

# Facilitating the Development and Deployment of Autonomous Vehicles in Canada

## Issue

Autonomous vehicles have the potential to transform Canadian transportation networks and fundamentally change how Canadians live and work. To maximize the Canadian benefits from the development of this transformational technology the federal government should help foster autonomous vehicle research and development in Canada and prepare Canada's policy and regulatory frameworks for the eventual adoption of self-driving vehicles.

## Background

Advances in computer processing, cameras, sensors, GPS and other technologies are accelerating the development of autonomous vehicles. These advances are expected to result in the progressive introduction of automated vehicles in the coming years, beginning with partially autonomous vehicles and eventually fully autonomous vehicles requiring no human intervention. Recognizing the potential of autonomous transportation, auto manufacturers and technology companies are investing billions of dollars in the technology. GM is already testing more than 50 autonomous electric vehicles on public roads in multiple U.S. cities.<sup>1</sup> Tesla is including all the hardware required for self-driving in all of the vehicles they produce and plan to test the company's software through a fully autonomous U.S. coast-to-coast trip (Los Angeles to New York) by the end of 2017. Uber is already offering customer trips in self-driving cars in Pittsburgh. Google's autonomous fleet has self-driven over 3 million test miles, mostly on city streets and in 2017 started public trials in Arizona.<sup>2</sup>

Despite uncertainty about when and the extent to which autonomous vehicle will be deployed and utilized by consumers and businesses, there is an emerging consensus that in the long-term they will significantly alter how people and goods are transported and transportation networks. Some of the potential impacts include:

- **Improved safety:** Studies and surveys have shown that 90 to 95 percent of vehicle crashes are the result of human error.<sup>3</sup> Autonomous vehicles can significantly reduce collisions that result in nearly 2,000 fatalities, 10,000 serious injuries and 150,000 injuries in Canada every year.<sup>4</sup>
- **Productivity gains:** Supply chains will become more efficient as autonomous vehicles help address some of the 'last mile' problems of connecting airports, seaports and rail lines to road transportation. Freight trucks may be able to travel 24/7 by not requiring driver rest time, or favouring overnight travel when roads are less congested (and when drivers are typically less interested in driving). Commuters will be freed up to do other personal or work tasks instead of focusing on driving during their daily commute and there will be improved mobility for those currently unable to drive.
- **Improved road capacity utilization:** While the convenience of autonomous technology could increase the number of Canadians travelling by vehicle, congestion may be reduced through new mobility models that include less ownership and more ride-sharing and on-demand travel – resulting in better utilization of existing transportation infrastructure. Autonomous vehicles are likely to improve traffic flow by interacting with the vehicles and environment around them. They may also improve multi-modal connectivity by simplifying the movement of people to and from transportation hubs.

Engineering, research and innovation capabilities in Canada have positioned this country to become a centre for autonomous vehicle development and attract a greater share of investment in these technologies. Canada's large automotive manufacturing base, highly skilled workforce, and IT clusters make this country a logical research and

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<sup>1</sup> GM Corporate Newsroom, [GM Announces More Than 1,100 Jobs to Expand Cruise Automation Self-Driving Operations in California](#) (April 13, 2017)

<sup>2</sup> Waymo, [On the Road](#) (May 2017)

<sup>3</sup> United States Department of Transportation National Highway Traffic Safety Administration, [Traffic Safety Facts, Critical Reasons for Crashes Investigated in the National Motor Vehicle Crash Causation Survey](#) (February, 2015)

<sup>4</sup> Transport Canada, [Canadian Motor Vehicle Collision Statistics](#) (2014)

development magnet. However, the development of autonomous vehicle technology is outpacing the regulatory frameworks that govern motor vehicles in Canada. There are a number of public policy issues that the federal government should start addressing to ensure Canada can attract increased investment and accelerate the adoption of the technology in Canada where appropriate. These include:

**Regulatory coherence:** Appropriate federal and provincial regulatory frameworks are needed to allow testing and adoption of autonomous vehicles. Without consistent regulatory approaches between Transport Canada and provincial governments, the testing and operation of autonomous vehicles across provincial borders will be challenged, hindering research, development and eventual deployment. Inconsistent regulations can also increase the cost and slow the pace of research and development in automated vehicles. Consultation with industry can help inform new regulations that provide investors the flexibility and guidance to test their technologies. Ontario launched an automated vehicle pilot project in January 2016 that allows companies and researchers to test self-driving technology on public roads as long as they receive a permit and have someone in the driver's seat ready to take over if something goes wrong. While first steps are welcome, nearby U.S. states are being more hands-off. Michigan passed a law in 2016 that will allow automakers to operate networks of self-driving vehicles (with no backup driver) in the state.<sup>5</sup> In 2016 the U.S. Department of Transportation also released a [Federal Automated Vehicles Policy](#) which sets performance standards for self-driving cars and offers guidelines for how states can legislate autonomous vehicles.

**Federal Innovation Programs:** Autonomous vehicle development should be prioritized in the federal innovation agenda including as part of Innovation, Science and Economic Development Canada's *Innovation Superclusters Initiative*. Federal innovation programs can provide a strong incentive for domestic and global companies to choose to innovate in Canada. Federal innovation support could result in more investments like the BlackBerry QNX Autonomous Vehicle Innovation Centre opened in Kanata in December 2016.

**Smart infrastructure:** Autonomous vehicles will require a re-think in the design of public and private transportation infrastructure. Fully autonomous vehicles will be adopted more quickly where 'smart' or connected infrastructure will allow vehicles to communicate with roads, bridges and rails and other infrastructure in real-time. Given the length of time transportation infrastructure assets are used in Canada, governments should start including a forward looking lens on current investments, and do so in tandem with leading smart infrastructure jurisdictions, the automotive industry, and academic and other research institutions.

There are numerous other public policy issues that will need to be addressed with the development of autonomous vehicles. For example, the connected nature of the technology will open up complex privacy issues that will need to be addressed before vehicles are commercialized. Increasingly connected vehicles will also be vulnerable to new to cyber threats. The federal government should proactively initiate dialogues on these issues with industry, other jurisdictions in Canada and with other countries.

## Recommendations

To support the development and deployment of autonomous transportation technologies in Canada, the Canadian Chamber of Commerce recommends that the federal government:

1. Work with provinces and territories, municipalities, and industry to develop a national regulatory and standards framework that provides flexibility for the testing and deployment of autonomous vehicles in Canada. The Framework should provide a platform for cross-jurisdictional discussions about emerging policy issues related to autonomous transportation including, but not limited to, privacy and Canada's preparedness and response to cyber threats.
2. Prioritize autonomous transportation in the government's innovation agenda to help coordinate research initiatives, guide Canada's long-term investments in transportation technologies and create smart incentives to private sector investment in transportation innovation and technology.

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<sup>5</sup> Government of Michigan, [News Release: Gov. Rick Snyder signs landmark legislation to allow operation of autonomous vehicles on Michigan roadways](#) (December 9, 2016)

3. Include an innovation lens in federal infrastructure programs to inform public and private infrastructure investment decisions that will facilitate the introduction of innovation and technology in the transportation sector, including but not limited to autonomous vehicle deployment.