Canadian Automated Vehicle Initiative

CAV Update May 2024

From the Editors

Self-driving vehicles should be expected to achieve a level of safety equivalent to, or higher than, a careful and competent human driver. This definition is taken from a new Autonomous Vehicle Bill in the UK that received Royal Assent on May 20, 2024.

In the past, there has been too much hype about self-driving cars, including their safety. I have called out the US Government, Vision Zero, Volvo, and others. The rhetoric about “the end of traffic deaths” and “crash-proof cars” has been both unfortunate and misleading.

The reality is that self-driving cars will be safer than human-driven vehicles because they have an array of sensors including long-range radar, short-range radar, LiDAR, and vision systems that are linked to powerful processors and Artificial Intelligence systems. The sensors will scan around the vehicle many times each second. In addition, self-driving technology does not get distracted or drunk, and it obeys all the traffic laws. If there is an issue, the system can react in a fraction of a second, compared to a few seconds for a human driver.

However, self-driving vehicles will never be totally safe. We know that all hardware and software fail occasionally. Also, there are “edge case” situations which were not envisaged. For example, there was a recent collision in the US when a robotaxi was confused when it saw a car being towed backwards. When these cases are identified, software updates can be distributed over-the-air to self-driving cars so they can all benefit from the upgrade.

People understand that human drivers make mistakes, but they expect that self-driving technology will be perfect -- and it won't be. The definition of safety in the UK's AV Bill is much better

In Canada, stakeholders – governments, industry, associations, and academia -- need to do a better job of managing the public's expectations on the safety of self-driving vehicles. At the moment, governments say that they will ensure that self-driving vehicles will be “safe”. Many people could easily misunderstand this to mean "totally safe", which will never happen. One result of this messaging is that when self-driving cars are deployed in volume on Canadian roads, there will, sadly, be collisions and deaths. This will cause a huge negative reaction from the media and the public. I encourage Canadian governments to get ahead of this and adopt similar messaging to the UK’s.

Canadian CAV News

CAVI is very pleased to announce the first five members of its Board of Directors:

- Brigid Canil, Director, **BC Ministry of Transportation and Infrastructure**
- Burak Kantarci, Full Professor, **University of Ottawa**
- Dana Borschewski, Regional VP Americas, **Aurrigo**
- Keith Fagan, Senior Advisor, **Canadian Automated Vehicle Initiative**
- Lui Greco, Manager Regulatory Affairs, **CNIB Foundation** - Halifax

Barrie Kirk, CAVI's President, said "I am pleased with the expertise that the Board members bring to CAVI. Its mission is exciting and challenging, and I welcome the Board's extensive combined experience. I am especially pleased that we are achieving diversification both by expertise and geographically. We are striving to continue this with the additional Board members."

The plan is that there will be a 12-person Board that is diversified by expertise, geography, and gender. The remaining Board members will be announced in June.

CAVI is working with Andrew Miller of **Paladin Consulting** to help self-driving cars improve life in Canada. As part of that work, we are building a database of the Canadian automated vehicle ecosystem. To that end, we are encouraging all stakeholder organizations to fill out a short survey.

As a subscriber to *CAV Update,* your organization is almost certainly such a stakeholder. We encourage you to participate!

This survey will take around three minutes to complete and will help CAVI develop strategies to unlock the power of vehicle automation to improve the lives of all Canadians.

This is a voluntary survey, but your participation is important. Let's work together to build a better, safer Canada!

The survey is here. Please note that the form can be completed from any e-mail address. While a prompt to log into Google may appear, this is not required.

We had previously reported on a truck platooning project in Alberta led by the **Alberta Motor Transport Association** (AMTA) in collaboration with the **University of Alberta** (U of A), **Bison Transport** and other partners. The $2.3 million funding for this project was provided by Transport Canada. Officially known as *Cooperative Truck Platooning System* (CTPS), this project was the next phase of a truck platooning project conducted at Transport Canada's *Motor Vehicle Test Centre* in Blainville, Québec in October 2016. Whereas the 2016 project was performed on a limited access test track, the CTPS project was conducted on Highway 2 – a major north-south roadway between Calgary and Edmonton. In all, two semi-trailer trucks made 41 trips between Calgary and Edmonton. In theory, truck platoons can benefit from lower aerodynamic drag, leading to better fuel efficiency and fewer emissions. However, the research project's findings did not show substantial benefits for fuel saving, although the technology itself worked safely, even when the trucks were driving in –27C and on snow-covered roads. More information at this link. Copy of the 13-page paper by the U of A researchers titled *Cooperative truck platooning trial on Canadian public highway under commercial operation in winter driving conditions* can be viewed/downloaded at this link.

A paper published in June 2021 by the **University of Calgary**'s Department of Geography was recently cited in an article on drone delivery in the **Wired** magazine. The paper titled *Weather constraints on global drone flyability* had taken an in-depth analysis (via simulation) on how weather conditions can dictate and limit the flight of delivery drones. Now **Amazon** has indicated that its drone delivery operations in Arizona will not be possible when the ambient temperature exceeds 104 degrees Fahrenheit, or 40 degrees Celsius. Evidently, temperatures in Arizona exceed 40 C for about 3-months in a year. Amazon had high hopes when it first announced its **Prime Air** drone delivery initiative in 2013. However, the program is years behind and still operating a very limited service in some parts of the United States. According to Wired, Amazon had to offer gift cards to its customers in California to incentivize them to use its drone delivery service. At present, Prime Air delivers light-weight merchandise in certain markets in California and Texas. The Wired article can be viewed at this link, and the 13-page paper by the U of C can be viewed/downloaded at this link.

International CAV News

Simulation, Testing & Validation for Automated Driving is an interesting conference that will take place on 10–12 September 2024 in Stuttgart, Germany. The conference will focus on the full lifecycle of automated driving, concentrating mainly on the trend of L2, L2+ and L3. The event will also discuss the jump from L3 to L4 and L5. Topics to be covered will include simulation, testing and validation, sensors, homologation, and other new technologies.

Speakers include: **CAVI, Scania, Renault, Hyundai Motor, Volvo, IVECO,** and **ZF Group.** CAVI is pleased that it has entered into a media partnership with Automotive IQ of the UK, the event organizer. Barrie Kirk will also speak at the conference. For more information, the official event website is here.

A recent report in **ITS International** titled *Breathing life into V2X 'Zombie* explored some of the issues that have stalled wide adoption and deployment of connected vehicle technologies. For any technology to make a serious inroad into society, a critical mass of users is needed. For example, if Google Maps did not have a billion active users submitting their position data to the cloud, this app may not have found the near universal acceptance that it now enjoys. There is now renewed optimism that *Vehicle-to-Everything* (V2X) technologies may be on an upswing once more. Reasons for this optimism are global interest in *Net Zero* initiatives to reduce carbon emissions, and to create more efficient traffic systems for tackling traffic congestion in many cities. Another factor is significant reduction in cost of the equipment needed for implementing V2X compared to earlier times. It is envisaged that V2X capability can be embedded into 5G connectivity platforms using the cellular V2X (C-V2X) protocol standard. Some countries such as China have been quicker in adopting the technology. It is estimated that 50% of all new cars sold in China will feature C-V2X as standard in 2025. The article is in two publications and can be viewed at this link or this link.

Many modern high-end vehicles are equipped with an assortment of *Advanced Driver Assistance Systems* (ADAS). These include *Adaptive Cruise Control* (ACC), *Automatic Emergency Braking* (AEB) and *Automatic Lane Centring* (ALC) among others. The **Insurance Institute for Highway Safety** (IIHS) is an independent, non-profit organization dedicated to reducing deaths, injuries and property damage from motor vehicle crashes. IIHS recently evaluated 14 different ADAS systems from BMW, Ford, General Motors, Genesis, Lexus, Mercedes-Benz, Nissan, Tesla and Volvo. Out of the 14 systems, only one (Lexus) got a pass. Two were rated marginal and 11 were rated as poor. Broadly, the evaluations looked at five criteria as follows:

- Driver Monitoring
- Attention Reminders
- Emergency Procedures
- Driver Involvement
- Safety Features

IIHS has developed a ratings system for assessing the efficacy of exsiting and future ADAS systems. This 32-page document was published in March 2024 and is titled *Safeguards For Partial Driving Automation: Test Protocol and Rating Guidelines*. It can be viewed/downloaded at this link. The IIHS article on this subject can be viewed at this link. A short YouTube video by the President of IIHS on this subject can be viewed at this link.

In a somewhat related story, the **American Automobile Association** (AAA) reports that most car buyers trust ADAS systems such as *Adaptive Cruise Control* (ACC), *Automatic Emergency Braking* (AEB) and *Automatic Lane Centring* (ALC) despite tests and verification results reported in the previous story. However, this is not the case when it comes to trusting self-driving cars. This year's survey by AAA revealed that mistrust in AVs is still around 66% of those surveyed. This is virtually the same as in 2023 and has been creeping up over the past several years. Only 9% said they trusted AV technology. The survey suggests that some high profile crashes by Tesla vehicles may have eroded trust in AVs in general. More information at AAA's site at this link.

Cambridge-based (UK) AV developer **Wayve** made news on May 7, 2024 by announcing a new funding round in the amount of US$1.05 billion – Europe's biggest-ever AI deal. The lead investor is Japan's venture capital firm **Softbank**. Other investors are GPU-maker **Nvidia** and an existing investor **Microsoft**. Wayve claims its AI based automated driving system is hardware-agnostic and can be incorporated into all vehicles and robotic systems. Its term for its system is *Embodied AI* which features an AI that can understand and adapt to unpredictable circumstances. Wayve has integrated its automated driving system with a chatbot-style langauge model, so it can explain what it is doing. Founded in 2017, Wayve has so far raised US$1.3 billion in funding. More information on Wayve's site at this link. For a contrasting story on this news item, see the last article of this newsletter.

At the opening of the **UK Parliament** in November 2023, King Charles declared the passage of legislation for automated vehicles as one of the priorities for the government. Since then, as mentioned above, the *Automated Vehicles Bill* has made steady progress through the House of Lords and the House of Commons. The Bill received Royal Assent on **May 20, 2024** and is now law in the United Kingdom. The UK Government says this is "one of the world's most comprehensive legal frameworks for self-driving vehicles, with safety at its core". Hopefully, this will accelerate the development and deployment of CAVs as well as attracting substantial investment in industry. The bill itself and the history of its progress can be viewed at the UK Parliament's site at this link.

A recent article in **Forbes** magazine focused on the proliferation of *Advanced Air Mobility* (AAM) and the need to prepare for when there are swarm of these drones in the skies over urban areas carrying goods, passengers or both. In anticipation, the **National Aeronautics and Space Administration** (NASA); has gotten involved in the research to determine how much noise tolerance the citizens living under these skies are willing to put up with. It is often stated that the noise generated by a multi-rotor drone is much less than the noise made by a helicopter. However, this will not be the case when there are many drones flying overhead simultaneously. The NASA study is called *Remotely Administered Psychoacoustic Test for Advanced Air Mobility Noise Human Response*, and it involves a group of volunteers who have agreed to listen to various levels of simulated noise similar to that generated by a fleet of drones. The test subjects will participate in an online test application using their

own computers and audio playback devices, such as headphones, to listen to calibrated sound stimuli. This will then determine the *level of annoyance* endured by the participants. The Forbes article can be viewed at Forbes's site in two places: this link or this one.

German carmaker **Volkswagen** (VW) has announced plans for large-scale production of service vehicles with Level 4 capability.

The vehicle known as *VW ID. Buzz AD* is the result of a partnership between VW and Intel-owned **Mobileye**. The *Buzz AD* part of the name is Mobileye's automated driving system that will be integrated into the VW vehicle. The VW ID. Buzz AD vehicle will be equipped with two independent computers, 13 cameras, nine LiDAR units developed by **Innoviz**, and five radar units, each capable of producing 360-degree views of the surroundings. A cloud connection provides autonomous vehicles with swarm data from other road users about the traffic situation and updates to the 3D maps. More information is at this link.

And finally, a recent article in **Jalopnik** titled *We've Wasted Nearly $50 Billion On Self-Driving Cars. Here's Where That Money Should Have Gone* - plays a *what if* with all the monies earmarked for further development of autonomous vehicle technologies. It speculates that US$50 billion will be spent till the end of 2025. It then gets into a thought experiment of what other transportation projects could be paid for with US$50 billion. Examples given are the recently announced **Brightline** high-speed railway between Los Angeles and Las Vegas at an estimated cost of US$12 billion and expected to remove 3 million cars from the roads every year, modernizing the rail system between Boston and New York at a cost US$23.4 billion and other rail projects for the rest of the US$50 billion. The article has a definite slant towards public transportation and especially high-speed rail projects. The Jalopnik article can be viewed at this link.

JALOPNIK

Obsessed With The Culture Of Cars

CAVI Speakers' Bureau

CAVI provides speakers for many different types of events across Canada, the US and overseas. On the one hand, our keynotes and presentations have core messaging on the status of CAVs, their deployment scenarios, and the impact on business plans, government regulations, and almost all aspects of society. On the other hand, each presentation is customized for the audience and the time available.

To inquire about a speaker for your event, please write to speakers@cavi-icva.ca

Upcoming CAV-Related Events

June 4-6, 2024	ADAS & Autonomous Vehicle Technology Expo – Europe, Stuttgart, Germany
June 5-6, 2024	AutoTech Detroit, Suburban Collection Showplace, Novi MI
June 27-28, 2024	Last Mile Delivery Conference & Expo, Las Vegas NV
August 28-29, 2024	ADAS & Autonomous Vehicle Technology Expo, San Jose, CA
September 10-12, 2024	Simulation, Testing & Validation for Automated Driving, Stuttgart, Germany
September 16-20, 2024	30th ITS World Congress, Dubai, UAE
September 22-25, 2024	2024 TAC Conference & Exhibition, Vancouver, B.C.
Fall 2024	IEEE Vehicular Technology Conference (VTC) 2024 Fall, Washington DC
October 22-24, 2024	Automotive Testing Expo, Novi, MI
November 5-7, 2024	2024 Aerial Evolution Canada Conference & Exhibition, Ottawa ON

About CAV Update

CAV Update is a free, monthly summary of news and analysis in the world of connected and automated vehicles, and their impact on the private sector, government, and society.

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The Canadian Automated Vehicle Initiative (CAVI - formerly CAVCOE) is an association for all stakeholders in industry, government and academia involved in any aspect of the ever-increasing automated vehicles ecosystem.

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