Canadian Automated Vehicle Initiative

CAV Update December 2024

From the Editors

We hope you had a very enjoyable holiday season. All of us at CAVI wish you much success and happiness in 2025.

The New Year is a traditional time to look back and to look ahead.

AV Update (as it was then called) was launched in 2013 and we have been perusing back issues. One key prediction from those years is that the arrival of CAVs would be a light-switch moment. In fact, the entire CAV ecosystem is far more complex and comprises many sectors, each with their own dynamics, timelines, benefits, business cases, and challenges. Some sectors, such as mining, are well into commercial deployment. Other sectors, such as freight and logistics, have a lot of promise but are still used for pilot projects. Truly driverless robotaxis are in use in some U.S. states but are not yet being tested or deployed at all in Canada.

Looking ahead, CAVI's Working Group on CAV strategy is making very good progress. The WG is co-chaired by Andrew Miller of Paladin Consulting and Barrie Kirk. We are on track to publish a White Paper in January. If you are a member of CAVI, you will receive a draft version for your review and comments. If you are not a member of CAVI, you will receive the final, published version.

As Shakespeare wrote "what is past is prologue". In Canada, we have achieved a great deal since 2013 – but not enough because we are lagging other countries in some key ways. The CAV Strategy White Paper will include a SWOT analysis of where we are and make key recommendations, especially for action at the national level. We can and should do better than we have since 2013.

Canadian CAV News

We had previously reported on *Project Arrow* (Version 1.0) which was built in a collaborative effort between the **Automotive Parts Manufacturers' Association** (APMA) and about 60 Canadian companies in the automotive and technology sectors. The purpose of this demonstration project was to showcase Canadian know-how and expertise in all areas of automotive engineering and related technologies such as connectivity and autonomy. In its latest iteration, (Version 2.0), *Project Arrow* has received $11 million in funding from the federal and Ontario governments to build a fleet of demonstration vehicles. The vehicles will be displayed at various motor shows in North America and around the world, as well as

technology events such as the **CES** in Las Vegas. They serve to give name recognition to Canadian suppliers and put Canada on the map. A *digital twin* of the vehicle has been developed and used as a virtual platform for testing and validating parts and technologies from which the Arrow is built. According to the project's backers, *Project Arrow* has thus far generated about $500 million worth of business for the participant companies in this project. More information is at this link.

Autonomous haul trucks are a common sight in the Alberta oilsands. Suncor, Imperial Oil and other oil majors have deployed these vehicles for a few years now. Now, an Ontario gold mining company has deployed similar automated haul trucks at its mining site in northern Ontario. The mine site is owned by **IAMGOLD**, a joint venture between the Canadian partner (60%) and Japan's **Sumitomo Metal Mining Co. Ltd.** (40%). The heavy haul vehicles are made by Caterpillar (Model 793F) and are capable of carrying 240 tonnes of ore. Currently, there are 18 such vehicles deployed at the mine site with plans for 6 more. The trucks operate in special zones and use AI, GPS and sensors to navigate complex terrain, plot efficient paths, and avoid obstacles. Connected by Wi-Fi and cellular towers, autonomous trucks are supervised from an onsite control room. More information is at this link or this one.

The harassment women experience on public transportation systems in some developing countries such as India or Bangladesh has been extensively covered by the media. The harassment can be in the form of verbal or physical abuse such as groping and touching. A female Ph.D. student at the **University of Calgary** (U of C) has conducted research into this issue and whether a properly designed autonomous vehicle can mitigate the situations women have been experiencing on public transportation in these countries. Her research concluded that an optimal autonomous vehicle appears to be one designed for six to eight people that has seat dividers preventing close contact with other passengers. More information is at the U of C site at this link. A copy of her paper titled *"Shotitwo First!": Unraveling Global South Women's Challenges in Public Transport to Inform Autonomous Vehicle Design* can be downloaded at this link. A related short video can also be watched at the same link.

We are very pleased to profile **Arcadis,** a CAVI corporate member. Arcadis is the world's leading company delivering sustainable design, engineering, digital and consultancy solutions for natural and built assets. They have more than 36,000 architects, data analysts, designers, engineers, project planners, water management and sustainability experts, all driven by their passion for improving quality of life. More information can be viewed at the Arcadis website at this link.

On December 6, 2024, **Transport Canada** announced the winners of its *Enhanced Road Safety Transfer Payment Program* (ERSTPP) competition. In all, 35 projects will be funded from 2024 till 2026. The total award money is $14,685,027.80. Several projects are CAV related. Of note is the $1,433,337 award made to **Kanata North Business Association** (KNBA) for a project titled *Smart Mobility Solution: Testing and Deployment of a Medium-Speed Autonomous Shuttle in Canada's Largest Tech Park*. Partnering with KBNA are **Aurrigo**, **Invest Ottawa**, **City of Ottawa**, **University of Ottawa**, and **Wesley Clover**. More information is on KBNA's site at this link. A local Kanata publication called *Community Voice*, has a more detailed article about this project at this link. The complete list of all 35 projects receiving ERSTPP funding can be viewed at Transport Canada's site at this link.

International CAV News

In another sign for the weak European automotive market, German company **Bosch** has announced plans to lay off up to 5,500 of its employees in its various automotive divisions. This includes reductions in the parts of the company that develop *Advanced Driver Assistance Systems* (ADAS), automated driving technologies, and centralized vehicle software. According to the company, slowing global auto sales, too much factory capacity in the auto industry compared to sales prospects, and a slower than expected transition to electric-powered, software-controlled vehicles are some of the reasons for the planned reduction in workforce. Some 230,000 people work for Bosch's mobility division, out of a global workforce of 429,000. More information is at this link.

Through a partnership with **Waymo**, **Uber** has been offering robotaxi rides to its customers in Phoenix, San Francisco, Austin and Atlanta for some time. In its first foray outside the United States, Uber is now offering robotaxi rides in Abu Dhabi, UAE. In Abu Dhabi, Uber has partnered with Chinese company **WeRide** to offer its new robotaxi services. In addition to Waymo, Uber has struck at least seven related partnerships since June 2024. The former CEO of Uber once considered the emergence of robotaxis as an existential threat to his company. Through these investments and partnerships, Uber is hedging its bets that someday, human-driven taxis will be a thing of the past. The government of Abu Dhabi is supporting Uber's service through its *Integrated Transport Centre*. More information is at this link or this one.

Ford Motor Company's *Transit* vans are a very popular commercial vehicle. The vans can be configured for carrying goods or passengers (up to 10 people). The electric version of these vans is known as Ford *E-Transit*. The UK-based autonomous vehicle developer – **Oxa**, has converted a number of *E-Transit* vans to be self-driving. The hardware conversion includes installation of all the usual sensors (radar, LiDAR, cameras, etc.), as well as a *fly-by-wire* system for steering, acceleration and deceleration, braking, turn signals and other vehicle controls. The Oxa *Driver* software system is the brain of the operation for localization, perception and control functions of the vehicle. These vehicles are now deployed in both the UK and US. In autonomous operation, they can go as high as 56km/h in mixed traffic. The *E-Transit* retains its manual controls, enabling it to be used in a non-autonomous mode if required. More details at Oxa's site at this link . A short YouTube video of the Oxa-equipped Ford *E-Transit* vans in action can be viewed at this link.

A recent article in **Forbes** magazine titled *Forget Tesla, Here's What's Real In Moving People Driverlessly* takes a look at the dominant companies in robotaxi business. At present, the dominant robotaxi provider is **Waymo** by a very large margin. It is reported that Waymo has 150,000 paying customers per week; using its 700 robotaxi vehicles. Waymo operates in San Francisco, Los Angeles and Phoenix. Robotaxi service will be expanded to Atlanta and Austin in 2025 according to the company. Waymo's ridership equates to about 1 million miles per week (1.61 million Km). Far behind is **May Mobility** with presence in 9 U.S. cities

providing mainly autonomous shuttle services. However, May Mobility has made inroads in Japan partnering with **Toyota** and **NTT**. On October 10, 2024, **Tesla** showcased its *Cybercab* robotaxi and its *Robovan* passenger shuttle and announced big plans for entering the robotaxi market. Given past such promises by Tesla, Forbes does not put too much store in them. The Forbes article can be viewed at this link or this one.

On November 17, 2024, **Bloomberg** published an article titled *Self-Driving Car Rules May Be Eased Under Trump*. The article suggests that up to now, the **U.S. Department of Transportation** (USDoT) has been some sort of roadblock hampering the rapid development and deployment of autonomous vehicles. Case in point has been the department's reluctance to ease the rules for AVs with no conventional brake/accelerator pedals and steering wheels. For example, the AV arm of **General Motors** – **Cruise**, submitted such an application to USDoT and waited 2-years for a decision. Later on, GM abandoned its application and cancelled the project. Another issue is the limited number of permits that USDoT issues to AV developers. This stands at 2,500 permits per year at present. The industry has been asking for this limit to be raised to 100,000. This has been repeatedly rejected by USDoT. The report speculates that under Trump's second term, USDoT leadership may be staffed by people who are more friendly to the nascent AV industry. The Bloomberg article can be viewed at this link or this one.

In a surprise move, on December 10, 2024, **General Motors**, the parent company of **Cruise**, announced that it will no longer fund Cruise's robotaxi development work or operations. GM's focus will now be on autonomous technology for personal vehicles as well as further development of its offerings in the *Advanced Driver Assistance Systems* (ADAS). This change of focus is expected to save GM US$1 billion annually. The reasons cited by GM for the change in its autonomous strategy are the high development costs, and considerable time and resources that would be needed to scale the business, along with an increasingly competitive robotaxi market. GM acquired Cruise in 2016 for a reported $1 billion. According to crunchbase.com, Cruise had raised US$16 billion through 13 funding rounds since its inception in 2013. More information is on GM's site at this link. A more in-depth article by Andrew Miller (Principal at **Paladin Consulting**) can be viewed at this link.

On November 21, 2024, The United States **Federal Communications Commission** (FCC) issued a final ruling for the allocation and use of the 5.9 Ghz spectrum for *Cellular to everything* (C-V2X) applications. The ruling also set a sunset date for the ill-fated *Dedicated Short-Range Communication* (DSRC) technology which was once destined to be the technology of choice for connected vehicles. The ruling codifies C-V2X technical parameters in the Commission's rules, including power and emission limits and message prioritization. More information is at this link. The FCC's 58-page order can be viewed/downloaded from FCC's site at this link.

And finally, an Irish university called **The Atlantic Technological University** (ATU) is now offering a *Master of Engineering* (M.Eng.) degree in *Connected and Autonomous Vehicles* (CAVs). This course is through ATU's Sligo campus and is mostly part-time and online. The course duration is 2.5 years and the fees for students from EU countries is €10,800 (about US$11,500 at the current exchange rate). Fees are higher for students from non-EU countries. The Master's degree course has been developed in collaboration with industry and is aimed at current Electronic, Computer, Mechanical and Mechatronic engineers who wish to develop the skills required to design the next generation of technology for smart and autonomous vehicles. More information is at ATU's site at this link . ATU's prospectus for prospective students can be viewed/downloaded at this link.

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

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Upcoming CAV-Related Events

January 7-10, 2025	Consumer Electronics Show (CES), Las Vegas
January 15-16, 2025	UK Maritime Autonomous Systems Regulatory Working Group Conference: Maritime Autonomous Ship Systems (MASS) (On-line)
January 23, 2025	J.D. Power Auto Summit, New Orleans
January 28, 2025	SAE International and CSA Group a facilitated, collaborative session to discuss a North American Digital Standard that will improve the performance of CAVs and infrastructure. The meeting is in Washington. Please contact Mahmood Nesheli of CSA group for more details. mahmood.nesheli@csagroup.org
January 28-29, 2025	Autonomous Vehicles and Public Transport, organized by AV America and Global Mass Transit, San Francisco
January 29, 2025	Exploring Human-Robot Interactions, Zoom webinar by Urban Robotics Foundation
February 19-21, 2025	1st International Conference on Drones and Unmanned Systems (DAUS' 2025), Granada, Spain
March 19-20, 2025	Connected Places Summit, London, England
April 16-17, 2025	DiscoveryX, organized by the Ontario Centre of Innovation, Toronto, Ontario
May 21, 2025	CSA Group and SAE International will host a workshop on the development of a North American Digital Standard aimed at supporting the performance of connected and automated vehicles and infrastructure. To be held in conjunction with the ITS Canada conference – see below
May 21-23, 2025	ITS Canada 2025 Conference & Expo, Ottawa, ON

June 3-5,2025	AutoTech 2025, Novi MI
June 9-11, 2025	CCMTA Annual Meeting, Regina SK
June 15-18, 2025	UITP Summit, Hamburg, Germany
June 24-26, 2025	Autonomous Ship Conference, Amsterdam, Netherlands (call for speakers)
June 25-26, 2025	Last Mile Delivery Conference & Expo, Las Vegas
August 27-28, 2025	ADAS & Autonomous Vehicle Technology Summit North America, San Jose CA
October 5-8, 2025	TAC Conference & Exhibition, Quebec City
October 21-23, 2025	Automotive Testing Expo, Novi MI

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) 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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