Second, in an environment where driving decisions are shared between the driver and the vehicle, we may see a consolidation of legal exposure. Providing insurance to both the driver and the manufacturer could prove to be a legal advantage by reducing the volume of cross-suits between the two regarding blame.

Third, the next generation of cars will capture increasing amounts of data via an array of sensors and cameras. Who will get to use and control that data?

Finally, control of the new driving data, relationship between the vehicle and its owner and assumptions of legal exposure will allow the manufacturers to redefine

the driving insurance marketplace. In the future, the manufacturer could disintermediate the insurance companies altogether.

## Data privacy and security

As Internet-connected technology is integrated into more parts of everyday life, companies are gathering more consumer data through increasingly sophisticated technology, including the use of internet of things (IoT) technology by connected autonomous vehicles (CAVs) US laws governing data privacy and information security are quickly falling behind.

The laws and regulations governing data privacy and information security in the US are largely sectoral, which has resulted in a patchwork of federal and state standards across multiple industries. At the federal level, there is no uniform data privacy or information security law. Instead, the Federal Trade Commission (FTC) broadly enforces data privacy and information security standards through a variety of mechanisms, including “unfair and deceptive trade practice” enforcement actions under the FTC Act, the treatment of minor data through the Children’s Online Privacy Protection Act (COPPA), and the data privacy and information security practices of financial institutions under the Gramm-Leach-Bliley-Act (GLBA). In the healthcare space, data privacy and information security is largely governed by the Health Insurance Portability and Accountability Act (HIPAA) and its associated Privacy and Security Rules. And at the state level, the patchwork is even greater. Most states have their own version of the FTC Act, COPPA, GLBA, and HIPAA. A number of states have specific online-privacy policy requirements for commercial websites and automatic license plate reader privacy laws. Nearly every state has a data breach notification law along with some type of law requiring that personal information collected must be secured in a reasonable manner. And many states now have cybersecurity laws specific to a particular industry, such as the financial sector in New York and the investment advisor/broker sector in Colorado.

Current federal law has little to say about the data collected and used by CAVs or other IoT devices. At the state level, the laws are few and far between. Michigan and Nevada have AV laws that require operators to provide certain privacy disclosures in external-facing privacy notifications before releasing personal

information to third parties. California also has a new IoT law that took effect on January 1, 2020 that will require manufacturers of connected devices to equip their devices with reasonable security mechanisms to protect against data loss and exposure. Moreover, the new California Consumer Privacy Act (CCPA), which also took effect on January 1, 2020, will significantly impact how IoT companies, including CAVs, collect, use, store, and share the personal information of California residents. The CCPA is particularly relevant to CAVs because the definition of “personal information” is so broad that it includes IP address, geolocation data, and consumer tendency data which may be relevant to CAV passengers. The CCPA is the first law in the US that will give consumers broad new rights to request access to their personal information, request that the information be deleted, and opt-out of the sale of their personal information (similar to rights existing within the European Union). Dozens of other states are likely to introduce their own version of the CCPA in the coming legislative sessions.

The increased combination of internet connectivity with physical items such as CAVs further highlights why many laws in the US are lagging behind as it relates to data privacy. Most laws on the books today relate to online behavior and activity, and do not contemplate the combination of internet connectivity with physical devices and the additional considerations of physical safety and well-being that may come into play with CAVs. For example, while some consumers may have no problem sharing their personal information for safety and reliability reasons, they might hesitate if their travel data is being sold to third parties. How those factors are balanced (privacy v. functionality v. safety) is something any future state of data privacy law in the AV space will need to take into account.

The rise of IoT devices such as CAVs has also created increased cybersecurity concerns. A Consumer Watchdog report warned that all of the top ten 2020 car models are vulnerable to fleet-wide hacks because of their Internet connectivity. Industry professionals are warning of increased CAV security vulnerabilities — **only 10 percent of IT security professionals have high confidence in their organization’s ability to properly secure IoT devices, according to a survey released by Deloitte and Dragos.** There are a number

of industry frameworks at both the international and federal level that have been proposed for the AV sector, most notably the National Institute of Standards and Technology's (NIST) recently released draft standards for IoT cybersecurity that may inform similar efforts in the AV industry. This report, in addition to NIST's proposed Privacy Framework and well accepted Cybersecurity Framework serve as potential standards AV companies may use to measure against the growing cybersecurity threat landscape. At the state level, California's IoT law is the first law in the US to require IoT device manufacturers to implement reasonable security features to protect devices against threats. And although the California IoT law leaves a lot to be desired in terms of specifics, it could represent a growing trend in the law. How it will be enforced is still unknown.

At the federal level, there are also several data privacy proposals that could alter the legal and regulatory landscape. At one end of the spectrum, Sen. Marco Rubio (R-FL) has introduced the American Data Dissemination Act, under which the FTC would be charged with developing and proposing new rules relating to data privacy to Congress. This bill has been criticized for offering few concrete consumer protections and for the fact that it would preempt more comprehensive state legislation, including the CCPA. At the other end of the spectrum, congressional Democrats have offered several proposals with stronger consumer protections.



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**Sen. Amy Klobuchar (D-MN)**

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A bill sponsored by Sen. Amy Klobuchar (D-MN), would require companies to rewrite service agreements, using "language that is clear, concise, and well-organized," to allow consumers to see data collected on them and would require companies to notify consumers of any breaches within 72 hours.



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**Sen. Ron Wyden (D-OR)**

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The Consumer Data Protection Act, sponsored by Sen. Ron Wyden (D-OR), would require companies to release annual reports detailing privacy-protection efforts and to set up a "do-not-track" site where consumers can opt out of data collection.



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**Sen. Brian Schatz (D-HI)**

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Finally, the most comprehensive proposal may be the Data Care Act, sponsored by Sen. Brian Schatz (D-HI), which would give personal data protections similar to medical records, creating three main duties of data collectors, the "duty to care," the "duty of loyalty," the "duty of confidentiality," to be enforced by FTC rules.

As CAVs become increasingly operational, the focus on AV data privacy and information security standards will also likely increase. Whether federal and state law can keep up with the rapidly evolving technological space for IoT devices remains to be seen. Although a federal data privacy and information security law is unlikely in the near future, state laws such as the CCPA and California IoT law are likely to remain as the data privacy and information security law that will most significantly impact the CAV industry. How robustly those state protections will be enforced by regulators and through private rights of action remains to be seen.

## Spotlight

### Driverless truck test in Florida

On June 16, 2019 automated truck technology startup [Starsky Robotics](#) completed a driverless truck test drive on a 9.4 mile stretch of public highway in Orlando, Florida. The vehicles was able to fully navigate roads with other vehicles present, including merging onto the highway, entering a rest area and changing lanes.

## Telecommunications and 5G

Unlocking the full potential of autonomous transportation will require smart, forward-looking decisions about how to manage the spectrum on which driverless vehicles will rely. A vote from the Federal Communications Commission shows the United States is preparing for a fully autonomous future. After months of debate, the FCC voted unanimously to propose reallocating the 5.9 GHz band for both unlicensed uses and transportation-specific applications, which would be the first step to making spectrum in this band available for new autonomous vehicle technology.

In an effort to provide predictability for automakers and broadband providers, the FCC voted unanimously to initiate the process that would open up the 5.9 GHz spectrum band for new uses. By way of background, the agency first set aside spectrum in what is called the 5.9 GHz band to support transportation uses in 1999. Under current FCC rules, the 5.9 GHz band is reserved for dedicated short-range communications (DSRC), which facilitates both vehicle-to-vehicle and vehicle-to-infrastructure communications. Because DSRC has been around for three decades, some automakers and localities had begun to equip vehicles and roadside infrastructure with DSRC-based technologies. However, inevitably, technology has advanced since 1999, resulting in several alternatives to DSRC, the most noteworthy being cellular vehicle-to-everything (C-V2X) communication that offers

vehicle-to-vehicle, vehicle-to-infrastructure and vehicle-to-pedestrian communication.

To address technological advancements and the underutilization of the 5.9 GHz band to date, the FCC approved a plan to allocate the upper 20 MHz of the 5.9 GHz band for new automotive communication technology, and specifically C-V2X, while saving the lower 45 MHz of the band for unlicensed uses like Wi-Fi. Additionally, the FCC will seek further public input on whether to allocate the remaining 10 MHz in the band to C-V2X or DSRC. The Commission voted in favor of the Notice of Proposed Rulemaking at the agency's December 12, 2019 open meeting.

According to FCC Chairman Ajit Pai, C-V2X would use standard cellular protocols to provide direct communications between autonomous vehicles and other vehicles on the road, in addition to infrastructure, cyclists, pedestrians and road workers. C-V2X is also expected to support new, advanced applications as cellular companies transition to faster, more responsive 5G networks. While C-V2X can technically be deployed over both 4G LTE and 5G cellular networks, the near-20-times faster speed of 5G will ultimately allow autonomous vehicles to be able to process and react to data in just nanoseconds. Opening the band to C-V2X is backed by large automakers as well as wireless carriers and wired broadband providers, who support the proposal for its commitment to both C-V2X and unlicensed uses.



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### **Ajit Pai**

Chairman of the Federal Communications Commission

"After 20 years of seeing these prime airwaves go largely unused, the time has come for the FCC to take a fresh look at the 5.9 GHz band," Pai said. "DSRC has evolved slowly. It's not widely deployed. And in the meantime, a wave of new transportation communication technologies has emerged."

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The Department of Transportation (DOT) opposes the proposal to allocate spectrum for unlicensed uses in addition to transportation. Prior to the vote, the FCC had held off on 5.9 GHz spectrum rulemaking efforts at the request of DOT Secretary Elaine Chao. The transportation agency said in a statement that "the Department of Transportation has clearly stated in testimony and correspondence that the 75 MHz allocated in the 5.9 GHz, what we call the 'Safety Band,' must be preserved for transportation safety purposes." The DOT is primarily concerned with unlicensed uses interfering with transportation communications, although there is not any conclusive research that settles the issue.

Next steps would involve evaluating comments from interested stakeholders and developing final rules on which the Commission would vote. Even if the final rules adopted by the FCC are similar to the current proposal, it will still take years for the auto industry to coalesce around and implement C-V2X. As such, consumers may not feel the practical implications of this decision for years and possibly decades. Nonetheless, carving out dedicated space for C-V2X will give the industry the assurance it needs to invest in an autonomous future.

The FCC's 5.9 GHz rulemaking complements several spectrum efforts that will support the next-generation networks underlying autonomous vehicle capabilities, including 5G. In December 2019, the FCC will conduct a public auction of high-band millimeter-wave spectrum (in the 37 GHz, 39 GHz, and 47 GHz bands) and the agency's auction of the 3.5 GHz band will begin in June 2020. The Commission has also proposed changes to the rules governing the 3.1 - 3.55 GHz band to make it available for commercial uses for the first time, and has announced a public auction of the 3.7- 4.2 GHz band,

commonly referred to as the "C-band." The high-band and mid-band spectrum coming to market both play critical roles in making 5G a reality. High-band spectrum will facilitate fiber-like connections that will support a broad range of 5G applications. Mid-band spectrum is what makes ultra-fast speeds possible. The FCC's comprehensive and expeditious approach to spectrum policy in recent months demonstrates that it is taking seriously the United States' goal to be a 5G leader.

The United States is not alone in the pursuit of 5G and an enterprising spectrum policy to match. The United States is on the cusp of building out a truly nationwide 5G system while Chinese carrier Unicom has 5G coverage in 50 cities and Europe aims to have 5G connectivity in at least one major city in each EU member state.

In regard to spectrum policy, China is currently making the most concerted effort to push manufacturers to include C-V2X. The country set aside a dedicated bandwidth on the 5.9 GHz spectrum solely for Connected V2X use, and plans to have the technology rolled out across 90 percent of major cities and highways by 2020. Manufacturers in the US and have been slower to move away from Dedicated-Short-Range-Communication (DSRC) technology but the recent decision by the FCC will provide the predictability required for automotive companies to increase investment in C-V2X. The European Parliament took a more restrictive approach to C-V2X by voting in May 2018 to endorse DSRC in new vehicles, essentially de-incentivize the installation of C-V2X.

Going forward, the ongoing embrace of 5G and investment in C-V2X technology will determine, in large part, which countries lead the autonomous revolution.



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