



CRI

Centre for Regulatory Innovation

Regulators' Capacity Fund

Transport Canada (TC)

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Establishing novel testing methodologies to evaluate the safety of new vehicle technologies and support road safety regulatory design

Human behaviour is a contributing factor in approximately 85% of fatal motor vehicle collisions in Canada. Recent advances in technology may help to reduce collisions and enhance road safety. Automated vehicles in particular have great potential, but more research is needed to determine how regulators can accurately assess and in turn establish formal safety requirements for those vehicles. Establishing effective validation methods and standards will support the safe development of these technologies and mitigate regulatory costs for industry in the future.

Traditional physical testing cannot replicate the complex multi-vehicle scenarios reflective of real-world driving. Without simulation-based validation, highly automated vehicles would require billions of test miles driven to demonstrate a sufficient level of safety, making the process cost and time prohibitive for manufacturers. As such, new virtual simulation-based validation methods are required to effectively validate the safety of automated vehicle technologies. This project explored potential approaches to confirm the accuracy and reliability of virtual testing as it may be used to assess the safety performance of automated driving systems (ADS).

Simulation-based validation and verification of the safety of automated driving systems is an innovative process to evaluate vehicle safety. TC has engaged and consulted with industry stakeholders and international regulatory counterparts to identify best practices and needs and has developed a methodology that can be used to qualify simulation-based safety validation tests. This will enable TC to contribute to the development of international standards for simulation-based safety validation, which will in turn help inform future adaptations to our regulatory framework when the standards and automated vehicle technology reach a sufficient state of maturity.

The findings of the project will provide a basis for the eventual development of standards to validate test platforms for ADS simulation. Although development of these technologies and the associated regulatory framework is still in its early days, this project represents a foundational step towards future regulatory changes. Including simulation-based testing into the testing regime will increase testing efficiency and cost-effectiveness for both manufacturers and TC, which will in turn increase cost competitiveness in the longer term.