Canadian Automated Vehicle Initiative

CAV Update August 2024

From the Editors

The *Canadian Automated Vehicle Initiative* (CAVI) has made significant progress since it was formed earlier this year:

- We have formed a Board of Directors, and we are pleased to achieve our objectives of diversity by geography (coast-to-coast), expertise, and gender.
- We continue to encourage people to reduce their excessive hype about CAVs. For example, PostMedia recently published my op-ed on CAV safety here.
- We have continued our liaison with all three levels of government. There is more activity at the government level and the momentum is building.
- We continue our international liaison, especially with Europe. In September, I will be speaking at a conference in Germany about the CAV testing ecosystem.
- The organizations and individuals that have joined CAVI are from the Federal and Provincial Governments, academia, other associations, and industry.
- We are developing and will soon publish a directory of the stakeholders in the Canadian CAV ecosystem.
- Our members continue to receive regular updates on all aspects of the Canadian and international CAV ecosystem via this newsletter.
- We have expanded the CAVI team which now comprises eight part-time and full-time people.
- We continue to develop relationships with various associations, including in the transportation space.
- We have done early-stage advocacy for an automated bus demonstration project.
- We have started to ensure that CAVI's organizational members have an increased profile by being named (with their logos) in all our reports and presentations to national and international audiences.

Over the next few months, we will continue the above and:

- Announce our webinar program.
- Announce whether we will hold a national Canadian CAV conference in 2025.
- Announce CAVI committees and research projects and ask our members to participate.
- Encourage our members to have a voice in this national conversation and contribute to government policies and regulations related to CAVs.

I invite you to get more involved in this exciting and important ecosystem, both for the benefits to you as a member and to help move the Canadian CAV ecosystem forward more quickly. CAVI organizational “early adopter” memberships rates are $1,000 and individual memberships are $200. Please go to www.cavi-icva.ca and click on "Join Us".

Canadian CAV News

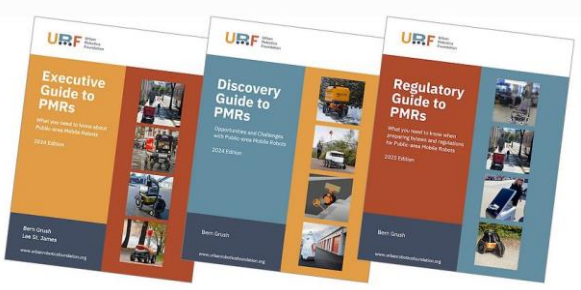
The **Québec Government**'s *Ministry of Transportation and Sustainable Mobility* is seeking public input into the new and emerging transportation technologies. The Ministry is specifically targeting four strategic areas as follows:

- New forms of mobility (electric scooters, shared bicycles, etc.)
- Integrated mobility (applications such as *Chrono* for transit users)
- Intelligent transportation systems (automated fog detection systems, automatic incident detection systems, etc.)
- Automated and connected vehicles (robotaxis, blind spot warning, etc.).

The Ministry's 2023-2028 *Road Safety Action Plan* includes a consultation process with stakeholders both in Quebec and outside. We encourage interested parties to view and complete the survey at this link in French or this link in English. The Ministry will also accept submissions via e-mail at this address: mobilitiesinnovantes@transports.gouv.qc.ca

The deadline for submissions is **October 1, 2024**.

Canada's **Urban Robotics Foundation** (URF) is working at the forefront of *Public-area mobile robots* (PMRs) deployment thinking. URF will be publishing a new document titled *Regulatory Roadmap to PMRs*. The new standards-based Guide draws from existing regulations from several countries and is expanded to encompass current ISO draft standards (4448) to serve as a valuable resource for municipal, provincial/state, and national regulators. Motor vehicle regulations were first introduced at the beginning of the 20th century and have evolved ever since as automotive technology, and its supporting infrastructure has advanced over the years. The URF *Regulatory Guide to PMRs* begins with the existing traffic guidance frameworks extracted from these recent motor code updates and significantly expands these based on the provisions of ISO DTS 4448 - *Public-area mobile robots*.



A two-page preview of the new guide can be viewed/downloaded from the URF's site at this link.

On August 7, 2024, the **CBC** published a report about **Suncor Energy** and how its petroleum production from the Alberta oilsands has been better than expected this year. The article made a brief mention of Suncor's increasing utilization of autonomous haul trucks. At present, Suncor has 22 fully autonomous haul trucks in its fleet. Fifteen more new autonomous trucks will be delivered to its Fort Hills site by the end of November 2024, and an additional 18 will be in place at the company's other sites by the first quarter of 2025. Suncor estimates that once fully deployed, its 55 autonomous trucks will lower its total operating costs by more than $300 million annually. The CBC article can be viewed at this link.

Starting with this issue of *CAV Update*, we are highlighting CAVI's corporate members. CAVI welcomes the **Canadian National Institute for the Blind** (CNIB). Founded in 1918, CNIB is a non-profit organization driven to change what it is to be blind today. They deliver innovative programs and powerful advocacy that empower people impacted by blindness to live their dreams and tear down barriers to inclusion. Their work as a blind foundation is powered by a network of volunteers, donors, and partners from coast to coast to coast. More information can be viewed at CNIB's website at this link.

International CAV News

Hagerty Media is a publication for drivers who love driving and their cars. In its *About us* section, it says this about itself: *We illuminate the joy of driving, the wonder of mechanical components, and the bond drivers share with their machines*. A recent issue of this publication had autonomous vehicles as its focus. For example, it pointed out that while funding for many AV companies has dried up, **Alphabet**, the parent company of Google and **Waymo** recently announced a further US$5 billion investment in its AV technology. And whereas **Uber** and **Cruise** have badly suffered PR nightmares after their AVs were involved in serious incidents, Waymo has largely been unscathed despite having a few of its own. The article points out that it is unlikely that AVs would become affordable for everyday people such as taxi drivers. This is because a Waymo robotaxi capital cost is in the high six figures, whereas an Uber driver can buy a vehicle for about US$30,000. The article can be viewed at Hagerty's site at this link.

Due to rapid advances in drone technologies and the desire of many companies to deliver goods and services via drone, the U.S. **Federal Aviation Administration** (FAA) has been working for several years to create the required regulations and technologies to allow many delivery drones to simultaneously share the airspace in a safe and efficient manner, and to do so *Beyond Visual Line of Sight* (BVLOS). A key enabling piece of this work has been the development of *Unmanned Aircraft System Traffic Management* (UTM) system. The FAA describes the UTM as an ecosystem for uncontrolled operations that is separate from, but complementary to, the FAA's *Air Traffic Management* (ATM) system. In a recent development, the FAA has authorized multiple companies to operate without visual observers in the same airspace using the UTM technology. The authorization applies to **Zipline International** and Alphabet-backed **Wing Aviation**, allowing them to both make deliveries in the Dallas region. Their BLVOS autonomous drones will be flying below 400 feet (122 metres) and away from crewed aircraft. More information on FAA's site at this link. A short YouTube video (produced by FAA) showing how the UTM system works can also be viewed at this link.

Federal Aviation Administration

Staying with drones, on July 29, 2024, the Chinese passenger drone developer **EHang** announced that it has delivered the first batch of 10 EH216-S pilotless electric vertical takeoff and landing (eVTOL) aircraft to **Xishan Tourism**. The drones dubbed *Urban Air Mobility* (UAM) aircraft are intended for sightseeing flights by tourists. The drone can carry two passengers and flies autonomously. The first such flights with passengers onboard took place on July 28, 2024. The authorities call this *low-altitude tourism*, part of a larger system envisioned recently by the Chinese Premier as *low-altitude economy* which includes delivery drones and other types. EHang has also developed the long-range pilotless EH216-F designed for firefighting, and the EH216-L for logistics use. More information at this link. A short YouTube video of the Ehang drones in action can be viewed at this link.

Carnegie Mellon University (CMU) located in Pittsburgh is renowned for its robotics research and expertise. Indeed, some of the high-profile people in the AV world got their start at CMU. Now two of CMU's professors and their students at CMU's *Human-Computer Interaction Institute* (HCII) have turned their attention to delivery robots as well other types of sidewalk robots; such as robots that can clear sidewalks of debris or snow, provide directions, act as crossing guards, carry books and other supplies for people, or help humans shop in stores. Their research has focused on the interaction of sidewalk robots with disabled people and accessability. The researchers state that accessibility is often overlooked in the design process because most companies making sidewalk robots are startups, and things move quickly, and that consideration for accessibility often comes too late in the design process - often at the very end. The CMU research has brought people with disabilities into the R&D loop by consulting them and seeing the world through their eyes and capabilities. More information at this link

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Back in January 2024, we reported on a new connected vehicle (CV) initiative by the **U.S. Department of Transportation** (USDoT) called *Saving Lives with Connectivity: A Plan to Accelerate V2X* Deployment. Now USDoT has backed this plan with a US$60 million grant program for CV projects in several states. The selected grant recipients are Maricopa County in Arizona for a largescale deployment of V2X technologies, Texas A&M Transportation Institute for deploying V2X technology in the Greater Houston area, the City of College Station, including near the campus of Texas A&M University (TAMU), and Utah's Department of Transportation for V2X deployments in three states -Utah, Colorado and Wyoming. The intent of all of these V2X deployment projects is to assess the full lifesaving potential of V2X communication, while ensuring connected technologies communicate securely and without harmful interference across a variety of devices and platforms. More information at USDoT's site at this link.

A perennial topic concerning autonomous vehicles is how safe they are. Some advocates of AVs insist that an AV must be as good as a competent human driver or better. To this end, researchers at the **University of Central Florida** have conducted advanced statistical analysis on available accident data for AVs and Human Driven Vehicles (HDVs) to gain insight into how the two different modes of driving compare. The analysis had tried to isolate the conditions or circumstances when an AV would have performed better or worse than an

HDV. For example, variables such as accident type, road conditions, and pre-accident movements were considered for the chances of an accident occurring or not occurring. Incident data from 2,100 AVs and 35,113 HDVs was used in this study. The analysis revealed that AVs performed worse than HDVs under dawn/dusk conditions, and making turning movement maneuvers, e.g., turning left against the oncoming traffic. They also did not do too well in work zones and during traffic incidents compared to HDVs. On the plus side, AVs exhibited lower rates of accidents due to inattention or poor driving behavior compared to HDVs. The overall conclusion was that AVs are likely safer than HDVs with everything considered, from a statistical point of view. More information at this link. The full paper can be viewed at this link.

We have published a few articles in the past about how artificial intelligence (AI) and autonomous weapon systems can change the nature of warfare. A recent article in the **Economist** magazine titled *AI will transform the character of warfare* focuses on these issues. Although autonomous vehicles have always been of interest to the military, the current generation are now supercharged with AI making them much more lethal. Indeed, the U.S. military's *Defense Advanced Research Projects Agency* (DARPA) kickstarted the whole civilian AV race back in 2004 by offering a US$1 million prize for any vehicle that could complete a relatively simple 150 mile (240 Km) route across the Mojave Desert. Fast forward twenty years to 2024 and there are now reported autonomous military vehicles operating in the Russia-Ukraine war. These autonomous vehicles include aerial types (drones) and surface and submersible naval types. AI has enabled these weapons to become jam-proof so a drone can home in on targets, even if GPS signals or the link to the pilot have been cut. Low-cost weaponized drones are able to search and attack a target by processing data at extremely high speed and plucking every tank out of a thousand satellite images, or interpret light, heat, sound and radio waves to distinguish decoys from the real thing. The article can be viewed on Economist's site at this link or this one.

And finally, robotaxi development is not the exclusive preserve of the leading Western countries or deep-pocketed companies. Zagreb, Croatia-based **Rimac** has announced big plans for a luxury robotaxi with more room and comfort than a Rolls Royce. Dubbed the *Verne* (after Jules Verne), Rimac's robotaxi has a roomy interior for two people, and

resembles more to a living room than the interior of a car. The automated driving system (ADS) is supplied by Intel-owned **Mobileye**. Rimac claims to have created the entire robotaxi ecosystem in-house. This includes the car, the app, and the *mothership* buildings, to which the vehicles will return to be charged and cleaned. At present, *Verne* has 280 employees. As for the ownership of the *Verne*, the Rimac Group has a 47 percent stake in *Verne*, with investors including **Hyundai** and the **Saudi government** holding the rest. The company states that it has signed agreements to bring the service to nine cities in Europe and the Middle-east, and is in talks to roll out to another 30 cities worldwide. More information 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

Upcoming CAV-Related Events

September 10-12, 2024	Simulation, Testing & Validation for Automated Driving L2, L2+, L3 & Beyond, hosted by Automotive IQ; Stuttgart, Germany
September 16-18, 2024	IEEE's International Conference on Smart Mobility, Niagara Falls, ON
September 16-20, 2024	30th ITS World Congress, Dubai, UAE
September 22-25, 2024	2024 TAC Conference & Exhibition, Vancouver, B.C.
September 26, 2024	GCXpo 2024, hosted by Area X.O, in collaboration with the Government of Canada
October 7-10, 2024	IEEE Vehicular Technology Conference (VTC) 2024 Fall, Washington DC
October 22-24, 2024	The Future of Automotive Testing Conference, Novi, MI
November 5-7, 2024	2024 Aerial Evolution Canada Conference & Exhibition, Ottawa ON
January 23, 2025	J.D. Power Auto Summit, New Orleans
March 19-20, 2025	Connected Places Summit, London, England
August 24-28, 2025	31st ITS World Congress, Atlanta GA

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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