



CONNECTED AND AUTOMATED VEHICLES AND THEIR IMPACT ON THE AUTOMOBILE INSURANCE MARKET

ISSUES PAPER



**A DOCUMENT PREPARED BY THE CANADIAN
COUNCIL OF INSURANCE REGULATORS
FINTECH WORKING GROUP**

January 2021

This document reflects the work of regulators who are members of CCIR and is intended to generate discussion. The views expressed should not be considered as legal opinions.

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FOREWORD

We have never been so close to have self-driving vehicles on the road.

The development of connected and automated vehicle (CAV) technology continues to deliver more cost effective, high-performance computing, which enables algorithms to deliver real-time machine perception that helps CAV to be safe and secure for human use.

Today, there is already CAV testing on public roads both in Canada and across the globe. As these tests progress, the industry will get a better picture of how to deal with some of the challenges that are unique to CAV. While the launch will not be immediate, we expect to see full self-driving vehicles in the next 5 to 10 years. What is clear today is that different stakeholders at different levels of government, in tech companies, the telecoms sector, at car manufacturers and test facilities, will need to come together and develop new tools to drive deployment and adoption, and help achieve the promised benefits of the self-driving revolution over the next decades - Collaboration will be important.

Discussions between the Canadian insurance regulators are already taking place. The Canadian Council of Insurance Regulators (CCIR) intends to further the dialogue with CAV developers, the legal and insurance sectors in order to explore a host of questions and risks and to jointly identify future regulatory needs.

This issues paper intends explore issues and engage stakeholders to further support the safe and swift deployment of CAV.

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1. INTRODUCTION

As part of its 2017-2020 Strategic Plan, the CCIR set up the Fintech Working Group (FWG) aimed at establishing a coordinated approach for harmonized regulation of new financial technologies. The FWG is currently working on various initiatives, one of which concerns the impact of the arrival of autonomous vehicles in insurance. To this end, the FWG's mandate is to identify the legislative and regulatory issues as well as the inherent risks associated with the arrival of CAV in the automobile insurance sector.

Automobile manufacturers, tech companies and government agencies have been working on CAV. To this end, progress has been made but significant challenges remain. The implementation of CAV relies not only on the technology itself, but on the infrastructure to support it alongside public policy and ethical considerations. In addition, public acceptance of the use of the technology is a potential barrier to its adoption. As a result, automobile manufacturers and experts do not expect to commercially launch fully driverless vehicles in the short-term¹. Meanwhile, road users currently drive cars equipped with advanced driver assistance systems (ADAS)².

As the shift towards automated vehicles occurs, the responsibility for collisions remains a question to be answered. Is an accident the responsibility of the vehicle, their manufacturers and their suppliers (software)? Or does it remain the responsibility of the driver? Liability will now arise from different sources and therefore, need to be addressed from different perspectives as and further, be adequately reflected in an insurance policy. Moreover, consumer sentiment toward CAV will be driven by information on key issues such as data privacy, safety and, equally important, education and experience.

This issues paper on automated vehicles and their impact on the automobile market is intended to outline a common understanding of the legal and regulatory actions to be taken for the implementation of CAV and to consider specific issues related to the protection of personal information and cybersecurity attributable to the development and use of these vehicles.

2. TERMINOLOGY

The terminology “automated” vehicle is used in this issues paper. This encompasses the terms semi-autonomous, autonomous, driverless, or self-driving vehicles. Transport Canada³ defines automated vehicles as a vehicle that:

- uses a combination of sensors, controllers and on-board computers, along with sophisticated software; and
- allows the vehicle to control at least some driving functions, instead of a human driver (for example, steering, braking and acceleration, and checking and monitoring the driving environment).

The classification level of CAV used in this issues paper is based on the Society of Automobile Engineers International's standard J3016 (SAE-J3016)⁴, which is the standard most used internationally. For levels 0, 1, 2 and 3 the human driver must remain in control of the vehicle and he must be connected about the driving environment, while for levels 4 and 5 there is no control by the human driver and he must does not have to worry about the driving environment.

Depending on its installed characteristics, a “connected” vehicle may be able to communicate for example with:

- its occupants, such as through their mobile devices;
- with other vehicles and road users; and
- with the surrounding transportation infrastructure, such as roadways and traffic lights.

Issues may arise whether the vehicle is partly automated, fully automated and/or connected. This Issues paper discusses some of these.

1 Society of Motor Manufacturers and Traders (SMMT) and Frost and Sullivan, the *Connected and Autonomous Vehicles: Winning the Global Race to Market*.

2 Many vehicles today are equipped with ADAS such as lane keeping assistance, adaptive cruise control, automatic emergency braking and self-parking. Transports Canada also defines Automated Driving Systems (ADS) as the hardware and software that are collectively capable of performing the entire Dynamic Driving Task (DDT) on a sustained basis, regardless of whether it is limited to a specific Operational Design Domain (ODD); this term is used specifically to describe a level 3, 4, or 5 driving automation system. Transports Canada, “[Testing Highly Automated Vehicles in Canada: Guidelines for Trial Organizations](#)”, June 2018, pp. 7-8.

3 Transports Canada, “Automated and connected vehicles”, consulted on July 4, 2020, at <https://www.tc.gc.ca/en/services/road/innovative-technologies/automated-connected-vehicles.html>

4 See Annex A for more details.

3. REVIEW OF EXISTING REGULATION AND REGULATORY REQUIREMENTS

In **Canada**, the federal government regulates the manufacture and importation of motor vehicles and motor vehicle parts to reduce the risk of death, injury and damage to property and the environment. It is responsible for setting and enforcing safety standards⁵.

Provincial and territorial governments are responsible for regulating drivers and vehicles used on the roads, which includes authorizing the use of roads for CAV testing. The focus of this issues paper are the issues pertaining to governing the conduct of drivers, including the civil liability arising from accidents.

While a number of manufacturers, software companies and start-ups are testing vehicles on the Canadian roads, provincial and territorial governments are playing catch-up with legislation and regulation trying to balance the need to protect the public and to address security and privacy concerns without stifling innovation.

In **Ontario**, the current legal framework addresses most situations where the driver and/or owner are involved in the operation of the vehicle and possible liability resulting from accidents. In this context, any changes to the auto insurance policy framework would require changes to the Insurance Act. In addition, section 192 of the Highway Traffic Act may need to be modified as it currently defines an owner, lessee or driver of a vehicle is liable for any loss or damage caused by the negligence of the operation of the automobile.

Also, sharing of data from CAV with insurers and police at time of the accident may be needed to determine cause of accident. This data sharing will also be necessary for insurers to enable them to assess and quantify the risk posed by CAV. Changes to this effect may be set out in the Highway Traffic Act or Insurance Act.

Since January 1, 2016, the Ontario government has launched a pilot project that allows the testing of automated vehicles on public roads under specific conditions. The objectives of this pilot project are in particular to:

- establish rules;
- monitor industry developments;
- evaluate the safety of autonomous vehicles prior a widely accessibility by the public.

Among the conditions listed in the pilot project, it is worth noting that all Highway Traffic Act rules of the roads and penalties apply to the operation of CAV and subsequent responsibilities of the driver/vehicle owner, including collision reporting to the police. In addition, all participating motor vehicles must be insured under an automobile insurance contract with an insurer licensed to operate in Ontario to the limit stipulated in the pilot regulation, i.e. \$5 million liability coverage or, if there are eight or more passengers, \$8 million.

At the end of 2020, there were twelve automated vehicle pilot projects in Ontario. Since the pilot projects began, there have been no incidents reported.

In **Québec**, the Automobile Insurance Act does not provide for the determination of liability in an accident involving a CAV. Moreover, automobile insurance contracts provide for certain provisions regarding the order of action of automobile liability insurance policies between the owner and the driver, in accordance with the Automobile Insurance Act⁶.

In April 2018, the Québec government amended the Highway Safety Code to include the following definition: *“autonomous vehicle means a road vehicle equipped with an automated driving system that can operate a vehicle at driving automation level 3, 4 or 5 of the SAE International’s Standard J3016”*. Also, a new section was added to prohibit autonomous vehicles on Québec’s public roads. However, this new section does not apply to autonomous vehicles at driving automation level 3 whose sale is allowed in Canada. Finally, the amendments to the Highway Safety Code allow the government to set up pilot projects for CAV.

5 See [Motor Vehicle Safety Act](#), S.C. 1993, c.16.

6 CQLR, c. A-25.

Thus, the government of Québec may authorize the implementation of pilot projects to study, test or innovate with regards to the driving of CAV. To this end, within the framework of pilot projects relating to CAV, the government may provide for an exemption from the insurance contribution associated with the authorization to operate a vehicle and set the minimum required amount of liability insurance guaranteeing compensation for property damage caused by a CAV. The government may also require the manufacturer or distributor to reimburse the Société de l'assurance automobile du Québec (SAAQ) for compensation that it will be required to pay in the event of an accident involving a CAV. These special rules succeed rules prescribed by the Automobile Insurance Act and its regulations.

In August 2018, the Québec government implemented the *Autonomous Bus and Minibus Pilot Project* which is accompanied by guidelines specifying certain conditions of use, in particular that the manufacturer or distributor must:

- Provide and maintain a bond, the amount of which is determined by the SAAQ to cover the bodily injuries that the SAAQ may have to pay.
- Hold a civil liability insurance policy guaranteeing compensation for the material damage caused by the autonomous vehicle of at least \$ 1 million.

In addition, the guideline includes a specific definition of a “driver” applicable in the context of the use of a CAV. This definition reads as follows:

“a natural person, present in the vehicle, who totally or partially controls the operation of vehicle or, if the automated driving system is performing all the driving tasks, oversees the operation of the system, and is capable of taking over control of the vehicle’s automated system.”

The addition of this definition means that the operator of a CAV qualifies as a driver under the Automobile Insurance Act and is therefore protected under the Québec’s Public Automobile Insurance Plan, including under the Direct Compensation Agreement (DCA) that applies in the event of a collision.

Other aspects to be considered include the development of specific insurance products that allow consumers to protect themselves against cyberattacks while driving a CAV. The Fichier central des sinistres automobiles (FCSA), in its current form, was designed to allow insurers to know the history of a person’s driving experience, meaning their claim history. In the context of autonomous vehicles, the finality of the FCSA could be questioned. In the near future it might perhaps be more useful to collect information on the loss experience of a vehicle model rather than information on the loss experience of drivers. Finally, the DCA for the settlement of automobile claims applies to all property damage resulting from a collision involving two or more vehicles. Given that the compensation provided for in the DCA arises from the notion of liability, the DCA will have to be modified to deal with the liability attributable to an autonomous vehicle.

In **Alberta**, an owner of a vehicle is liable for the negligence of a driver who is in possession of the vehicle with the owner’s express or implied consent. The owner’s liability is grounded in section 187(2) of Alberta’s Traffic Safety Act, which deems a driver who is in possession of the vehicle with the owner’s consent to be the owner’s agent.

Moreover, in this province, basic insurance coverage (third party liability and accident benefits) is mandatory. Additional coverage (collision and comprehensive) is optional.

In the Fall 2018, the City of Edmonton conducted one of the first electric autonomous vehicle pilot projects in Western Canada. To ensure public safety during the pilots, a trained operator was in the vehicle to stop the vehicle at any point.

Regarding the other Canadian provinces and territories, the various laws or regulations provided substantially similar provisions as those listed above. Consequently, these provinces and territories will face the same issues with regards to CAV and legislative changes will have to be made.

4. SURVEY'S RESULTS

The development of CAV raises a host of questions and risks which could disrupt the automobile insurance industry. Among the many considerations, regulatory amendments to the various automobile insurance related Acts across Canada and the concepts of liability are of interest to regulators. It is in this context that the CCIR conducted a survey in order to better understand the concerns stakeholders. The survey addresses five specific themes, namely:

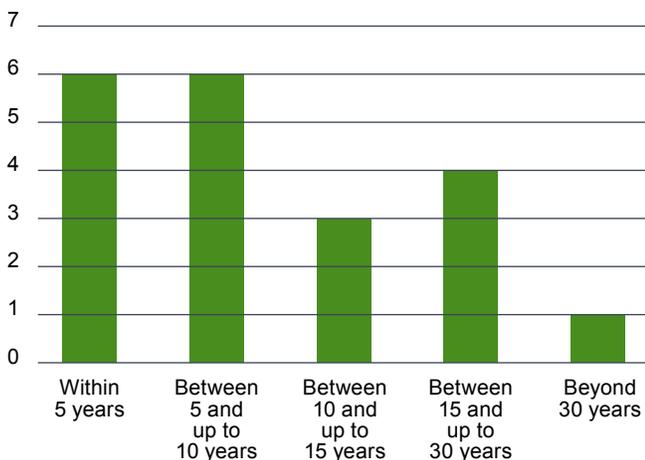
- **Timeline:** When will CAV be adopted?
- **Impact:** To what degree will adoption change the insurance landscape?
- **Preparedness:** Is the insurance industry ready for these changes?
- **Responsibility:** To whom for what?
- **Approach:** Which model should be adopted?

The survey was conducted during February and March 2020 among governments and industry associations; 20 responses were received.

4.1 Timeline: When will CAV be adopted?

The CCIR sought to know what were the stakeholders perspective regarding the presence of CAV on the roads.

Question: For some, full autonomous vehicles will arrive shortly on our roads or, according to others, we are decades away. What is your perspective?



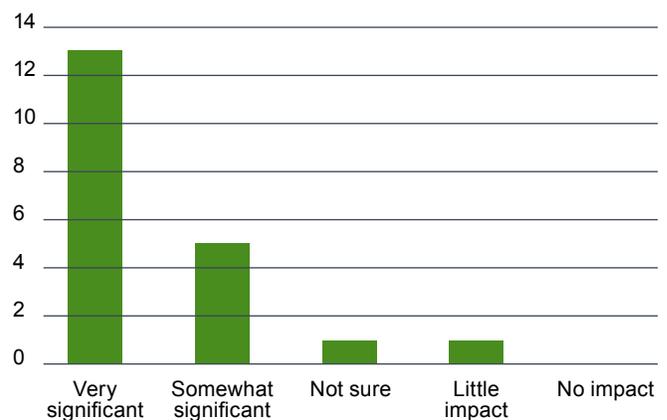
Among the responses obtained, 60% indicated that they believed autonomous vehicles will be more prevalent on our roads over the next ten years, while 25% do not expect to see these vehicles circulating for at least fifteen years.

For some, the use of these vehicles will be very limited for well beyond five years as their utility in Canada will be at best seasonal, and primarily in controlled driving situations. As well, the local environment, roadways and other infrastructure are challenging for full autonomous vehicles operations. The respondents advised that it will be difficult for autonomous vehicles to travel on gravel and winter roads, especially if these vehicles are only equipped with devices that follow the pavement marks. In addition, the limited Internet and cellular coverage in certain regions of Canada could be a challenge for the deployment of fully autonomous vehicles. Some respondents however, mentioned that in controlled weather conditions, autonomous vehicles would probably be able to better operate in the near future, while in locations where weather is a major factor for the operation of a vehicle, it might take many years before these vehicles are sophisticated enough to be used.

4.2 Impact: To what degree will adoption change the insurance landscape?

The CCIR asked whether the arrival of CAV would have a significant impact on the automobile insurance industry in Canada, particularly on the underwriting and pricing process.

Question: How significant an impact will autonomous vehicles have on your industry



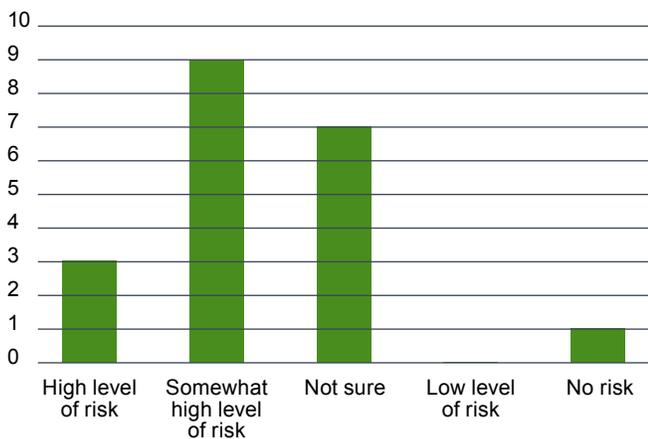
Among the twenty responses received, 90% believe autonomous vehicles will have a fairly or very significant impact on the automobile insurance industry in Canada.

In general, the respondents were unanimous regarding the fact that fully autonomous vehicles have the potential to change the entire paradigm of the automotive sector, in terms of automobile insurance, road safety, driving and well as vehicle ownership patterns. CAV will also collect significant amounts of data, thereby creating new risks, such as cyber security and software failures. This will also have the consequence of significantly modifying the claims management, fraud detection as well as underwriting and pricing processes.

It is anticipated that in the short term, fewer collisions shall occur. However, it is agreed the technology in the automated vehicles will make repair and replacement more expensive. Insurance policies will need to adapt to an environment where traditional vehicles and CAV will coexist. Consumers will therefore need to have access to policies that provides seamless coverage without the need to recover/submit claims to multiple stakeholders. In this context, it is noteworthy that the reporting of collisions will require data fields to indicate the degree of automation of the vehicle and/or the degree of care and control the driver is expected to have in the operation of the vehicle.

From a long-term perspective, when autonomous vehicles are fully adopted, the fundamental need for personal automobile insurance shall substantially decline, thereby reducing the volume of insurance premiums. Driver liability is likely to be transferred in whole or in part to automobile manufacturers, which may change how vehicles are insured and by whom.

Question: In your opinion, what level of risk do autonomous vehicles present to your organization/ company?

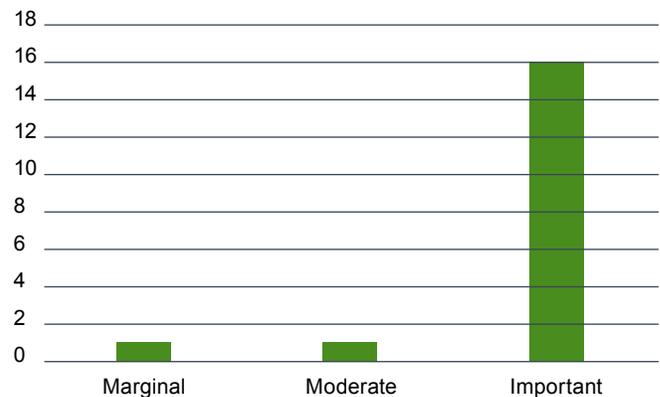


60% of respondents believe that the risk autonomous vehicles represents for their organization/company is high or very high, while 35% have no opinion.

Given that, in the long term, a reduction in insurance premiums is likely to occur, it may therefore also lead to a reduction in income for the insurance industry. Some respondents consider the risk posed by autonomous vehicles to be high and plan to review their business model to remain viable in the long term. Others felt that despite the high risk, it could be easily managed by appropriately adapting insurance products to offer cyber and product liability coverage for automobile insurance policies.

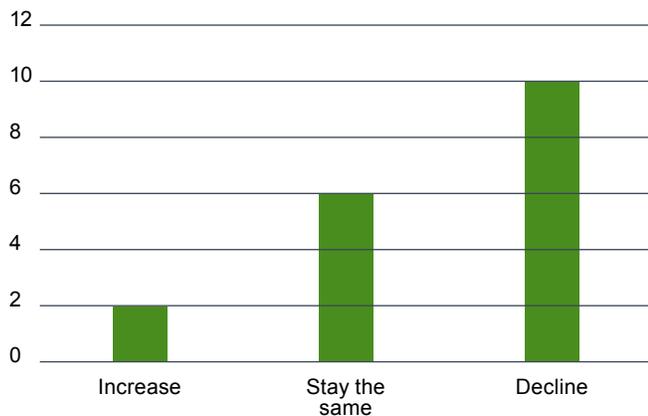
It was also mentioned that automated technology creates an additional risk for the industry, particularly regarding the costs associated with claims. Also, the shift in responsibility for collisions from the driver to product liability claims would be generally more complex, costlier and take longer to resolve than typical vehicle collision liability claims, meaning people injured in collisions involving an autonomous vehicle could have to wait longer to be compensated.

Question: Overall, what will be the importance of the impact of autonomous vehicles on the automobile insurance market?



Most respondents believe that autonomous vehicles will have a significant impact on the automobile insurance market. Indeed, given that the vehicles will be fully automated and that there will be no driver or no one in care or control of the vehicle, one of the biggest challenges will be the determination of responsibility during an accident. Who is responsible? Is it the owner, the automobile manufacturer or the software manufacturer? Thus, provincial governments will need to update their insurance laws to reflect this new reality, including technology malfunction in automobile insurance liability coverage. Also, autonomous vehicles will transform the insurance agency. Departments within insurance companies such as underwriting, actuarial and claims will need to understand this technology and adapt their business practices.

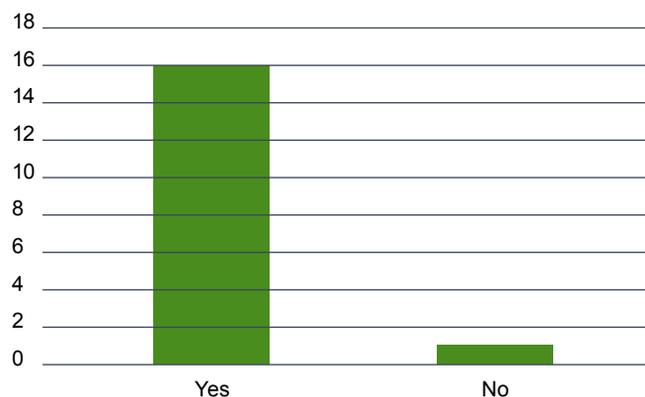
Question: What will be the likely impact of autonomous vehicles on the individual insurance premium?



In the short-term horizon, most respondents believe that insurance premiums will increase due to the higher repair costs associated with new technologies. However, in the long term, the impact of the decrease in the frequency of claims will be greater than the increase in repair costs, causing insurance premiums to decrease. As the fleet of vehicles on Canadian roads becomes more automated, and the technology improves – becoming more affordable, the rate of loss will decrease allowing insurance premiums to decline.

For others, it is very difficult to decide which predictions are accurate, especially when it comes to projecting collision frequency trends. Therefore, some expect the insurance premiums to remain the same, or even increase, given that the impact of the increase in repair costs will be greater than the decrease in the frequency of claims and that other incidents such as theft, vandalism, hail or environmental damage will likely persist.

Question: Will autonomous vehicles change insurance underwriting, pricing, sales, distribution and/or claims management?



The arrival of autonomous vehicles will have an impact on all the main departments of an insurer and they will have to adapt and understand this new technology. As these vehicles will provide access to more data, it is expected to help underwrite and price these risks.

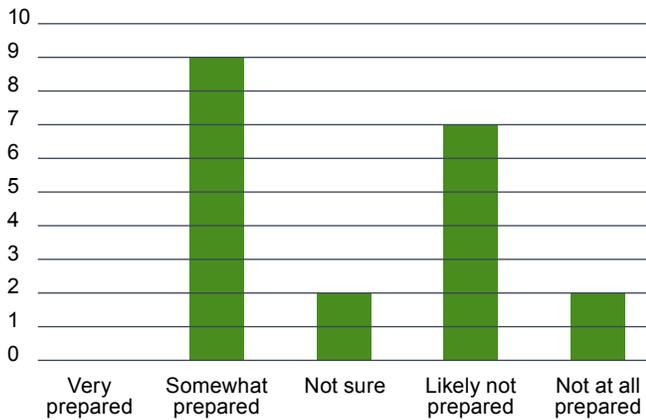
The evolution of ownership patterns accelerated by this new technology means sales could be “by trip” or “passenger/user” or the insurance might be part of the car purchase, thus forcing insurers to review their business model. Also, it will be more difficult to price if insurers can no longer use “normal” rating variables to determine premiums, especially since it is likely that vehicle and technology will become more important than the driver’s skill and experience.

On the side of claims management, the main change/challenge will be the determination of liability in a collision. Which party will be at fault? Was it the manufacturer error, could it be the municipality at fault, or is it possible for the vehicle to be hacked by an outside party?

4.3 Preparedness: Is the insurance industry ready for these changes?

The CCIR also asked respondents whether they believe that the automobile insurance industry in Canada is ready for the arrival of autonomous vehicles. A sub-question asked respondents to consider what kind of measures are planned in preparation for this.

Question: Is your organization/company prepared for the arrival of autonomous vehicles?

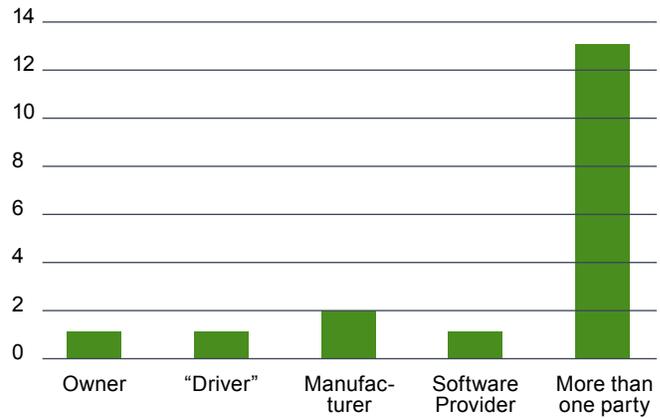


Based on the survey results, the automobile insurance industry in Canada does not appear prepared for the arrival of autonomous vehicles. Many insurers believe it is too early to predict how autonomous vehicles will change their business models and how the distribution of insurance products will be changed. Several insurers indicated a preference to wait and see the nature of the legislative measures proposed before beginning their analysis and work.

4.4 Responsibility: To whom for what?

With the arrival of autonomous vehicles, one of the biggest changes/challenges facing the automobile insurance industry will be the determination of liability in the event of an accident. The CCIR therefore sought to explore what the position of the industry was in this regard.

Question: In the case of an accident involving an autonomous vehicle, who should be held responsible?

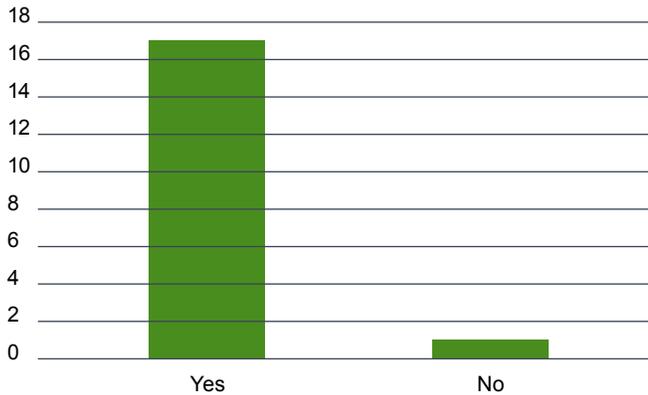


The industry's position seems divided as to who should be held responsible in the event of an accident involving an autonomous vehicle. For many, it depends on the level of autonomy of the vehicle at the time of the accident and whether the driver is required to be engaged. Therefore, for vehicles with a level of automation between 1 and 4, the party causing the collision must be held responsible and subject to a liability claim. It could be the vehicle owner, the driver/user, the manufacturer, the technology provider or any combination of these. However, for collisions involving fully autonomous vehicles, the industry is unanimous that the responsibility would be with the vehicle manufacturer and the provider of any software associated with the vehicle.

For some, fault rules will need to apply very much like they do today. However, instead of "party making left is at fault", it will need to consider exactly where the error occurred. Was it with the manufacturer, driver, software? Thus, the law must evolve to accommodate the additional potential cause of loss created by autonomous vehicles and software/satellite failures.

In summary, whatever method is used to determine liability, it is important for the insurance industry to make the claims process as simple as possible for the public.

Question: Should automobile manufacturers and software providers be required to provide data for accidents involving their vehicles?



94% of respondents indicated manufacturers and software providers should share data with insurers when an autonomous vehicle is involved in an accident.

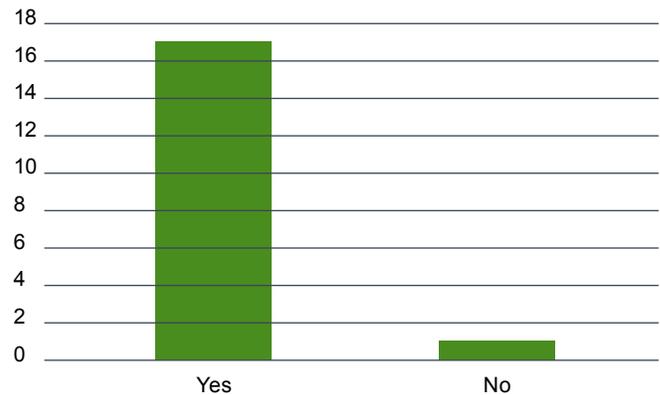
Respondents are unanimous that the data collected by manufacturers and software providers would be able to give details of pre-collision, collision and post-collision events that the driver or any vehicle occupant would not be able to provide to the insurer. Access to this data will facilitate the claims process and will be essential in determining liability in the event of a collision.

In addition, access to this data would allow insurers to carry out statistical analysis of collisions in order to identify trends specific to certain models of autonomous vehicles and establish pricing specific to each model of autonomous vehicles

4.5 Approach: Which model should be adopted?

Some jurisdictions, especially the United Kingdom (UK), have developed insurance programs for autonomous vehicles. The CCIR sought to explore if the programs developed by other jurisdictions could be applied in Canada or if there were other solutions.

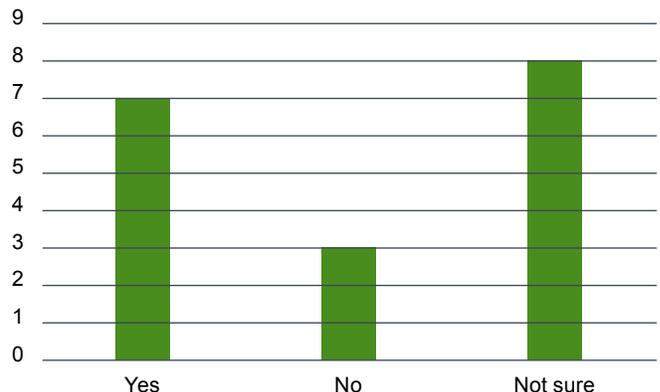
Question: Do you think a similar approach as UK is feasible for all Canadian provinces?



A majority of respondents believe that an approach like that adopted in the UK could be applicable in Canada. Many recommended the use of a single insurance policy covering driver negligence and the automated technology. The single insurance policy would be a more straight-forward claims process for the injured person. The injured person could pursue a liability claim against the insurer of the automated vehicle. After paying the liability claim, the insurer of the automated vehicle could try to recover part of the payment from the vehicle manufacturer or technology provider or other responsible party. With such an approach, anyone injured in an automobile accident involving an autonomous vehicle would receive timely treatment focused on recovery, regardless of who is at fault or responsible. This approach puts consumers first, which is important.

Respondents were supportive of this approach since determining product liability can be complex and take months, or even years, before a settlement is reached, leaving the injured party waiting for settlement.

Question: IBC recently proposed the establishment of a single insurance policy. Do you think this approach is feasible for all Canadian provinces?



As discussed in the previous question, most respondents believe that the use of a single insurance policy covering driver negligence and the automated technology would be a good solution for Canada. This solution ensures the customer is taken care of quickly and eliminates the possibility that the driver/owner/insured person suffering a loss must wait while multiple parties try to determine liability. However, opinions are more divided on whether this single insurance policy could apply to all Canadian provinces, especially in Québec.

5. ISSUES

5.1 Clarification of Liabilities - Fault Determination

Central to deployment of CAV on the road is the issue of liability. CAV may change the paradigm on which insurance liability determinations are based on in most Canadian common law provinces: namely the driver's fault. In fact, in the current auto insurance landscape, liability is determined by who's at fault. When fully automated vehicles hit the road with "users" instead of drivers, manufacturers might be at fault instead of the users/drivers in an accident, because of bugs in the software running the CAV or programming choices, for example.

Today, even though there have been fatalities resulting from flaws in the vehicle's software, Tesla has been able to avoid much of the criticism and legal trouble⁷. Tesla has argued its policy requires drivers to be constantly vigilant and always keep their hands on the steering wheel, so they can take control of the vehicle when needed, leaving the driver ultimately responsible for accidents.

However, with ADAS, the interaction or handover between the driver and the vehicle becomes an issue. Therefore, Google and some other manufacturers want to "skip" SAE Level 3 to concentrate on Level 4 and 5. In fact, human intervention once the "autopilot" is on posed a safety threat⁸ and could make the situation worse. If, for example, a manufacturer designs and sells a vehicle with a certain level of automation (Level 2 or 3) and an accident occurs, manufacturers may face a design defect, underperforming system or failure to warn the driver causing uncertainty of where the liability should be placed. With technology rapidly advancing, it is imperative that legislative framework deals with such matters.

Status Quo

The use of automated vehicles presents the possibility that an incident where damage to a vehicle or person occurs could have more than one cause, including the driver, the manufacturer, the software developers or other third parties. Therefore, assigning liabilities is and will become more complex. If the industry still wants to offer fair and quick compensation for people injured in collisions involving automated vehicles, the traditional approach to auto liability needs to give way to more product-related liability coverage or hybrid coverage. Thereby, the status quo does not seem to be viable.

If so, what would be the best way to regulate liability and fault determination? As mentioned in section II, the UK Parliament and the Insurance Bureau of Canada (IBC) both have proposed a legal framework for CAV.

⁷ HTSB [News Release](#), Final Reports for 2 Advanced Driver Assistance System Crash Investigations Published, March 19, 2020.

⁸ <https://www.autonews.com/shift/why-level-3-automated-technology-has-failed-take-hold>

Proposed Approaches

1. UK's Framework

In the UK, the Automated and Electric Vehicles Act 2018 (the "Act") received Royal Assent on July 19, 2018⁹. This legislation introduces the notion that an insurer can be liable for the consequences of an accident caused by the actions of a CAV at a time when it is not under the immediate physical control of a human being. The Act provides that an insurer will be directly liable for an accident caused by an automated vehicle where it is:

- "driving itself¹⁰ on a road or other public place in Great Britain";
- "insured"; and
- an "insured person or any other person suffers damage as a result of the accident"¹¹.

The Act does not indicate at which SAE Levels it would be deemed lawful or safe for a CAV to "drive itself" on the road. It is worth noting that the Act states that the insurer is not liable for the person's negligence in allowing the vehicle to begin driving itself when it was not appropriate to do so. The Act also allows the insurer to pursue the manufacturer or other person for any reimbursement or contribution if they can prove their liability in respect of the accident. The policy may also exclude or limit the insurer's liability for damage suffered by an insured person arising from an accident occurring as a direct result of:

- software alterations made by the insured person, or with the insured person's knowledge, that are prohibited under the policy; and
- a failure to install safety-critical software updates that the insured person knows, or reasonably ought to have known, are safety critical¹².

This Act gives people in the UK a potential route to compensation through insurance instead of via a product liability against the manufacturer.

- Are vehicles with SAE Level 3 automation to be excluded from the coverage?
- What kinds of rules would be needed from human-to-machine and machine-to-human to determine liability?
- Which software updates should be viewed as safety-critical? Who will decide which software updates are safety-critical? How would a reasonable person be defined to assess which software updates should be viewed as safety-critical? Should manufacturers be required to confirm whether a software upgrade is safety-critical?
- Does the framework sufficiently protect the individual/consumer in an emerging field?
- If the insurance coverage only applies when the vehicle is "driving itself", how will the industry be able to ensure that compensation claims continue to be paid quickly, fairly and easily if it needs to know who was driving at the time of the accident? Additionally, what if it needs to assess if it was "appropriate" to let the system drive?

Most of the survey's respondents believe that an approach like the UK could be applicable in Canada. Will the industry also deem this to be acceptable in Canada?

2. IBC's Framework

If the UK regime is not adequate for the Canadian context, is the IBC's proposed framework¹³ more appropriate? As described in their position paper, this framework consists of two components:

1. A single insurance policy covering both driver negligence and the automated technology; and,
2. A data-sharing arrangement with vehicle manufacturers, vehicle owners and/or insurers.

9 <https://services.parliament.uk/bills/2017-19/automatedandelectricvehicles.html>. Implementation is anticipated via several statutory instruments within the next few years.

10 The notion of "driving itself" is defined as "operating in a mode which is not being controlled and does not need to be monitored by an individual". The Act makes no mention of the varying levels of automation at which an AV may be driven.

11 Part 1, section 2 of the Act

12 Part 1, section 4(1) of the Act.

13 Insurance Bureau of Canada, "Auto Insurance for Automated Vehicles: Preparing for the Future of Mobility", November 2018 (the "IBC Framework").

The IBC Framework would also cover people injured in a collision caused by a cyber breach.

The IBC's proposed framework does not indicate at which SAE Levels it refers to when covering "automated technology". But like the UK's approach, the IBC Framework provides that if the technology in the CAV is responsible for the collision or the breach, the insurer will be able to recover, among other things, a certain amount from the party responsible for the malfunction or if the owner/operator fails to maintain safety-critical software. This amount will be reduced by a monetary deductible.

Despite access to the single insurance policy, it will still be possible for the injured person to sue a manufacturer or a technology provider and the claim would proceed according to standard tort rules¹⁴.

The IBC Framework also suggests establishing a legislated data-sharing arrangement among manufacturers, owners and insurers to facilitate determining the cause of an accident.

- Does IBC framework carefully manage the torts and insurance laws?
- What if the network crashes and an accident occur as a result? Who will be responsible?
- Does IBC framework encourage manufacturers to invest in product improvement?
- Is a product liability regime relevant for a system that performed (or did not perform) as it is advertised to not perform?
- Would it be necessary to ban manufacturers from using "autopilot", "self-driving" or "driverless car" in their advertising until they can clearly confirm that it is the case? Stated otherwise, should there be a clear distinction between "driver assistance" and "automated driving"?
- If a CAV does not have the latest "safety-critical software"¹⁵ updates installed, should it be automatically disabled as presenting a risk to other CAV/road users?
- How will insurers navigate situations involving a collision between a CAV and a traditional vehicle?

These frameworks are interesting and give the stakeholders a starting point to discuss what needs to be explored and adapted. Appendix B presents a comparative analysis of both.

5.2 Claims Resolution

The introduction of CAV is also expected to change the claims resolution process. It took two years for the *National Transportation Safety Board* (NTSB), an independent United States federal government agency, to determine fault, when somebody driving a Tesla Model X died using the "autopilot" on Highway 85 in Silicon Valley. The IBC proposed that insurers, manufacturers and technology providers have access to a mandatory binding arbitration process to settle any disputes.

- How is responsibility for the collision shared between the parties involved?
- Knowing that the supply chain in the automobile industry is a complex ecosystem composed of all levels of suppliers, subcontractors and third-party vendors, what would the fault determination rules be?
- How will insurers navigate situations involving a collision between a CAV and a traditional vehicle and how will the industry be able to ensure that compensation claims continue to be paid quickly, fairly and easily in these cases?
- How will insurers navigate situations when technology is used incorrectly, an accident occurs, and the manufacturer wants to defend itself?
- Would it be necessary to change limitation periods?
- How will the insured remain in control of their vehicle data to present its claim or to contest the insurer's decision not to pay?

¹⁴ *Idem*, pp. 11-12.

¹⁵ See IBC Framework, p. 11

5.3 Pricing of Insurance Products or Risks Assessment

In Canada, as around the world, human error is the most common cause of collisions. Over the next decades, this may change, which will raise questions for insurers on how to quantify risk and price insurance coverage.

The determination of the premium for CAV depends upon the collection of tremendous amounts of relevant, accurate and granular data, local conditions, type of vehicles, infrastructure in place and technology's performance. Technology is paramount to make CAV safer and the cost of insurance more affordable.

As shown in the survey, most respondents believe that manufacturers and software providers should share data with insurers when an automated vehicle is involved in an accident. However today, insurers are often unable to identify the complex nature of the technology on vehicles and how it is rolled out. It would also be important that the thinking and research regarding CAV not occur in silos. To introduce such technology safely to the public, collaboration is key, and insurers have a critical role to play to bring CAV in the market. Therefore, data sharing will become essential not only in claims handling, but also in the development and testing phase, in order to adequately adjust insurers' pricing models.

- How will insurers discount pricing as CAV technology increases the safety?
- How are insurers and manufacturers going to work together in a transparent way to ensure that the technology is clearly identifiable in the insurers' datasets and its performance is explicitly quantified considering intellectual property, patents and trade secrets?
- What is the degree to which potential benefits can be achieved when only a portion of the vehicles are automated and covered. What would be the threshold for this?
- How will the premium for the insured be calculated if the accident is caused by a malfunction of the technology?
- As the technologies develop and mature, would the algorithms be able to make better decisions than the average human driver, thus lowering the premiums? If this is the case, will society accept occasional "computer/code errors"?

5.4 Cyber Security and Data Privacy

As vehicles get connected, cyber security in the automotive industry is becoming an increasing concern. In fact, cars are more vulnerable than ever to hacking and data theft. Moreover, CAV collect a large volume of data from a variety of sources (sensors and cameras, geolocation, and sending/receiving data using electronic communications systems, for example). The responsible collection, use, protection, and disclosure of personal information is therefore a vital and fundamental part of any CAV development and deployment.

In January 2018, the Senate's Standing Committee on Transport and Communications published a report titled "*Driving Change: Technology and the future of the automated vehicle*"¹⁶, which highlighted significant security and privacy concerns. The IBC has also made a recommendation to suggest that the federal government updates its vehicles safety standards to meet "the highest standards for technology and cyber security".

In March 2020, Transport Canada published a report titled "Canada's Vehicle Cyber Security Guidance"¹⁷ to provide guiding principles that align with international best practices and to develop and approach to CAV that "prioritizes safety, security, and privacy". As ongoing issues in this field evolve, many issues need to be resolved.

- Considering that all levels of government and industry associations are responsible for providing leadership in managing and protecting data, what would be the best way to advance a coordinated national approach to cyber security in the transportation sector?
- What kind of approach may be proposed to ensure the findings are effectively captured by the stakeholders and used to support policy?
- Does the Transport Canada report on cyber security tackle the problem of complex and fragmented supply chain in the automotive industry?
- If a CAV does not have the latest "safety-critical software"¹⁸ updates installed, should it be automatically disabled as presenting a risk to other CAV/road users?

16 Report of the Standing Senate Committee on Transport and Communications, "[Driving Change: Technology and the future of the automated vehicle](#)", January 2018.

17 Transports Canada, « [Canada's Vehicle Cyber Security Guidance](#) », March 2020. This report provides an in-depth analysis of the current state of CAV work in Canada and to inform all stakeholders about the TC's vision for the safety of CAV.

18 See IBC Framework, p. 11

- When a vulnerability is discovered, how would it be possible to update thousands of cars quickly, particularly if those cars need to be taken to a dealer/garage to be updated?¹⁹
- What if the vehicle is involved in an accident on the way to the garage for the software or hardware update?
- Who would be able to access the large amount of data from CAV?
- How can personally identifiable data may be managed appropriately?
- How can we ensure individuals are properly notified about what personal data is collected, how it is used and who it is disclosed to?
- In case of an accident, who will own, access, and use the data that CAV generate?
- In the years to come, should CAV be equipped with a “black box” data recorders²⁰, much like the aviation industry, to collect and record a set of prescribed data?

5.5 Conclusion

To ensure the risks associated with CAVs are managed appropriately, policymakers and regulators may consider a shift from a driver’s fault or negligence-based personal liability focus to a products liability setting. This shift is only possible through careful considerations. The mechanisms by which CAV liability should be evaluated, and responsibility assessed, are complex issues involving trade-offs.

Insurers will need to adapt their models for pricing of insurance coverage. These models will need to recognize improved performance of the technology over the years. The risks will also need to be assessed and compared to appropriate benchmarks and to be looked at holistically.

For CAVs to gain some momentum, the collection of data should be a cooperative effort amongst all stakeholders. During testing and learning, it is important for the ecosystem to come together. Armed with information that it is shared; all stakeholders can learn from each others’ challenges and experiences and devise a roadmap for the safe deployment of CAVs in Canada.

Difficulties around attempts to adapt the current law is likely to lead to years of uncertainty for drivers and injured people as the use of CAV increases. That is why more dialogue between the public and government is important and likely to impact consumers’ appetite for CAV on Canada’s roads.

¹⁹ Transports Canada, “[Safety Assessment for Automated Driving Systems in Canada](#)”, January 2019, p. 18.

²⁰ See IBC Framework, pp. 12-13

APPENDIX A

AUTONOMOUS VEHICLES

Levels of Vehicle Automation

The Society of Automotive Engineers have developed the following five levels of vehicle automation:

Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
No Automation: the driver is in complete control of the vehicle at all times.	Driver Assistance: the vehicles can assist the driver or take control of either the vehicles speed, through cruise control, or its lane position, through lane guidance.	Occasional Self-driving: the vehicle can take control of both the vehicles speed and lane position in some situations, for example on limited access freeways.	Limited Self-driving: the vehicles is in full control in some situations, monitors the road and traffic, and will inform the driver when he or she must take control.	Full Self-driving Under Certain Conditions: the vehicle is on full control for the entire trip in these conditions, such as urban ridesharing.	Full Self-driving Under All Conditions: the vehicle can operate without a human driver or occupants.

What does the human in the driver's seat have to do?

You are driving whenever these driver support features are engaged - even if your feet are off the pedals and you are not steering.

You are not driving when these automated driving features are engaged - even if you are seated in "the driver's seat".

You must constantly supervise these support features; you must steer, brake or accelerate as needed to maintain safety.

When the feature requests, you must drive.

These automated driving features will not require you to take over driving.

These are driver support features

These are automated driving features

What does these features do?

Provide warnings and momentary assistance driver.

Provide steering OR brake/acceleration support to driver.

Provide steering AND brake/acceleration support to driver.

Can drive the vehicle under limited conditions and will not operate unless all required conditions are met.

Can drive the vehicle under all conditions.

Examples

Automatic Emergency Breaking, Blind Spot Warning, Lane Departure Warning

Lane Centering OR Adaptive Cruise Control

Lane Centering AND Adaptive Cruise Control

Traffic Jam Chauffeur

Local Driver-less Taxi (Pedals steering wheel may not be installed)

Same as 4 but features can drive everywhere in all conditions

APPENDIX B

Object	UK's Approach	IBC's Proposed Framework
Purpose	Quick and smooth path to compensation for the injured person	Fair and quick compensation for people injured in collisions involving automated vehicles
Scope	Vehicles that is designed or adapted to <u>be capable</u> , in at least some circumstances (...), of <u>safely driving themselves</u>	Automated vehicles that are equipped with technologies that <u>facilitate or control</u> driving systems <u>without direct input</u> from the human driver (SAE Five Levels of Vehicle Autonomy)
Liability	An accident is caused by an <u>automated vehicle driving itself</u> The automated vehicle's insurer is liable for damage.	A single insurance policy covering both <u>driver negligence</u> , the <u>automated technology</u> and a <u>cyber breach</u> . The automated vehicle's insurer is liable for damage.
Contributory negligence	If the accident is caused by the injured party, the insurer's liability is subject to whatever reduction under the Law Reform.	
Liability Payments Recovery	The insurer may attempt to recover any liability payments from: <ul style="list-style-type: none"> • Negligence (vehicle manufacturer or technology provider) • Product liability (vehicle manufacturer or technology provider) 	The insurer may attempt to recover any liability payments (part associate to their fault minus a monetary deductible) from: <ul style="list-style-type: none"> • Negligence (vehicle manufacturer or technology provider) • Product liability (vehicle manufacturer or technology provider) • Cyber breach (party responsible) <p>The injured person with a claim valued at more than the single insurance policy's liability limits may also attempt to be compensated by the above-mentioned persons.</p>

Object	UK's Approach	IBC's Proposed Framework
Coverage	Insured person or any other person suffers damage because of an accident: no maximum amount specified	Driver negligence or automated technology: no amount specified If a collision is caused by the vehicle owner and /or operator circumventing, modifying or failing to maintain safety-critical software: up to the minimum legislated amount
No coverage	Accident resulting from unauthorized software alterations or failure to update software. Person negligence in allowing the vehicle to begin driving itself when it was not appropriate to do so	
Claims	Once the insurance claim has been settled, the insurer can claim against anyone who is liable to the injured party	If the automated technology caused the collision, the insurer would have the right to recover liability payments from the party responsible for the collision
Arbitration process	N/A	Insurer, vehicle manufacturer and technology provider have access to a mandatory binding arbitration process
Data	N/A	A data-sharing arrangement with vehicle manufacturers, vehicle owners and/or insurers
Entry into force	Implementation is anticipated via several statutory instruments within the next few years.	Still a proposition – a starting point for an interesting discussion