CAVCOE

A monthly update on the CAV ecosystem

January 2024

From the Editors

CAVCOE has been asking key stakeholders if Canada should have an organization that provides an integrated, national perspective for the CAV ecosystem in all its many sectors, including cars, public transit, freight, service vehicles, aviation, farming, etc.

The roles of such an organization would include being a champion for the Canadian CAV ecosystem, contributing to a national strategy, helping to replace silos with synergies, and bringing streams together without duplicating work by other organizations. The new entity would also be a public voice, and while mindful of government policy, it could say and do things that governments cannot or will not do.

To answer the above question, 29 organizations from the CAV ecosystem accepted an invitation from CAVCOE to attend a meeting held on January 16, 2024. The participating organizations included governments, the private sector, and academia.

To help us focus on the key question above, we were fortunate to have guest speakers from the UK, Australia and New Zealand. These countries have national bodies that provide this kind of strategic vision. Australia and New Zealand have the **Centre for Connected and Automated Transport** (CCAT), and the UK has **Zenzic** and the **Centre for Connected and Autonomous Vehicles** (CCAV). We heard presentations from senior people with these organizations. We then had an excellent round-table discussion on whether Canada should have an organization along the lines of these entities.

The conclusions from the round-table discussion and a poll conducted at the end showed a substantial level of support for such an initiative. Nobody opposed or voted against this initiative.

This is just the beginning, and there are many details to be addressed. And yes, there will be challenges!

If you would like to receive the notes on the January meeting and/or be added to the mailing list to receive invitations and notes on future meetings, please email Barrie Kirk at bkirk@cavcoe.com

Canadian CAV News

In early January 2024, Toronto-based **Urban Robotics Foundation** (URF) published a 19-page document titled *Executive Guide to PMRS: What you need to know about Public-area Mobile Robots* (PMRs). Many people envision a PMR as a delivery robot for delivering food or parcels using a sidewalk. In reality, the scope is much wider. PMRs have also been deployed for maintenance, security, and many other tasks. In addition to using sidewalks, PMRs can also be deployed on college campuses, pathways, hospitals, parks, zoos, airports, and malls. Many billions of dollars have been invested by venture capital firms to bring the PMR technology to the market. The guide can be downloaded for free by visiting URF's site at this link.

RSG International, based in Whitchurch-Stouffville ON, north of Toronto, is a global leader in the road safety sector, and is known for its cutting-edge research and road safety product development. RSG has announced a licensing agreement with **Elmo**, an Estonian company behind this teledriving technology. This collaboration marks a significant milestone in advancing road safety technology and creating new opportunities in the field.

Elmo's teledriving technology, which is currently in operation on public streets, caught the attention of RSG International due to its transformative potential for the road safety sector. Under the terms of the agreement, Elmo will license its technology to RSG International and retrofit teledriving technology onto RSG's Ford F550 crash trucks. Additionally, Elmo will work on integrating new features into its teledriving station, making it more accessible for individuals with disabilities to operate the station and forging new career paths within the road safety industry.

When the Ford F550 crash truck has been retrofitted with this technology in Estonia, it will return to Canada and be tested at RSG's in-house test sites in Ontario. The equipment testing will also include the validity of the system. More information is available here.

Québec City-based **LeddarTech Inc.** is a manufacturer of LiDAR systems for various applications including autonomous vehicles. On December 21, 2023, the company announced that it has become a publicly traded company through a merger with a U.S. *Special Purpose Acquistion Company* (SPAC) called **Prospector Capital Corp**. The shares of LeddarTech are now trading on NASDAQ under the symbol LDTC. This transaction together with a US$44 million *Private Investment in Public Equity* (PIPE) brings the total money raised by LeddarTech to US$58.6 million. Founded in 2007, the company has

research and development centers in Montreal, Toronto and Tel Aviv. As of this writing, the market capitalization of the firm was US$112.5 million. More details are at this link.

In the January 2023 edition of *CAV Update*, we reported on Canada's **Project Arrow** electric demonstration vehicle that attracted a lot of attention at that year's CES show in Las Vegas. The original vehicle (Arrow 1.0) was designed and built in a collaborative effort between **Automotive Parts Manufacturers' Association** (APMA) and about 60 Canadian companies in the automotive and technology sectors. The Arrow was showcased at many auto shows after Las Vegas and solidified Canada's reputation in building advanced electric and autonomous vehicles. APMA estimates that the Arrow 1.0 demo vehicle generated an incremental $500 million worth of sales for carmakers because of their involvement with the project. Given this resounding success, APMA has now announced plans for creating Arrow 2.0 with a target date of 2026. More details are at this link.

Vaughan, Ontario-based **Drone Delivery Canada** (DDC) has been licenced by **Transport Canada** for drone delivery of medical supplies *Beyond Visual Line-of-Sight* (BVLOS). The drone service is between Milton District Hospital and Oakville Trafalgar Memorial Hospital (a distance of approximately 12 Km as the crow flies). The service dubbed the *DroneCare* by DDC, will fly blood and serum chemistry tests, blood bank materials, urine cultures, tissue specimens, small cytology containers with formalin, and blood culture bottles among other things. According to DDC, this Transport Canada approval is the first of its kind in Canada. As of January 9, 2024, the *DroneCare* system became commercially operational. The full media release is here.

International CAV News

The **2028 Summer Olympics in Los Angeles** are more than 4-years away. However, infrastructure and transportation planning are well underway. One such planned project is a 1.6 Mile (2.6 Km) *automated people mover,* estimated to cost US$2 billion. Dubbed the *Inglewood Transit Connector*, the elevated system will have three stations. It will provide connections to the Olympic venues at the *Kia Forum*, *SoFi Stadium*, and *Intuit Dome*. It would also connect to L.A. Metro's K Line train at the Downtown Inglewood Station. As for the funding of the project, the **Federal Transit Administration** has agreed to provide half of the US$2 billion cost. The project will be jointly managed by the **City of Inglewood** and the **Los Angeles County Metropolitan Transportation Authority**. At present, three

consortiums have been shortlisted to design-build-finance-operate and maintain the people mover system. The award of the contract is expected by the summer of 2024. More information is at this link.

On January 4, 2024, **IEEE Spectrum** published an article titled *What You Might Not Know About Connected Autonomous Vehicles*. Although the mainstream media routinely publishes news and articles about autonomous vehicles, some of the related issues are not given much attention by the media, issues such as the ethics, liability, privacy, and cybersecurity aspects of CAVs. These issues were discussed and debated during three webinars in 2023. The webinar topics were as follows:

- *Behind the Wheel: Who is driving the Driverless Car?*
- *Risk-based Methodology for Deriving Scenarios for Testing Artificial Intelligence Systems*
- *Human vs. "Digital Driver" - Compliance and Homologation Challenges in the Automotive Industry*

The three webinars are free to watch at this link. More information is at the IEEE site at this link.

Staying with a less-covered aspect of CAVs, a recent article in **Psychology Today** discusses the findings of research into the psychological factors associated with self-driving cars, e.g., the types of personalities who are more comfortable riding in an AV versus those that do not feel as comfortable. To quantify their data, the researchers used biosensors to measure heart rate, muscle activity, eye movements, and brain waves on electroencephalography (EEG) of passengers during real-world or virtual reality simulations. They then compared these results with a group of passengers being driven by a human driver in the same car. While it was found that there were no differences between stress signals among the two groups, the eye movements were different. Autonomous vehicle passengers showed much less variable eye movements. This suggests that further research into this area of research might shed light on the user experience of autonomous vehicles. More information on Psychology Today website at this link. The full research paper can be viewed at this link.

We have extensively covered **Cruise**'s misfortunes in the past three editions of this newsletter. To add to the misery, the parent company of Cruise - **General Motors** (GM), has now laid off 24% of Cruise's workforce which amounts to 900 people. This was not unexpected, but all the same shocking for the affected employees. **CNBC** published the actual memo sent by GM to Cruise personnel informing them of this decision. More information and the memo itself are at CNBC's site at this link.

In a somewhat related development, a number of AV industry associations and lobby groups have sent a letter to the **U.S. Transportation Secretary** (Peter Buttigieg) asking for his support for the AV industry lest it falls behind China in the technology race to bring AVs to market. Some of the signatories to the letter were the **Autonomous Vehicle Industry Association**, which represents Cruise, Waymo, Zoox, Motional, and others, as well as the **US Chamber of Commerce** and the **Alliance for Automotive Innovation**, which lobbies on behalf of the auto industry. In their letter, the group advocates for AVs on the grounds that AVs are safer than human drivers because they eliminate human shortcomings such as being fatigued, impaired or distracted. Legislation pertaining to AVs has been in limbo in the U.S. Congress for the past six years due to disagreements between the Democrats and the Republicans, and the strong lobby efforts by labour and transportation unions opposed to AVs. More information is at this link.

Almost all research and development as well as deployment of AVs have happened in urban areas. According to available population statistics, 19% of the U.S. population lives in rural areas as well as a quarter of all Americans aged 65 and older. Yet, 47% of all roadway fatalities and 34% of all public highway-rail grade crossing fatalities occur on rural roads. Emergency response times are more than twice as long in rural areas as compared to urban areas. To correct the imbalance, the **U.S. Department of Transportation** has recently announced a US$25 million initiative focused squarely on *Rural Autonomous Vehicle* (RAV) research. Of this total, US$15 million of the money will focus on passenger transportation, and the other US$10 million will focus on movement of freight to support and enable automated freight and delivery vehicles serving rural and Tribal areas. More information is this link.

A recent article in **theverge.com** titled *Where are all the robot trucks?* takes a deep dive into the issues and concerns related to autonomous trucks. Developers working in this niche had made many promises that their driverless 18-wheelers will be in commercial service by now. This has not come to pass for a number of reasons. Perhaps the largest force opposing automated trucks are labour unions representing truck drivers and the organizations representing the owner-operators of the big rigs such as the **Owner-Operator Independent Drivers Association** (OOIDA), an organization representing 150,000 truckers across the US and Canada. One oft-repeated and core argument by the proponents of driverless trucks is addressing the perceived driver shortage. The unions and OOIDA dispute this core argument. They cite numbers by the **American Trucking Association** indicating that in the State of California, for example, there were over 600,000 people with a *Commercial Driver License* (Class A or B licenses) in 2021

for only 140,000 truck transportation jobs. OOIDA believes the issue is not a driver shortage but the retention of drivers. They say that typically, the newly licensed truck drivers leave after six months to a year because of the low pay and being away for long periods from their home and family. The Verge article can be viewed at this link.

Connected Vehicle technology has been touted for many years as a means of reducing death and injuries on the roads. The presumption is that if vehicles could communicate with each other, with the roadway infrastructure, and vulnerable road users such as pedestrians, cyclists, etc., a higher level of safety can be achieved. This so called *Vehicle-to-Everything* (V2X) technology has been championed by the **U.S. Department of Transportation** (USDoT) for a number of years. Its latest iteration is a 16-page draft document published by USDoT and titled *Saving Lives with Connectivity: A Plan to Accelerate V2X Deployment* is now out for comment by anyone interested in the V2X technology. Deadline for comments is January 31, 2024. The draft document can be viewed/downloaded at this link. The final *National V2X Deployment Plan* is expected to be released in the spring of 2024.

Aurrigo, based in Coventry, England, is a leading developer of autonomous vehicles for passenger transport as well as service vehicles. One such service vehicle is its autonomous vehicle for carrying cargo and luggage at airports. Known as *Auto-DollyTug*®, this automated vehicle had been deployed at some airports in Asia and Europe. In its first foray into the United States, the *Auto-DollyTug*® will now be deployed at the **Cincinnati/Northern Kentucky International** airport in collaboration with the airport authority and the **International Airlines Group** (IAG) - the parent company of British Airways, Aer Lingus, Iberia and other airline subsidiaries. According to the CEO of Cincinnati airport, automated baggage handling systems such as Aurrigo's can help mitigate staffing shortages, safety, capacity and environmental concerns. Aurrigo has also developed *3D digital twin* to visualize operations and model the impact of new technologies such as electric and or autonomous vehicles. More information is on Aurrigo's site at this link.

And finally, a method of goods delivery popular in 19th century and early 20th century has been adapted by the Texas-based **Pipedream Labs** to deliver food and other goods using an 18 inch (45.2 cm) underground pipe at a depth of three to six feet, in what the company calls an *autonomous delivery robot*. Whereas the *pneumatic tube* delivery system first deployed in Britain in 19th century used compressed air for delivering mail and other small items, the system developed by Pipedream Labs uses electric power to propel a trolley containing goods at speeds of up to 45 Mph (72 Km/h) down the 18 inch pipe. The first system has been installed in an Atlanta suburb between a shopping mall and a technology development hub. The distance between the two points is three-quarter of a mile (1.2 Km) and the system is operational at present. The company has raised US$9.5 million in funding to date. More information is at this link. A short YouTube video showing Pipedream Labs' autonomous delivery robot system in action can be viewed at this link.

CAVCOE Speakers' Bureau

CAVCOE 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 enquire about a speaker for your event, please write to speakers@cavcoe.com

Upcoming CAV-Related Events

February 1, 2024	J.D. Power Auto Summit, Las Vegas NV
March 20-21, 2024	Connected Places Summit, London UK
March 26, 2024	Automotive Forum, New York City
March 26-27, 2024	VTM Vehicle & Transportation Innovation Meetings, Torino, Italy
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 22-25, 2024	2024 TAC Conference & Exhibition, Vancouver, B.C.

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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***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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