CAVCOE

CAV Update

A monthly newsletter on the CAV ecosystem

June 2022

From the Editors

Canada's supply chain needs improving. This is why Transport Minister the Honourable Omar Alghabra together with some of his fellow ministers hosted a National Supply Chain Summit. As part of this initiative, a new Supply Chain Task Force was created. The Task Force will consult with industry experts to make recommendations regarding short and long-term actions pertaining to Canada's supply chain.

One area where Canada can make improvements is by leveraging the expertise in CAV technology and accelerating the adoption of automated freight and logistics systems.

CAVCOE is starting an initiative to develop a coordinated Canadian ecosystem for automated freight and logistics, with a focus on the synergies, business case benefits, the cost of the new technology, and industry expertise. The scope will include inter-city freight, intra-city (e.g., warehouse-to-store), last mile (e.g., sidewalk delivery robots), and delivery drones.

If you would like to learn more and/or assist with this initiative, please write to Barrie Kirk at bkirk@cavcoe.com

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Following on from the above article, *CAV Update* readers will have read about the webinar in June 2022 on *Automated Freight and Logistics*. It was organized by **Logistics UK**, **Zenzic**, and the UK's **Centre for Connected and Autonomous Vehicles**. The webinar was excellent and highlighted the strategy of focusing on creating synergies in this space and leveraging them. A video of the 2-hour webinar is available at https://www.youtube.com/watch?v=YXnpmaLgJyc

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Canadian CAV News

Automation has made steady progress in the farming sector. On June 2, 2022, the **Canadian Agri-foods Automation and Intelligence Network** (CAAIN) announced a new $5 million funding program to further develop various technologies as part of its *National Smart Farm* program. The technologies beneficial to farming include GPS, drones, satellite imagery, digital traceability of barley, soil potential software, precision ranching and autonomy. Some of the organizations participating in the Smart Farm program are **Olds College** in Olds AB, **Lakeland College** in Vermillion AB, and the **Glacier FarmMedia Discovery Farm** in Langham SK. The latest $5 million funding is coming out of the federal government's $50-million strategic innovation fund and will add to the $26 million already invested in this sector. More information is at CCAIN site at this link.

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In the first of its kind in Canada, **Drone Delivery Canada** (DDC) has started commercial drone flights in collaboration with its partners from **Edmonton International Airport** (EIA). The partners are **Air Canada** and two local delivery companies providing same day/next day service and last-mile service – **Apple Express** and **Zing Final Mile**. Planning and testing of this operation has been ongoing since July 2021 and has now entered full commercial operation. The drone flights are monitored from DDC's flight control centre in Vaughan ON. The commercial operation will be in effect for a 12-month term. More details are at DDC's website at this link.

Partners for Automated Vehicle Education (PAVE) Canada recently teamed up with JD Power and MIT's AVT Consortium to conduct a survey of Canadian consumers' AV knowledge and comfort levels with fully automated self-driving vehicles. The J.D. Power 2022 Canadian Mobility Confidence Index (MCI) Study was released on June 15th and revealed that a high percentage of Canadian consumers (67%) have misconceptions and/or an overall lack of knowledge about fully automated self-driving vehicles. Other notable information found in the study included:

PAVE
PARTNERS FOR AUTOMATED VEHICLE EDUCATION

- Canadian consumer readiness scored 37 on a 100-point scale
- Consumers in Canada show low levels of readiness for AVs including purchasing, sharing roads with goods being transported by and riding in fully automated, self-driving vehicles.

- Only 33% of Canadians could properly define functions of fully automated, self-driving vehicles.
- Increased knowledge about AVs leads to increased comfort in adopting the technology.

“This study paints a broader picture of Canadians’ current level of understanding about AVs, which also helps us understand the knowledge gaps,” said **Tara Andringa, executive director of PAVE**. “Canadians are curious about AV technology on the roads today and what’s coming in the future, and it’s our mission at PAVE Canada to help the public better understand the full scope and potential of driverless technology.”

CAVCOE is a member of PAVE Canada, and Barrie Kirk sits on their Advisory Board. For further information about the study findings, please visit this link.

Sub Zero North, in conjunction with **Transport Canada’s** and the **National Research Council’s Community of Practice Committee**, is excited to bring the Winter Weather Testing conference to Winnipeg and Thompson on November 15-17, 2022. This unique, live three-day event has an amazing program, including a *Networking Meet N Greet* at the Canadian Museum for Human Rights, a full day of engaging speakers and breakout sessions, and an opportunity to fly to Thompson, Manitoba, tour of some of the testing sites and infrastructure, and enjoy a traditional feast with entertainment. For those that stay up late, SZN hopes to show you the beautiful northern lights! For more information and to register: https://eventcamp.ca/event/ready-set-test-2022/access

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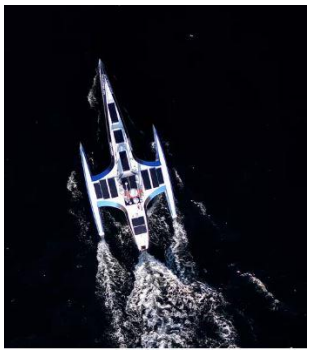
A **Tesla** Model Y owner in Medicine Hat, AB is one of the people in Tesla’s (Canadian) program for testing out its *Full Self-Drive* (FSD) technology. There are approximately 1,000 *beta testers* of FSD in Canada at present. The Tesla owner was chosen to take part in the technology's beta testing phase after completing a multi-day safety test and paying $10,000 to upgrade the car's software. According to him, the technology occasionally slips up, such as leaving a necessary lane change until the very last second. He and other drivers in the program submit feedback about these errors to Tesla so the company can improve its FSD technology. More information is at this link. A short video of the Tesla in action can be viewed at the same link.

Toronto-based AV developer **Waabi** made big news a year ago when it raised US$83.5 million to get itself started. The company made a recent announcement regarding recruiting some top subject-matter-experts in AV hardware design (two people), hardware integration

and system engineering. More information and profiles of the four individuals are at Waabi's website at this link.

The **University of British Columbia** (UBC) Department of Electrical & Computer Engineering has been collaborating for a few years with **Rogers Communications** on various connected vehicle technologies. One of the principal researchers for this work is *Dr. Hamed Noori*. On June 8, 2022, he posted a short video on YouTube giving an overview of his team's research in this area. The YouTube video can be viewed at this link.

Here is an update on an article we had in this newsletter in the June 2021 edition. The **Mayflower Autonomous Ship** (MAS) started its trip on April 29, 2022 across the Atlantic Ocean from Plymouth, UK. The destination was Plymouth, Massachusetts. Due to technical issues, the MAS was diverted to Halifax, Nova Scotia. It arrived there on June 12, 2022, covering a distance of 4,400 Km (2,700 miles). Mayflower is equipped with 6 AI powered cameras and 50 onboard sensors. The ship has connectivity but is able to make its own decisions and navigation if connectivity is lost. The AI system was designed by **IBM**. More information is at this link.



International CAV News

The Economist, in its June 18, 2022 issue, had an excellent big-picture analysis of the disruption in the car industry. The sub-title is "*The great Teslafication: How supply-chain turmoil is remaking the car industry*." This analysis is about the entire car industry, which of course includes CAVs. The article says:

"Having outsourced much of the manufacturing process in the past half-century to focus on design, supplier management and parts assembly, car firms want greater control over their value chain—from the metals that go into EV batteries to the software those EVs run on and the shops in which they are sold.'

"Doing everything under one roof is an idea both old and new. Tesla's industrial system is at first glance an embrace of Silicon Valley's "full stack"—internalising all aspects of production, and therefore all the profits. Elon Musk, Tesla's opinionated boss, once claimed that his company was "absurdly vertically integrated" by any standard, not just the car industry's. In fact, Mr Musk borrows heavily from carmaking's past. Henry Ford often sourced raw materials, like rubber for tyres and steel for chassis, from plantations and blast furnaces owned by his firm. His River Rouge factory in Detroit was powered by coal from Ford mines."

It is clear that the CAV ecosystem will need to face the dual challenges of designing CAVs as well as adapting to the trend towards in-sourcing parts and sub-systems.

The **American Automobile Association** (AAA) is a large organization with over 60 million members in the United States and Canada. Since 2016, AAA has conducted a survey of its members to solicit information on what the members perceive as useful automobile technologies. In the latest AAA survey, an overwhelming majority of respondents put a much higher value on *Advanced Driver Assistance Systems* (ADAS) than on self-driving cars (77% vs. 18%). The survey also found that 85% are fearful or unsure of self-driving technology, a level that has remained steady for the past several years. When transporting their children or loved ones, 85% also said they would not be comfortable with using a self-driving vehicle. More information is at this link.

In April 2022, the **European Commission** (EC) published a draft 70-page document titled *Uniform Procedures and Technical Specifications for the type-approval of the Automated Driving System (ADS) of Fully Automated Vehicles*. This major publication is comprised of two parts. The first part concerns *performance requirements* for ADS while the second part is about ADS *compliance assessment*. The ADS *performance requirements* specify what capabilities an autonomous vehicle (AV) must have to receive a type–approval in Europe. The ADS *compliance assessment* specifies how an AV will be evaluated, audited, and tested before it will get type–approval. The *compliance assessment* accounts for 50 pages of the ADS draft legislation or five times larger than ADS *performance requirements*. This suggests that the ADS evaluation, assessment, and testing has much more complexity and specifications than the ADS *performance requirements*. More information is at this link. A copy of the report can be viewed/downloaded at the EC site at this link.

A recent article in **CNBC** does a good roundup of all major players in the AV space. It covers cars, robotaxis, automated trucks, truck platooning and robotic delivery vehicles. The fact that the U.S. and Chinese AV developers are in a race to commercialize AVs could lead to *two global ecosystems* according to the article. Although the Chinese and U.S. AV markets are developing closely in parallel, given heightened U.S.-China technology rivalry, neither country is eager to let the other vacuum up data and testing information about their respective AV projects. And despite promises that commercilization is just round the corner, many industry insiders believe widespread deployment is at least 10 years

away. All the same, the AV industry attracted US$12 billion in funding in 2021 alone, 50% more than 2020. The CNBC article can be viewed at this link .

The **UK Government** recently announced a new £40 million (US$49.2 million) funding program to accelerate commercilization of autonomous technologies. Dubbed the *Commercialising Connected and Automated Mobility*, this competition will provide grants to help roll out commercial use self-driving vehicles across the UK. The eligible vehicles include delivery vans, passenger buses, shuttles and pods, as well as vehicles that move people and luggage at airports and containers at shipping ports. This brings the total UK investment in AV technologies to about £440 million (US$542 million) todate. Along with the fundings, the UK Government is actively working on developing a comprehensive legal and assurance framework for self-driving vehicles to ensure the safety of the technology. More information is at this link.

A recent article in **Autonomous Vehicle International** titled *Is camera-only the future of self-driving cars?* delves deep into the issue by looking at arguments for and against among the subject-matter-experts. Starting with the premise that humans perform almost all of the driving task visual means, the computer vision advocates posit that this suggests the best sensor for autonomous driving are one or more cameras coupled by advanced AI using neural networks and appropriate training data for the AI. The article can be viewed at this link.

One of the main challenges in advancing connected vehicle technology in the 5G domain is to have seamless interoperability between different wireless carriers. To this end, the **European Commission** (EC) has provided funding to a consortium of 21 partners from nine European countries to develop innovative and commercially exploitable connected and automated mobility (CAM) use cases and ensure cross-border automated mobility among a number of network operators. The project known as *5G-Routes* is currently running in cross-border scenarios in Latvia, Estonia and Finland. One demonstration project concerned a *vulnerable road user* (VRU) where a pedestrian received alerts from a connected electric vehicle that had detected the pedestrian via its sensors and warned the pedestrian of a potential collision thus providing crucial seconds to remove himself/herself from danger.The VRU and the electric vehicle were each connected to a different mobile operator, testing the cross-border connectivity. More information is at the *5G-Routes* website at this link.

Dubai's *Roads and Transport Authority* (RTA) has had a long interest in autonomous vehicles. It hopes to have 25% of all vehicles in that city be of driverless type by 2030. Towards that aim, it has run two previous competitions among AV developers to encourage R&D in this field. The RTA recently announced a third competition with US$2 million in prize money. This competition is focused on self-driving buses. The competition is open to all local and global firms active in the field of developing or operating self-driving buses. Competition rules stipulate that the submitted automated bus designs must be at least 5.6 m in length with a minimum capacity of 12 seats. More information is at this link

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We often hear these days that *Data is the new oil* of the digital era. Just like oil, which is worth more when transformed into more useful products, when data is processed, analyzed and utilized efficiently and instantly, it will have a much greater value. The **European Commission** (EC) appears to be onboard with this. New draft legislation by EC known as *EU Data Act* includes data generated and/or collected by connected & autonomous vehicles, and defines the rights of data holders (eg. vehicle manufacturers) and those acting as potential data recipients (eg. independent aftermarket and service providers). Collecting large data sets of different driving scenarios and environments is not only necessary for the safe and efficient rollout of AVs, but it is also labourious and expensive. The application of this proposed legislation will have a significant impact on all AV stakeholders. More information is at this link.

And finally, Swedish AV developer **Einride** wanting to demonstrate the millimetre precision of its cabless automated trucks, had a pair of its *Pod* driverless electric trucks navigate autonomously through a maze of fragile China vases. Einride currently operates on public roads and at customer sites in Sweden with remote oversight and drive capability. The 2-minute video of the demo is available for viewing on YouTube at this link.

Upcoming CAV-Related Events

July 18-21, 2022	Transportation Research Board (TRB) Automated Road Transportation Symposium (ARTS), Garden Grove, Calif.
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
Nov 15-17, 2022	Sub Zero North's Winter Weather Testing Conference, Winnipeg and Thompson, Manitoba, Canada
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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