

CAV Update

A monthly newsletter
on the CAV ecosystem

November 2022

From the Editors

We have often addressed in this newsletter the fact that Canada is very strong in CAV innovation, research, development and testing, but is not doing enough to plan for CAV deployment, especially compared to other countries. A recent example is the Transport Minister's Supply Chain report that has a 30-50 year planning horizon but failed to even mention the role and benefits of automated freight in Canada's supply chain.

We therefore congratulate **BLG** and the **Ontario Vehicle Innovation Network** for their upcoming *Smart Mobility Roadmap Virtual Summit*. To be held on December 6th, this summit will address future proofing our regulatory frameworks for two vectors of change in the transportation, automotive, and infrastructure sectors: electrification and automation. The event showcases a discussion of key regulators and policy makers, as well as achievements in autonomous vehicle deployment in Canada. Additional details are [here](#).

We noticed a related theme in an announcement from the other side of the world. The new **Centre for Connected and Automated Transport (CCAT)** is the next iteration of the **Australia and New Zealand Driverless Vehicle Initiative (ADVI)**. Its mission is to facilitate the transition to connected and automated transport, with a particular focus on physical and digital infrastructure preparedness. They say that ***now is the time to move beyond promoting the technology. Now is the time to prepare for it.***

CCAT has a broad scope, encompassing the application of connected and automated technologies across different transport sectors – not just roads. They say that this recognizes the convergence of technologies that will transform our transport future.

CCAT is a diverse government, industry, academia and community collaboration and they have already seen strong support from government. More information on CCAT is [here](#).

Our take is that Canada needs an organization like CCAT. In 2018, CAVCOE tried to launch the **Canadian Automated Vehicles Institute (CAVI)** but failed because of a lack of support from the government. Is now the time to re-visit CAVI? And, if so, the first step would be for the federal government to provide a commitment and initial support. We hope that happens.

Canadian CAV News

Kitchener, Ontario based **Clearpath Robotics** has been a beneficiary of tight supply chain issues and labour shortages over the past 2.5 years. The company is a leader for the design and manufacture of autonomous vehicles intended for industrial plants and warehouses. These vehicles typically move parts on the factory/warehouse floor or the production line. Its *OTTO Motors* division employs 350 people and is looking to hire 50 more. It has exported its products to the U.S., Germany, Japan and is planning expansion into Australia and New Zealand. The company is tipped to have a billion dollars in revenue in the near future. Clearpath Robotics was formed in 2009 by a group of University of Waterloo graduates. More information is at [this link](#).



In what is believed to be the first of its kind in Canada, Vaughan, Ontario based **Drone Delivery Canada Corp.** (DDC) has announced a commercial revenue service with **Halton Healthcare Services Corporation** (Halton Healthcare) for delivery by cargo drones of a wide variety of healthcare goods including medical isotopes for cancer care (supplied from McMaster University) to *Oakville Trafalgar Memorial Hospital*, located in Oakville, Ontario. The service known as *Care By Air*, will be operational for a 6-month term. DDC indicates that all operations will be conducted in accordance with the appropriate Canadian regulations. Assuming Halton Healthcare sees value in this method of delivery of critical medical supplies, the service could be extended to its other two hospitals - *Georgetown Hospital* and *Milton District Hospital*. More details on DDC's site at [this link](#).



Calgary-based **NovAtel Inc.** is part of *Autonomy & Positioning Division* of Sweden's **Hexagon AB**. NovAtel and Hexagon are involved in the massive iron ore mining operations in the Pilbara region in Western Australia. Specifically, the technologies developed by these companies are incorporated into trucks hauling the mined iron ore from the mine site to the port for export markets. Locally, these haul trucks are known as *road trains*. The distance from the mine site to the port is about 200 Km for a round trip. A typical *road train* pulls three trailers each loaded with 100 tonnes of iron





ore. Making these trucks automated can result in substantial savings. According to NovAtel/Hexagon, the cost to move one tonne of ore via a human-driven truck for 1 kilometre is about 8 cents, which translates to about US\$2,400 for a one-way 100 kilometre (62 mile) trip loaded up to 300 tonnes. With automation (no driver), the cost is reduced to 3-4 cents per kilometre. If scaled up to a 100 truck fleet, the savings can be as high as US\$236 million per year using the autonomous platooning system. More information is on NovAtel's site at [this link](#).

Kitchener-based **Swap Robotics** has developed a six-wheeled electrically powered autonomous snowplow for snow clearing and salting on sidewalks. **Transport Canada** in collaboration with this company and **Innovation, Science and Economic Development Canada (ISED)**, has been putting this automated snowplow through its paces.



Transport Canada states that this is the first automated snowplow of its kind in the world. On a full charge, the snowplow can run for 12 to 18 hours. The company says batteries can be swapped in about 5-minutes. The snowplow has visual detection, edge sensing, six built-in emergency-stops (all over the robot), wireless emergency-stop, two-way audio, back-up beeper, amber revolving lights and signal indicators. Swap Robotics also makes automated machines for grass cutting. A short YouTube video showing the automated snowplow in action can be viewed at [this link](#). A Transport Canada official provides commentary for the video.

International CAV News

In a major setback for the AV industry, one of the bestknown AV developers, **Argo AI** abruptly shutdown on October 26, 2022. Both **Ford Motor Company** and **Volkswagen** had invested substantially in Argo. In all, US\$3.6 billion had been raised by Argo prior to its sudden shutdown. The media reports say that Ford and VW pulled the plug on Argo. Ford CEO stated that his company will not be pursuing in-house development of AV technology any longer. Instead, Ford will buy the technology from others when the technology has matured and ready for wide deployment. It is also reported that ride-hailing company **Lyft** also lost its US\$137.5 million investment in Argo. More information is at [this link](#).



Aurrigo, based in Coventry, England, is now listed on the AIM market of the London Stock Exchange as it looks to accelerate growth across its aviation division. The strategic expansion plans will see the continued development and roll-out of its *Auto-Dolly* product, an autonomous vehicle for carrying cargo and luggage at airports around the world. The new investment will be used to scale up future production and build on successful trials at Changi International Airport in Singapore and Gerald R Ford



International Airport in North America. Prof. David Keene, CEO of Aurrigo, said: “The global transportation market is ripe for disruption. Aviation has significant structural constraints, with decades old technology/equipment and labour shortages hampering its recovery from Covid-19 and its long-term growth prospects.” Additional information is [here](#).

Aurrigo also has a satellite team based in Ottawa, Canada. We reported recently that the latest hire in Ottawa is **Dana Borschewski**, VP Aviation Products and Operations.

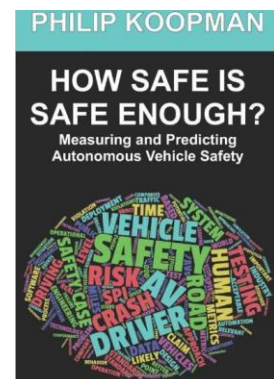
The U.S. Secretary of Transportation, **Pete Buttigieg**, has weighed in again on the future of AVs. In his opinion, at present, AVs are in a kind of *valley of death* between where they started and where they are headed. He believes AV technologies do run the risk of making things worse in the short term. He is also concerned that people owning ADAS equipped vehicles have too much trust in these systems and treat it like a driver replacement system. He adds that there is no car that you can buy today from a dealer where you do not have to be paying attention at all times when you are driving. More information is at [this link](#).



The question of who is liable should an automated vehicle get involved in a collision remains largely unanswered. With increased automation, some authorities are leaning towards holding the vehicle manufacturer liable in such cases. However, this issue remains unresolved for the time being. In what could be a test case on the liability issue, an upcoming trial in California in a double fatality involving a **Tesla** Model 3 vehicle could set a precedence on liability of AVs. In December 2019, the Tesla vehicle while operating in its *Autopilot* mode ran a red light and collided with another vehicle killing both occupants. The trial could hinge on the question of 'man vs machine'. More information is at [this link](#).



A new book on autonomous vehicles titled **How safe is safe enough? Measuring and Predicting Autonomous Vehicle Safety** was published in September 2022. The author is *Philip Koopman*, an AV expert. He is an Associate Professor at Carnegie Mellon University’s College of Engineering (Electrical and Computer Engineering Department) in Pittsburgh, PA. The book covers terminology, autonomous vehicle safety challenges, risk acceptance frameworks, setting an acceptable safety goal, measuring safety, safety cases, safety performance indicators, deciding when to deploy, and ethical AV deployment. The book’s intended audiences are engineers, policymakers, stakeholders and technology enthusiasts. The book is available in paperback from Amazon (Canada) for \$59.99. More information is at [this link](#).



The **U.S. Department of Transportation** (USDOT) has announced a new US\$800 million program (over five years) aimed at leveraging technology to improve the transportation system. The new funding has two components. The first is called *Strengthening Mobility and Revolutionizing Transportation* (SMART) which will provide up to US\$100 million in grants annually over the next five years and will fund projects that use data and technology to solve real-world challenges. These include:



- *Vehicle technology, like automation and connectivity*
- *Systems innovation, like delivery and logistics, traffic signals, smart grid, and data integration*
- *And new ways to monitor and manage infrastructure, like sensors and UAS*


The second program is *Advanced Transportation Technology and Innovation* (ATTAIN), and is intended for adopting advanced technologies to improve safety and reduce travel times for drivers and transit riders and will serve as national demonstration projects. More details are at [this link](#).

Airport operators are always looking for more efficiency and cost reduction. A new autonomous baggage tractor developed jointly by French companies **EasyMile**, **TLD** and **Alyzia** has been deployed in a few major airports such as Changi (Singapore), Narita (Japan), Schipol (Netherlands) and Toulouse (France). The companies claim it can reduce the costs by 50% and address the current labour shortage. The autonomous tractor has also been deployed in major automotive manufacturing plants and logistics centers in Europe and the United States. More information is at [this link](#). A short YouTube video of the baggage tractor in action can be viewed at [this link](#).



San Francisco has served as a test bed for AV developers for a few years now. **Cruise** and **Waymo** have sizeable fleets operating in that city. Cruise is reported to have over 100 vehicles providing a commercial robotaxi service in San Francisco. A couple of transportation organizations in San Francisco have concerns about this. They are **San Francisco Municipal Transportation Agency** (SFMTA) and the **San Francisco**





County Transportation Authority (SFCTA). In a joint 39-page letter addressed to the **National Highway Traffic Safety Administration (NHTSA)**, they detail these concerns and urge NHTSA to attach conditions on any approvals it may grant to Cruise or other AV developers deploying AVs in their jurisdiction. They cite a few examples of mishaps caused by Cruise AVs such as blocking lanes, many AVs converging on a single location, problems with the pick-up and drop off of passengers, and other issues. SFMTA and SFCTA make 14 recommendations in their letter and ask that NHTSA take these into consideration when examining applications by Cruise and others for expanding their AV fleets in San Francisco. More details are at [this link](#). The 39-page letter to NHTSA can be viewed/downloaded at this [link](#).

In a similar move, the **National Association of City Transportation Officials (NACTO)** has petitioned NHTSA to impose many conditions on AV companies before granting them permissions and (safety) exemptions for expanding their fleets. The AV companies are hoping to gain permission to deploy up to 5,000 additional automated vehicles on public roads. More information on NACTO's action is at [this link](#).

AV companies are keen to highlight their efforts in ensuring their products are safe. Some boast that their *virtual driver* is better than the average human driver in terms of avoiding or mitigating crashes. Now, **Waymo** has gone a step further by creating a simulated *superhuman driver* and pitching it against its own *Waymo Driver* software. It is dubbed NIEON - for a *non-impaired, with eyes always on* the conflict. Unlike a normal human driver who experiences fatigue and distraction, this virtual superhuman driver is always attentive, never gets tired or distracted, and is always ready to react. Using real crash data, Waymo simulations showed that its *Waymo Driver* handily beat NIEON. NIEON scored 62.5 percent in avoiding simulated crashes and reducing the risk of serious injury in 84 percent of the situations. By contrast, *Waymo Driver* scored 75 percent in avoiding collisions and reduced serious injury risk by 93 percent. Waymo claims this type of analysis the first of its kind. More information is at [this link](#).



And finally, staying with the safety theme, self-driving truck developer – **Kodiak Robotics**, demonstrated how its automated trucks are capable of handling a tire blowout when under computer control. A short video was published on YouTube by the company on November 10, 2022 showing the tire blowout demonstration. The YouTube video can be viewed at [this link](#).





CAVCOE Speakers' Bureau

CAVCOE provides speakers for many different types of events across Canada, the US and overseas; we are now booking for 2023. 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 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

Nov 29-30, 2022	Towards AD Certification – Integrated development and testing based on standards <i>What are the standards that will enable autonomous driving?</i> Dresden, Germany.
Dec 5, 2022	CAV Canada conference, hosted collaboratively by Area X.O, Invest Ottawa, and the Kanata North Business Association (KNBA); Ottawa ON and virtual
Dec 6, 2022	Smart Mobility Roadmap Virtual Summit , free webinar organized by BLG law group and Ontario Vehicle Innovation Network (OVIN). Registration required.
Mar 15, 2023	CAM Innovators Event 2023 , hosted by Zenzic and held at IET Place, London, UK.
June 4-7, 2023	UITP Global Public Transport Summit , Barcelona, Spain



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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