

# AUTOMOTIVE INNOVATION

Canada's forward-looking technology leader 

VOLUME 1 | NUMBER 1 | MARCH/APRIL 2019  
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## MITSUBISHI AIMS AT NEW HEIGHTS WITH THE ENGELBERG CONCEPT



### EV2019VÉ CONFERENCE

INTERVIEW OF CATHERINE KARGAS  
CHAIR OF THE ELECTRIC MOBILITY CANADA

INTELLIGENT MOBILITY IS **ELECTRIC**



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# The new Automotive Innovations Magazine Proactively contributing to the protection of the environment

The automotive industry has just produced what will become its greatest metamorphosis since the invention of the combustion engine: the electric vehicle (EV), a major step forward for the protection of the planet.

Everyone, without exception, were challenged when EVs became a reality: car manufacturers, researchers and engineers, workers and managers in the maintenance and repair sector, supply and distribution networks, suppliers of specialized parts and services as well as technical and academic training staff.

## TOWARDS A FULLY AUTONOMOUS VEHICLE

The energy crisis that began in the 1980s triggered a series of innovations aimed at making cars more fuel-efficient and environmentally friendly. Over the years, several promising technologies have been developed.



We must not forget the technology superstar: artificial intelligence. Nowadays, many vehicles are equipped with applications enabling greater autonomy. Our vehicles will go from partial to full automation in the coming decades.

## INFORMING, SHARING, DEMISTIFYING

It is in this context that Innovations Automobiles Magazine was created, a publication that will benefit all Canadian industry players. In each of our bimonthly editions, we will discuss the effects of the arrival on the market of EVs, hybrids and fuel cell vehicles, but also all innovations that the industry has in store for us. We will also discuss innovative trends and ideas in business management, human resources, training and customer and supplier relations.

## IN SHORT, WE OFFER YOU:

- Our vision: to forge a new definition of the industry to make it even better.
- Our mission: to inform, share, demystify, take action and think outside the box.
- Our values: love and passion!

Rémy Rousseau, Publisher

Canada's forward-looking technology leader

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**THE BERTHA BENZ'S TRIP THAT CHANGED EVERYTHING**

Carl Benz was a misunderstood man. The public remained skeptical at the sight of this curious horseless carriage he had built and which could move by means of «mysterious» forces. One morning in August 1888, without his knowledge, his wife Bertha left the family home with her two sons to travel the 106 km between Mannheim and Pforzheim. She wanted to draw people's attention to this car, a three-wheeled cart powered by a 2.5 horsepower single-cylinder engine.

She ignored at the time that she had just completed the first long car trip in history. «She was bolder than me», Carl admits. This historic trip, recounted in a short film broadcast by Mercedes-Benz in March, then convinced him to start a business. A decision that helped launch an industry that is now a century old.



**VW SPEEDS IT UP**

The Wolfsburg manufacturer wants to work twice as hard to be “green”. Nearly 70 new electric models will be launched by 2028 instead of the 50 originally planned. In addition, the Volkswagen Group hopes to achieve a CO<sub>2</sub>-neutral balance by 2050. At a press conference in March, Herbert Diess, Chairman of the Executive Board of Management of Volkswagen AG (photo), said: “The change at Volkswagen will be radical. We have decided to take responsibility for the key trends of the future, particularly with regard to climate protection.”



**ELECTRIFYING NEWS**

March was a fertile month for new electric products. Tesla finally introduced its second SUV: the Model Y (above). Smaller than the Model X, it shares the platform of the compact Model 3. With a five- or seven-seater interior, it is available starting at \$64,000 in Canada. The first units are promised for the fall of 2020.



**TOYOTA TO GO INTO SPACE**

The exploration of the Moon and Mars may be done in a Toyota off-road vehicle. In March, the Japan Aerospace Exploration Agency (JAXA) and Toyota confirmed the continuation of a joint study on a space exploration vehicle. Six metres long, this two-seater mastodon will have an electric motor powered by a fuel cell, which will give it a range of more than 10,000 km. JAXA plans to launch such a vehicle into space in 2029.

Fisker, a manufacturer in the making, has released the first draft of an SUV (right, below) capable of equaling the range promised by its future rival Tesla, around 480 km. Offered for less than US\$40,000, it will go into production in the second half of 2021.

Closer to home, Quebec electric bus manufacturer Lion unveiled the Lion8 (right, above), a class 8 urban truck capable of driving up to 300 km. The first Lion8 will be delivered next fall.

## Electric vehicles

# The point of view of a mechanic

For this article, we did not consider hybrids and plug-in hybrids using fossil fuels to focus solely on all-electric cars.

With factors such as environment, maintenance and energy consumption, an all-electric vehicle will be more advantageous than a conventional car by 2025.



### UNDENIABLE BENEFIT FOR THE ENVIRONMENT

With energy generated almost exclusively by its dams, Quebec is one of the places in the world where the life cycle of an electric car is the least damaging to the environment. In many countries, and even elsewhere in Canada, electricity is produced by fossil fuels.

This means that with a well-structured charging network throughout the territory, particularly in urban areas, our energy source will not be problematic in the years to come.

### MINIMAL MAINTENANCE

Everyone agrees that maintaining a car that has no transmission nor exhaust or ignition system will cost much less than a conventional vehicle. Even the use of lubricants will be limited to air conditioning and the braking system. “There will be not much to maintain”, says Mr. Brassard. Preventative maintenance, as offered by dealers for new vehicles, will quickly become the norm in shops like ours as the manufacturer’s warranties expire.”

### ALL-SIDED TRAININGS

Centre de l’auto Beaumont has eight technicians supervised by Helder Medeiros. Over his 37 years of experience, Jean-Pierre Brassard has witnessed several changes in the way of repairing and maintaining vehicles. But this new wave is truly a game changer. “We have a personalized and continuing training system, including universal access through our Mister Muffler banner, which allows our technicians to be up-to-date and ready for most all-electric, hybrid and plug-in hybrid vehicles.”

**“MAINTAINING A CAR THAT HAS NO TRANSMISSION NOR EXHAUST OR IGNITION SYSTEM WILL COST MUCH LESS THAN A CONVENTIONAL VEHICLE.”**

Jean-Pierre Brassard,  
Service Manager at  
Centre de l’auto Beaumont

Jean-Pierre Brassard, Service Manager at Centre de l’auto Beaumont, believes this day will come when battery electric vehicles (BEVs) will have reached an approximate range of 400 km during the winter and 500 km during the summer, about twice as much as of today. “Powertrain technology is well developed

but there is still a lot to be done for batteries. The industry faces the challenge of substantially reducing the weight of batteries – they can be as heavy as 75kg – while increasing their range. This is imperative for the success of BEVs.”

An EV battery contains about 3kg of lithium carbonate, a colorless salt extracted mainly in China, the United States, Chile and Argentina. In Quebec, mining exploration is underway.

Fabien Adam, Director,  
CIBC Auto Finance



# CIBC returns to indirect automotive financing

CIBC – one of Canada’s Big Five banks – is making an impact with innovative automotive financing products & solutions.

CIBC has a strong history in automotive lending and was under the banner of CIBC Dealerplan, the bank very active in the vehicle financing landscape (20 years ago). During that time, financing a vehicle loan for a client involved a relationship between the dealership and the local banking centre for obtaining approvals, completing the paperwork, and walking out with a bank draft. After many years in the market a decision was made to retire the CIBC Dealerplan program.

**TODAY, THANKS  
TO ONLINE  
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FROM DEALERSHIPS  
ARE DECISIONED  
VERY QUICKLY  
WHILE A PURCHASE  
BEING FINALIZED.**

As the bank continued its focus on being a relationship-based bank for the modern world, CIBC’s re-entered the auto financing market in late 2015 with “the principal goal of providing CIBC clients greater access to our lending solutions, and making it easier for them to bank when, where and how they want,” explains Fabien Adam, Director, CIBC Auto Finance.

## BOOTS ON THE GROUND

To expedite its re-entry into the auto financing business, CIBC enlisted the help of AutoCapital Canada (ACC). Leveraging ACC’s existing network was a key advantage in building the business quickly while being fully supported by professionals who have an excellent relationship with existing dealer networks.

## EXPANDING THE CIBC AUTO FINANCE PROGRAM

Since re-entering the market, CIBC has introduced a number of new programs such as a New to Canada program for those who have landed within the last 5 years and have little or no Canadian credit history, an Electric Vehicle financing offer to help with declining government EV subsidies and piloted digital pre-qualification application entirely online via participating dealerships website.

## GOING DIGITAL

Today, thanks to online capabilities, loans initiated from dealerships are decisioned very quickly while a purchase is being finalized. Piloting new types of financing offers is key to the continued evolution of CIBC Auto Finance, as the bank expands its focus on key market segments and looks to offer clients the most innovative solutions.

Going forward the bank sees innovative new partnerships as helping further refine the financing process buyers have a seamless, convenient experience that includes being able to complete financial contracts online. With this in mind, the bank is taking the complexity out of arranging financing, in order to improve the car purchase experience for dealers and customers alike.



Peter Hatges from KPMG checks out the Petro-Canada charging station at CIAS.

# Drivetrain innovation and Canada's auto sector

At the Canadian International AutoShow in Toronto, we met with Peter Hatges, National Sector Leader, Automotive for KPMG who shared his insights on where technology and innovation are taking the Canadian industry.

**IMAGINE A VICTORIA DAY WEEKEND WHEN EVERYONE NEEDS 20 TO 90 MINUTES TO CHARGE.**

According to KPMG's 2019 Global Automotive Executive Survey of 900 senior executives from the world's leading automotive and technology companies, and approximately 2,100 consumers globally, a majority of executives believe multiple drivetrain technologies will coexist in the near future. They see battery electric vehicles (30%), hybrids (25%), fuel cell EVs (23%) and internal combustion engines (23%), all sharing the space by 2040.

"The industry is at a crossroads. Carbon emissions are difficult to sustain at current levels so what must happen is that the federal government and the provinces need to have some congruency around how they are going to set targets and what they are going to do to induce the industry to meet them", Peter Hatges explains. He points out that the US has firm guidelines under CAFE requirements, while this country has only set some soft targets. There is a good reason for that; Canada does not make the cars. He feels that if the government can reach an agreement with the US for North America, we will see a predictable change and ultimately the best technology will prevail.

Hatges feels that while lithium batteries are good technology, it might not be the optimal way to charge a car

in North America. Hydrogen fuel cells have attributes because you can fill a vehicle in five to ten minutes. This is meaningful, he maintains, because the infrastructure to charge a vehicle that takes at best 30 minutes or alternately nine hours at home with 30 amps at 240 volts will necessarily be massive. "Imagine a Victoria Day Weekend when everyone needs 20 to 90 minutes to charge. We will need five times the 12,000 gas stations we now have. There are cold weather and recycling questions as well." With a billion cars in the world, the disposal or recycling of the batteries would soon be complex.

Over the years, when KPMG has conducted their study of executives the results have been consistent; there is not a single strategy. According to Hatges, the 11 OEMs including Tesla cumulatively produce \$125B gross profit in the last 12 months. Only Tesla lost money – the electric car is expensive to produce. It is a lot cheaper to build 900,000 Ford F 150s than 3,000 Model 3s.

"Like the computer industry that started with many formats and builders, consumers will consider the various options and ultimately settle on a technology that is easy to understand and to use. I don't think we know what that is yet."

# The Electric Circuit, A Canadian First



The Electric Circuit, Hydro-Québec's public charging network, has announced that fast-charge stations will now be deployed more quickly with the rollout of approximately one hundred new fast-charge stations. Over the next 10 years, 1,600 new fast-charge stations will be deployed in Québec.

The Electric Circuit is Canada's first public charging network for EVs. It offers both 240-volt and 400-volt charging stations. The stations are installed in the parking lots of the Circuit's numerous partners across Québec and in the North-East of Ontario.

Since its launch on March 30, 2012, the Electric Circuit has rapidly expanded to many Québec regions, with continued expansion into new urban areas. Electric Circuit charging stations are rolled out based on the geographical distribution of EV sales, users' needs and partners' business strategies.

In June 2018, the National Assembly unanimously adopted An Act to promote the establishment of a public fast-charging service for electric vehicles. The new legislation authorizes Hydro-Québec to use revenue from the increase in electricity sales generated by charges carried out primarily at electric vehicle drivers' homes to fund the installation of more fast-charge stations. Electricity rates will therefore not be affected.

Hydro-Québec's specific objectives will be as follows:

- Commission 1,600 fast-charge stations in the next 10 years. As many as 22 new fast-charge stations have already been deployed in 2019 and about 100 in total will be deployed this year.
- Expand the network in areas that currently have fewer fast-charge stations, such as Mauricie, Côte-Nord, Saguenay-Lac-St-Jean and Abitibi-Témiscamingue.
- Densify the network in the busiest areas in order to eliminate waiting times at some stations in peak hours, particularly along highways.
- Provide a high-quality, reliable service that is provided

at the same price for all electric vehicle drivers so they can travel anywhere in Québec with ease.

Over time, the speed with which the new charging stations are installed will be modified based on the following:

- Forecasts of the number of electric vehicle drivers, where they are located and the usage of existing charging stations
- Costs incurred by expanding the network
- New technologies that simplify the installation of fast-charge stations
- Our desire to ensure that the rollout of fast-charge stations has no impact on electricity rates

The successful rollout relies on the cooperation between partners who will provide space for the new charging stations, namely Desjardins, Le Groupe Crevier, Les Rôtisseries St-Hubert and Metro, as well as the Ministère des Transports du Québec, given that some charging stations will be located at rest stops.

There are currently close to 40,000 electric vehicles registered in Québec and the Electric Circuit has more than 1,700 charging stations, including close to 180 fast-charge stations.

To follow the deployment of the charging stations or to learn more about transportation electrification, follow the Electric Circuit on Facebook ([facebook.com/lecircuitelectrique/](https://facebook.com/lecircuitelectrique/)) or visit our website ([lecircuitelectrique.com](https://lecircuitelectrique.com)).





Response to the Generator from visitors was more than positive, says MADC's Denis Dessureault (2nd from left).



"A record number of EVs for test drive this year reflects the growing number of models on the market", says Jesse Caron of CAA-Quebec (right).

# Montreal Auto Show's new *Generator*

The growing number of EVs drives auto shows to reinvent themselves. With this in mind, the organizers of the 2019 Montreal International Auto Show have created The Generator, an event designed for brainstorming.

Electric mobility in all its forms. This is what was showcased in The Generator, a new section of the Montreal International Auto Show (MIAS) presented in January.

"For several years now, the Show has put in place and created initiatives to promote electric mobility in all its forms", said Dany Lemelin, President of the 76th MIAS at the inauguration of this exhibit area that brought together twenty companies to address future EV buyers as well as consumers wishing to familiarize themselves with the new technologies related to sustainable mobility.

## A MORE THAN POSITIVE RESPONSE

"The response from visitors was more than positive, says Denis Dessureault, Executive Vice-President, MADC & MIAS. The organizations and entrepreneurs at The Generator have been invaded by interested visitors. With such a craze, The Generator will take even more place next year with more stakeholders. We are already working with manufacturers to introduce more new electric models throughout the Floor Plan."

**"WITH SUCH A CRAZE, THE GENERATOR WILL TAKE EVEN MORE PLACE NEXT YEAR." — DENIS DESSUREAULT**

What Mr. Dessureault is referring to is a floor plan created this year to help visitors identify the 42 EVs showcased. A brochure and a plan were also made available to facilitate their identification.

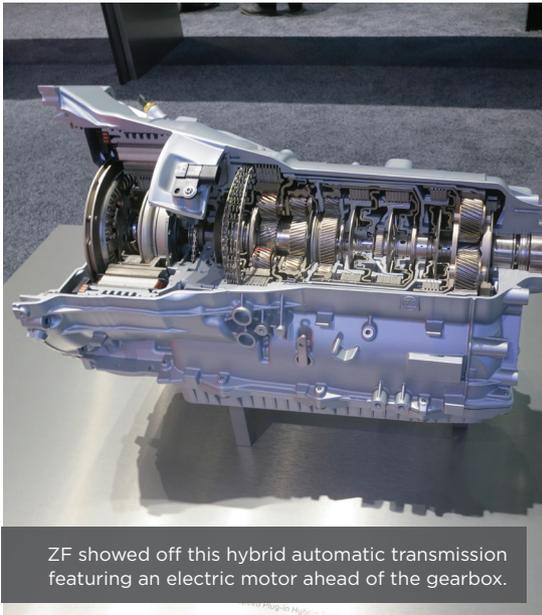
## THE ESSENTIAL EV TEST DRIVES

EV test drives were also proposed, a classic activity for MIAS visitors that was established in 2013. Developed in partnership with CAA-Quebec, they allow consumers to identify which vehicle best meets their needs.

After seven years and about 20,000 test drives, this aspect of the MIAS seems more relevant than ever with the growing number of EVs, their increasing range and their more and more affordable prices.

The newcomer 2019 Hyundai Kona Electric validates this claim. With a range of more than 400km, this new model starting from \$45,599 was the most popular car among the participants. "And by far", says Jesse Caron, CAA-Quebec Automotive Expert and Test Drive Coordinator. Of the 2,729 visitors who participated in the test drives this year, 443 test drove the Kona.

"This Hyundai was one of twelve electric models available to visitors at 2019 MIAS, a record number reflecting the growing diversity of the offer on the market, said Mr. Caron. The participants are surprised by the instant acceleration of EVs and their silence in 100% electric mode. No, driving an EV is not boring. And yes, it may cost less to drive than an equivalent gas car!", exclaims the CAA-Quebec expert.



ZF showed off this hybrid automatic transmission featuring an electric motor ahead of the gearbox.



Important suppliers like Mahle had their own prototypes at Automobili-D in Detroit.



Some prototypes were the works of independent manufacturers or universities.

# Re-Thinking the Detroit Auto Show

Are car shows really doomed as many observers would want us to believe? Not necessarily. But they are evolving!

Gone are the days when concept vehicles would fall off the ceiling or roll on the stage with explosions and smoke. Tomorrow's auto show will feature more technology than ever. If I have chosen to talk about the latest North American International Auto Show (NAIAS) that was held in January in Detroit, I could well have mentioned the Consumer Electronics Show that took place early in 2019. It might not be a genuine car show but so many auto manufacturers choose it to unveil some of their most outrageous technologies that it is now considered a major venue for automotive development.

As far as the Detroit Auto Show is concerned, its latest edition caught a lot of people by surprise by its lack of international new product presentations. Yet, there were quite a few technological suppliers who were present with impressive booths on the main floor, namely companies like well-known Denso or ZF.

## AUTOMOBILI-D: EVERYTHING ABOUT START-UPS AND MOBILITY

Many visitors might have missed the 3rd annual AutoMobi-li-D presented in Cobo Hall's lower level exhibit halls. This exhibition was mostly occupied by suppliers, new technology companies, and Michigan universities. While very few cars were present, there were mostly people movers and autonomous carriers. Furthermore, some were the results

of works done by many major suppliers, including air industry related companies, developing compact electric powered autonomous helicopters.

AutoMobi-li-D might have seemed for the people of the industry but it was in fact open to anyone who wanted to learn more about the upcoming technologies. On the other hand, there were also some workshops where curious observers could listen to speakers introducing their technology or simply discussing today's mobility problems that could be solved by tomorrow's technology.

In some cases, depending on the venue size, visitors could actually ride in prototypes of all kinds including autonomous vehicles just like it is being done nowadays at the Chicago and New York Auto Shows. That is what will be most probably happening at the next NAIAS to be held in Detroit in June 2020. Instead of being a captive car show limited to the tight quarters of an exhibition centre, major manufacturers and suppliers will be offering real life road tests to visitors.

The 2020 Detroit Auto Show could very well be the first of tomorrow's auto shows, one you might want to attend to learn more about new technology.



A helicopter at a car show? It is actually an electric and autonomous people mover!

**AUTOMOBILI-D MIGHT HAVE SEEMED FOR THE PEOPLE OF THE INDUSTRY BUT IT WAS IN FACT OPEN TO ANYONE WHO WANTED TO LEARN MORE ABOUT THE UPCOMING TECHNOLOGIES**



SOLAR PANELS

HOME BATTERY

BI-DIRECTIONAL CHARGER

PHEV

Dendo Drive House



# Mitsubishi: Striding Forward With Technology

Mitsubishi Motors Corporation (MMC) is expressing its commitment to technology and automotive design with a series of innovations over the past year highlighted by recent high profile unveilings at the Geneva Motor Show

The Outlander PHEV is already the category leading sales in Canada. Featuring a highly efficient 2.0-litre gas engine and two highly efficient electric motors, the Outlander PHEV is an affordable modern energy SUV that makes it possible to travel without concerns for range anxiety.

## DENDO DRIVE HOUSE: THINKING OUT OF THE BOX

In Geneva, Dendo Drive House (DDH) premiered a revolutionary breakthrough in practical lifestyle technology.

**IN GENEVA, DENDO DRIVE HOUSE PREMIERED A REVOLUTIONARY BREAKTHROUGH IN PRACTICAL LIFESTYLE TECHNOLOGY.**

Building on the worldwide success of the Outlander PHEV, DDH, already on stream in Japan, is a packaged system comprising the EV/PHEV, a bi-directional charger, solar panels and home battery and is designed for home use. The package lets custom-

ers charge their EV/PHEV at home using solar generated power and to supply electricity from their EV/PHEV to the home.

The DDH system delivers significant cost benefits reducing fuel costs by using solar panels to generate power during the day for charging both the EV/PHEV and domestic storage batteries. At night, the system reduces power costs by using a bi-directional charger to supply power back from their EV/PHEV to the home. The customer can use the electricity generated by solar panels to power domestic appliances or to provide the power to operate the EV/PHEV.

In an emergency the EV/PHEV or storage battery can supply power to run appliances in the home.

Photos: Mitsubishi

Mitsubishi Engelberg Tourer Concept



2020 Mitsubishi RVR



Mitsubishi Motors plans to sell the system at its dealerships beginning in Japan before it makes its way to North America.

**ENGELBERG TOURER CONCEPT: VISION OF A NEAR FUTURE**

Also introduced in Geneva is the Mitsubishi Engelberg Tourer. Engelberg is a famous ski resort in Switzerland that offers grand panoramic vistas. The Mitsubishi Engelberg Tourer is a twin motor 4WD PHEV.

As per the Engelberg name, it offers high levels of performance so the driver can enjoy driving in any condition on any road surface with confidence. The EV cruising range is over 70km and with a fully charged battery and full fuel tank it has a total cruising range of over 700km.

The Engelberg's Dynamic Shield Design features body-side panels that come to the front of the vehicle protecting the body corners. The strong vertical and horizontal design lines reflect its powerful image.

We can expect to see elements of this concept in production vehicles in the future.

**2020 RVR: ROBUST & INGENIOUS**

To further consolidate its commitment to design, the company also unveiled the 2020 model year RVR compact SUV in Geneva. RVR was Canada's top-selling Mitsubishi nameplate in 2018 with 6,229 vehicles sold and 54,042 RVRs sold since model year 2011.

The new RVR also features MMC's Dynamic Shield front design. The bumper embraces the central protective shape from both sides and the squared horizontal and vertical line treatment of the grille expresses strength and toughness with a distinctive LED lighting layout, which locates the turn signals and fog lamps at the ends of the bumper.

Added together, MMC's three powerful statements demonstrate that technology and design not only brings fuel efficiency and driving capability to Canadians but also points the way to a dynamic future

**New Mitsubishi Motors Canada President and CEO Juyu Jeon**



Mitsubishi Motor Sales of Canada, Inc. has named Juyu Jeon (JJ) new President and CEO. The appointment is effective April 1, 2019, the beginning of Mitsubishi Motors Corp. fiscal year.

Mr. Jeon joined Mitsubishi Motors in 2005 and held a variety of positions of increasing responsibility in the U.S., Latin America, the Middle East, Africa and Australia before joining Mitsubishi Motors in Canada in March 2017 as Vice President, Sales & Marketing, Corporate Planning and Business Control.

He resides in Oakville, Ontario with his wife Eriko and his three children. He previously lived in Vancouver, BC during his youth.



Rinspeed Etos concept car.

## Autonomous vehicles

# Automation: the future is now

The autonomous vehicle is coming soon. Some people consider the absence of automated systems as the ultimate freedom of driving. However, autonomous driving seeks to eliminate the risks of human error while driving.

What does the inevitable evolution of technology towards the fully driverless vehicle hold in store for us? To get a clearer picture, we updated a dossier from the German magazine ZF published in 2017 and titled The five levels of automation, and consulted Transport Canada's website (tc.gc.ca).

### **THE REALITY TODAY: LEVELS 1 & 2**

Level 1 vehicles already benefit from driving assistance. The driver must always focus on traffic, have both hands on the wheel and be ready to brake. However, it is assisted by sensors that monitor certain areas of its environment. Alerts using audible, visual or tactile signals can indicate errors or lack of attention, or ensure that they are anticipated. Almost all classes of vehicle types benefit from assistance systems such as adaptive cruise control, lane departure warning, parking assistance or emergency brake assistance.

Level 2 vehicles are partially automated. Unlike the previous level, this system has full access to acceleration, brakes and steering. Some models can automatically stay in their lane or follow a vehicle in front of them, as well as recognize speed limit changes. On separate roads, they can also overtake other vehicles and avoid traffic. Despite these varied characteristics, only the driver is responsible for monitoring his or her environment, as defined by the Society of Automotive Engineers (SAE).

### **THE IMMEDIATE FUTURE: LEVEL 3**

Level 3, or conditional automation, is of particular interest to us as some of these cars will be introduced on the market next year. From this point on, the driver no longer needs to keep one hand on the steering wheel as long as he or she is able to regain control at any time after being informed in a sufficient timeframe. In other words, these vehicles are responsible for full environmental

**WHEN ALL THESE  
STEPS WILL HAVE  
BEEN COMPLETED,  
THE VEHICLES WILL  
BECOME FULLY  
AUTONOMOUS.**

Rinspeed Oasis concept vehicle.



With the Oasis concept vehicle, Rinspeed shows an interesting way to turn a normal steering wheel into a mobile office keyboard while traveling in full autonomous mode.



monitoring, provided that an appropriate legal framework is in place in the country where they operate.

SAE believes that the industry has already reached this level, but that major challenges remain. How can the driver stay focused after several hours of automated driving on the highway? It will also be necessary to establish civil liability in the event of an accident.

### BACK TO THE FUTURE: LEVEL 4

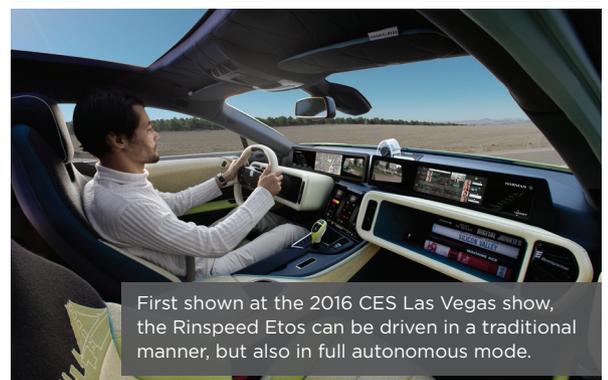
Level 4, or high automation, removes the conditional limitations of the previous level and represents the main challenge for the upcoming years. The driver is allowed to focus completely on other activities and no longer has to keep an eye on the road or be ready to suddenly regain control of the car. The manufacturer will be held responsible for the first time.

It is estimated that such vehicles will be on our roads by 2025. Some obstacles still need to be overcome, including Car2X and Car2Car communication as well as HD maps. In the first case, they must be able to communicate with other road users, including pedestrians, buses or trams. In the other, they will need to have high-resolution maps that are incredibly accurate. A complex aspect especially in cities, tunnels and other problematic areas.

### FULL AUTOMATION: LEVEL 5

It is only when all these steps will have been completed that the vehicles will become fully autonomous. According to SAE, this will move us to level 5, or full automation. No need for a steering wheel, accelerator or brake pedal. However, many uncertainties make it difficult to predict how long it will take for such robots to be allowed on our roads. Among these:

- Insurance and ethical issues
- 100% reliable autonomy features
- Sensor and image technology in HD
- High-performance software for processing large volumes of data
- A legal framework throughout the world
- 5G network available worldwide



First shown at the 2016 CES Las Vegas show, the Rinspeed Etos can be driven in a traditional manner, but also in full autonomous mode.



On the left, Michael Kopke (centre), Réjean Furoy (left) and Lee Kant (right) from Kia Canada with the 2020 Soul EV. On the right, the new 2019 Kia Niro EV.

# Kia expands its electrified line-up

With the launch of the 2019 Niro EV and 2020 Soul EV, Kia becomes the first manufacturer to offer two EVs for the general public in Canada.

Kia is more present than we think on the EV market. Since the launch of its first hybrid model, the 2011 Optima Hybrid, it has constantly expanded its offer. In 2017, Kia launched the Optima Plug-in Hybrid and the Utility Niro Hybrid, followed by a plug-in hybrid version of the latter the year after. This is without mentioning the Soul EV available since September 2014. About 2,700 units of this small 100% electric utility vehicle have been sold across the country, including almost a thousand units last year.

With the unveiling of the 2019 Niro EV and 2020 Soul EV last January, Kia doubled its offer of 100% EVs. This is a first in Canada. And it is all the more interesting because Kia offers three new products to meet the needs of different consumers.

**“THE 2019 NIRO EV WILL BE IDEAL FOR A SMALL FAMILY WITH ONLY ONE VEHICLE”  
— MICHAEL KOPKE,  
KIA CANADA**

## NIRO EV: FOR THOSE WITH ONLY ONE VEHICLE

“The 2019 Niro EV will be ideal for a small family with only one vehicle”, said Michael Kopke, Marketing Director at Kia Canada.

Larger and more spacious than a Soul EV, the range of this vehicle will reach 385 km. “A family could do a Montreal/Mont-Tremblant round trip without any range anxiety”, says Mr. Kopke.

If needed, an on-board fast charging system (standard) will inject enough energy into its 64 kWh liquid-cooled lithium-ion-polymer battery in 30 minutes using a 50 kW charging station to travel approximately 135 km. With a 100 kW station, the range could be of 190 km.

## SOUL EV: TWO BATTERIES, TWO CONSUMER TYPES

The 2020 Soul EV is smaller and will now target two distinct customer types with different capacity batteries.

This vehicle, which inaugurates the second generation of the Soul, will feature a new 39.2 kWh battery (standard on the Canadian market), while it will be optional for the Niro EV.

According to Réjean Furoy, Director of Training, with this 64 kWh battery, the Soul EV would have a range of more than 390 km. This is twice as much as the 179 km range promised by the manufacturer with the 30 kWh battery of the 2019 Soul EV.

“While the Niro EV has a more traditional look, the Soul EV’s original silhouette has a head-turning design”, explains Mr. Kopke. This vehicle is built on this popular eccentric style, but also on attractive equipment that can include a 640-watt Harman Kardon sound system with 10 speakers.

## IMAGINE BY KIA

Kia will not stop there. The “Imagine by Kia” concept presented at the Geneva Motor Show in March confirms this.

Halfway between a sedan and a utility vehicle, this four-seat EV belonging to an undetermined future would use a compact powertrain powered by a low-mounted induction battery. However, Kia does not reveal any technical data, probably because this concept is called Imagine!



The « Imagine by Kia » concept

# INTELLIGENT MOBILITY IS ELECTRIC

## EV2019VÉ CONFERENCE



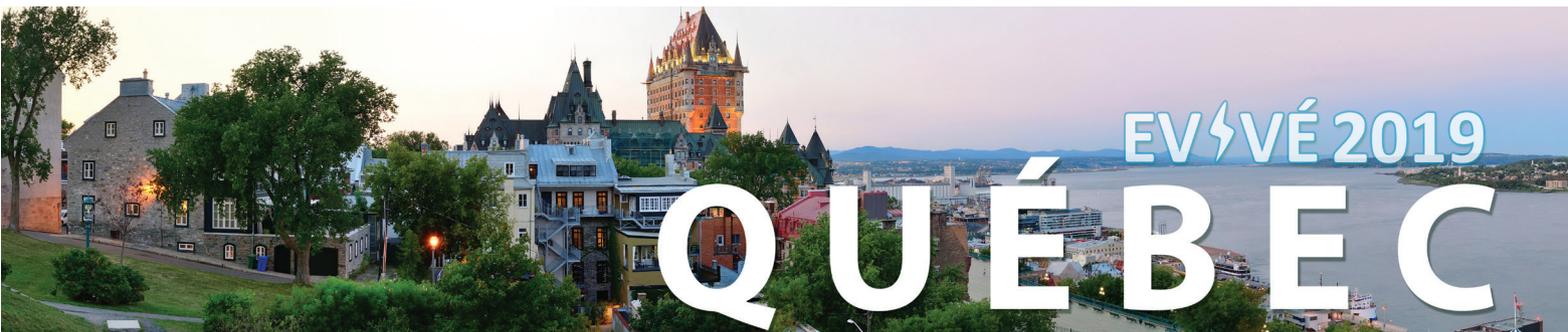
**ELECTRIC  
MOBILITY  
CANADA**  
ACCELERATING ELECTRIC  
TRANSPORTATION

**AUTOMOTIVE  
INNOVATIONS  
MAGAZINE**

SPOTLIGHT ON THE FUTURE OF E-MOBILITY IN CANADA  
AND THE EV2019VÉ CONFERENCE & TRADE SHOW

## INTERVIEW WITH CATHERINE KARGAS

CHAIR OF ELECTRIC MOBILITY CANADA



EV VÉ 2019

QUÉBEC

## Interview of

# Catherine Kargas, Chair of the Electric Mobility Canada

### **CATHERINE, TELL US A BIT ABOUT ELECTRIC MOBILITY CANADA**

Electric Mobility Canada (EMC) is the national organization representing the value chain in electromobility, including governments entities (all levels of government), universities and research institutes, electric utilities, manufacturers of vehicles (including buses, trucks and passenger vehicles) and components, charging station manufacturers, charging network operators, fleet operators (including transit), technology and service providers as well as EV owner groups.

The mission of the organization is to accelerate the deployment of EVs in Canada. To fulfill this mission, EMC lobbies the federal and provincial governments to encourage pro-EV measures and policies. The role of EMC is also to facilitate learning and cooperation among stakeholders, and we organize an annual conference and trade show to advance these objectives.

### **HOW LONG HAVE YOU BEEN AFFILIATED WITH EMC?**

I joined EMC as a member of the board more than a decade ago. In 2012, I was asked to step in as Vice-Chair. A year later I became Chair of the organization, a position I have held since then.

### **WHAT CHANGES HAVE YOU WITNESSED IN ELECTROMOBILITY SINCE YOU JOINED THE BOARD?**

**THE EV SPACE HAS CHANGED TREMENDOUSLY IN THE LAST DECADE... THINGS ARE NOW PROMISING.**

The EV space has changed tremendously in the last decade. The commercial availability of light-duty EVs to the general public, the growing number of model options, the expansion of the networks of charging stations, the spread of viable electromobility options for transit buses, school buses, trucks and now the mushrooming of electric options among more active mobility forms (e-scooters and e-bikes), have all been accomplished in the last decade.

The statistics of EV adoption in Canada are promising. Today, there are approximately 100,000 electric cars on Canadian roads. In the last year alone, the number of

electric cars increased by 90% in the country and sales grew by 125% compared to 2017. In 2018, these sales accounted for 2.2% of all passenger vehicle sales in Canada. (more info <https://emc-mec.ca/wp-content/uploads/EMC-Sales-Report-Rapport-de-ventes-MÉC-2018.pdf>).

### **WHAT CAN YOU TELL US ABOUT THIS YEAR'S ANNUAL CONFERENCE AND TRADE SHOW?**

With the theme "Intelligent Mobility is Electric", the EV2019VÉ Conference and Trade Show will be held in picturesque Québec City from May 6th to 9th. The first day of the event will feature a multimodal ride and drive open to both delegates and the general public. This year marks the 10th anniversary of our annual conferences and trade shows. We will therefore have many new additions to the program. The social networking also promises to be "special".

### **WHAT ARE YOUR HOPES FOR ELECTROMOBILITY IN CANADA FOR THE NEXT DECADE?**

Today, three Canadian provinces – Québec, Ontario and British Columbia – represent approximately 97% of EV sales. I hope that moving forward Canadians from across the country will have access to EV supply and that electric mobility will be adopted by Canadians in all provinces and territories.

**QUÉBEC, ONTARIO AND BRITISH COLUMBIA REPRESENT APPROXIMATELY 97% OF EV SALES CANADA.**

I am confident that Québec will meet its 2020 target of 100,000 EVs on the Province's roads as an increasing number of Quebecers understand both the financial and environmental benefits of switching to an EV.

With the electrification of additional models (including the popular SUV and light truck categories), with further improvements in battery technology, with the rapid expansion of the public charging infrastructure network as well as with vehicle prices inching closer

to price parity with their ICE vehicle counterparts, I am certain that an increasing percentage of Canadians will make the switch.

My hope is that shared mobility options will increasingly integrate EVs. Given the relatively greater number of vehicle kilometers traveled (VKT) by shared vehicles (car sharing, taxi, ride hailing), it is imperative that these vehicles be electric. In 2018, I wrote a report for the ZEV Alliance titled “Accelerating the Transition to ZEVs in Shared and Autonomous Fleets” (<http://www.zevalliance.org/zevs-in-shared-fleets/>). Studies undertaken to date warn of the increase in VKT associated with the use of autonomous vehicles (AV). It is therefore essential for governments to be prepared with the relevant policies and regulations that will ensure that AVs are shared and electric. Government policies and regulations should ensure that “Mobility as a Service” (MaaS) becomes E-MaaS, to then give way to E-A-MaaS.

I also hope that municipalities will increasingly adopt policies that will favour the use of electric mobility. Municipalities should lead by example, adopting EVs for city fleets (including transit buses). Some of the measures that can influence the decision of the public to transition to e-mobility include parking policies, zone-access rights and the availability of strategically-positioned public charging infrastructure in densely populated areas characterized by garage orphans. I also hope that municipalities will work with all mobility stakeholders to ensure the transition to e-mobility by shared fleets.

**MUNICIPALITIES NEED TO INCREASINGLY ADOPT POLICIES THAT WILL FAVOUR USE OF ELECTRIC MOBILITY.**

In the next decade, we will witness more changes in mobility than we have in the previous one hundred years. Governments

have the opportunity to set the stage for a future of sustainable mobility. The right combination of collaborations, measures, policies, regulations, incentives and disincentives will get us there. A holistic vision, planning and a municipal team that can champion the change are necessary.

**SHARED MOBILITY OPTIONS WILL INCREASINGLY INTEGRATE EVS.**





# EV VÉ 2019

CONFERENCE + TRADESHOW

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May 7th	Hydro-Québec's Networking Evening
May 6th & 7th	Multimodal Ride N' Drive

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ACCÉLÉRER L'ÉLECTRIFICATION  
DES TRANSPORTS

Petro-Canada's test site is currently operational at 235 Steeles Ave. in Milton, Ontario.



# Petro-Canada announces EV charging network

Which comes first – the chicken or the egg? The EV or the charging facilities? Petro-Canada believes that if they build it, drivers will come. And they are making it happen.

Amid the extensive discussions on EVs at the recent Canadian International AutoShow in Toronto, Petro-Canada unveiled an electric charging station and announced the development of a network of 50 such units stretching across the country. While manufacturers are eagerly rolling out EVs, consumers have been slow to embrace them due partially to range anxiety. Petro-Canada is taking a step forward to dispel that anxiety and get in front of the need for non-home charging as it develops.

**THE STATIONS WILL OFFER DC FAST CHARGERS WITH BOTH CHADEMO AND CCS/SAE CONNECTORS.**

More than 50 EV fast charging stations will be located along the Trans-Canada highway at strategically located Petro-Canada stations from Nova Scotia to British Columbia. Construction is set to begin this spring with sites opening over the next year.

## STATION DETAILS

The stations will offer DC fast chargers with both CHAdeMO and CCS/SAE connectors that support a broad selection of vehicles. The chargers can provide up to a 200 kilowatt charge – enough to provide an 80% charge to most EVs in less than 30 minutes. The units are capable of 350 kilowatt charging with future upgrades. Each charging station is equipped with two connectors and set up to notify owners via text.

A test site is currently operational at 235 Steeles Ave. in Milton, Ontario. The full list of the locations where an EV fast charge will be available can be seen at [petro-canada.ca/ev](http://petro-canada.ca/ev). The Milton EV fast charger will operate for free for a limited time. (The company also currently has a few other stations offering Level 2 chargers and third-party Level 3 chargers.)

Petro-Canada's network is a first for a Canadian fuel retailer but currently there are several initiatives including private operators and Tesla. In July, Volkswagen Group Canada announced the creation of Electrify Canada, a new company that will build an ultra-fast EV direct current (DC) charging network across Canada, slated to be operational in the second quarter of 2019.

The VW initial plan includes installation of 32 EV charging sites near major highways and in major metro areas in B.C., Alberta, Ontario and Quebec.

Petro-Canada is a Suncor business, operating more than 1,500 retail stations and 300 Petro-Pass wholesale locations nationwide.



# Transervice: tomorrow's fleet management

Dozens of large and medium-sized companies, such as Bell Canada and the Port of Montreal, have chosen to outsource the maintenance of their fleet of vehicles and specialized equipment to Transervice Lease Co., the Canadian subsidiary of Transervice Logistics Inc., which employs 175 people in Quebec, Ontario and Newfoundland. Automotive Innovations met with Pierre Bujold, Vice-President of Canadian Operations.

Several factors explain why Transervice attracts and retains these organizations for which their fleet of vehicles of all sizes, from heavy duty trucks to vans, represents an essential condition of survival and is key to their development. By visiting their website ([transervice.com](http://transervice.com)), we see the full extent of the know-how the company has developed over the past fifty years: fleet optimization, health and safety, green logistics, human resources management, and performance indicators.

to their reality in the context of a profitable cost/benefit ratio.”

## LISTENING TO AND ANALYZING THE DATA

The widespread integration of embedded computer systems on today's vehicles is not just for drivers, but especially for those who maintain them and extract crucial information for the future. “We obtain essential driver behaviour data to ensure making the right choice of equipment, adds Bujold. Information related to drive train, gearshift, and acceleration curves, among others, is captured to help identify problems and propose efficient functional improvements.”

## THE AUTONOMOUS VEHICLE

The ability to analyze vehicle and driver behaviour data is one of the cornerstones on which tomorrow's vehicle is based. “We are moving closer to the auton-

**“WE OBTAIN  
ESSENTIAL DRIVER  
BEHAVIOUR  
DATA TO ENSURE  
MAKING THE  
RIGHT CHOICE OF  
EQUIPMENT.” -  
PIERRE BUJOLD**

## THE CENTRAL ROLE OF INNOVATION

One of Transervice key drivers is to continually adapt to the fast changing technologies and exponentially rapid evolution of the automotive industry. According to Pierre Bujold, it is indeed one of the main challenges of the company. “We are an integral part of our customers' operations, he says. Each one of them calls for special attention so that our expertise is adapted



Pierre Bujold, Vice-President of Canadian Operations



Bell Canada aerial bucket van

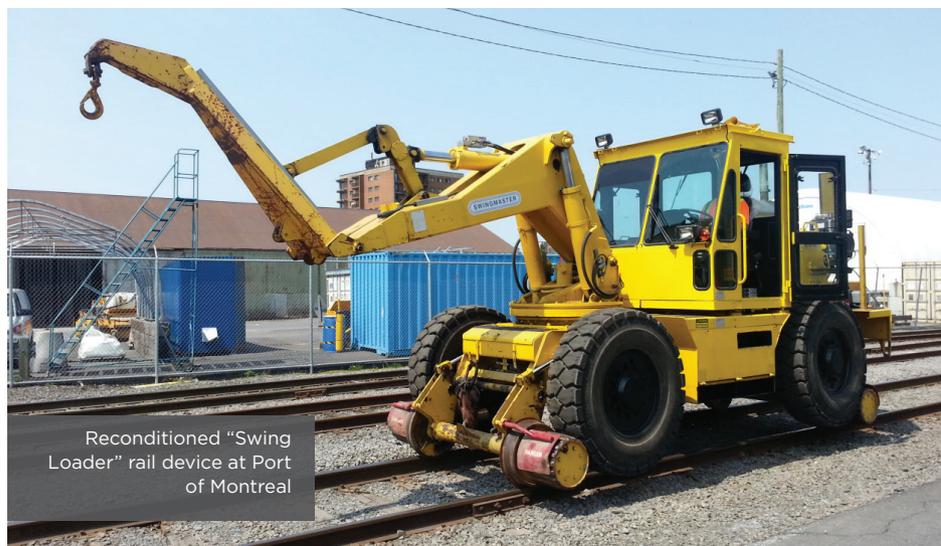
omous vehicle thanks to our current data modeling. This puts our organization at the forefront as a vector for change. But it depends on our ability to have reliable data and interact with other technology players in the industry. Our challenge is to raise the bar of our performance to support our customers in a perspective of continuous improvement.”

**RETURN AND CAPITALIZATION**

All of these efforts would be wasted if they did not take into account the performance of improvements over their acquisition cost. “At the Port of Montreal, says Pierre Bujold, Transervice has reduced the cost of repairing a handling system to \$80,000 by changing relays, panels and the material handling system. The acquisition of new equipment would have cost \$600,000. At Bell Canada, our modeling has allowed for a low increase of only 3% in the annual maintenance budget of \$33 million for their 13,000 or so vehicles.”

**PREVENTIVE MAINTENANCE AND TRAINING**

The example of the Port of Montreal is indicative of Transervice role. The relatively small fleet of 150 vehicles is however very diverse: generators, locomotives, vans, safety vehicles, etc. “The maintenance of new hybrid vehicles and powertrains by only three mechanics – thanks to an appropriate training program – has resulted in a significant reduction in the number of out of service vehicles”, concludes Bujold.



Reconditioned “Swing Loader” rail device at Port of Montreal



Transervice received the environmental certification Clé Verte for its work at Port of Montreal.



The 2020 Ford Transit dashboard



The 2020 Ford Transit features an all-wheel-drive system option.

# 2020 Ford Transit: reimagining the delivery van

How Ford is leading the way in reinventing what used to be a box on wheels.

For many years, the only type of small delivery van on our roads was the Econoline type, a bare metal box resting on a van chassis with little to offer its driver. The Ford Econoline (later renamed the E-Series), the Chevrolet G-Van and the Dodge Ram Van now belong to the past.

**“FORD ALSO OFFERS A DRIVE TRAIN THAT INCLUDES A NEW, MORE ECONOMICAL 10-SPEED AUTOMATIC TRANSMISSION AND ALL-WHEEL DRIVE.”**

A few years ago, Chrysler partnered with Daimler in Germany to create a new vehicle based on the already well-known Mercedes-Benz Sprinter. This design has been very successful on the market despite the vehicle's bare styling. More recently, Ford started offering an interesting alternative to the E-Series van, the Transit Universal. Although it seems to be based on a European van, this vehicle was created for all international markets. While the Transit Universal remained rear-wheel-drive, Chrysler adopted the van of its new partner, the front-wheel-drive Fiat Ducato, which became the Ram ProMaster in the US.

It was probably quite an evolution at the time, but Ford didn't stop there. Today, Ford is taking a step further with its new 2020 Transit whose front end has been slightly redesigned. The new 2.0-litre four-cylinder turbo diesel engine replaces the old 3.2-litre five-cylinder engine. The vehicle also has a more sophisticated 3.5-litre V6 gasoline engine with fuel injection switching to intake ports or combustion chambers depending on the engine speed. Ford also offers a drive train that includes a new, more economical 10-speed automatic transmission and all-wheel drive (with gasoline engines). It is true that Mercedes-Benz already has

a four-wheel drive Sprinter model. However, the latter offers nothing more than these four-wheel drive available on order. On the other hand, the new Transit has an automatic transfer case that can transfer 100% of the power to the front without driver intervention.

## THE LATEST TECHNOLOGY

The new Transit that will arrive this fall is even more modern with its driver assistance system. For example, the passenger version will be available with Ford's Co-Pilot360 which covers blind spots and includes parking sensors. This system can even help the Transit driver to automatically exit a tight parking space. It can also be ordered with the adaptive automatic cruise control.

And that's not all. There is the option of the FordPass Connect modem with 4G LTE WiFi connection, while commercial versions can be ordered with Ford's Telematics system which can help fleet managers monitor vehicle usage in real time. With this tool, fuel consumption can also be analyzed to optimise routes and generate savings.

Other technologies are available, including a redesigned dashboard with an eight-inch touch screen combined with the latest SYNC 3 system including Apple CarPlay and Android Auto. A smaller four-inch screen in the centre of the instrumentation displays vehicle information and phone calls.

The Econoline era is definitively over.



DriverFocus is offered for the 2019 Subaru Forester and the 2020 Legacy.



DriverFocus is discrete on the instrument panel but definitely efficient.

# 2019 Forester: the evolution of Subaru's driver assist tech

Driver assistance technology, first introduced as an interesting novelty, has become a crucial part of vehicle safety equipment. The AI and sensor development involved is a precursor to fully autonomous vehicles.

Look lazily out the window or reach for something in the console and the car is all over you. “Keep Eyes on Road” it chastises you and as a driver, you are reminded that you were indeed distracted and feel that slight panic of potentially causing a crash. Now that’s technology I can get behind.

This is probably why Subaru was awarded Best Safety Innovation for 2019 for its DriverFocus system by Automobile Journalists Association of Canada (AJAC).

Once the DriverFocus camera on the dash registers the driver, it analyzes the driver’s face in real time. The camera ‘watches’ using facial recognition software to identify signs of driver fatigue or distraction. The position of the driver’s head indicates whether or not they are looking straight at the road ahead. The system can even measure the distance between the driver’s eyelids and tracks it to detect fading.

Using its observations, the system provides audible and visual alerts when the driver is distracted or losing attention through fatigue.

In addition to providing the driver focus function, the camera on the dash can also register and recognize up

to five drivers and remember their individual pre-sets for seat position and door mirror angle and other preferences.

## GROWING DEMAND FOR EYESIGHT

The DriverFocus Distraction Mitigation System, now available in the 2019 Forester and newly announced 2020 Legacy, is companion to Subaru’s EyeSight.

EyeSight uses cameras as well, but these focus outside the car to warn of driving hazards. It also facilitates the adaptive cruise and issues lane departure warnings. Introduced as a pioneer technology in 2013, it was initially embraced by a small fraction of purchasers. Last year that proportion rose to 36.2% and so far in 2019 that has been significantly eclipsed. The growth of consumer enthusiasm for the technology is impressive.

Subaru showed some vision (pun intended) in 2013 and has been rewarded with a growing reputation for road safety for Eyesight and other driving attributes. Even most vehicles are adding driving assist technologies and augmenting them every model year. Clearly driver assist technology is becoming a requisite feature for many Canadians.

**DRIVERFOCUS CAN EVEN MEASURE THE DISTANCE BETWEEN THE DRIVER’S EYELIDS AND TRACKS IT TO DETECT FADING.**

EYESIGHT DEMAND IN CANADA (%)

2013	2.3%
2014	7.2%
2015	18.1%
2016	25.4%
2017	30.9%
2018	36.2%
2019 YTD	52.2%

The BMW i3 uses Bridgestone Ecopia EP500 tires.



# Challenges in Developing Efficient Tires for EVs

EVs involve the development of new technologies and products in the tire industry.

Electric and hybrid vehicles have been with us for quite a while now. Consumers expect to get the most out of them: higher ranges for 100% EVs and lower fuel consumptions for hybrids. Tires have a big role to play to meet these expectations. However, it is not that easy to develop an efficient tire that will contribute to better range or fuel economy.

**THIS TYPE OF TIRE STILL HAVE TO COMPROMISE IN ORDER TO REACH FUEL ECONOMY EXPECTATIONS.**

There are already well-known products on the market: Bridgestone Ecopia, Goodyear Assurance Fuel Max, Hankook Kinergy, Michelin Energy Saver and Yokohama Avid Ascend, just to name a few. But this type of tire still have to compromise in order to reach fuel economy expectations.

## DESIGNING THE RIGHT COMPOUND

Better results are achieved through very low rolling resistance that can mostly be obtained by harder

rubber compounds. The drawback is that such tires do not have the same traction on water or slippery surface than performance tires. And these tires will reach higher durability but they will tend to develop irregular wear.

To avoid slippery tires with less traction, the solution would be to opt for tires with more mechanical grip. But energy consumption will increase.



In 2018, Goodyear unveiled its EfficientGrip Performance, a prototype tire with smaller sipes to meet the specific needs of EVs.

## NEW CONCEPTS IN THE WORKS

It makes sense that all the major tire manufacturers are creating low-resistance tires that will remain fuel efficient while still providing satisfactory road grip.

Goodyear has already introduced a prototype, the EfficientGrip Performance, with thinner sipes (little channels in the tread) in order to give better support to the heavier EVs with big batteries, and thus control irregular wear. Bridgestone has already worked on EV tires. Specifically designed for the BMW i3, the EP500 is part of its already efficient Ecopia family.

Michelin promotes a tire introduced in 2012, the Energy E-V used on the Renault Zoe city car, with still less rolling resistance and lower road noise. Road noise is in fact another factor tire manufacturers have to deal with. Obviously, with mechanical noises gone with the adoption of an electrical drive, road noise is more audible once in the vehicle. And it has to be contained.

What's next in the industry is the development of newer rubbers or replacement products to reach even lower rolling resistance while attaining more grip on the road. Something we will keep an eye on. And we have not even tackled winter tires for EVs yet!



Michelin is working on tires for all kinds of EVs, including race cars.



Michelin provides Energy E-V tires for the Renault Zoe city car.

Photos: Goodyear, Éric Descarries, BMW, Renault

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# DRIVING TO THE FUTURE

JUNE 11-12, 2019, TORONTO



Ecotuned has developed an electric powertrain for light trucks such as Ford F-150.

## Partnership with Spectra Premium

# Ecotuned in the commercialization phase

Two years after launching its demonstration vans for customers such as the City of Montreal, Hydro-Québec and Aéroports de Montréal, among others, Ecotuned has just taken a new step towards commercializing the electric conversion of gasoline vehicles.

Ecotuned has just concluded a partnership with Spectra Premium for the industrialization of its electrical technology, which represents an essential step in the commercialization of the project. This Boucherville-based plant is a North American leader in the design, manufacture, distribution and sale of car and heavy and light truck parts.

### **AN INGENIOUS CONCEPT**

The concept, developed by Andy Tă, a former student of the École de technologie supérieure de Montréal, has generated a lot of interest since its launch in

2016. His company, Ecotuned, has demonstrated that it is possible and cost-effective to install an all-electric engine and drivetrain on light trucks such as the Ford F-150 when their warranty has expired. Taking advantage of the longevity of the electric motor, the system is designed to be easily uninstalled and reused at least three times in another vehicle. This approach allows consumers to save the costs associated with replacing and purchasing a new pickup truck (over \$40,000), while reducing their operating (80%) and maintenance (50%) costs. To date, 17 units have been completed for fleet customers.



Ecotuned electric powertrain



Andy Ta, President &amp; Founder of Ecotuned

## ACT INTERNATIONAL CONFERENCE

Ecotuned will be part of the Quebec delegation at the Advance Clean Transportation (ACT) conference to be held from April 23 to 26 in Long Beach, California. This exhibition attracts the main stakeholders in the fleet sector. Building on its successful achievements and the partnership with Spectra Premium, the company will take a step further towards its commercialization objective by targeting the entire North American market of Class 2 to 4 light truck fleets, a market estimated at more than two million vehicles, all makes and models combined.

**THE SYSTEM IS DESIGNED TO BE EASILY UNINSTALLED AND REUSED AT LEAST THREE TIMES IN ANOTHER VEHICLE.**

## THE AMAZON APPROACH

However, the company is realistic. Its objective is to have 1,000 installations per year within three years. To achieve this, while establishing a rapid and cost-effective market deployment, Ecotuned will decentralize part of its production by entrusting the installation of its technology to accredited car garages, and not by centralizing all operations in a head office, similar to how Amazon operates through its participating dealers.



A Chevrolet Bolt EV ready for repair.



Bruce Eccles

# That independent feeling

The popularity of EVs and hybrids continues to slope upward. For the independent service facilities, they represent new opportunities and some challenges.

Bruce Eccles is unfazed by the prospects of new technology in vehicles. He believes change is constant and is part of the business. “When I was starting out 25 years ago, ignition points were completely replaced by a staggering new technology: electronic ignition. We realized how much better it was.”

**“THE MOST DANGEROUS MECHANIC IS THE ONE WHO ‘THINKS’ HE KNOWS WHAT TO DO.”**

Today Eccles Auto Service Inc. grown to three centres near Hamilton in Ontario. While technology is changing dramatically, the approach to managing it is the same. A shop must stay current or face the consequences. Fortunately training is available and Bruce makes sure his techs benefit from it, usually during working hours. Component manufacturers continue to provide complete training but these days if you do not follow protocol, you might blow something up.

## SAFE PROCEDURES

When an EV or hybrid arrives at an independent facility for conventional service like wipers or tires, it cannot be treated as a conventional vehicle. The EV technology has implications for the entire vehicle. “The very first thing you may need to do is to disable the electronic parking brakes even if it is just for an inspection”, Bruce explains. Checking the suspension may require knowing that fluid viscosity in the struts is electronically controlled. Battery or drivetrain issues have not even been addressed yet.

Safety is paramount. “The most dangerous mechanic is the one who ‘thinks’ he knows what to do”, Bruce adds. The Eccles teams include younger technicians who have grown up in the electronic age while the senior staff have the wisdom to use proper safety equipment and proceed slowly.

## PARTS ARE COMING

EV parts are becoming more commonly available. Bruce’s APC source had four sets of front calipers for the regenerative braking system in a 2016 Prius. “No-one is willing to wait two days for a part.” Many of the OEMs are using new upstream suppliers like LG for high tech solutions so the aftermarket chain is adapting.

Bruce takes steps to ensure that his client base stays on top of maintenance regardless of the car’s motive power. His customer relationship management system adapts to individual customer patterns but in some cases, maintenance recommendations remain what they always have been. “Everyone should have an alignment on an annual basis, particularly with the pothole count these years. Wipers, tires, brakes must be inspected. We had a customer whose mechanical brakes had stiffened up through reduced use because the regenerative brakes were constantly doing the stopping. We need to embrace the many new aspects of technology just as we always have as cars continue to evolve and get better.”



Terry Erb is Director, Marketing, Sales and Service at Lincoln Motor Company of Canada Ltd since 2015.



2020 Lincoln Aviator PHEV

# Lincoln's electrification takes off with the Aviator

The electrification of the car fleet continues to grow. Experts estimate that a hundred new EVs and plug-in hybrids will make their debut in the North American market by 2022. And Lincoln will not stay out of the game.

Lincoln will electrify its entire car line-up, a process that will begin with the 2020 Aviator. The brand will benefit from a portion of the \$11 billion that Ford is investing in a program that began in 2015 and that will eventually lead to the launch of some 40 new models by 2022. We met with Terry Erb, Director, Marketing, Sales and Service at Lincoln Motor Company of Canada Ltd, who outlined the brand strategy at the Montreal International Auto Show.

## AI— HOW DOES ELECTRIFICATION AFFECTS LINCOLN?

Terry Erb —Premium customers do not face the same entry barriers as non-premium. If you are buying a \$20,000 car and you are on a tight budget, you are worried about every buck on your monthly payment. If you are spending \$70,000 or \$100,000, that entry barrier on price suddenly goes away. And everybody is paying a premium to get in an electrified product.

## AI — HOW IS IT EXPERIENCED AT LINCOLN?

Terry Erb —All our products share the DNA we believe Lincoln should embody, which I call "American luxury": big, powerful, comfortable vehicles that exude luxury. Let's take the Aviator. Its entry-level powertrain is a 400 hp and 400 ft-lb twin-turbo V6 engine. All Lincolns, including the Aviator, will be electrified over time. They will either be hybrid, plug-in hybrid or fully electric. It really comes down to what suits each product best. The Aviator will be Lincoln's first PHEV. It

will be a very powerful vehicle with 450 hp and 600 ft-lb. That is why it was branded Aviator Grand Touring.

## AI — WHAT MOTIVATES THE LINCOLN BUYER?

Terry Erb —Buyers have different motivations. Some buyers like the fact that it is green, other will like its performance. There is a certain convenience to being able to drive for weeks without having to stop at a gas station. We hear that from people considering EVs during our consumer research. But one thing we often hear is: how is this going to save me time and make my life simpler? You are buying something to fit your lifestyle and your personality. Luxury consumer probably has bags of money, is probably well informed, but they just don't have bags of time!

## AI — YOU ARE INTERESTED IN MAKING LIFE EASIER FOR YOUR CUSTOMERS?

Terry Erb —In addition to less frequent stops at the pump, Lincoln uses technologies design to make life simpler. One example is Co-Pilot360 Plus, a technology with semi-autonomous features. It brings some existing technologies with new ones. By integrating adaptive cruise control and lane keeping to automatic high beams and 360 degree cameras, you keep your hands on the wheel and your eyes on the road but it will drive the car for you. It is standard on Aviator, Nautilus, Continental and MKZ, and it is going to show up on the MKC and the Navigator in the next year.

**ALL LINCOLNS, INCLUDING THE AVIATOR, WILL BE ELECTRIFIED OVER TIME. IT WILL EITHER BE HYBRID, PLUG-IN HYBRID OR FULLY ELECTRIC. IT REALLY COMES DOWN TO WHAT SUITS EACH PRODUCT BEST.**

# Human resources: the importance of commitment

Four companies specializing in human resources, BambooHR, Officevibe, PayScale and Lattice, demonstrate on their own and on the basis of their thousands of corporate clients the added value generated by committed employees. Here is a summary of their research.

First and foremost, the leadership style of executives accounts for 70% of the employees' commitment. It is up to them to create a winning work environment.

**THE SALARY OF AN EMPLOYEE IS NOT JUST A NUMBER. IT IS AN EMOTION BECAUSE IT HAS THE POTENTIAL TO REVEAL THE INEQUALITY OF OPPORTUNITY IN THE COMPANY.**

## EMOTIONAL EXPERIENCE

In order to develop a positive employee emotional experience with regards to their employer, leaders have to forge individual connections with all employees. The primary objective is to invest in their growth by ensuring their well-being while reducing their stress at work. One way to do this is to study their autonomy, their sense of responsibility, the mastery of their knowledge and the monitoring of their progress.

## SALARY: NOT JUST A NUMBER

Proper working conditions and appropriate salary are among the main factors of commitment. The salary of an employee is not just a number. It is an emotion because it has the potential to reveal the inequality of opportunity in the company. Additional benefits say a lot about the value attached to a job.

## ADEQUATE WORK TOOLS

High technology sectors need to be updated regularly. This is particularly relevant to innovation in the automotive in-

dustry. It is necessary to constantly identifying the best specific training adapted to each type of job and making it available to all.

## A CULTURE OF APPRECIATION

Recognition should never be neglected when aiming to improve commitment. The ways are diverse and often creative. In collaboration with their employees, leaders should set up an internal or public system of recognition of individual and team achievements.

## AN EMPLOYEE-CENTERED APPROACH

To materialize this approach, managers must involve their employees in the process of setting goals that can be linked to those of the company. This is a very commendable challenge for a manager. They will then have to actually celebrate the achievement of individual goals and those of the organization.

## POINTS TO REMEMBER

- Have clear expectations and practice open bilateral communication
- Communicate the values of the organization
- Align competence and needs of the company
- Demonstrate trust in employees and value them in their work



Frédéric Sigouin and his wife Valérie

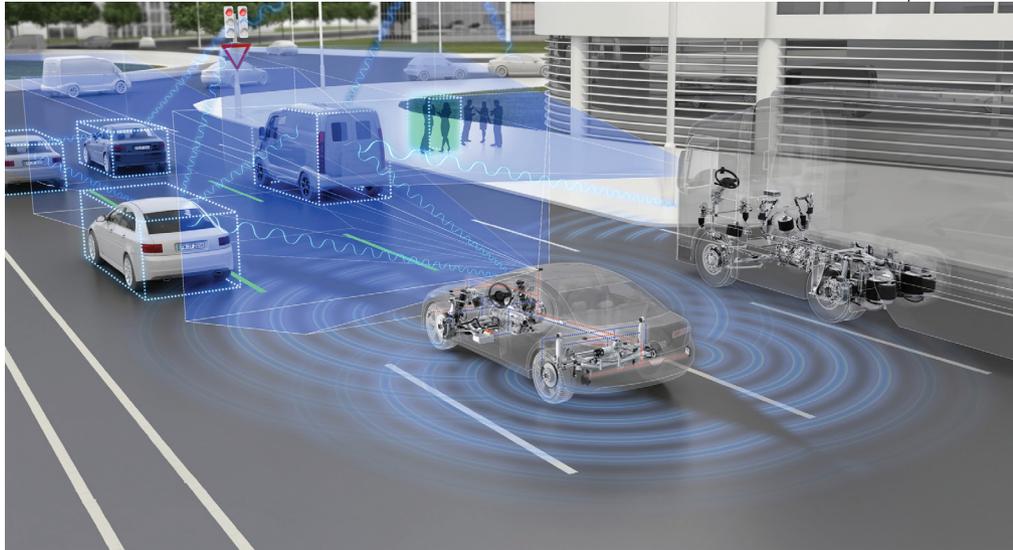
## Frédéric Sigouin's insights

In a recent survey conducted as part of the Exceptional Employer program, employees at Pièces d'auto et de camion F. Sigouin inc, the NAPA Auto Parts store in Vaudreuil-Dorion, said they were very satisfied with their organization. How does Frédéric Sigouin, the owner, promote their commitment?

- By keeping them informed of the customer-business relationship
- By listening to them to help them adapt to technological changes
- By being honest and not covering up the problems
- By giving equal importance to all to create a culture of mutual respect
- By constantly offering them specific training to be updated on the latest innovations



Richard Wallace from the Center for Automotive Research.



# Autonomous vehicles: a disruptive new mobility

Last November, Richard Wallace, Vice-President, Transportation Systems Analysis at the Center for Automotive Research in Ann Arbor, Michigan, was speaking at TalkAUTO Canada, a conference hosted by JD Power and Canadian Black Book in Toronto. Automotive Innovations Magazine attended the event.

In a conference titled “New Mobility: Connected, Automotive, Shared (and Disruptive)”, Wallace said the development of automated vehicles and the emergence of on-demand, shared mobility platforms will alter significantly how travelers interact with and their expectations of vehicles, all this leading to a transportation system that is more multimodal and less personal-vehicle centric.

He naturally started his presentation with an explanation of the different levels of vehicle autonomy, a topic presented in more details by our colleague Raynald Bouchard in this edition of the magazine.

Autonomous driving is measured in levels: level 0 is considered to have no self-driving features, while level 5 is hands-free, human-less mobility to the point where steering wheels and pedals are not even needed.

## 360° EVOLUTION

Mr. Wallace showed the audience that vehicles are evolving quickly along several dimensions:

1. Growth in vehicle communication and connectivity
2. Increase in electronic content & amount and importance of software
3. Proliferation of sensor-based safety systems

4. Electrification of the powertrain
5. Changing mix of vehicle types (end of cars?)
6. Increased competition from many directions
7. Advent of mobility services (end of ownership?)
8. Emergence of highly automated vehicles

Some 52 different companies have been approved by the California Department of Motor Vehicles to test autonomous vehicles on the road.

## TESLA AIMS TO GO FURTHER

The highest level of autonomy expected in 2019 will come from the Audi A8 with driving aids boasting level 3 semi-autonomous driving capabilities. However, some say Tesla could be close to skipping levels 3 and 4 and could soon be ready for full automation – or level 5. Until then, no matter what improvements are made, a Tesla must have a driver behind the wheel ready to take over at a moment's notice.

**AUTOMAKERS  
ARE WELL ON THE  
ROAD TO FULL  
AUTOMATION.**

Richard Wallace made it clear that while automakers are well on the road to full automation (level 5) and many vehicles are already reaching the level of partial automation, much research and efforts are still required before we can reach full automation.



A century of disruptive technologies illustrated by the Ford Model T and the Tesla Model X.

# A take on disruptive technologies

Overview and raison d'être of Innovations Automobiles Magazine, the first magazine entirely dedicated to innovative technologies in the Canadian automotive sector.

The introduction of electric, hybrid and hydrogen vehicles as well as autonomous vehicles and its associated artificial intelligence are disruptive innovations that will change the world the way the Ford Model T did a century ago.

Automotive industry leaders agree that the next decade will expose us to more changes than we have seen in 50 years. These changes include the electrification of vehicles and the gradual integration of driving assistance tools leading to full automation, but also the digitization

of processes, the products and the global service networks. There is no doubt that these technological breakthroughs will provide important opportunities for manufacturers.

Practically a century ago, the world of transportation saw a competition between internal combustion engines and those propelled by electricity. Once again, the world is faced with this disruptive choice. Back then, electric cars had a major problem: limited range. This range limitation is now increasingly a thing of the past as EVs are now ready to replace internal combustion engine vehicles at the beginning of the 21st century.

In 2018, the International Energy Agency announced that the EV fleet had exceeded 3 million units in 2017, a 50% increase over the previous year, indicating rapid market growth. Every day brings new developments in the automated vehicle industry. Despite these unprecedented breakthroughs, no discussion and exchange forum has yet been made available in Canada for sharing information on B2B automotive innovations. We are honoured to be the first Canadian magazine to offer such a platform.

Our magazine is committed to becoming the premier forum for service providers in this emerging industry and a leading media platform for electric cars and trucks. It is more than a magazine, it is a community where ideas, goods and services can be exchanged.

Disruptive changes occur on a regular basis. Electric, hybrid, hydrogen and autonomous vehicles as well as artificial intelligence related to the automotive industry are all technological innovations impacting our lives. Innovations Automobiles Magazine is the ideal platform to help you navigate this ever-changing world, and to create and optimize opportunities. Join us and be at the forefront of the wonderful world of disruptive technologies!

**A CENTURY OF  
DISRUPTIVE  
TECHNOLOGIES  
ILLUSTRATED BY THE  
FORD MODEL T AND  
THE TESLA MODEL X.**



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