

Canadian Innovation



PHOTO COURTESY OF JAMNICK LAURENT

Q&A

Serial entrepreneur, Clearbanc Co-Founder, and Dragon on *Dragons' Den*, **Michele Romanow** shares her thoughts on entrepreneurship and the landscape for innovation in Canada.

With an expansive resume and having played a large role in accelerating Canadian innovation, what have been your proudest accomplishments?

I'm most proud of the Clearbanc team. We started out of our Toronto condo five years ago and now we're over 200 people and have invested over a billion dollars in more than 2,500 e-commerce companies, making us the largest e-commerce investor in the world.

In response to the COVID-19 pandemic, and as a serial entrepreneur, what's your current outlook on Canada's innovation landscape?

Innovation has never been more important for the Canadian economy, especially as we move our economy beyond resources. It's important to remember that so many incredible companies came out of recessionary periods and I have no doubt this time will be the same. The COVID-19 pandemic has accelerated secular changes in the economy — for example, e-commerce penetration as a percentage of retail sales has soared from 16 percent to 28 percent in the last eight weeks. Even in slow-moving sectors like health care, telemedicine technology has been rapidly adopted. There's no better time to innovate than now.

In your opinion, what unique edge or advantage does Canada have in the global landscape for innovation and entrepreneurship?

Canada has a chip on its shoulder, but that's not a bad thing. We sit next to the largest economy in the world and it can be easy to think we're lost in their shadow. But Canada has shown that with such a diverse, ambitious, and educated population, we're building the next generation of great companies. We're hungry and have all the tools we need to get started. Now it's about launching, iteration, and execution.

Throughout your career, what have you found to be the crucial traits or habits individuals need to consistently innovate and problem-solve creatively?

Understanding success is impossible without failure. When you build a company, there's so much iteration and evolution before you find true innovation. I've had to iterate 10 times on some ideas before things really started to work. The most successful entrepreneurs on *Dragons' Den* are open to feedback and are comfortable testing and pivoting. I've also found that the entrepreneurs that get lucky on their first try often fail in the long run because they haven't built this iteration muscle. ■

Innovation Is the Key to Canada's Economic Rebound

Jon Dogterom

ThornhillMedical's portable intensive-care device, the MOVES SLC, is a marvel of miniaturization. It functions as a ventilator, delivers concentrated oxygen, provides suction, and monitors patients' vital signs, all in a battery-operated package about the size of a rolled-up yoga mat. While half the size of typical units, it's robust enough to handle the freezing Arctic or scorching desert — it even works while being bounced around in a helicopter.

Thornhill's MOVES SLC is small and tough because it's usually found in the hands of military medics saving lives in combat zones. Now, this Canadian technology is being deployed in the fight against COVID-19. The federal government has purchased more than 1,000 units in its efforts to increase the supply of ventilator equipment. The

order is so large — 10 times Thornhill's usual capacity — that the firm has partnered with manufacturing giant Linamar.

Thornhill is just one example of Canada's ability to develop innovative technologies in health care, cleantech, and artificial intelligence (AI) — industries that drive our economy. During the COVID-19 pandemic, many ventures have stepped up, providing technologies and services to help combat the effects of the pandemic.

Biopharmaceutical venture Plant-Form is using a genetically-modified version of the tobacco plant to develop Canada's first blood test for COVID-19 immunity and to create antibodies that could be used to treat patients. To accelerate drug development, Cyclica has opened up its AI-enabled platform to researchers around the world. And

telehealth ventures, such as Maple and Dialogue, are providing crucial links to care.

Canada's tech ventures are important sources of growth for the economy. They're also part of a supply chain of innovations that enable other companies to stay competitive. As we begin to reopen the economy, these firms will play major roles in the adjustment to the new normal. In the hard-hit food services sector, for instance, ordering app Ritual has created a platform that makes it easy for restaurants to accept contactless orders both online and in store. And to help universities pivot to online education, Top Hat is making a free version of its virtual classroom next semester.

As Gord Nixon, a former chief executive of RBC, pointed out in a recent report from the Innovation

Economy Council, innovative startups led the way out of the 2008 recession. Tech ventures can do so again. But they're facing challenges of their own. Young businesses don't have the deep reserves of established corporations. After more than a decade of investment, Canada has a strong network of innovation hubs, including MaRS, Communitech, and the DMZ, to help companies scale rapidly and bring their innovations to market. But first we need them to make it through the next six to nine months.

To ensure these high-potential businesses have the financial backstop they need to resume their trajectory once the crisis passes, government support is vital. The goal must be to help these companies survive so that the rest of the economy can thrive. ■



Jon Dogterom
Senior Vice President, Venture Services, MaRS Discovery District

Cyclica Is Building the Biotech Pipeline of the Future

Naheed Kurji

Six years ago, Cyclica had a big decision to make: move to Silicon Valley or stay local. Frankly, it would have been easier to raise money to move, but we elected to stay local. In our opinion, the epicentre of research, invention, and innovation at the intersection of artificial intelligence (AI) and life sciences is here in Canada. Just look at the number of renowned institutions on the beltway between the

University of Waterloo and McGill University. That's why we proudly stayed in the heart of it at all — in Toronto — and will continue to invest in our local talent pool.

We believe that the future of drug discovery is in the hands of innovative research institutions and emerging biotech companies. Our vision is to decentralize the discovery of better medicines by partnering with these hyper-innovative biotech companies.

With a rapidly-growing portfolio of more than 30 active and advancing drug discovery programs, we'll continue to spark innovation through a combination of venture creation and partnerships with early-stage and emerging biotech companies and top tier research institutions, both locally and globally. In Canada, this includes joint ventures with Toronto-based Mannin Research and NeuroTheryX, partnerships with Phoenix Pharma

and Tieōs Pharmaceuticals, and the creation of two companies that will be announced within the next few months. By executing at scale on this innovative business model on the back of our discovery platform, we're creating the biotech pipeline of the future. ■

This article was **sponsored by Cyclica.**



Naheed Kurji
Co-Founder, President & CEO, Cyclica



How Beaumont Is Changing the Game for Innovation in Canada

Ken Donohue

When you think of Canada's innovation hubs you might consider Vancouver, Toronto, or maybe even Waterloo. But what about Beaumont, AB? You could be forgiven for never having heard of this city, but there are some cool things happening there and it's drawing interest from innovators across Canada and around the world.



Located just nine kilometres east of the Edmonton International Airport, Beaumont has 20,000 citizens and is known as one of the fastest-growing communities in Canada. The city is building a reputation as a place that's open to new tech ideas and entrepreneurship, and its municipal government has a can-do attitude.

"Our council wanted to encourage non-residential growth in Beaumont. We didn't want to be a bedroom community to Edmonton," says Mayor John Stewart. "Alberta is still known largely as a resource-based economy, but we see a lot of advantages to being open to innovation and to being a disrupter."

Small enough to be nimble, big enough to be relevant

The advantages of Beaumont include a younger-than-average population, and one that's highly-educated with high disposable income. Beaumont also has cultural cachet as one of Alberta's few officially bilingual communities. For that 30-something who's been living in Vancouver or Toronto, the proximity to Edmonton's culture, sports, and nightlife gives them everything those larger centres do, but with a more affordable lifestyle.

Beaumont wants to be a city that can cultivate and commercialize new ideas and technology. To start, the municipal government got rid of the red tape and completely revamped its development and permitting processes to enable growth and business development. For example, instead of 37 land use zoning districts, there are now just seven.

The testing ground for the future

"We see ourselves a bit like a sandbox. Companies can come here and test innovative

ideas and approaches," says Stewart. "If someone has a vision, they can realize it here. If you have a great idea, come talk to us. We'll figure out how to say 'yes' to it."

Last year, Beaumont was the first city in Canada to integrate a driverless shuttle on its streets with the six-month Electric Autonomous pilot project. Stewart says there were no federal or provincial regulations for autonomous vehicles, but that didn't stop the community from supporting the pilot. "We want to make sure concepts are safe and in the public interest, but sometimes when we're risk-averse, we lose our place," he says. "We want to be that testing ground. We want to prove it here, rather than see the technology show up elsewhere later."

Several more pilots are coming to Beaumont, including smart kiosks and new paint technology that will simulate a three-dimensional crosswalk to enhance pedestrian safety. The city is also in conversations with partners to become Western Canada's most connected city with the fastest broadband infrastructure available globally.

The city itself has adopted a culture of innovation by embracing risk-taking and encouraging different approaches. "We established a coworking space, which makes it easier for innovators to come here and test their ideas," says Stewart. "If they land here and stay, that's great." ■



John Stewart
Mayor,
City of Beaumont

i If you've felt stymied in advancing your ideas, then Beaumont is ready to welcome you. Visit beaumont.ab.ca to learn more.

This article was sponsored by the **City of Beaumont.**



Using AI and VR to Help Pivot Careers and Develop Job-Ready Graduates

Shannon van Leenen

The economic turmoil facing thousands of Canadians in the aftermath of the COVID-19 pandemic will have long-lasting effects. Layoffs and the temporary and permanent shuttering of businesses are a devastating reality. Bow Valley College recognizes the need to solve the complex workforce problems emerging from this crisis. The post-secondary institution in downtown Calgary is re-imagining adult education through Pivot-Ed, an ecosystem meant to get people who have been laid off, or those who are under-employed, working again.

The college is using artificial intelligence (AI) to do scalable assessments to identify the proven competencies of professionals. Through Pivot-Ed, people will be awarded a Bow Valley College micro-credential as evidence that they've mastered specific skills and knowledge. If the assessment of industry-recognized competencies reveals gaps in a learner's performance, they'll be put on a targeted path toward filling those gaps.

"This is all about upskilling and reskilling individuals to meet employers' needs," says Dr. Misheck Mwaba, Academic Vice President at Bow Valley College. "Through these AI assessments, we can pinpoint missing technical and soft skills and provide the learner with the education necessary to increase efficiency and effectiveness."

Bow Valley College is actively searching for new ways to incorporate AI and virtual reality (VR) into its curriculum. The college teamed up with Calgary-based technology

company ICOM Productions to develop an immersive virtual experience in respiratory assessment, which made its debut in a new VR lab earlier this year. The assessment tool is being integrated into the college's Practical Nurse Diploma program.

The VR respiratory assessment features nine different avatars ranging in age, ethnicity, and respiratory conditions. The nursing students do assessments on the virtual patients to recognize normal and abnormal findings. Before this innovation, the students practised on their classmates, most of whom had healthy lungs. "This tool provides our learners with an invaluable experience that would sometimes take months to become proficient at in a hospital or clinical setting," says Nora MacLachlan, Dean of Health and Community Studies at Bow Valley College.

"I've never been into video games or much of a techy person, so I was nervous about learning to operate the VR. But the instructor that I had was very helpful, and I caught on quickly," says Kristen Cameron, a Practical Nursing student who was one of the first to pilot the stethoscope. "Our learners are doing amazing activities to perform skills and develop competencies in the virtual environment," says MacLachlan.

Bow Valley College is proud of the innovative ways it's helping to develop the skills its learners need to be work-ready, and to secure employment even in these challenging times. "Our vision is to open doors and open minds," says Dr. Mwaba. "And we're also making it our mission to make all learning count." ■



Shannon van Leenen
Media Relations
Officer,
Bow Valley College

i To learn more, visit bowvalleycollege.ca.

This article was sponsored by **Bow Valley College.**





Growing Innovation in Saskatchewan's Biobusiness

For more than 30 years, Ag-West Bio has been a catalyst for innovation and growth in Saskatchewan's bioeconomy. Mediaplanet spoke with President and CEO **Karen Churchill** about how the province's highly-innovative ag-science sector is advancing value-added agriculture.

Ken Donohue

How important are ag-science and innovation in the bioeconomy?

Innovation is the seed and agricultural science is what will help grow the bioeconomy. Canada has huge, untapped potential to be a global leader in the bioeconomy. The investment we've made in innovation has led to agricultural diversity, making it so we're not too reliant on one sector.

Why is value-added agriculture important?

Increasing the economic value of agriculture is good for consumers, producers, industry, and the environment. There's increased consumer demand for more nutritious foods, and so we're diversifying what we grow to respond to this demand. Value-added production creates a need for new infrastructure and jobs, which contributes to a healthy economy and secure food supply.

How does Ag-West Bio support startups and small businesses?

We have a wide range of support services, including networking events that foster the growth of new ideas. Our in-house experts work with startups to overcome some of the hurdles in getting their businesses going.

We also provide seed funding to companies that have proven commercial capacity, in order to accelerate their businesses and leverage additional capital. We know that innovation is worth nurturing.



Karen Churchill
President & CEO,
Ag-West Bio

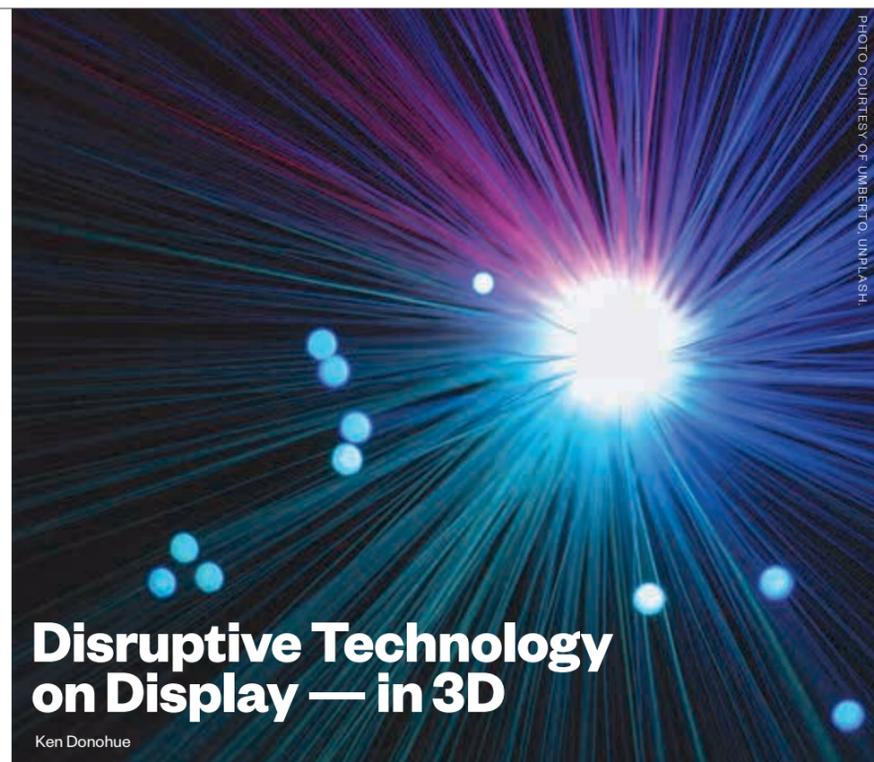
What's the future of bio-science and value-added agriculture?

We're poised for tremendous growth. We have an emerging agri-food cluster in Saskatchewan, and national and international research and business talents are attracted to the province because they know the type of support we can offer. The concentration of agriculture knowledge here feeds research and development, which creates spin-off benefits. ■



To learn more about biobusiness innovation in Saskatchewan, visit agwest.sk.ca.

This article was sponsored by **Ag-West Bio**.



Disruptive Technology on Display — in 3D

Ken Donohue

A Newfoundland-based tech startup has developed the world's most advanced "natural 3D" commercial light field display — and it's poised to disrupt the \$200 billion global display market.

Led by experienced entrepreneurs, Avalon Holographics is spearheading the next wave of display innovation with light field technology. This tech will revolutionize the way we produce, view, and understand visual content. By replicating the experience of looking at real objects, Avalon's light field displays produce realistic, comfortable, and accessory-free holographic — or 3D — experiences. No longer will we be encumbered by current 3D technologies that require virtual reality (VR) headsets or glasses for TV and film.

A visual experience like no other

Light field display technology is the future and will replace many of the screens that we use today, especially in critical industries that require advanced 3D visualization such as aerospace, defence, medicine, and industrial design. As the technology evolves, holographic displays will even replace the screens on our phones and computers, providing experiences that can only be imagined today.



Wally Haas
Co-Founder & President,
Avalon Holographics



Russ Baker
Co-Founder & Vice President, Business Development,
Avalon Holographics

After five years of work, Avalon has emerged from stealth mode with working prototypes, which have been met with positive feedback. For investors, this is the entry point — the company anticipates getting into niche markets early. Then, as the technology matures, they'll scale up and drive the costs down, which will accelerate growth and adoption. ■



Learn more about Avalon Holographics' technology, and investment and partnership opportunities, at avalonholographics.com.

This article was sponsored by **Avalon Holographics**.



Durham College Helps SMEs Access Talent and Technology

Research isn't just about microscopes and lab coats — it's about solving real-world problems for local businesses. Here's how small and medium enterprises benefit from working with Durham College.

Veronica Stephenson



Debbie McKee Demczyk
Dean, Research Services, Innovation, & Entrepreneurship,
Durham College

When people think about research, a picture of someone in a laboratory bent over a microscope might come to mind," says Debbie McKee Demczyk, Dean of Research Services, Innovation, and Entrepreneurship at Durham College. "But at the college level, we engage in applied research, which means working with local businesses and community partners to help them solve a problem. We do that by forming a project team — consisting of faculty, students, and the industry partner — to address their business needs."

Applied research projects are a win-win for colleges and small- and medium-sized enterprises (SMEs). SMEs looking to grow and innovate by developing their technology draw on Durham's considerable infrastructure, access to funding, and specialized talent pool. Meanwhile, Durham students gain invaluable real-world experience in their field of study.

"Our mission statement is 'Together, we're leading the way,' which really speaks to our culture of collaboration," says McKee Demczyk. "Working with businesses to see our community grow and succeed, and training the right talent for businesses so that we can all be successful, is foundational to our work." SMEs can expect to retain full control of their project, since the college doesn't typically take a stake in companies' intellectual property.



Durham College has four dedicated applied research centres:

Hub for Applied Research in Artificial Intelligence for Business Solutions (the AI Hub)

The AI Hub — Durham College's first and largest applied research centre — has two primary tracks. The first centres on companies seeking to leverage existing data within their corporate systems. Researchers at Durham use state-of-the-art AI techniques to create business insights and recommendations from data, which can be a highly-beneficial asset when used appropriately. Durham also specializes in developing AI to help companies interface with their clients through automation, like advanced chatbots and voice recognition software.

Recently, Durham researchers collaborated with Precise ParkLink, a parking management solutions company, to help improve forecasting with regard to parking capacity, location marketing, and profitability. Using AI-driven data analysis enabled by Durham College, Precise ParkLink was able to deploy Canada's first-ever AI-based virtual parking assistant.

Centre for Cybersecurity Innovation

Cybersecurity is at the forefront of many business owners' minds, and for good reason. Cyber threats are a serious liability for SMEs — about 20 percent of cyber attacks in Canada target businesses with 10 to 49 employees, according to Statistics Canada. Durham College's Centre for Cybersecurity Innovation — the first of its kind in the region — leverages its market-driven educational approach to tackle the ever-evolving landscape of cyber threats.

"With COVID-19, many businesses have had to rely on the internet in ways they never have before," says McKee Demczyk. "Our researchers ensure companies' systems are as robust as they can possibly be." State-of-the-art cybersecurity is important for any company, but is especially crucial for businesses that collect personal information from customers.

PHOTOS COURTESY OF DURHAM COLLEGE.



Centre for Craft Brewing Innovation (CCBI)

The CCBI, complete with a 50-litre pilot brew line and state-of-the-art brew lab, draws on the expertise of its resident microbiologist and brewmaster to help craft brewers improve their products. One recent project saw the development of a non-alcoholic beer, for a company called Partake Brewing, that went on to win multiple awards.

Mixed Reality Capture (MRC) Studio

Virtual reality (VR) training simulations are becoming increasingly important as companies and services look to train their employees while minimizing safety risks. The MRC Studio works with businesses to develop effective, immersive virtual training scenarios. SMEs benefit from the studio's VR tracking equipment, green screen compositing space, and the extensive expertise of Durham's student and faculty talent pool. ■



To find out how your SME can collaborate with Durham College on applied research, visit durhamcollege.ca/research.

This article was sponsored by **Durham College**.





MICROTRAFFIC TECHNOLOGY MEASURING BIKE LANE SAFETY PERFORMANCE IN MONTREAL. IMAGE COURTESY OF MICROTRAFFIC.

How One Innovative Canadian Startup Is Improving Road Safety

By harnessing artificial intelligence to analyze near-miss data, Winnipeg startup MicroTraffic is helping to proactively mitigate traffic collisions.

Tania Amardeil

Most Canadians are familiar with the Humboldt Broncos road tragedy that killed 16 people.

While it's all too common to encounter news about traffic collisions, new technology is enabling cities to build a safer future for drivers.

"Road safety is one of the hidden dangers of Canada," says Craig Milligan, CEO and Co-Founder of MicroTraffic, a Winnipeg-based startup working to reduce traffic fatalities. "The size and depth of the pain and suffering coming from this issue aren't top of mind for many people, but they're very significant."

"Whether we're driving, biking, or walking, we all see the issues with safety on our roads. Every time I'm behind the wheel, I see many opportunities to use data to make our roads safer," adds Baiju Devani, Chief Data Officer and Senior Vice President of Data Science at Aviva Canada, a leading property and auto insurance group.

There are about 2,000 road fatalities every year in Canada and many more serious injuries. The numbers aren't improving, either — and the

subset involving pedestrians and cyclists is on the rise. What makes these numbers especially vexing is the fact that they're all preventable.

“MicroTraffic is part of an effort to know the risk ahead of time and address it proactively.”

The value of near-miss data
 "Traffic engineers have traditionally used historical crash data to find high-risk intersections and to try to bring targeted infrastructure to them," says Milligan. However, 75 percent of fatalities occur at locations where fatalities haven't previously occurred, which means the reactive approach isn't working.

Near misses — essentially close calls or near crashes — can help cities to better understand risks within intersections and to make modifica-

tions before any fatalities occur. While many cities already have cameras pointed at intersections where near-miss collisions happen every day, the information isn't getting recorded or turning into action.

A unique, proactive solution
 MicroTraffic is a video analytics company that uses artificial intelligence to review and assess intersection camera footage for collisions and near-miss collisions, providing traffic engineers with invaluable diagnostics.

"This technology allows governments to be more proactive," says Milligan. "We're not reactively waiting for risk factors to materialize as a result of a tragic outcome and then fixing them after the tragedy. MicroTraffic is part of an effort to know the risk ahead of time and address it proactively."

To date, 37 governments — including in the Greater Toronto Area, Los Angeles, Austin, Detroit, New Jersey, Montreal, Calgary, and Edmonton — have programmed over \$200 million of road safety improvements using

MicroTraffic's diagnostic technology: changing the signal timing, adding signs, and even reconfiguring intersections' physical layouts. Some cities have seen intersections drop from 15 critical near misses per day to zero after measuring with MicroTraffic and installing an improvement. There's no doubt: the company's analytics are creating safer roads.

Working together to make cities safer
 MicroTraffic is one of four startups that are part of the inaugural cohort of Aviva Insurance and Highline Beta's Safe x Connected Cities Accelerator, a program that's helping scale startups with a focus on tackling road safety, mobility, and smart city challenges. The program offers mentorship, networking, and pilot opportunities. This includes a grant program that will be coming later this year, and that will allow more Canadian municipalities to access MicroTraffic's technology.

"The relationship Aviva Canada has with MicroTraffic is collaborative and partnership-based, and we're excited to have them on board," says Devani. ■

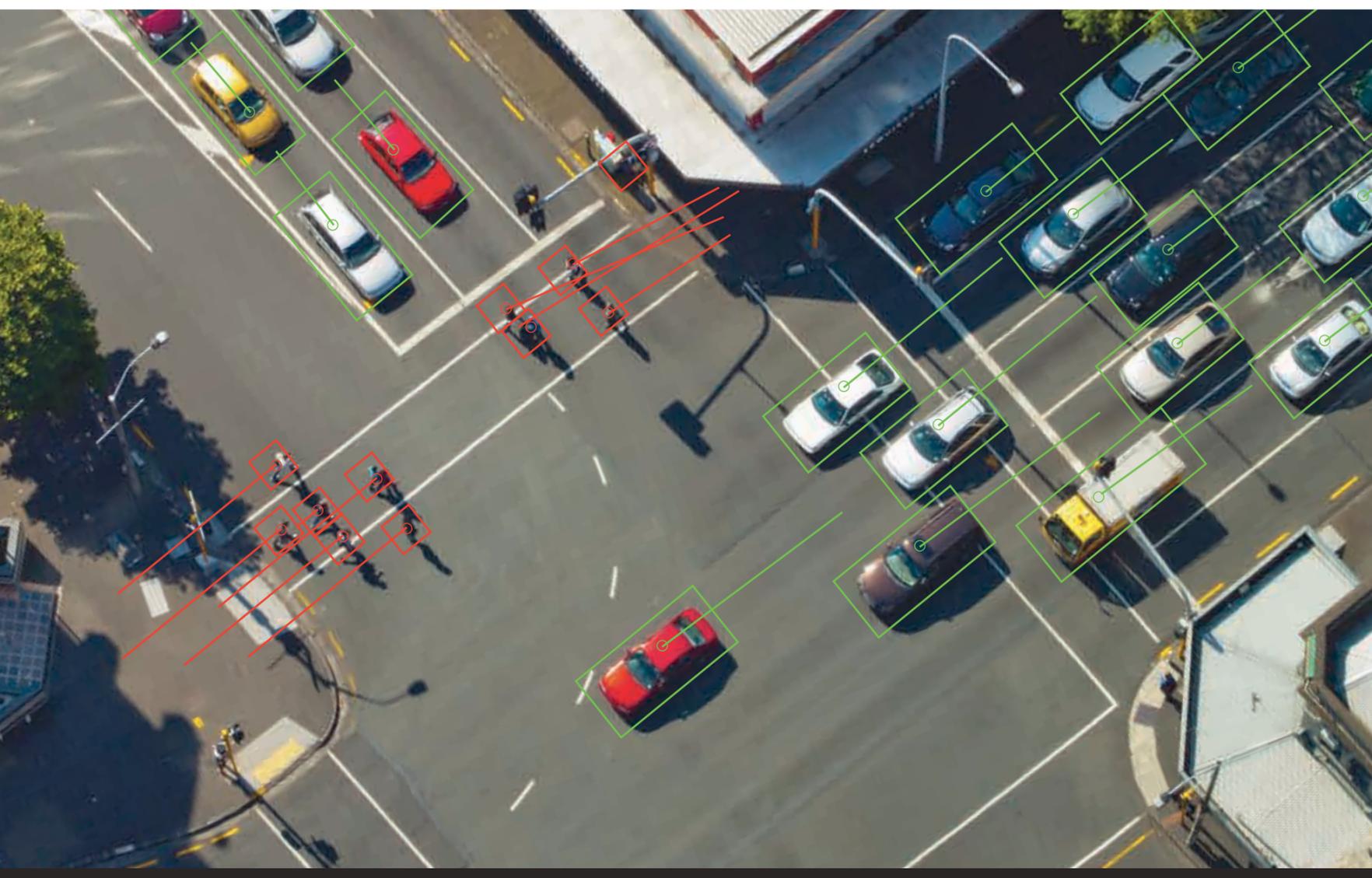


Craig Milligan
 CEO & Co-Founder, MicroTraffic



Baiju Devani
 Chief Data Officer & Senior Vice President, Data Science Aviva Canada

This article was sponsored by **Aviva and MicroTraffic.**



Creating safer intersections with AI

We're committed to safer roads for pedestrians, cyclists, and all road users.

microtraffic.com



PHOTOS COURTESY OF UBC.



entrepreneurship@UBC Is Mobilizing Knowledge through Venture Creation

entrepreneurship@UBC: Launching transformative companies from the research and innovation of the University of British Columbia (UBC).



Kari LaMotte
Managing Director,
entrepreneurship@
UBC

entrepreneurship@UBC helps to propel UBC innovations out into the world through entrepreneurship and venture creation. It provides UBC students, researchers, faculty members, alumni and staff with access to the resources, networks, and funding they need to succeed.

As one of the world's top 40 research universities with 80,000 students, faculty and staff and over \$650 million in annual research funding, UBC has long been a catalyst for innovation. entrepreneurship@UBC supports UBC ventures and entrepreneurs to generate social and economic impacts in BC and around the world. As part of the Innovation UBC network, it encompasses entrepreneurship programs across both its Vancouver and Okanagan campuses, and has created an expansive footprint of entrepreneurial leaders province wide. To date, ventures that have been supported by entrepreneurship@UBC in Vancouver and the Okanagan have raised more than \$221 million in funding and generated more than \$30 million in revenue, stimulating the economic and social landscape of BC while building anchor companies that have a global impact.

entrepreneurship@ UBC's story

UBC is a world-class university and bedrock of innovation at the heart of the province's booming tech and life sciences sectors. entrepreneurship@UBC was created in 2013 to build on UBC's history of launching successful companies based on research discoveries, helping to generate commercially viable entities and translate the university's leading-edge research into tangible impact. UBC is consistently recognized for its global impact and was recently ranked the number one university for both Climate Action and Life Under Water and number seven globally for overall impact in the 2020 Times Higher Education Impact Rankings based on the UN Sustainable Development Goals

As part of the Innovation UBC network, entrepreneurship@UBC provides research-led and high-potential ventures with the industry expertise, practical business training, and deep mentorship to transform discoveries into viable ventures. It connects with expertise and support across Innovation UBC, which helps researchers and their partners bring ideas to life through venture building, patenting and licensing, influencing practice, policy and public debate, and by forming new partnerships with industry, government, and non-profit and community networks.

Cultivating real-world intrapreneurial and entrepreneurial leadership, entrepreneurship@UBC supports innovation from the ground up, ranging from student entrepreneurial development to end-to-end venture creation through its incubator and HATCH Accelerator programs.

Building ventures by mobilizing knowledge

The entrepreneurship@UBC venture-building journey spans from ideation to launch and funding, giving founders a platform to validate their venture through incubator streams that transform research knowledge in areas like health science innovations, climate solutions, and marketplace disruptions into tangible companies that can drive global change. Teams are guided through company building by industry thought leaders, which is further elevated by the active participa-

tion of over 330 mentors and subject matter experts from the Vancouver and Okanagan innovation communities.

The HATCH Accelerator program creates unparalleled experiences for UBC entrepreneurs, uniting a spectrum of university expertise, high-tech spaces, and industry knowledge. It began as a collaboration between entrepreneurship@UBC and the Institute for Computing, Information and Cognitive Systems (ICICS) and has expanded to form a diverse network including centres of innovation across the UBC ecosystem. HATCH ventures have access to over 10,500 square feet of office and makerspace housing state-of-the-art infrastructure and equipment to help them take their cutting-edge innovations to the next level. Founders are supported by established Entrepreneurs in Residence (EiRs) who bring a wealth of industry expertise, broad professional networks, and business acumen to their venture-building journey.

For Aspect Biosystems CEO and Co-Founder Tamer Mohamed, entrepreneurship@UBC helped transform his venture from a wild idea into a BC anchor company pioneering the advancement of 3D printing human tissue. "Thanks to entrepreneurship@UBC, we added our fourth co-founder, became a group of business founders instead of just a group of scientists and engineers, and were prepared to launch our company," he says.

Critical to early-stage company building, the UBC Seed Fund and entrepreneurship@UBC's own Concept Fund help to get promising startups off the ground and close the gap in funding between basic research and investable ventures. These funds breathe life into the ventures, giving them the financial runway while in R&D to transform and flourish outside of the university into solutions that generate social, economic, environmental, cultural, and health impacts.

entrepreneurship@UBC has facilitated cross-disciplinary partnerships across the university's Vancouver and Okanagan campuses, strengthening their contribution to the tapestry of innovation across the province. By way of the HATCH network, it has brought together facilities, faculty, and industry who share the values of creative energy and inclusive collaboration. Through venture-building programs and multidisciplinary collaborations, entrepreneurship@UBC helps unlock innovation by creating the next wave of companies and leaders poised to make a meaningful impact, worldwide.

"As part of Innovation UBC, entrepreneurship@UBC builds connections between the university, research, and entrepreneurs coming out of UBC, launching their innovations into transformative and investable companies. These companies generate economic impacts and contribute to the scientific and technological evolution of our world," says Kari LaMotte, Managing Director at entrepreneurship@UBC.



Join entrepreneurship@UBC's community by scanning this code with your phone's camera:



entrepreneurship@UBC
accelerates ventures
that are innovating their
industries.

Meet some of its alumni:



Founder: Manoj Singh, 2017

Acuva Technologies is empowering customers to produce safe drinking water through its advanced UV-LED disinfection systems with disinfection rates up to 99.9 percent, securing partnerships with major OEMs (original equipment manufacturers) around the globe.



Founders: Tamer Mohamed, Simon Beyer, Konrad Walus, and Sam Wadsworth, 2013

Aspect Biosystems is a UBC spin-off venture pioneering the advancement of 3D printing human tissue through microfluidics and 3D bioprinting, having recently raised a \$26 million Series A funding round in early 2020.



Founder: Valerie Song, 2016

AVA Technologies is creating the world's smartest indoor garden filled with smart tech, an HD camera, and environmental sensors, having launched its product in spring 2020.



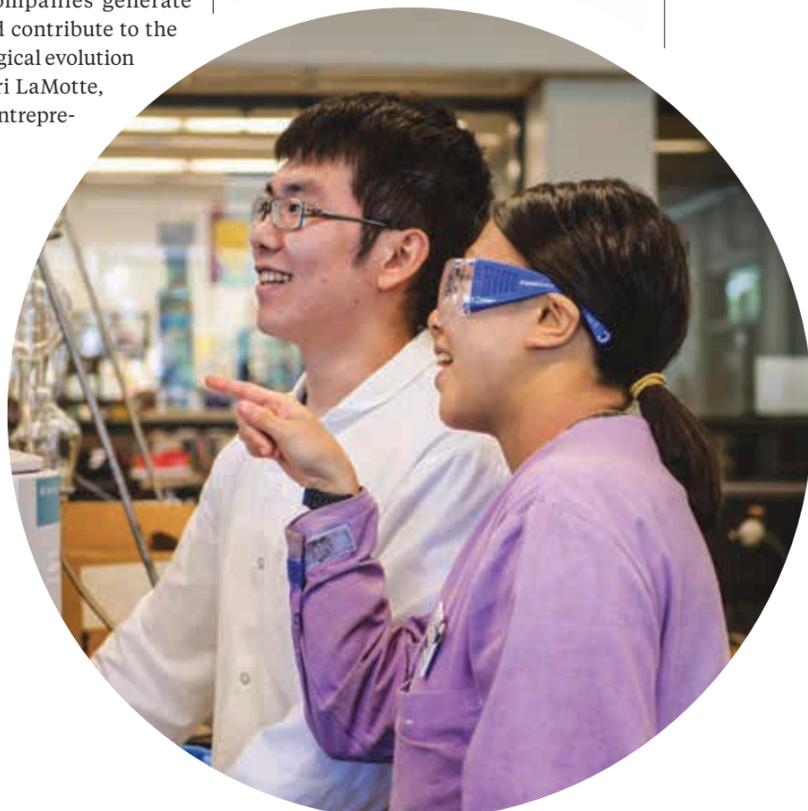
Founder: Michael Carlson, 2018

CarboNet is changing the way we treat water through technology that sustainably and economically removes contaminants from water, and was recently announced as a finalist for the BC Tech Association's Company of the Year — Startup Success.



Founders: Alyssa Farr and Linsey Reimer, 2017

TasteAdvisor takes the guesswork out of buying wine. Their digital solution can be licensed by wine regions, retailers, and liquor boards to match consumer taste preferences to wine they love.



This article was sponsored by **entrepreneurship@UBC at the University of British Columbia.**



Eyes on Geospatial Data Could Reap Rewards for Canadian Business

Geospatial data was once solely leveraged in map production, but the contextual information it provides can now be crucial to success in many industries.

Ted Kritsonis

Will Cadell, CEO at Sparkgeo, offers his own insights into how this could play out for businesses and their consumers.

What insights can the geospatial data industry provide to both organizations and consumers?

We can provide insight into human movement patterns and create indexes of oil demand. We can discern places with higher flood risk, where wildfires are more likely to happen, or watch for landscape changes. We can monitor the movement of high-value assets, and determine which countries are moving products to other countries (that perhaps they shouldn't).

Where humans move there's value, and by studying various elements of that movement we can provide valuable commercial insights. In reality, the analytics we create emerge from an "art of the possible" discussion. The great news is that geospatial data capture technology is way ahead of the curve, and we can answer questions that couldn't have been conceived of even a year or two ago.

How might organizations better utilize such data? Do you have advice on what they should consider or execute?

A commitment to curiosity and innovation. Even the most traditional industries now need to innovate, so the trend is differentiating those companies that commit to innovation

from those who "wait and see." Those who are waiting, wait too long. Cultures of innovation are like organizational muscles: without use they atrophy. Building a culture of data, innovation, and technology literacy is a good pathway to success.



Will Cadell
CEO,
Sparkgeo

How do you see geospatial technology developing further? What are the possibilities?

There are so many options. I think we'll see a great deal of movement around augmented reality (AR) and virtual reality (VR) powered by geospatial tech. Automated vehicles need high-definition (HD) maps. Most of the use cases for 5G have a strong geospatial or location component. These, combined with robust data fusion from numerous sensors in low Earth orbit, provide a creative environment from which to pull numerous new business models and products. ■



For the full story, visit innovatingcanada.ca.

This article was sponsored by Sparkgeo.



Innovation Could Be the Solution to Canada's Growing Health Care Crisis

D.F. McCourt

The Canadian health care system has a reputation as one of the best in the world, but today we're gradually falling behind other major countries. One key opportunity is to embrace innovation.

"We work with local clinicians to understand the gaps in care within communities and the innovations that can fill those gaps," says Reg Joseph, CEO of the Canadian not-for-profit corporation Health City. "The goal of these projects is not only to create new business opportunities, but also to generate data that can inform policymakers and bring about a new way of delivering health care. Fortunately, we have the tools and skills right here in Canada to make a positive and lasting change."



Organizations like Health City are working hard to get us moving forward again, starting with technologies developed right here in Canada. Its initiatives include harnessing artificial intelligence to provide diagnostic imaging to rural communities and revolutionizing the field of health data using synthetic data that both increases access and helps address privacy concerns.

Health City works with clinicians, innovators, philanthropic organizations, and companies to drive better health outcomes and economic development in the health sector.

By marrying Canada's technological strengths with carefully-identified community health care challenges and by scaling local solutions up to the national level, Canada's health care system might just get the second wind it needs to overtake and exceed its reputation. ■

This article was sponsored by Health City.



Reg Joseph
CEO,
Health City



THE SANEXEN TEAM, KEY REPRESENTATIVES OF CORNELL UNIVERSITY, AND LEADING WATER UTILITIES ACROSS NORTH AMERICA AT CORNELL'S GEOTECHNICAL LIFELINES LARGE-SCALE TESTING FACILITY IN ITHACA, NY THIS PAST DECEMBER. PHOTO COURTESY OF LOGISTEC.

New Water Tech Ensures Safe Drinking Water and Environmental Protection



Dr. Martin Bureau
Vice President,
Innovation,
SANEXEN WATER

If there's one thing the experts and scientists at SANEXEN are known for, it's their unrelenting focus on ensuring safe, clean drinking water for generations to come. So when they developed their next generation of Aqua-Pipe water technology, they designed a game-changing, resilient solution that would not only fulfil this mission but also provide additional critical protection against water main rupture during earthquake-induced ground deformation.

Effectiveness proven through rigorous testing

To prove their water technology's resilience to extreme seismic events, the team at SANEXEN knew they had to go big. SANEXEN partnered with several of North America's leading environmental public and municipal utility services and the world-renowned research team at Cornell University's Geotechnical Lifelines Large-Scale Testing Facility to see just how far it could push its technology before it would rupture.

The tests confirmed conclusively that the pipe with SANEXEN's next-generation water technology was easily able to withstand large degrees of ground deformation and abrupt ground rupture. It would have even kept its integrity during the 1906 San Francisco earthquake, which caused extensive and long-lasting damage to the city's water distribution system.

With the results of the tests published, the experts weighed in. "The resilience achieved by the Aqua-Pipe water technology has surpassed everything we've tested so far. This is the best result we've seen and we actually achieved the maximum we could test. This new generation of water technology performed extremely well under extreme seismic forces," says Dr. Thomas Denis O'Rourke, the Thomas R. Briggs Professor of Engineering in the School of Civil and Environmental Engineering at Cornell University.

"This is a game-changer for cities near fault lines along the west coast and earthquake-sensitive regions throughout

the US and Canada. Aqua-Pipe can transform our water main and gas lines' infrastructure from being a liability during an earthquake, to a utility that can be counted upon during a time of need," adds Benoit Côté, President of SANEXEN WATER.

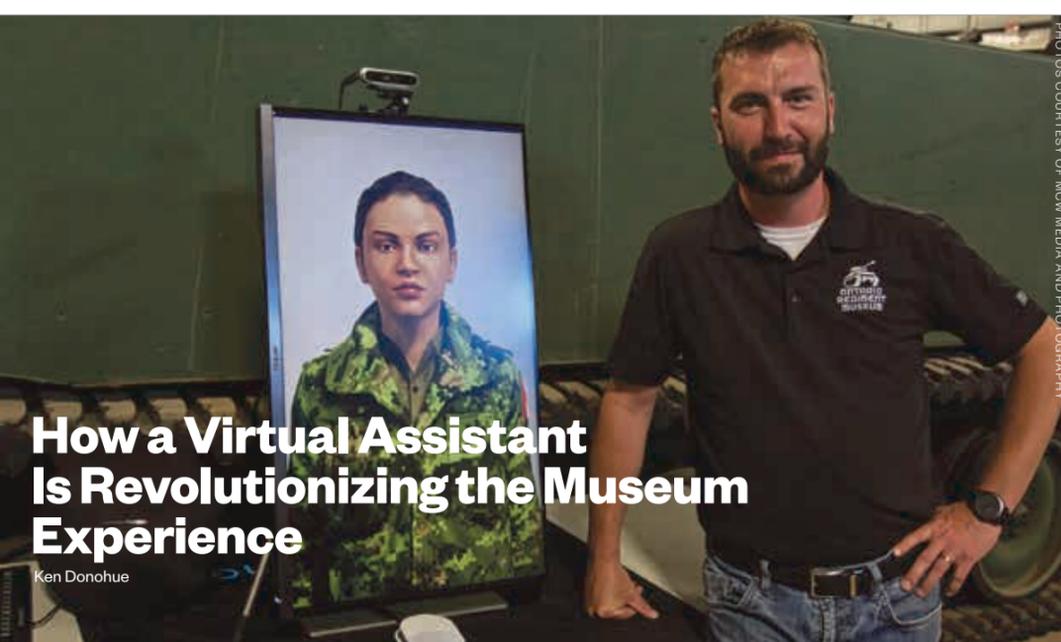
The right technology for our time

The timing couldn't be better for the arrival of this new water technology. Right now, cities and communities around the globe are facing rapidly-deteriorating water infrastructure while experiencing increasingly complex and severe environmental conditions that threaten critical underground lifelines. On top of these challenges, lead in drinking water has become a global concern and communities are demanding that the problem be fixed. Luckily, this next generation of water technology is here to stay and to provide the peace of mind municipalities are looking for to ensure safe, clean, and protected drinking water for generations to come. ■

This article was sponsored by Logistec and SANEXEN WATER.



Benoit Côté
President,
SANEXEN WATER



PHOTOS COURTESY OF NOW MEDIA AND PHOTOGRAPHY

How a Virtual Assistant Is Revolutionizing the Museum Experience

Ken Donohue

Master Corporal Lana recently joined the Ontario Regiment RCAC Museum, but she isn't any ordinary recruit. Lana is an animated virtual assistant developed by CloudConstable. Powered by artificial intelligence (AI), she's poised to revolutionize the visitor and volunteer experience at the museum. "We're always looking to present historical content in fresh ways, and this was an innovative way to do so," says Jeremy Neal Blowers, Executive Director at the museum. "There's also a practical application because Lana can help to automate the entry process, especially when we host large events."

Integrating the technology into the museum's operations was seamless. All that was required was an internet connection, and Blowers says that it was easy to customize the technology by working with CloudConstable. "We love working with them," says Blowers. "When we first tested Lana, people were curious and excited to see a virtual person assisting them. They wanted her to do more, which helped us develop the capabilities further." Lana uses an advanced Intel® RealSense™ depth camera, which allows the museum to extend her capabilities for natural human interactions and to provide new and useful functionality.

“Intel® RealSense™ technology is used to develop products that enrich people's lives by enabling machines and devices to perceive the world in 3D. CloudConstable leverages Intel's technology to help create a state-of-the-art natural voice and vision interface with touchless self-service COVID-19 screening. We're excited to be a part of CloudConstable and delivering innovation that improves lives.

Joel Hagberg, Head of Product Management and Marketing, Intel RealSense Group

Lana is proving her value in ways that weren't expected when the museum began working with the technology last year. The COVID-19 pandemic has expanded Lana's role, as she can screen visitors and staff and provide health and safety guidance such as reminders on hand washing and social distancing. She even has a body scanning feature with fever-screening protocol. "It's comforting having a touchless, safe reception and entry experience," says Blowers. "Lana allows us to sidestep some of the challenges that other museums and cultural spaces are having to deal with, while offering our visitors an innovative experience that they'll enjoy and that'll make them feel safe."

Q&A

The Surprising Benefits of a Virtual Assistant

The Ontario Regiment RCAC Museum is welcoming Master Corporal Lana into its ranks. The museum's Executive Director, Jeremy Neal Blowers, shares how she's revolutionizing the visitor and volunteer experience at the museum.

What motivated the RCAC Museum to invest in this technology?

We're always experimenting with new technology to enhance our visitor experience, and CloudConstable's virtual assistant provides a next-generation solution.

How does it work?

Lana is pre-programmed to do tasks, answer specific questions, and give directions to visitors. We can program the questions that people ask most. She can help automate our entry process, and with facial recognition technology she can provide an enhanced experience for pass holders, staff, and volunteers. For example, tracking volunteer hours can be done automatically.

How has the COVID-19 pandemic changed Lana's duties?

When we first started working with Lana last year, we didn't know we'd be impacted by COVID-19, but we've been able to pivot and the technology is allowing us to get ahead of the curve when it comes to re-opening the museum. Lana provides a safe, touchless reception and entry experience that reduces face-to-face interaction. She's able to screen visitors and staff and alert us if anything's wrong. There's also a built-in body scanning feature with fever-screening protocol.

What impact does this technology have on the museum?

It's a game-changer for us. We can already see a lot of uses for it, not only for museums and cultural spaces, but for other areas of society. ■



Master Corporal Lana
Virtual Assistant,
CloudConstable

This article was sponsored by **CloudConstable**.

CLOUDCONSTABLE



Canadian Biotech Offers Hope for COVID-19 Vaccine

Innovative cell therapy research in Canada could hold the answer for a COVID-19 vaccine.

Sandra MacGregor



Dr. Riam Shammaa
Founder & CEO,
IntelliStem

The worldwide COVID-19 pandemic has had a devastating effect on lives and economies around the planet. While much is not fully known about the virus, all experts agree that a vaccine is the only conclusive way to end the devastating effects of COVID-19. The creation of a vaccine appears to be fraught with uncertainty, as well as development timelines of well over a year. Luckily, however, IntelliStem, a Toronto-based biotechnology company, is offering a brighter hope.

"IntelliStem is a biotechnology company pioneering cellular and peptide therapeutics and vaccines to create the next generation of affordable therapeutics and vaccines," says Dr. Riam Shammaa, Founder and CEO of IntelliStem. "IntelliStem's platform is quite unique as it relies on proprietary, genetically-engineered stem cells to create immune cells that mount a stronger response against catastrophic diseases, such as cancer and infections."

IntelliStem has two main divisions: one that specializes in developing cellular vaccines against difficult cancers and an infectious diseases division that develops vaccines against pathogens like Ebola, SARS, and COVID-19.

Hope for a COVID-19 vaccine

Dr. Shammaa says his company's research

can play a key role in making affordable vaccines. "During the last two years, IntelliStem developed IntelliPeptidome™, which is a platform that permits the systematic analysis and identification of peptides selected by our genetically-engineered stem cells, IntelliCells™, for triggering efficient and specific immune responses. This process leads to developing vaccines in a substantially faster way that's more efficient and less expensive."

In fact, the company has already been working on a vaccine for COVID-19. "We have our vaccine candidate ready and we're having meetings with Health Canada to file for a clinical trial as soon as possible," says Dr. Shammaa.

Challenges to vaccine development, at home and abroad

Dr. Shammaa notes there are issues impeding the smooth development of a COVID-19 vaccine. "We face many challenges due to the current lockdown in Canada," he says. "These range from sourcing the proteins of the virus to having them delivered to having the materials to research the virus and develop the vaccine. That's why we want to develop our platform and make it ready against other pathogens. If we developed this platform eight months ago, we would've had the vaccine ready in fewer than five weeks, but because of

all the delays we're facing, things that used to take two days are taking two weeks."

Despite these difficulties, Dr. Shammaa says more pressing issues still threaten vaccine development. "In spite of all the challenges we had developing the vaccine, our biggest challenge is yet to come," he notes. "In the last decade, most manufacturing was shipped out of Canada due to globalization. We were told it was cheaper to manufacture abroad. Well, with how expensive this pandemic has proven to be, I strongly challenge that premise. We exported the technology, know-how, and highly-skilled people abroad. Add to that the national protectionism that we've seen recently and you have a recipe for disaster. We've already seen countries refusing to send supplies to Canada and prioritizing their own interests. Do you think vaccine distribution won't encounter the same issues?"

Dr. Shammaa encourages Canadians to speak to their elected officials and ask them to bring the people and technology needed to manufacture vaccines back to Canada. "Currently, we're at the mercy and generosity of other countries to allow technologies to be exported to Canada," he says. "Even now with our vaccine, we're looking for manufacturers across the globe to manufacture and export our own vaccine back to us!" ■

This article was sponsored by **IntelliStem**.

INTELLISTEM

Unlocking the Future of 5G Technology

The beginning of the 5G era is almost upon us, promising a new age of hyper-connectivity that will change our lives — both in ways we understand and ways we have yet to imagine.

Defined by lightning-fast speeds (at least 10 times faster than those we experience today), higher bandwidth, more reliable connections, and incredible responsiveness, 5G will eventually become the backbone of smart cities and autonomous vehicles, as well as next-generation virtual health care, immersive education, agriculture technology, and next-level gaming, among a forecasted 75 billion connected devices worldwide expected to become mainstream over the next few years.

It's a future that's eagerly anticipated by many Canadians. We're already highly connected on one of the world's fastest 4G LTE networks and have embraced everything from smart fridges, TVs, thermostats, and door locks to parking meters, environmental sensors, health-focused watches, and virtual health care apps.



PHOTOS COURTESY OF SWOOP.

Even so, experts say the move to 5G represents a transformative change unlike anything we've seen in the evolution of wireless technology to date — it will comprehensively reshape how we interact with our devices and the world around us.

"Wireless will become even more seamless, natural, and much more omnipresent," says Dr. Xavier Fernando, engineering professor at Ryerson University and an expert in wireless communication systems.

In Canada, the next generation of wireless networks is set for a gradual rollout this year. Leading the effort, TELUS has launched its first-wave 5G network in Vancouver, Montreal, Calgary, Edmonton, and the Greater Toronto Area, and will continue to expand to an additional 26 markets across Canada throughout 2020, the company announced on June 19.

Businesses, consumers, and students with access to the TELUS 5G network will experience peak speeds reaching up to a blistering 1.7 Gbps to support remote work, virtual health, and distance education, while inspiring technological innovations that will drive the Canadian economy into the future.

Critically, the benefits of 5G extend well beyond consumer applications. Next-generation networks will fuel Canadian innovation across industries, with new applications and emerging technologies — like augmented and virtual reality (AR and VR), digital health care and robotics — vastly improving productivity and boosting efficiencies across industries.

"The promise of increased speeds, reliability, and capacity that 5G brings will change the way we live and work by fostering the development of Canadian innovation and technology while enabling growth across all verticals of our economy," says Eros Spadotto, Executive Vice President of Technology Strategy and Business Transformation at TELUS.



The promise of increased speeds, reliability, and capacity that 5G brings will change the way we live and work by fostering the development of Canadian innovation and technology while enabling growth across all verticals of our economy.

Over the next few years, new 5G wireless networks are expected to create more than 250,000 permanent jobs and contribute an estimated \$40 billion annually to Canada's economy.

TELUS has selected Samsung as a network infrastructure partner, with the goal to provide transformational 5G mobile services for Canadians. The company has been supporting 5G commercial services in leading markets, including Korea, Japan, New Zealand, Canada, and the U.S. TELUS previously announced that it's also working with Ericsson and Nokia as partners in building its 5G network.

Since 2000, TELUS has invested nearly \$200 billion in wireless and fibre optic network infrastructure, spectrum, and operations to enhance the coverage, speed, and reliability of its networks to connect customers across Canada. TELUS has committed to investing an additional \$40 billion over the next three years to support the rollout of its 5G network. ■



For more information, visit telus.com.

This article was sponsored by **TELUS**.



The Key to Solving COVID-19 Air Travel Challenges Is Collaboration

When Swoop took to the skies in June 2018, its ultra-low-cost carrier (ULCC) model was a relatively new and innovative concept in the Canadian air travel market. A few were offering no-frills air travel, but no one else was selling a \$1 base fare before taxes.

In just two years of operation and with a mission to make air travel more accessible and affordable, Swoop has welcomed 2.5 million travellers on board with Canadians reap-



ing the benefits of its ultra-low fares to the tune of \$159 million in direct fare savings in 2019. Now, as the air travel industry weathers the single greatest financial impact in commercial aviation history, Swoop is using its challenger-brand mentality to find simple and innovative solutions to problems new and old.

As the pandemic rapidly impacted the demand for air travel, Swoop quickly pivoted by introducing the Swoop Sprint. This domestic through-flight network connects Canadians coast to coast, from Abbotsford, Edmonton, and Hamilton to Halifax and back at #FairFares.

"We heard from our travellers that access to low-fare air travel remained critical during these unprecedented times, as there's no one-size-fits-all when it comes to defining essential travel," says Charles Duncan, Swoop President.

This adaptability and forward thinking are paying dividends as Swoop has released its summer schedule, which doubles the amount of flying in July and August from what it had been doing the two months prior.

Pivoting to meet demand

Faced with the question of how to support Canadian health care workers in the ongoing battle against COVID-19, Swoop put its creativity to the test again. With masks being mandatory in airports and onboard when a physical distance of two metres can't be maintained, many travellers weren't prepared to go through security with the required face covering.

The beauty of a simple solution

Swoop took those two challenges and used them to solve each other, offering travellers the ability to pick up a disposable mask at check-in for a minimum suggested donation of \$2 as well as donating \$5 from every new

travel booking in June to The Frontline Fund. This national organization provides funding for the supplies, support, and research that hospital foundations and health care workers need in the continued battle against COVID-19.

"There's nothing groundbreaking about this solution, which is the beauty of it," says Duncan. "It was a simple solution with a small but meaningful impact, and all it took was collaboration and creative problem-solving. This is what we hope to do with airport partners in the coming months and years as the industry rebounds from the impacts of COVID-19."

Innovating ULCC air travel

It's with that spirit of collaboration and innovation that Swoop recently issued a request for proposal (RFP) seeking like-minded airport partners who welcome ULCC investment at a time when access to affordable air transportation options is essential for stimulating recovery in industries like hospitality, retail, and others who rely on access to travellers with savings in their pockets.

The announcement of the RFP is intended to kick-start conversations with industry partners, collaborating in response to challenges new and old to find innovative solutions that stimulate economic recovery.

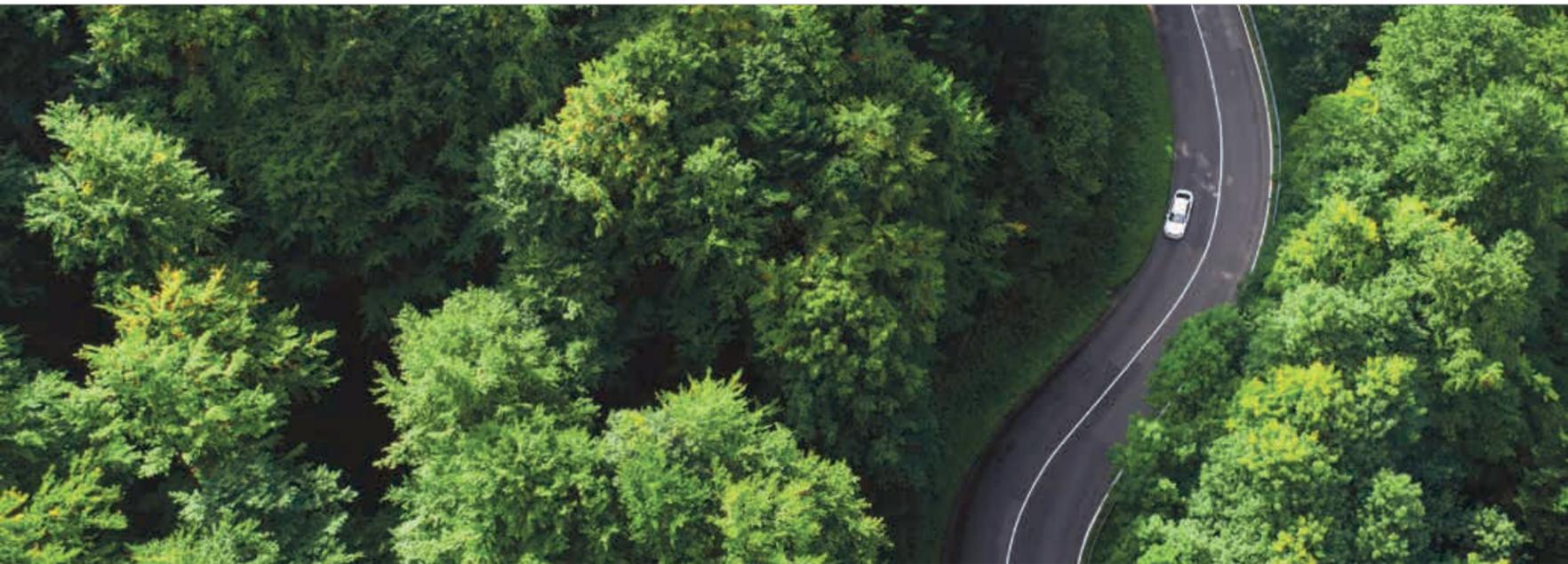
Travel will rebound, and Swoop knows that its ultra-low fares will play a key role in giving more Canadians the option to travel and roam freely again when the time is right. ■



To learn more, visit flyswoop.com.

This article was sponsored by **Swoop**.





Is Pay-As-You-Go Auto Insurance the Way of the Future?

Kaitlynn Furse

The pandemic has changed the way we interact with each other, the way we get around, and the way we use our vehicles.

As people continue to drive less, it's no coincidence that pay-as-you-go auto insurance has been growing in popularity. CAA Insurance has seen 250 percent year-over-year growth for CAA MyPace™, which is Canada's only pay-as-you-go insurance option (currently only available in Ontario with plans to expand to other provinces in the coming months).

According to CAA data, driving is down 50 percent compared to last year, and on average, pay-as-you-go drivers are saving 40 to 60 percent on their auto insurance costs due to their lower mileage.

While the kilometres driven are expected to increase as restrictions loosen, people will continue to commute less as workplaces implement more flexible work-from-home options. Does this suggest that pay-as-you-go auto insurance may be the way of the future?

What the COVID-19 pandemic has shown us is that customers want more flexibility when it comes to auto insurance. Over the past few months, many customers have had to call their insurers to change their coverage for financial savings. They'll have to call back as their driving behaviours increase once again.

"While drivers have been able to adapt their coverage, there's increased risk that

people will be left without the appropriate coverage, as the onus is on drivers to call back when their driving behaviours change," says Matthew Turack, President of CAA Insurance. "A pay-as-you-go model puts the control into the hands of customers while alleviating the inconvenience and manual labour involved with changing coverage."

CAA Insurance took a different approach, being the only Canadian insurer to date to offer an automatic 10 percent rate reduction and a \$100 relief benefit for policyholders during the pandemic, valid for the duration of a full policy term.

When CAA first launched CAA MyPace in 2018, the model predicted that people who drive less would get into fewer collisions. Subsequent data has shown that those predictions were accurate. This allows customers who enrol to benefit by paying a lower premium. Simply put, they're driving less and getting into fewer collisions.

"We designed this program by first asking what customers would like to see and benefit from and then created a solution that revolved around that," says Turack. "Traditionally, companies create a product and figure out the math, the profit margin, and the rating structure and then figure out how to sell it to customers and convince them it was right for them."

Based on a recent survey conducted by

“

Regulators are encouraging innovation, and more insurance companies need to take advantage of this to deliver products and services that customers are asking for.

CAA South Central Ontario, 6 out of 10 CAA members would consider exploring a pay-as-you-go insurance product that would allow them to buy auto insurance only for the kilometres they drive. Seventy-eight percent of CAA members stated that they'll now likely drive only 10,000 kilometres or less annually, compared to only 45 percent pre-pandemic.

"We hope that more insurance companies will look at offering more flexible options for auto insurance like pay-as-you-go," says Turack. "Regulators are encouraging innovation, and more insurance companies need to take advantage of this to deliver products and services that customers are asking for."

CAA Insurance expects to see continued growth of CAA MyPace in the months and years ahead. ■

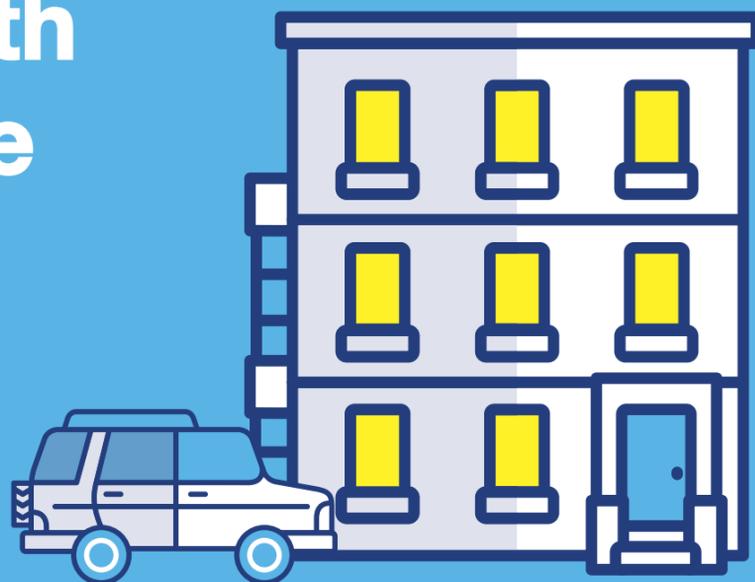
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To learn more about CAA Insurance and your eligibility for CAA MyPace, visit caamypace.com.

This article was sponsored by CAA Insurance.

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Driving less? Take control of your costs with pay-as-you-drive insurance.



If you aren't driving as much, it's time you switched to CAA MyPace™, the only auto insurance payment program in Canada for low-mileage drivers. With CAA MyPace, you get the freedom to pay only for the distance you need, helping you save on insurance costs at a time when many of us could use a little breathing room.

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