# CAVCOE

# CAV Update

**A monthly newsletter on the CAV ecosystem**

September 2021

## From the Editors

There are many interesting Canadian news items this month. This shows that the Canadian CAV ecosystem is doing very well. This syncs very well with our knowledge of many activities across the country.

In addition, there are various things happening that we cannot report on this month, but which we will include in next month's issue. One of these will be several announcements related to the Thompson (MB) Winter Weather Testing Campus.

Stay tuned!

## Canadian CAV News

The **Town of Whitby** in Ontario is planning to launch a self-driving shuttle dubbed the *Whitby Autonomous Vehicle Electric* (WAVE). This shuttle service is to complement the

current transit Route 300; beginning and ending at the Whitby GO station. The shuttle will operate weekdays between 8:30 AM and 3:30 PM and on weekends between 7 AM and 7 PM.  At 6 Kilometres, this will be the longest such route in North America.  Some of the project partners are the Town of Whitby, Region of Durham, Durham Region Transit (DRT), Metrolinx, Nokia Canada, Transport Canada, Ontario Ministry of Transportation, SmartCone Technologies, AutoGuardian By SmartCone and others. The project is partly funded by Ontario's **Autonomous Vehicle Innovation Network** (AVIN) as well as other partners. More information is at this link.

**AVIN** also provided funding to Toronto-based **Ecopia AI** for developing a high-definition (HD) map of the city of Toronto for automated driving applications. The work also includes creating a *digital twin* of the city of Toronto. AVIN's contribution was $994,706 with an additional $2,039,561 raised from industrial partners. The HD maps will include road networks, pedestrian networks and 3D buildings. The **City of Toronto** will be a partner in this project as well. More information is at this link.

On August 11, 2021, the **Federal Economic Development Agency for Southern Ontario** (FedDev Ontario) announced a $5 million investment in **Automotive Parts Manufacturers' Association** (APMA) in support of development work on next generation of connected, autonomous and zero emissions vehicles (ZEV) concept car and its digital twin in southern Ontario. This funding is expected to create up to 80 jobs and to attract additional funding of $56.6 million from the industry and other sources. This project is aligned with Government of Canada's mandate to have all new light-duty cars and passenger trucks sales to be zero-emission by 2035.  More information is at this link.

In another push into the automotive sector, Waterloo-based **BlackBerry Ltd.** has partnered with India-based **CarIQ** to deploy its *Intelligent Vehicle Data Platform* (IVY) for connected vehicle payment services. By creating a *digital fingerprint* for the vehicle, the technology will allow for secure connection to a bank's payment network to validate and  pay for a wide range of services such as fuel, tolls, parking, insurance, maintenance, and other types of payments. More information is at this link. On a related matter, the CBC published a recent article on BlackBerry's ever expanding penetration in the automotive world with an emphasis on CAV systems.  The CBC report and a short video can be viewed at this link.

Edmonton-based **CORRECT-AI** was launched in 2020. The company focuses on bringing intelligence and autonomy to heavy construction machinery with an eye on safety. Despite being a startup, the company has secured contracts in Alberta, B.C. and United States. This includes a partnership with *SITECH Western Canada* which is a part of **Finning** - the world's largest Caterpillar equipment dealer. The company leverages LiDAR, computer vision, robotics, and artificial intelligence to create *Proximity Detection Systems.* Collectively, these lower the risk of operating heavy equipment, prevent incidents and increase operator awareness, by real-time information and notifications regarding obstacle proximity and slope angles. More information is at this link.

Winnipeg-based **New Flyer Industries** (NFI) has partnered with Maryland-based

**Robotic Research LLC**. to develop a Level 4 automated transit bus and incorporate advanced driver assistance systems (ADAS) to help prevent collisions with pedestrians and cyclists. Dubbed *Xcelsior AV*, NFI supplies the transit vehicle while Robotic Research provides the automated driving technology to make the vehicle autonomous. By joining forces, the two companies hope to enhance road safety, shorten commute times, increase energy efficiency and reduce congestion.  More information is at this link.



On August 17, 2021, **Drone Delivery Canada** (DDC) - a maker of autonomous drones, announced a 24-month partnership with **Nexeya Canada** to explore military applications for its fleet of drones. More details at DDC's site at this link.

# *International CAV News*

The **City of New York** and its five boroughs are likely some of the most challanging places to test an autonomous vehicle in the western world. In August 2021, **New York City Department of Transportation** (DOT) published a draft 9-page proposal for

allowing companies to test their autonomous vehicles on public roads in its jurisdictions. The City invited interested parties to provide comments and held a public virtual meeting on September 1, 2021 to review the proposal. At this meeting, the proposal was adopted with some amendments. The proposed rules are probably some of the toughest set down by a major city. Briefly, companies wishing to test their AVs on NYC's roads must take out a permit with the City



at a cost of the $5,000.  Penalty for operating without a permit or expired permit is set at $5,000/day. There are many other terms and conditions that companies must comply with. Both the proposed rules and those adopted can be viewed on NYC's website at this link.

Munich-based **Siemens** has launched a new in-house startup known as *Simulytic* focused on accelerating autonomous mobility deployment at scale. This is done primarily through simulation to create insight into the impact and safety of autonomous driving. This includes simulating incident probabilities, changing traffic flows, congestion patterns, the effects of weather and road conditions and many other localized factors. Siemens believes its findings will be valuable for insurance companies, by helping them understand the risk potentials from increasingly automated road traffic and thus develop the right products, determine fair prices and create effective business strategies for a future with autonomous vehicles. More details at this link.

One of the leading AV developers is the California-based **Aurora Innovation, Inc.** In common with all other AV developers, Aurora recognizes safety as the number one for the products it is developing. Now Aurora has developed a sophisticated protocol to formalize its safety culture. It has published a detailed tool/document called *The Aurora Safety Case Framework*. The tool is applied at every step of the development, from concept to deployment, to ensure Aurora's self-driving vehicles are acceptably safe to operate on public roads. Aurora's approach to safety and methodology has five top level dimensions. They are: 1. Proficient 2. Fail-safe 3. Continuously improving 4. Resilient and 5. Trustworthy. Each of these are defined and described in great detail on Aurora's website. More general information at this link. Information on Aurora's *Safety Case Framework* can be viewed on Aurora's site at this link.

Competition in automated trucking business is fierce. One of the biggest players in this space is **Waymo**. In August 2021, Waymo announced its plans to develop a 9-acre site in Dallas, Texas, dedicated to its automated trucking development. Waymo expects hundreds of trucks and people to work from this new site. In this task, it has partnered with **Ryder System, Inc.**, one of the largest commercial rental truck companies in the U.S. Ryder will provide fleet management expertise to include fleet maintenance, inspections, and roadside assistance. Waymo's ultimate goal is to commercialize automated trucks for freight transport and logistics under its *Waymo Via* brand. Waymo and its competitors in automated trucking business have their eye on a very big prize. According to Waymo, about 70 percent of all freight moved in the
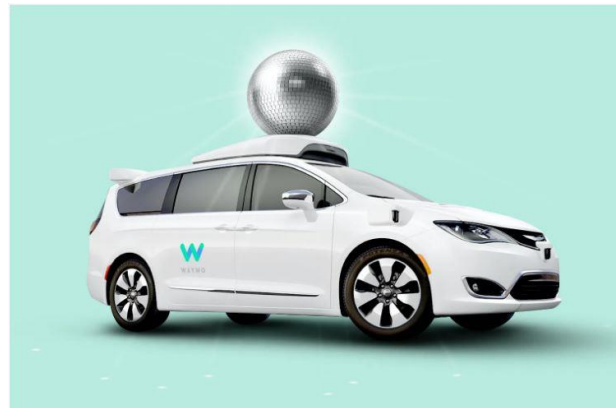
United States travels by truck, making it the leading freight transportation mode. Transport by trucks is estimated to be worth about US$800 billion in the U.S. alone. More information is at this link.

Staying with **Waymo**, a recent article in *morningbrew.com* takes a look at the realities behind Waymo's driverless robotaxi service in some parts of Arizona. The article implies that although many people are aware of the availability of this service, few people are bothered to try or use it on a regular basis. This does not bode well for making such services a commercial success. There are multiple reasons for this apathy towards Waymo's robotaxi service. Some people are afraid of the vehicle getting hacked, some are concerned by technical glitches and some simply do not trust a robotaxi. To counter these, Waymo has partnered with several organizations to educate and promote the benefits of robotaxis. One of these is the **Southern Christian Leadership Conference** where Waymo has initiated *Let's Talk Autonomous Driving* (LTAD). Another is **The Foundation for Blind Children** where Waymo attempts to show how robotaxis can be of help to disabled persons. The article can be viewed at this link.

In the February 2021 edition of *CAV Update*, we highlighted a small California startup called **Bear Flag Robotics**. Started in 2017, this company specialized in bringing autonomy to farm tractors. Its technology must have impressed agricultural equipment giant **John Deere**. In early August 2021, John Deere agreed to acquire Bear Flag Robotics for US$250 million. Similar to trucking industry where there is a shortage of qualified drivers, skilled labor to carry out time-sensitive operations that impact farming operations is in short supply. Farm equipment autonomy is one promising solution for addressing this problem. More details at this link.

The advent of autonomous and semi-autonomous vehicles has many socio-economic dimensions. One of the critical dimensions is vehicle insurance for these types of vehicles. The insurance industry has been exploring how to provide coverage for the vehicles themselves as well as passengers/goods travelling in them. More and more vehicles are fitted with advanced driver assist systems (ADAS). While these systems

assist drivers in certain ways such as collision avoidance, adaptive cruise control, automatic emergency braking, blind spot detection and lane departure, they are also expensive to repair in the event of a collision or damage. Delicate/expensive sensors may need to be replaced, calibrated and tested for proper operation. Some believe that the reduction in crashes due to automation and ADAS may eventually offset some of these costs. It remains to be seen. At present, many large and small insurance companies have developed insurance products for this emerging market. The article at this link describes some of these initiatives.

A recent article in **The Economist** magazine described novel research conducted at a Swedish university. This research has application for self-driving cars and is focused on *Object Permanence*. The article starts by saying that by the age of seven months, most



children have learned that objects still exist even when they are out of sight. Put a toy under a blanket and a child that old will know it is still there, and that he can reach underneath the blanket to get it back. By contrast, the perception systems of current self-driving cars lack this seemingly simple ability. For example, a bicycle that is momentarily hidden by a passing van is a bicycle that has ceased to exist, i.e., they do not understand *object permanence*. The Swedish researchers applied a technique called *symbolic-reasoning engine* to bestow this ability on AVs and tests showed that the technique works. The article can be viewed at this link or this one.

And finally, at a recent motor show in Germany, **Mercedes-Benz** demonstrated a *Brain-Computer Interface* (BCI) system known as *VISION AVTR*. *AVTR* stands for *Advanced Vehicle Transformation*. This concept system may allow future Mercedes cars to be controlled by the driver's thoughts and brain waves through a non-invasive BCI. For example, such a system can switch the radio station, give instructions to the navigation system, dim the interior ambient lighting or find a parking space by just thinking about it. More information on Mercedes-Benz's site is at this link.

## *Upcoming CAV-Related Events*

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| Oct 4-5, 2021 | UK CAV Infrastructure Symposium, London, UK |
| Oct 11-12, 2021 | Auto Sensors 2021, Detroit MI |
| Oct 11-15, 2021 | ITS World Congress, Hamburg, Germany |
| Oct 18-19, 2021 | Autonomous Vehicles and Public Transport in Europe, Amsterdam, The Netherlands. |
| Nov 17-18, 2021 | ADVI Summit, Australia and New Zealand Driverless Vehicle Initiative. |
| Nov 23-24, 2021 | Monetizing the Digital Car, live virtual event, UK |
| Dec 1-2, 2021 | Autonomous Vehicles Europe 2021, Berlin, Germany |
| Dec 14-17, 2021 | UITP Global Public Transport Summit; Melbourne, Australia |
| Feb 27 – Mar 2, 2022 | Ontario Good Roads Association's Conference; Fairmont Royal York, Toronto |
| Mar 1-2, 2022 | Autonomous Vehicle Technology Expo, San Jose CA |
| June 20-23. 2022 | HxGN LIVE Global, Las Vegas, Nevada |

## *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.*

*Chief Editor: Ahmad Radmanesh*
*Contributors to this issue: Barrie Kirk, Nicola McLeod, Keith Fagan and Donna Elliott*

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

*300 Earl Grey Drive, Suite 222, Ottawa ON K2T 1C1, Canada.*
*info@cavcoe.com          www.cavcoe.com*

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