

CAV Update

From the Editors

Despite the many impacts of COVID-19, it is a surprisingly busy time in the Canadian CAV ecosystem. This issue of *CAV Update* has many articles from Canada and internationally. And our radar screen tells us that there will be multiple, interesting Canadian announcements in the next two months, including contracts and webinars. Unfortunately, we cannot share them with you at this time. Stay tuned!

Canadian CAV News

The City of Toronto is contemplating creating a *Transportation Innovation Zone (TIZ)* at the City-owned *Exhibition Place* better known for the annual *Canadian National Exhibition (CNE)* held in the summer months. This 192-acre site has 8 Km of roadways and 30 intersections. The City believes the site is suitable for testing of driverless vehicles designed to move people or goods, smart traffic signals and sensors, new paving materials, and strategies to improve the safety of pedestrians and cyclists. More information is at [this link](#). A copy of the 8-page City of Toronto report on TIZ can be viewed/downloaded at [this link](#).



Standards are, of course, always important. Canada's **CIO Strategy Council** has a new technical committee on autonomous and connected vehicles and is currently developing minimum requirements for public testing and proving grounds, with an emphasis on the responsible use of data generated by CAVs. This *National Standard of Canada* is expected to be approved by the Standards Council of Canada and will focus principally on public infrastructure and public spaces, while addressing the challenges and opportunities when data intersects with these sectors.

For those who do not know the CIO Strategy Council, it provides a forum for Canada's most forward-thinking Chief Information Officers to focus on collectively transforming, shaping, and influencing the Canadian information and technology ecosystem. Learn more [here](#).

In a step forward for Canadian research & development in the CAV area, Ontario's **Centre for Integrated Transportation and Mobility (CITM)** has announced expansion of its Smart Mobility Network by partnering with **City of Hamilton** owned *HCE Telecom* and Edmonton-based *iSmartways* to accelerate R&D in cellular to vehicle (C-V2X) and related systems. Details are at [this link](#).

Edmonton-based **Drivewyze** and its parent company **Intelligent Imaging Systems (IIS)** have recently attracted US\$60 million in venture funding from Connecticut-based **Sageview Capital**. Drivewyze is a provider of software and services to commercial vehicle owners (mostly tractor trailers) and federal/state highway departments. Drivewyze's core product enables commercial vehicles to bypass highway weigh stations. This provides cost savings in time and fuel saved. More information is at [this link](#).

Drone Delivery Canada (DDC) in collaboration with **Peel Region Paramedics** and **Sunnybrook Centre for Prehospital Medicine** demonstrated the capability of its *Sparrow* drone and its cargo drop system by multiple deliveries of *Automated External Defibrillator (AED)*. The demonstrations involved a new audio announcement system and using lay people to retrieve and apply the AED device delivered by the drone to a simulated cardiac arrest patient. The Covid-19 pandemic has sharpened the focus on the usefulness of automated drones for making rapid deliveries of medicines, blood tests, swab samples and now AED. More information on DDC's site is at [this link](#).

Staying with drones, the well-known Chinese drone company **EHang** now has a presence in Canada. The company has partnered with **Unither Bioelectronics** (an offshoot of **United Therapeutics**) for the transport of human organs. EHang reports that it has been granted a *Special Flight Operations Certificate (SFOC)* by Transport Canada for its *EHang 216* drone to operate in Quebec in pursuit of its collaboration with Unither Bioelectronics. More information is at [this link](#).



The EHang 216 was displayed in Quebec last year at the International Civil Aviation Organization's 75th anniversary ceremony, EHang Photo

Natural Sciences and Engineering Research Council of Canada (NSERC) has provided a \$9 million funding to **Carleton University** to pursue research in several areas including connected and autonomous vehicles (CAVs). The CAV research will be led by Carleton's *School of Information Technology*. More information is at [this link](#).

Canada's **Shopify** has partnered with the maker of a delivery robot company – **Kiwibot**, to launch a robotic delivery service in San Jose, California. Businesses using the popular Shopify online platform can choose to have their goods delivered for a US\$3.99 fee by a Kiwibot delivery robot in certain neighbourhoods of San Jose. More information is at [this link](#).



CASPI News

CASPI recently held two successful strategic planning sessions, identifying the top priority as the need to build CASPI as a recognized organization in the winter operations and maintenance / CAV ecosystem.

Although CASPI is a new organization, the close link with CAVCOE provides a recognized branding in the CAV sector. This facilitates research studies on relevant topics affecting automated technologies for winter operations. This will be a major benefit to future CASPI members.

To build recognition in the CAV industry, CASPI is participating in an upcoming webinar on automated snow clearing. Details and the panelists will be announced soon.

CASPI is in early planning for an annual conference, likely held in Toronto, that will include a CASPI-led workshop with municipalities and other stakeholders to shape the direction for automated technologies for winter operations.

CASPI has created communication materials that will be distributed to an extensive list of stakeholders, raising its profile while encouraging membership participation to build the ecosystem for stakeholders involved in automated snow and ice management. The membership drive will begin in September.

The CASPI team is pleased to announce that preparations are underway for the launch of the *2021 Student Snow Plow Competition*. Teams from across Canada will compete to develop operational automated snow plows that must adhere to high safety and technical standards. This will be the third year for the Canadian-based competition and

will consist of two phases: A Technical Paper submission and an On-site Demonstration where the teams will showcase their robot's ability to plow and navigate through a series of course obstacles. The competition develops teamwork, creative thinking, and innovation among the participants.

Further announcements about the 2021 registration process and location of the competition site will be made in the upcoming weeks. CASPI encourages all interested student teams from academic institutions across Canada to contact us at competition@caspi-icda.com for more details. In 2020, six teams participated in the competition and Team VAUL from Laval was the Technical Paper Winner. The on-site demonstration and competition was canceled due to COVID 19.

CASPI also welcomes organizations who are interested in competition sponsorship opportunities to contact Ms. Glenn Martin at gmartin@caspi-icda.com.

The town of **Erin**, Ontario (near Guelph) has partnered with Waterloo-based **Top Hat Robotics** to deploy a semi-automated sidewalk inspection robotic vehicle. Using its high-resolution cameras, the vehicle can detect and record exact locations of lips, cracks, dips, and other sidewalk deficiencies. Future plans include a fully-autonomous robot that perform full maintenance of sidewalks including winter plowing and salting. More information is at [this link](#).



International CAV News

Aurrigo, based in Coventry, England and with a satellite operation in Ottawa, has recently launched a 13-seat, self-driving shuttle vehicle. The new shuttle comes after the success of their smaller *PodZero* (4-seat) vehicles which are already gaining popularity globally. The shuttle helps to provide transport for city centres, shopping and care facilities, airports, and heritage sites. (Barrie Kirk visited Aurrigo in Coventry in

August 2019, saw a prototype, and reports that it is great to see how much progress Aurrigo has made in 12 months.) More information about the new shuttle is at [this link](#).



Boschung is a Swiss company dedicated to manufacturing vehicles and systems for surface management of roads, airports, parks, and related applications. One of its latest products is an automated sweeper called *Urban-Sweeper S2.0 Autonomous*. More information about this product can be viewed on Boschung's site is at [this link](#). A short YouTube video can also be viewed at [this link](#).



We remind readers from time to time that vehicle automation is not limited to land vehicles. In a July 25, 2020 article, **The Economist** magazine reports from Japan on advances being made in making ships fully- or partially-automated. **Japan Marine Science** (JMS) is an organization leading the charge in this area. Their efforts are described as the maritime equivalent of self-driving cars. Part of the motivation for their work is to address the shortage of staff to crew the Japanese maritime fleets. This is somewhat similar to what drives R&D in the trucking industry where there is an acute shortage of qualified long-distance truck drivers. The Economist article can be viewed at [this link](#).

Staying with the marine topic, a recent article in **techrepublic.com** looks at the bigger picture of the marine industry. According to the **United Nations**, approximately 90% of all worldwide commerce are transported by ships. And in a similarity with automobiles, 75% to 95% of all marine accidents are due to human error, mostly caused by fatigue of the ship crew. Accordingly, a whole range of technologies are being applied to the shipping industry including AI, operating cranes from an office instead of a cab high up, cybersecurity and of course automation. The article can be viewed at [this link](#).

And in the world of aviation, **Airbus** has announced that it has made significant progress in making its latest passenger jet – the **A350-1000 XWB**, autonomous for most flight tasks. The project called the *Autonomous Taxi, Take-off, and Landing (ATTOL)* was started two years ago by Airbus in France and is now concluded. The first demonstrated task was automated take-off in December 2018. Five hundred flights later, Airbus claims other tasks such as taxi and landing have been automated as well. The key technology according to Airbus has been fully-automatic vision-based flight tests using on-board image recognition technology, machine learning algorithms and automated tools for data labelling, processing, and model generation. Full details are at [this link](#). Further information on ATTOL can be viewed on Airbus's own site at [this link](#).

An article titled *Self-driving industry takes to the highway after robotaxi failure* by UK's **Financial Times** delves into where the self-driving industry has come up short in delivering robotaxis and AVs that can drive in urban environments. Predictions of a US\$350 billion robotaxi market by well-known financial firms have not materialized in what one expert calls *autonomous disillusionment*. This has caused the attention for vehicle autonomy to turn onto easier problems such as automated trucks operating on long stretches of highway, delivery robots and automated warehouse robots. The FT article can be viewed at [this link](#) or [this one](#).

In a somewhat similar theme, an article titled *Exploring the Three Elephants in the Autonomous Vehicle*, **Forbes** magazine writes about three major issues that might be hampering the advancement of CAVs. First is the inadequacy of the current AI systems for self-driving tasks. Depending on ever larger databases to train AI systems is deemed infeasible. Second is the uncertain fate of **Dedicated Short Range Communication (DSRC)** to connect vehicles together and with the infrastructure. The writer does not have much faith in this technology. And last is the *Zoom Factor*, i.e. the negative impact of Covid-19 pandemic on conventional transportation. Full details can be viewed on Forbes site at [this link](#).

An article titled *Connected Cars: Let Me Count the Ways* by Dr. **Egil Juliessen** appeared in **eetimes.com** on July 29, 2020. The article covers the many ways a connected vehicle can be both a generator and consumer of valuable data. Tesla is cited as a leader in pioneering many of the advanced systems available today such as *Over the Air (OTA)* updates to add new functionality or improve on existing ones. Connectivity has created a whole new market for a number of business lines to generate revenue from/to a connected vehicle. The author also discusses the rivalry between DSRC and C-V2X where C-V2X seems to be garnering more support from the automotive industry. The article can be viewed at [this link](#).

In another connected vehicle initiative spearheaded by the **United Nations**, 53 countries became signatories to a resolution requiring tighter cybersecurity for automobiles and especially those with connectivity. The United States is not one of the signatories but is obligated to abide by it for the vehicles that it sells to the countries that are a party to the resolution. **South Korea** has indicated it will comply with the new requirements this year, **Japan** will in 2021 and **EU** in 2022. Details are at [this link](#).

Ford Motor Company has been working on developing AVs for several years. In order to educate the general public about AVs, Ford has now partnered with the **Michigan Science Center** by installing a mock-up of an AV and explaining how the car can drive itself without a human driver by using 3D maps, cameras, sensors and lidar. The exhibit was designed and built by Ford engineers and developers. More information is at [this link](#).

In yet another initiative to give a boost to CAV development, the **State of Michigan** is supporting a new initiative for creating a 40-mile high tech highway between Detroit and Ann Arbor to accelerate development of CAVs in that state. An offshoot of **Sidewalk Labs** called **Sidewalk Infrastructure Partners**, has partnered with **Ford, GM, Argo AI, Arrival, BMW, Honda, Toyota, TuSimple, Waymo** and others to do a two-year feasibility study into this by creating a subsidiary called **Cavnue**. Details are at [this link](#).

TuSimple is generally believed to be ahead of its competitors in developing self-driving trucks. In a not so rosy article, a litany of TuSimple's problems to date are discussed. Among them are worries of **U.S. Defense Department** about TuSimple's ties to China. Another red flag is the fact that TuSimple had applied to the *Paycheck Protection Program* for a loan of between \$2 million and \$5 million from the *U.S. Small Business Administration* to avoid layoffs. The company has also repeatedly missed deadlines for a number of milestones such as not needing safety drivers. And lastly, TuSimple has agreed to pay Navistar millions of dollars to have access to its trucks for its development work. This is a noticeable departure from the usual arrangement of vehicle manufacturers paying AV companies to incorporate their technology into their vehicles. More details are at [this link](#).

Autonomous Vehicles are on **World Bank's** radar too. In an August 11, 2020 blogpost, the World Bank opines that the Covid-19 pandemic may finally make a convincing case for developing and deploying automated vehicles. In its reasoning, the World Bank draws parallels with how elevators in buildings became operatorless after decades of having human operators; and how 46 of the world's light rail metro systems are now driverless. The blogpost can be viewed at [this link](#).

On August 18, 2020, **Wired** magazine published an article titled *A Move for Driverless Mass Transit Hits Speed Bumps*. In it, Wired writes that in many of the autonomous shuttle projects undertaken, the usefulness of this technology for public transportation remains unclear. The unions representing transit workers are very hostile to automating transit buses and shuttles due to many jobs that will be lost. The article states that **AFL-CIO** lobbied Congress on this issue resulting in legislation in the **House of Representatives** where it directs the **Department of Transportation** to not fund

autonomous transit projects that *eliminate or reduce* existing service. The bill is now with the **Senate**. The Wired article can be viewed at [this link](#).

Partners for Automated Vehicle Education (PAVE) is a diverse coalition that unites industry partners and non-profit groups who believe in the potential of AVs. One of its latest actions is the creation of a *Public Sector Advisory Council* whose members include academic experts and public sector officials. This new body considers AV impacts on public sector entities, including issues with infrastructure, law enforcement, and public transit. More information is at PAVE's site at [this link](#).

And finally, an interesting article titled ***The 100-Year History of Self-Driving Cars*** by Anthony Townsend examines the efforts made over the past 100 years in developing self-driving vehicles. The author starts by saying "*The first self-driving vehicles were ships!*". The article can be viewed at [this link](#) or [this one](#).

CAVCOE Speakers' Bureau

CAVCOE provides speakers for many different types of events across Canada, the US and overseas; we are now booking for 2021. This keeps us busy because people understand that CAVs will have an impact on almost everything. On the one hand, our presentations have core messaging on the status of CAVs, their deployment scenarios, and the impact on business plans, government policy, 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

Sept 22, 2020: [ITS Canada's Connected Automated Electric Shuttles \(CEAS\) technical sub-committee meeting](#); open to all via webinar link.

Oct 4-7, 2020: [IEEE 92nd Vehicular Technology Conference](#), Victoria BC

Oct 4-8, 2020: [ITS World Congress](#), Los Angeles CA: CANCELLED

Nov 2-6, 2020: [UC20 Remote: Unmanned Systems Canada's annual conference](#) On-line.

Nov 16-18, 2020: [Canadian Parking Association Annual Conference and Trade Show](#), Montreal (hybrid event)

Nov 16-17, 2020: [Car.HMI and Tech.AD USA 2020](#), Detroit MI

Dec 8-9, 2020: [Autonomous Vehicles 2020](#); Long Beach California

Jan 6-9, 2021 [Consumer Electronic Show](#) (CES), Las Vegas NV

Feb 21-24, 2021: [Ontario Good Roads Association Annual Conference](#); Toronto ON

Apr 2021: [ADAS Sensors 2021](#), Detroit MI

Jun 20-23, 2021: [ITS Canada 2021 Conference](#)

Dec 14-17, 2021: [UITP Global Public Transport Summit](#); Melbourne, Australia

CAV Update is a free, monthly roundup of news and analysis in the world of automated vehicles and their 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) provides advice to the public and private sectors to help plan for the arrival of self-driving vehicles.

CASPI (the Canadian Automated Snow Plow Initiative) is an association for all stakeholders involved in winter operations and maintenance of sidewalks and trails.

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