

# CAV Update

A monthly newsletter  
on the CAV ecosystem

February 2021

## **From the Editors**

There is a lot of Canadian news in this month's issue, including an update on the Thompson MB Winter Weather Testing Centre of Excellence, more news from AVIN and Drone Delivery Canada, and CASPI is expanding. Enjoy!

We always enjoy hearing from our readers, so feel free to write to us [here](#).

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## **Canadian CAV News**

We have previously reported on the current project by the **Thompson MB Chamber of Commerce** to develop a concept for a state-of-the-art *Winter Weather Testing Centre of Excellence* (WWTCE). **CAVCOE** is leading this project and there are some new developments. We are interested in your input to help us make this the best that it can be. If this testing facility is of interest to you, here are three suggested next steps:

1. A backgrounder document is available [here](#). It outlines the history of winter testing in Thompson, statistics about how incredible the cold weather is, and includes an invitation to talk to us more about this exciting opportunity.
2. We would appreciate your inputs to our survey. In 5 minutes or less you can quickly tell us what type of equipment that you need testing, and what your needs and expectations are for the proposed testing facility. The survey is [here](#).
3. To reach us directly, please write to [winterweather@cavcoe.com](mailto:winterweather@cavcoe.com)

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In January 2021, Ontario's **Autonomous Vehicle Innovation Network (AVIN)** published a 7-page report titled *Workforce Transformation: Realities and Future Outlook for the Automotive and Mobility Sector*. This report suggests automotive and mobility sectors are experiencing a significant transformation. Rapid technological advancements, continuous changes in consumer behaviors, and the emergence of new business models are bringing major opportunities including autonomous

vehicles. All of these are expected to influence the future of work, reshaping many jobs, and facilitating the emergence of new roles which require new and more advanced





skillsets. For example, future AVs will impact many jobs such as truck and transit drivers, mechanics, technicians, inspectors, and other vehicle operators. AVIN's report can be viewed/downloaded at [this link](#).

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**Drone Delivery Canada** (DDC) continues to make inroads in using its automated delivery drones in the healthcare area and other sectors. Covid-19 pandemic has shown the value of such services, especially in reaching remote communities such as some First Nation communities. Some of the First Nation projects started in 2020 entail multiple daily flights to these communities. The drones deliver medical supplies, PPE, test kits, blood samples and vaccines. DDC is in discussion with various Federal and Provincial Government agencies and Canadian logistics providers to expand the scope and reach of these services. More information is at DDC's site at [this link](#). Also see another drone story in the *International CAV News* below.

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On February 17, 2021, Toronto-based **AK Motors** issued a media release regarding plans for developing a made-in-Canada electric vehicle with autonomous capability built-in. The vehicle has been named *Maple Majestic*. The company emphasizes that the vehicle is specifically designed for the Canadian climate. The media release can be viewed at [this link](#). There is also a short video of the vehicle on YouTube at [this link](#).

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## **CASPI News**

**CASPI** is expanding! Based on feedback from stakeholders and research, the focus will now be on *all* use-cases for urban non-passenger automated robots, not just snow plows. These use-cases include delivery services, winter maintenance and inspections of roads and sidewalks, maintenance of sports fields, parks, trails and parking lots, and collection of waste and recyclables.

The new organization will create synergies among equipment and service suppliers, all three levels of government, and academia.

Like CASPI, it will be a member-driven, non-profit, federally incorporated, organization that operates through membership fees, sponsored research, and business and government networking events. Members will also benefit from exclusive white papers and research reports, technology demonstrations, and knowledge sharing.

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With this expansion, we need a new name to adequately reflect the broader mandate. Please send your suggestions to [gmartin@caspi-icda.com](mailto:gmartin@caspi-icda.com). The winner will receive profile recognition in *CAV Update*.

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CASPI is pleased to announce that **Four DRobotics** has become the most recent addition to the CASPI Corporate membership. Welcome Four DRobotics!

Four DRobotics, an Ottawa-based Canadian-owned company, combines technical knowledge of embedded software engineering, mechatronics, and artificial intelligence to develop all-season outdoor autonomous vehicles.

It has delivered custom autonomous ground vehicles for physical security, airport security, lunar/mars exploration and academia. Four DRobotics is currently investigating sensor configurations to increase the safety of manned snow plow operation, with some automation to minimize damage.

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**CAVCOE**, CASPI's partner organization, recently concluded a research project on Automated Sidewalk Winter Maintenance (ASWM) for the **City of Toronto**. The report states that ASWM may be able to complement existing snow plowing fleets as well as offer significant advantages compared to conventional winter maintenance services.

The interest in emerging ASWM technology is growing. The Cities of **Toronto, Calgary, Edmonton**, and **Grand Prairie** are aware of the potential of ASWM and were interviewed for this research. Municipalities see the potential of the technology to improve levels of service to residents in their jurisdictions. The desire for efficiency gains is a strong driver for innovation in this sector. The report's Executive Summary can be downloaded [here](#).

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You are invited to sponsor the virtual 2021 *Canadian Automated Snow Plow Competition*, free of charge!

Here is the twist! Sponsor organizations provide a promotional item of choice to all members of competing teams. Examples include T-shirts, books, digital magazine subscription. CASPI will profile your organization in the Competition Day and Awards Day presentations, the CASPI website, and in *CAV Update*. Sponsors also have an opportunity to speak at these events and will receive a copy of the student resumes.

For more details and to become a sponsor, please contact Glenn Martin [gmartin@caspi-icda.com](mailto:gmartin@caspi-icda.com).

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## International CAV News


Due to ever increasing popularity of delivery drones, in late December 2020, The **Federal Aviation Administration** (FAA) issued new rules for operation of delivery drones in the U.S. The new rules stipulate that drones will need to broadcast their identification through a new system called *Remote ID*, which will help the government track both the drones and their base "control" stations. Those operating at night will also need to have anti-collision lights, and drones must have no "exposed rotating parts" (like the flight blades) that could cut human skin. And people who manage the drones will need to have a drone pilot's license with them whenever operating the aircraft. According to FAA, drones are the fastest-growing segment in the entire transportation sector – with currently over 1.7 million drone registrations and 203,000 FAA-certified remote pilots. More information on FAA's site is at [this link](#).



That delivery drone is a step closer to reality.

On January 4, 2021, **IEEE Spectrum** published an article on the fast-developing automated trucking industry. The article indicates that driverless depot-to-depot deliveries by automated trucks could begin in 2021. The company highlighted in the article is San Diego-based **TuSimple**. This company is already hauling freight for **UPS** in southwest U.S. using its fleet of 40 automated **Freightliner** trucks. Unlike AV technology developed for cars, TuSimple claims its technology was designed from ground up for large *Class 8* trucks (18 wheelers). In some ways, these types of trucks lend themselves better for automation due to being taller and having more power available for the great number of sensors and onboard systems. They are also designed to detect objects up to 1,000 m ahead of the vehicle vs. about 200 m for cars. Furthermore, the automated trucks use their brakes less often than trucks operated by human drivers, leading to improvements in fuel economy of about 10 percent. Steadier driving, with less side-to-side movement in a lane, brings additional efficiency gains while also minimizing tire wear. All these and having no driver in the cab improve the bottom line for trucking companies. The IEEE article can be viewed at [this link](#).





In another link-up between an automaker and a high-tech company, China's **Nio** has partnered with **Nvidia** to develop a new generation of automated driving electric vehicles. This includes incorporation of *NVIDIA DRIVE Orin™* system-on-a-chip (SoC) for Nio's new generation of electric vehicles. Nvidia claims that its *Orin* processor is the fastest in its class and capable of 254 trillions of operations per second (TOPS). The new Nio ET7 premium electric vehicle will have four of these supercomputers onboard. More information is at [this link](#).

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Perhaps the next best thing to getting an actual ride in one **Waymo's** *robotaxis* operating in Arizona is to watch a regular user of this service describe their experience with this service while riding a Waymo driverless robotaxi from his home to work. The 7-minute video was posted on YouTube in mid-January 2021 and can be watched at [this link](#).

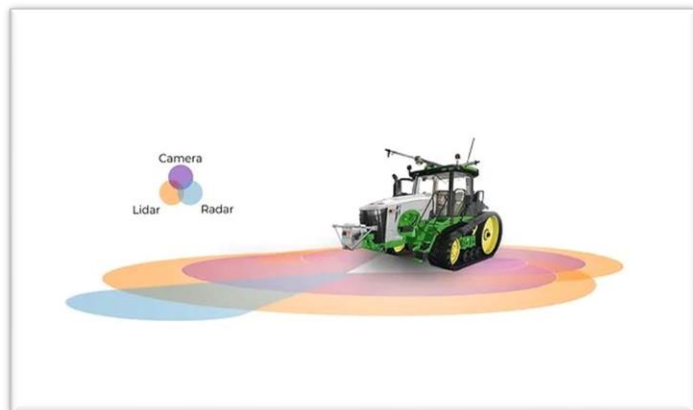
Waymo has also starting testing in San Francisco, and in their blog post (link [here](#)), they make some interesting statements about their expanding capabilities. We liked this comment in particular: "We've also designed our software to reason about the context, which is essential for driving safely in busy cities. Our perception system lets our Driver [i.e., driving system] know how to handle a pedestrian, a tree – and a pedestrian carrying a Christmas tree." We also note that Waymo is now marketing their Laser Bear Honeycomb™ LiDAR which boasts a very impressive 95° vertical field of view ([here](#)).

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California-based **Bear Flag Robotics** has set its sights on automating tractors used in the farming industry. This company is a part of AgTech industry which has attracted over US\$15.7 billion in investments since 2015.


According to Bear Flag, the leading cause of death on farms is tractor rollovers. Removing people from this rather hazardous piece of equipment has safety benefits.

Additionally, the automated tractors gather various useful data on field patterns and crops to provide predictive analytics that helps growers better plan each season. More information is at [this link](#).



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The automated driving division of **General Motors** (GM) is **Cruise**, which GM acquired in 2016 for US\$1 billion. Cruise's market cap is now about US\$30 billion based on the latest external investment of US\$2 billion in it. One of the latest investors in Cruise is **Microsoft**. According to Microsoft's CEO, GM & Cruise will use Microsoft's *Azure* cloud



computing platform to enable them to scale and make autonomous transportation mainstream. More information at [this link](#).

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At the virtual 2021 **Consumer Electronic Show (CES)**; automotive company **APTIV** unveiled a new *Smart Vehicle Architecture* for future electric and autonomous vehicles. The crux of the new APTIV is splitting the vehicle's *brain & nervous system* into four so-called *zone controllers*. APTIV states that this approach simplifies manufacturing of cars, improves reliability and is a major step towards a *software-defined car*. More information on APTIV's site at [this link](#). APTIV has published a 7-page *White Paper* where it discusses the new concept in more details. The White Paper can be viewed/downloaded at [this link](#).

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**Foxconn** is the company best known for making iPhones for Apple. In another sign of transformation in the car industry, Foxconn has now signed an agreement with the major Chinese automaker **Geely** to design and build vehicles that are connected, autonomous, shared, and electric (CASE). This includes catering to ridesharing companies and their specific requirements. Foxconn's strength is in Information & Communication




Technologies (ICT) while Geely's is in design and mass manufacturing of automobiles. The partnership is on a 50-50 basis. No timeline on when products from this new joint-venture will come to market. More information is at [this link](#).

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On the heels of exiting its autonomous vehicles and airtaxi businesses, **Uber** continues to shed more unprofitable and iffy Business Units (BU). The latest to go is its sidewalk delivery robot business known as **Postmates X**. This BU was part of Postmates food delivery business that Uber acquired in July 2020 for \$2.65 billion. Uber is planning to spin-off Postmates X as an independent company and is looking for a suitable partner; much as it did with making deals with Aurora for its AV business and Joby Aviation for its airtaxi business. Uber will retain an ownership stake in the new sidewalk robot company once the transaction is concluded. More information is at [this link](#).





The appointment to a key position at the **U.S. Department of Transportation** (USDOT) of a **University of Michigan** professor could be an indication of renewed interest by the new U.S. Administration in pushing the agenda forward in the U.S. CAV space. According to the University of Michigan's new release, Prof. Robert Hampshire has expertise in research, policy formulation and the impact of autonomous and connected vehicles on the society, climate, transportation equity as well as other innovative mobility services. He will be in charge of coordinating research, development, and technology activities across all divisions of USDOT and the 40 University Transportation Centers. He will also oversee the *Bureau of Transportation Statistics*, the *Volpe National Transportation Systems Center* in Cambridge, Massachusetts, and the *Transportation Safety Institute* in Oklahoma City, Oklahoma. More information is at [this link](#). Other key appointments at the USDOT can be viewed at [this link](#).

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In January 2021, a **group of eight major European organizations** involved in car insurance, vehicle maintenance, roadside assistance, and other related fields; published a 32-page report titled *Connected vehicle: 8 principles for a balanced ecosystem accessible to everyone*. With an eye on the rapid advancement in vehicle connectivity, the report describes how these new services will improve the comfort and lives of drivers and passengers. It suggests that connectivity will improve road safety, infrastructure optimization, climate change and vehicle electrification. It also advocates for access to data for all stakeholders in this emerging ecosystem. Copy of the report can be viewed/downloaded at [this link](#).

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In a departure from the approach adopted by some automakers, the world's second largest vehicle manufacturer – the **Volkswagen Group** of Germany has indicated its plans to develop the bulk of its autonomous driving technology in-house. It reportedly has 5,000 of its staff working on VW.OS operating system and other software necessary for an automated vehicle. It appears that VW wishes to have full control over its product development and to perhaps be able to license its technology to other companies. More information is at [this link](#).



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On February 4, 2021, the website of **Semiconductor Engineering** published an article titled *Bridging the Gap Between Smart Cities and Autonomous Vehicles*. The article discusses some of the critical issues involved in integrating CAVs with a so-called *Smart City*. Experts from **Qualcomm, Siemens, Xilinx, Rambus, Cadence**, and other companies express their views about challenges and opportunities in the integration task. The article suggests that China, Japan, and Europe are more likely to make



advances into CAV-Smart City integration than the United States. The article can be viewed at [this link](#).

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On February 4, 2021, The **Los Angeles Times** published an article titled *Trump left a 'massive' traffic-safety mess for Biden. Item one: Tesla's self-driving claims*. The article suggests that under the Trump Administration, the **National Highway Traffic Safety Administration** (NHTSA) had gone easy on Tesla and its self-driving technology and avoided confronting Tesla directly on several issues; including Tesla's marking claim of having developed *Full Self-Driving* (FSD) capability and selling this feature on a subscription basis to its customers. Furthermore, it is alleged that the agency that took a hands-off approach to a wide range of other issues. LA Times article can be viewed at [this link](#).

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And finally, in one of his final acts as President, Donald Trump granted a full pardon to Anthony Levandowski who is one of the early contributors to the development of autonomous vehicles. Levandowski had been charged with the theft of trade secrets from Google and sentenced to 18-months prison in August 2020. According to former President Trump, Levandowski is an American entrepreneur who led Google's efforts to create self-driving technology. More information is at [this link](#).

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## ***Upcoming CAV-Related Events***

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| Apr 6-8, 2021    | <a href="#">ADAS Sensors 2021</a> ; Detroit MI   |
| Apr 25-28, 2021  | <a href="#">IEEE Vehicular Technology Conference 2021-Spring</a> , Helsinki, Finland                     |
| May 3-6, 2021    | <a href="#">Association for Unmanned Vehicle Systems International (AUVSI) 'XPONENTIAL'</a> , Atlanta GA |
| June 8-10, 2021  | <a href="#">Autonomous Vehicle Technology Expo 2021</a> , Stuttgart, Germany.                            |
| June 16-17, 2021 | <a href="#">Autonomous Vehicles 2021</a> , Long Beach CA   |
| June 20-23, 2021 | <a href="#">ITS Canada 2021 Conference</a>   |
| Sept 13-15, 2021 | <a href="#">MINExpo</a> , Las Vegas, Nevada  |
| Oct 11-15, 2021  | <a href="#">ITS World Congress</a> , Hamburg, Germany  |
| Dec 14-17, 2021  | <a href="#">UITP Global Public Transport Summit</a> ; Melbourne, Australia                               |





## **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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*We welcome all comments; please send them [here](#)*

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

**CASPI** (the Canadian Automated Snow Plow Initiative) is an association for all stakeholders involved in non-passenger CAVs for urban use-cases

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