Transport Canada: 2021 Guidelines for Testing Automated Driving Systems in Canada

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In 2018, Transport Canada replaced the *Testing Highly Automated Vehicles In Canada: Guidelines for Trial Organizations* (the HAV Trial Organization Guidelines) with the *Guidelines for Testing Automated Driving Systems in Canada* (the ADS Guidelines). The Trial Organization Guidelines set out provisions regarding safety, economic growth, insurance, automated driver system (ADS) requirements, cross-border testing, and encourage information sharing and collaboration.[1] The HAV Trial Organization Guidelines were released by Transport Canada as a response to the growth of ADS testing. The ADS Guidelines contain extensive, detailed, and wide-ranging changes meant to replace the HAV Trial Organization Guidelines, which we explain in further detail below.

The purpose of the ADS guidelines

The ADS Guidelines include new best practices developed by the international community that reflect Transport Canada's regulatory perspectives regarding ADS and autonomous vehicle development. In addition, the ADS Guidelines also provide insight on what ADS and autonomous vehicle features that Transport Canada views as a priority and seeks to incentivize the autonomous vehicle industry to develop further.

As autonomous vehicles and ADS continue to become more commonplace on roads in Canada and around the world, the ADS Guidelines are expected to form part of the regulatory backbone used to shape and support Canada's future ADS regulatory landscape. In addition, for members of the autonomous vehicle industry, regulatory guidelines like the ADS Guidelines can be used as predictive tools to provide insight into how regulators and governments view ADS generally, and how they view their role in regulating ADS and autonomous vehicle use and development.

In this article, we highlight some of the key changes that the ADS Guidelines usher in for the autonomous vehicles industry in Canada.

Key changes to the ADS Guidelines

The changes to the ADS Guidelines include:

- **Cyber security recommendations in the research & development phase, through to deployment**. Along with the support of digital and physical infrastructure, trial organizations are highly encouraged to implement risk assessments of the cyber security of their test vehicle. The ADS Guidelines now refer to the Canada Vehicle Cyber Security Guidance, published by Transport Canada in May 2020, for further guidance.[2]
- **The *Accessible Transportation for Persons with Disabilities Regulations* (ATPDR) falls under the powers of the Canada Transportation Agency (CTA)** and came into force July 25th, 2020. The CTA is a quasi-judicial tribunal and regulator. The ATPDR contains clear, consistent, and binding regulations for transportation services, and the ADS Guidelines suggest trial organizations consult the provisions, along with the further guidelines provided under the CTA, if they are preparing for a trial to determine whether their services are encompassed within the scope of the regulations.[3]
- **Reinforcing provincial and municipal jurisdictions for trial organizations interested in road testing their products.** Particularly in respect to regulations regarding: road safety, vehicle equipment safety and maintenance, vehicle insurance and driver licensing, and if passengers are involved in trials.[4]
- **Notifying stakeholders when trial organizations are conducting testing in residential areas**. The ADS Guidelines suggest as a best practice to work with community organizations and stakeholders to ensure a safe test zone.[5]
- The ADS Guidelines now contain a **"Pathway to Approval" checklist with key steps for trial organizations** to follow to get approval for ADS tests in Canada.[6]
- The ADS Guidelines provide a **checklist of 13 safety outcomes for ADS equipped vehicles** in the form of the Transport Canada Safety Assessment Tool.[7] Items on the checklist include: object event detection and response, human machine interface and accessibility of controls, user privacy, cyber security, and public education and awareness.
- **A bigger emphasis on a "graduated approach to testing."** This refers to trial organizations utilizing gradual increases to complexity and risk when testing ADS.[8] The graduated approach to testing can also assist with the review and modification of safety strategies throughout the testing phases.
- **The ADS Guidelines provide best practices for automated shuttle testing in Canada**.[9] Automated shuttles can have unique characteristics, but are commonly defined, under the Updated Guidelines, as having the capacity to carry 4-12 passengers, operational speeds that may range from 5-25km/h, maximum speeds of up to 60km/h, and are ultimately meant to operate autonomously of any human driver.
- It is important to note that **the Guidelines change the language from the 2018 version from "minimum standards" to "best practices" in the 2021 update**. The Guidelines serve as a starting point for all trial organizations wishing to conduct autonomous vehicles testing in Canada.[10]

Four key pillars of the regulatory landscape

The ADS Guidelines provide insight into key aspects of regulatory priorities that may well inform future policy and regulatory developments regarding autonomous vehicles, which can distilled into four key pillars: safety, security, accessibility, and stakeholder coordination.

Safety

Safety concerns will likely be the cornerstone of any future update to the ADS Guidelines. As the levels of automation increase and the public begins to adopt and rely on ADS in greater numbers, safety becomes a paramount consideration. For example, the ADS Guidelines require that:

> *"Safety drivers can intervene and assume manual control of the test vehicle in the event that the ADS does not function as intended or exceeds its ODD requiring assistance to achieve a minimal risk condition and/or continue its journey safely."*[11]

As trial organizations and developers begin to test and deploy ADS with greater levels of autonomy, regulators may require or recommend active safety systems that monitor the driver and conditions inside of the vehicle to ensure that an *attentive* human being is ready to takeover in the event the ADS does not function as intended. These driver monitoring systems could take the form of cameras inside the vehicle that are pointed at the driver or the driver's eye line, breathing monitors to detect whether someone is sleeping, or other biometric systems designed to gauge the attentiveness of a human driver and if necessary, prompt a human driver to pay attention. Installation of these types of systems could create further cybersecurity and privacy risks that developers must safeguard against.

Security

Security is another key pillar in increasing public acceptance and adoption of autonomous vehicles. Currently, the ADS Guidelines sets out the following cybersecurity guidance:

> *"Cyber security: Adequate design and mitigation strategies have been developed to protect the ADS-equipped vehicle from cyber security threats. Programs, plans, and/or operating procedures have been established to manage cyber events. Consideration should also be given to how these events are communicated to other stakeholders, including government agencies, to prevent similar events in the future. Trial organizations should also consider additional cyber security best practices found within Canada's Vehicle Cyber Security Guidance and consult Canada's Vehicle Cyber Security Assessment Tool (VCAT), as well as other international standards and best practices."*[12]

As we progress toward greater levels of autonomy, the sector can likely expect that future regulations and guidance will place an increased emphasis on cybersecurity and possible adoption of cybersecurity requirements into the very definition of how "autonomy' is defined from a regulatory perspective. Given the nature of governance of privacy and data protection in Canada, this is likely to require coordination at the federal and provincial level, as well as horizontally amongst key regulators at the federal level, including Transport Canada, Office of the Privacy Commissioner (OPC), and Innovation, Science, and Economic Development Canada (ISED).

Accessibility

As noted above, the ADS Guidelines emphasises the need for autonomous vehicles to comply with various accessibility requirements.

Autonomy represents an opportunity to increase accessibility in transportation by allowing those with limitations to access traditional transport solutions with greater independence in a safe and cost effective manner. As such, future regulatory guidance will likely incorporate aspects of accessibility requirements like those found in the ATPDR.

Coordination with stakeholders

The ADS Guidelines promote best practices for trial organizations collaborating with community stakeholders, including all levels of government, and residents of test areas when facilitating trials. These best practices fulfill an important policy goal as the more stakeholders are able to meaningfully participate in trial testing, the more willing those same stakeholders are to accept and use ADS in the future.

At a baseline, trial organization must ensure that trial activities comply with all applicable local, provincial, and federal laws and regulations. However, greater community involvement in testing activities can reduce risk and increase the quality of testing. Notifying, communicating, and coordinating with relevant parties in order to arrange trial activity mitigates safety risks. It can also create opportunities to use locations that would not be accessible to the trial organization without community involvement and coordination. This can increase the quality of applicable test results. More importantly, involving and notifying community stakeholders and especially emergency responders minimizes the risk of interference in testing activities.

As ADS continue to advance and improve, early consultation with community stakeholders in the development and testing stage can materially assist in the safe and streamlined deployment of this technology downstream. In addition, consolation and engagement with community stakeholders can assist in accelerating public support and adoption of ADS.

Conclusion

The ADS Guidelines provide helpful guidance to industry players looking to use Canadian roads to further develop ADS and autonomous vehicle systems. However, the ADS Guidelines also serve to signal key aspects of the developing regulatory framework that are likely to inform future regulatory requirements to ensure safety, security, accessibility, and identify best practices in the development and adoption of autonomous vehicles on public roads in Canada.

BLG's Autonomous Vehicles Group

If you have any questions or would like to learn more about Transport Canada’s updated ADS Guidelines, please reach out to your BLG lawyer or one of the key contacts listed below. BLG’s Autonomous Vehicles Group is here to help clients navigate the opportunities and challenges this revolutionary era of autonomy is expected to bring.

Footnotes

[1] HAV Trial Organization Guidelines, Introduction: Prefix

[2] ADS Guidelines, Purpose: Scope of the Guidelines.

[3] *Ibid,* Canadian Transportation Agency: 1.2.2.

[4] *Ibid,* Provincial and Territorial Governments: 1.3.

[5] *Ibid,* Municipalities: 1.4.

[6] *Ibid,* Table 2: Pathway to Approval.

[7] *Ibid,* Assessing the Safety of Test Vehicles: 2.1.

[8] *Ibid*, Graduated Approach to Testing: 3.1.

[9] *Ibid,* Best Practices for Automated Shuttle Safety: Annex A.

[10] *Ibid,* Introduction: Purpose.

[11] *Ibid,* Safety Driver Roles and Responsibilities During Trial: 3.4.

[12] *Ibid,* Assessing Safety of the Test Vehicle: 2.1 #10.

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