CAVCOE

CAV Update

A monthly newsletter on the CAV ecosystem

August 2022

From the Editors

The Canadian CAV ecosystem is looking great. We have more articles on Canadian initiatives and events than ever before: 7 articles on various announcements, as well as 6 more on Canadian conferences and webinars being held this Fall.

Here is a summary list in chronological sequence of Canadian events this Fall that may interest you:

- **September 20, 2022**: **TCXpo** hosted by **Area X.O** in partnership with **Transport Canada** and **Innovation, Science and Economic Development Canada (ISED)**
- **October 5, 2022**: webinar on **Supply Chain and Automated Freight** sponsored by CAVCOE and other stakeholders.
- **November 2, 2022**: webinar organized by **PAVE Canada** that CAVCOE is also helping with.
- **November 15-17, 2022**: double-header event. **Sub Zero North's** conference *Ready…Set…Test,* is its first ever cold weather testing conference with a special feature on alternative fuels. It is in Winnipeg and Thompson MB. Linked to this is the following event.
- **November 17, 2022**: the **National Research Council Canada (NRC)** and **Transport Canada (TC)**, in collaboration with **Sub Zero North**, have announced a one-day hybrid (in-person and online) workshop on *Canada: Terrains and Temperatures for Testing Transportation Technology,* this is part of the series on *Community of Practice (CoP) for Intelligent Transportation Systems (ITS) Living Labs in Canada*.
- **December 2022**: preliminary announcement for the next **CAV Canada** conference.

The following articles have details on each event.

Canadian CAV News

Area X.O in partnership with **Transport Canada** and **Innovation, Science and Economic Development Canada (ISED)** on September 20 will host *TCXpo***,** a smart mobility demonstration day featuring more than six dozen Canadian start-ups and hundreds of innovators, industry leaders, regulators, and investors. Hosted at Area X.O's all-weather R&D complex in Ottawa, this epic event will include interactive

demonstrations, tours, and multiple hands-on exhibits that span next-gen smart mobility, autonomous technology, smart city solutions, defence and security, public safety innovations, cybersecurity, smart farming, unmanned aerial systems and drones, IoT and robotic technology. We are advised that people should apply soon as there are a limited number of spots available. For more information, please click here.

In the next event, we invite you to learn about Canadian and global initiatives in *Supply Chain and Automated Freight,* and why and how we can make progress to move cargo to and from our ports, city to city, and the last mile. There will be industry and government speakers' presentations and a panel discussion on actualizing Automated Freight's full potential and benefits for Canada. This is also your opportunity to ask questions and offer input toward solutions.

Six leading stakeholders are sponsoring this webinar: **AIoT Canada**, **Alberta Motor Transport Association (AMTA)**, **CAVCOE**, **The Chartered Institute of Logistics & Transport in North America (CILTNA)**, **Intelligent Transportation Society of Canada (ITS Canada)**, and **Vitesse.**

When: Wednesday, October 5, 2022, 13:00 - 14:30 ET.
To register: https://bit.ly/3PMbWSR

As we announced last month, PAVE Canada is organizing a webinar set for November 2, 2022. CAVCOE and others are helping with this event.

The webinar title is ***CAVs Today, Emerging Trends and Getting to Market.***
As connected and autonomous vehicle (CAV) technologies evolve, these vehicles will become increasingly common in our communities, and the public will have an opportunity to experience the technology first-hand. And Canada is getting ready: all levels of government, industry and the public are evaluating the pros and cons and planning for this transportation future. But the introduction of this new technology raises many questions: What autonomous vehicles will we see first? Who is liable if things go wrong? And what does the public think?

The organizers have assembled CAV experts from industry and government across Canada to address these questions and share their insights into the CAV evolution.

This free webinar is on November 2, 2022, and is sponsored by **PAVE Canada**, **CAVCOE**, **Liberty Mutual**, and **Marsh**. Please RSVP at https://pavecampaign.org/event/webinar-cavs-today/

Sub Zero North has announced *Ready…Set…Test,* its first ever Cold Weather Testing Conference with a special feature on alternative fuels. The agenda is unique. It takes place over 3 days in both Winnipeg and Thompson. The agenda is packed with opportunities to learn and network with speakers and delegates from across Canada and beyond.

Ready…Set…Test takes place from November 15-17, 2022. The Early Bird rate ends on September 30th and there are a limited number of seats to Thompson with the presenting sponsor, Calm Air.

To register and view the agenda, visit SubZeroNorth.ca or contact Laura Finlay at lfinlay@northcentraldevelopment.ca

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As mentioned earlier, the **National Research Council Canada (NRC)** and **Transport Canada (TC)**, in collaboration with **Sub Zero North**, have announced a one-day hybrid (in-person and online) workshop on *Canada: Terrains and Temperatures for Testing Transportation Technology,* part of the *Community of Practice (CoP) for Intelligent Transportation Systems (ITS) Living Labs in Canada* series. The event will be held in Thompson, Manitoba on November 17, 2022. The workshop will consist of a guided tour of local winter testing facilities in the morning, followed by keynote speakers and CoP members' updates in the afternoon. Shuttle buses will be provided for participants. There is no cost for attending the CoP workshop.

IMPORTANT: The CoP is pleased to announce that CoP members who are planning to attend the CoP workshop in person can take advantage of special discount flights from Winnipeg to Thompson by registering for a separate event in Winnipeg being hosted by Sub Zero North. More information and contact details are above.

If you are interested in attending the CoP workshop, please write to Douglas Miller douglas.miller@tc.gc.ca or Kristine Philippe kristine.philippe@tc.gc.ca to register and attend. They can also answer any questions you may have. An agenda for the workshop will be published soon.

CAV Canada, Canada's smart mobility event is coming this December. Stay tuned for upcoming announcements on the 2022 date, program, format and registration link.

CAV CANADA
The Future of Smart Mobility

In other Canadian news**, Prairies Economic Development Canada** (PrairiesCan) is the federal department that diversifies the economy across the Canadian Prairies. On August 4, 2022, PrairiesCan opened a new office in **Thompson, MB**. At the opening event, the Minister for PrairiesCan also announced new funding of $2,350,435 for seven projects in communities across northern Manitoba. This includes the winter test facilities in Thompson used by jet engine manufacturers as well as automakers which use the facility for their cold weather testing. PrairiesCan will work and share offices with **Communities Economic Development Fund** (CEDF). CEDFis a Manitoba Crown Corporation that has operated in northern Manitoba since 1973. Its mission is community building, creating connections, and business development. More information is at this link.

Ontario-based **Magna International Inc.** is a major supplier of automotive parts as well as complete vehicles. Magna also has a thriving and expanding business in A*dvanced Driver Assistance Systems* (ADAS). Magna has teamed up with Waterloo-based **BlackBerry Limited** to leverage its QNX real-time operating system in Magna's ADAS and other advanced systems. Additionally, BlackBerry will provide professional engineering services for system-level integration, performance optimization, and solution validation. More information is at this link.

In a first for Canada, delivery drone company **Drone Delivery Canada** (DDC) has been issued a licence by **Transport Canada** to carry dangerous goods and fly its delivery drones *Beyond the Visual Line of Sight* (BVLS). The customer for this project is **University of British Columbia** (UBC) Faculty of Medicine. The project is known as the Remote Communities *Drone Transport Initiative* (DTI). Under this project, DDC will transport a variety of cargo for the *Stellat'en First Nation* and the *Village of Fraser Lake*, located in Central Northern British Columbia. More information is on DDC's site at this link.

In another **UBC** related development, the plans by UBC, the **British Columbia Automobile Association** (BCAA) and **Rogers Telecommunications** to deploy an *EasyMile EZ10* automated shuttle on the UBC campus have been cancelled. The reasons given for the cancellation were regulatory approval, vehicle availability, and government support. The regulatory approval necessary was for the provincial government to make an exception in the *BC Motor Vehicle Act* to allow for the legal operation of the driverless vehicles on the campus. The funding for this project was to come from **Transport Canada**. More information is at this link.

The Canadian Standards Association (CSA Group) has published two draft documents concerning CAVs and has invited comments from interested organizations and individuals. One document is titled *Digital Infrastructure Guidelines for Connected and Automated Vehicles* and the other is *Cybersecurity, Data Management, and Privacy Guidelines for Connected and Automated Vehicles*. The first document primarily addresses issues related to public safety, security, and privacy in conjunction with detailed knowledge

of the legal, regulatory, and technological landscape, and ensuring compliance with all relevant and applicable law, while the second document's purpose is to address issues related to security, privacy, and public safety. More information is at this link (for the first draft document) and this link (for the second draft document). The deadline for submission of comments is September 2, 2022.

ENCQOR 5G is a Canada-Québec-Ontario partnership focused on research and innovation in the field of 5G. It manages *Innovation Platform as a Service* (iPaaS) testbed designed for incorporating 5G technologies into areas such as connected and autonomous vehicles, remote healthcare, virtual/augmented reality, smart cities, and Internet of Things (IoT). At present, iPaaS is offered through three ENCQOR 5G *Digital Innovation Hubs*. This normally requires that interested companies and organizations be physically present in Ontario or Quebec to use these hubs. A new method of access is providing remote access to these facilities. More information and how to apply for remote access are at this link.

An autonomous food delivery robot developed at the **University of Waterloo** (UoW) is about to go into service soon on the campus of UoW. Dubbed the *GoosEX*, it weighs about 100 Kg and runs on four wheels, and is equipped with eight cameras, several radar units, ultrasonic sensors and a 5G router. It has six compartments for multiple food deliveries. On a full charge, it has a range of about 40 Km. The design supports a quick change of batteries when necessary. The startup behind this robot – **LoopX AI**, has signed agreements with the restaurants adjacent to the campus to provide the food. Customers can order through the company's website or through established food delivery companies like *UberEats*. The company charges a $2 flat fee for deliveries. More details at this link. A short YouTube video of the delivery robot in action is at this link.

International CAV News

On August 5, 2022, financial media - **Barron's**, published an article titled *When the Lawyers Come for Autonomous Vehicles*. The article highlights the influence lawyers in public and private domains exert on policy makers in general and on future AV legislation in particular. Furthermore, it is expected that the lawyers will exploit opportunities in areas like liability, intellectual property, and privacy to create new business, increase billable hours, and capture a share of the AV industry's capital. It is speculated that future AV

BARRON'S

users will be concerned if someone breaches their privacy by learning their whereabouts and activities inside an AV. Privacy lawyers will be in demand to seek damages from those who invade someone's privacy in multiple domains including healthcare and marital law. More information is at this link or this one.

In last month's issue of *CAV Update*, we reported on an incident that happened in May 2022 in Texas for a **Waymo** autonomous truck when the vehicle was run off the road while in automated mode. On August 1, 2022, the **Wall Street Journal** (WSJ) published a detailed report on an incident involving a **TuSimple** autonomous truck in Arizona. The incident occurred on April 6, 2022. According to the article, the truck suddenly veered left, cut across the I-10 highway in Tucson and slammed into a concrete barricade. No one was injured in this incident. It appears the truck's *Automated Driving System* (ADS) was not fully operational when the truck's *safety driver* engaged the ADS. This resulted in the ADS executing a 2.5-minute old command for turning the steering wheel to the left causing the truck to crash into the concrete median barrier. TuSimple has blamed the incident on *human error*. U.S. regulators are investigating the incident. The WSJ article can be viewed at this link. A whistleblower's revelations about this incident can be viewed in a short video on YouTube at this link.

Staying with the whistleblower theme, someone claiming to be an employee of **Cruise** has sent an annonymous letter to **California Public Utilities Commission** (CPUC) alleging that Cruise robotaxis operating in San Francisco have frequent technical issues which Cruise tries to cover up, and that many within the company do not believe Cruise's technology is ready for commercial deployment yet. But, under pressure from the parent company (General Motors) and investors, it is deploying its robotaxis on public roads. The company strongly denies this and says it is in frequent and consistent contact with CPUC on safety and other issues. On a related matter, a Crusie robotaxi operating in the autonomous mode was involved in a collision on June 3, 2022 in San Francisco resulting in minor injuries and damage to the robotaxi and another vehicle. More information on the whistleblower allegations is at this link. A copy of the collision report filed by Cruise is at this link.

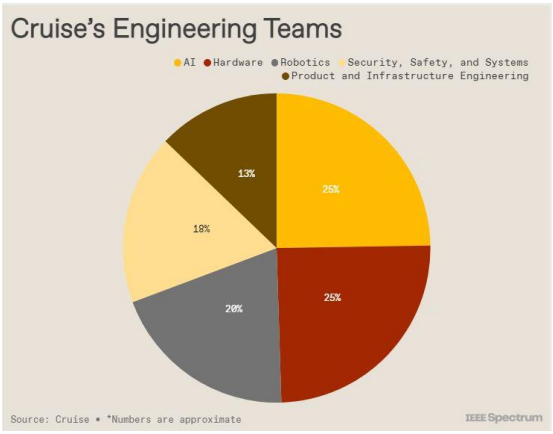
Staying in autonomous vehicle industry requires very deep pockets. In its latest financial results, **General Motors** (GM) revealed that its AV subsidiary – **Cruise**, has lost about US$500 million in the second quarter of 2022. This works out at about US$5 million per day over this quarter. Overall, Cruise has lost about US$5 billion since 2018. Despite the massive losses, GM's CEO (Mary Barra) is optimistic about the future of Cruise and self-driving technology. She has stated that Cruise could generate up to US$50 billion a year in revenue for GM by 2030. More details at this link.

Tesla has been selling its optional *Full Self-Driving* (FSD) system for about two years now. FSD costs US$12,000, and information is on Tesla's website states that *All you will need to do is get in and tell your car where to go. If you don't say anything, your car will look at your calendar and take you there as the assumed destination. Your Tesla will figure out the optimal route, navigating urban streets, complex intersections and freeways*. California's **Department of Motor Vehicles** (DMV) does not agree and has filed a complaint against Tesla accusing it of false advertising. According to DMV, Tesla cars never could, and cannot now, operate as autonomous vehicles. Tesla has not filed a response yet for these charges. More information is at this link .

In a major setback for the advocates of *Dedicated Short-Range Communication* (DSRC), on August 12, 2022, in a 15-page decision; a *United States Court of Appeals* in Washington D.C. ruled in favour of the **Federal Communications Commission** (FCC) and against the **Intelligent Transportation Society of America** (ITSA) and the **American Association of State Highway and Transportation Officials** (AASHTO). They along with **Continental Automotive Systems Inc.** (as intervenor) had petitioned the court to stop FCC from re-allocating a portion of 5.9 GHz spectrum reserved for ITS applications including *Vehicle-to-Vehicle* (V2V) and *Vehicle-to-Everything* (V2X) communication using the DSRC technology.

The court stated that the industry and government organizations have had 20+ years to put this valuable spectrum to use for these applications. However, this has not been the case and therefore the FCC made the decision to re-allocate some of this spectrum for other purposes. The petitioners contested this decision but lost the case in court. Contributing to the demise of DSRC was the development of newer technology called *Cellular V2X* (C-V2X) which a number of automakers support. It also does away with building another expensive infrastructure which DSRC requires. C-V2X uses the existing cellular infrastructure built over many years by various telecommunication companies. More details at this link. A copy of the court ruling can be viewed/downloaded at this link.

And finally, if you aspire to work in the CAV industry; you may wonder what sort of background you need to have to join this industry. On July 11, 2022, **IEEE Spectrum** published an article titled *What's the Tech Background of an Autonomous-Vehicle Engineer?* **Cruise**'s VP of Engineering was interviewed for this article. Cruise employs about 2,000 engineers with all sorts of technical backgrounds. This includes those who have worked in video games, finance, geospatial research, e-commerce, animation, cameras, semiconductors, hardware design, AI and even some from the ethical hacker community to test the systems for weaknesses and vulnerability. The current workforce is approximately 25% AI, 25% hardware, 20% robotics, 18% safety & security and 13% product & infrastructure engineering. On the software development side, *Python* is the most commonly used programming language followed by *C++*. The IEEE article is at this link.



Upcoming CAV-Related Events

Sept 5-6, 2022	UK CAV Infrastructure Symposium, London's County Hall, UK
Sept 7-8, 2022	ADAS & Autonomous Vehicle Technology Expo, San Jose, California (postponed from March 2022)
Sept 18-22, 2022	ITS World Congress, Los Angeles CA
Sept 18-20, 2022	National Insurance Conference of Canada, Halifax, Nova Scotia
Sept 20, 2022	*TCXpo* hosted by Area X.O in partnership with Transport Canada and Innovation, Science and Economic Development Canada (ISED), Ottawa ON
Sept 27-28, 2022	How can cities Safely Adopt Autonomous Vehicles?, Austin, Texas

Oct 3, 2022	Supply Chain and Automated Freight in Canada, a free webinar sponsored by AIoT Canada, Alberta Motor Transport Association (AMTA), CAVCOE, The Chartered Institute of Logistics & Transport in North America (CILTNA), Intelligent Transportation Society of Canada (ITS Canada), and Vitesse
Nov 2, 2022	CAVs Today, Emerging Trends, and Getting to Market, a free webinar sponsored by PAVE Canada, CAVCOE, Liberty Mutual, and Marsh
Nov 13-15, 2022	9th Tech.AD USA, Detroit, MI
Nov 15-16, 2022	Auto Tech: Europe 2022, Munich, Germany
Nov 15-17, 2022	Ready…Set…Test, Sub Zero North's Cold Weather Testing Conference; Winnipeg and Thompson, Manitoba, Canada
Nov 17, 2022	Canada: Terrains and Temperatures for Testing Transportation Technology, Transport Canada and National Research Council; Thompson, Manitoba and virtual. To register: Douglas Miller douglas.miller@tc.gc.ca or Kristine Philippe kristine.philippe@tc.gc.ca
Dec 2022	CAV Canada conference; details to be announced
June 4-7, 2023	UITP Global Public Transport Summit, Barcelona, Spain

About CAV Update

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

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***CAVCOE** (formerly the Canadian Automated Vehicles Centre of Excellence) advises the public and private sectors on planning for the arrival of self-driving vehicles.*

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