

WIRELESS TELECOM CANADA

OPEN THE DOOR TO THE FUTURE




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FOREWORD

How much do you really know about Canada's wireless sector? Were you aware, for instance, that over 99 per cent of all Canadians have access to mobile networks?

That we have the second fastest average mobile connection speeds in the world? That we invested more than \$58 billion in wireless between 1985 and 2016?

It adds up to an impressive profile, one that's built on innovation, foresight and a foundational belief that wireless technology, including 5G, will transform our world in ways that we're only now beginning to perceive.

As diverse as Canada itself, the industry finds its home in the Canadian Wireless Telecommunications Association (CWTA). The association is based in Canada's capital city, which includes the vibrant high-tech hub of Kanata, and plays a central role in everything from government relations and wireless accessibility to mobile content, consumer services and the evolution of 5G.

With a vigorous national voice in CWTA, a well-honed competitive instinct, and a deep pool of talent, the Canadian wireless industry is unequalled.

LEARN MORE ABOUT US...



5G

THE COMING TECHNOLOGICAL REVOLUTION

SET TO DEPLOY COMMERCIALLY BY 2020, 5TH GENERATION MOBILE NETWORKS, OR 5G, WILL CHANGE ALMOST EVERYTHING ABOUT THE WAY WE LIVE. WHAT WE DRIVE, WHERE WE LIVE, EVEN HOW OUR HEALTH CARE IS DELIVERED: BEFORE WE KNOW IT, ALL WILL BE REVOLUTIONIZED AS CONNECTIVITY MULTIPLIES AT BLINDING SPEED AND THE INTERNET OF THINGS BECOMES A PERVASIVE REALITY OVER THE NEXT FIVE TO TEN YEARS.

“We’re on the cusp of a total technological transformation,” says Scott Bradley, Vice President, Corporate Affairs for Huawei Canada. “There is a growing recognition that 5G is far more than an upgrade of wireless networks, but rather an evolution of the way we transmit and process information, and how that in turn will enable services, like automated vehicles, that require far greater data transmission and processing speeds and capacity.”

Canada, thanks to a history of technological innovation and the bold initiatives of its private, public and academic sectors, has already positioned itself as a leader in the coming 5G revolution.

For example, Huawei together with one of Canada’s telecommunications companies recently completed a 5G wireless connection using the global 3GPP technology standards platform. Undertaken at the 5G Living Lab in Vancouver, the pilot project represents one of the most advanced connections yet using technologies that will form the standard for global 5G.

On another front, Bell MTS recently announced generous funding to assist

the University of Manitoba in developing Internet of Things technologies for application to agriculture and food services.

And Videotron, a leading Canadian provider of wireless, Internet access and allied services, has teamed up with other firms to create the groundbreaking Open Sky Laboratory for Smart Life. Established to improve users’ daily lives, the organization is already at work on projects like a Self-Organizing Network that can transform traditional Wi-Fi access points into a smart network.

Breakthroughs like these are in keeping with the rapid thrust that has long characterized Canada’s wireless sector. “The country has a secure and robust wireless ecosystem in place to support future-oriented technological advancement,” says Bradley. Just as importantly, it’s an ecosystem that, thanks to the intensely competitive nature of the country’s wireless sector, continues to deepen and expand in a country where distances between people can be long and where consumer and commercial demand for ever-better connectivity drives innovation.

Canadian carriers are enthusiastic about 5G and want to be among the first globally to capitalize on it. CWTA, in

turn, has long supported the emerging technology. Its 5G Canada Council serves as a united voice of stakeholders by educating governments, businesses and the public on the benefits of 5G and by advocating for regulations that best facilitate its deployment and uptake.

The wireless industry’s ardour for the technology is shared by Canada’s federal and provincial governments and related funding bodies such as the Natural Sciences and Engineering Research Council of Canada (NSERC), which generously supports academic research, including that at the University of Ottawa’s School of Information Technology and Engineering.

Canadian universities are actively engaged in 5G research, as is Huawei’s Canada Research Centre in the flourishing technology landscape of Kanata, Ontario.

Add to all this Canada’s history of global partnering and its forward-thinking attitude, and it’s clear that the country’s ambitious 5G targets offer challenges, opportunities and rewards unlike any other. ■

THE CANADIAN WIRELESS LANDSCAPE

A GLOBAL LEADER IN WIRELESS INNOVATION, REACH AND RELIABILITY. EXTRAORDINARILY FAST CONNECTION SPEEDS. A HISTORY OF PROFITABLE COLLABORATION WITH MULTIPLE PARTNERS. IF ANY OF THESE FACTS ABOUT CANADA'S WIRELESS SECTOR SURPRISES YOU, THEN YOU NEED TO KNOW MORE ABOUT OUR INDUSTRY AND THE UNIQUE PATH IT IS FORGING.

THE CANADIAN WIRELESS LANDSCAPE

Consider this: Canada is the world's second largest country in terms of land mass, with only Russia being bigger. Coupled with a widely dispersed population of just over 36 million, that means a unique blend of challenges and opportunities for wireless providers. The industry has come through with blazing colours, offering coverage to more than 99 per cent of Canadians and reaching roughly 97 per cent of the population with LTE networks.

Canada's facilities-based carriers are largely to thank for those remarkable coverage numbers. When they make the major financial investment required for the right to use spectrum under Canada's facilities-based competition model, they naturally want to capitalize on that investment. They do that by building infrastructure, resulting in better network coverage.

Average 4G download speed in Canada: 30.58 MBps
(Source: Open Signal, June 2017)

The country also ranks among the top three internationally in terms of connection speed – a quick-silver 4G average download speed of 30.58 mbps – combined with very low latency.

To top it off, Canada recently launched its Innovation Superclusters Initiative. It will see public sector investment of up to \$950 million between now and 2022 to support business-led innovation superclusters destined to become engines of economic growth. Wireless is well-positioned to benefit from the initiative.

SOME BACKGROUND

Canada's flourishing wireless industry is a natural evolution of its long-established telecommunications sector. It comprises three large, national carriers and several regional carriers, many of which joined the market following the country's spectrum auction in 2008.

Working in a competitive environment, these facilities-based carriers are making the massive and ongoing investment that continues to expand Canada's wireless footprint and to provide the enviable coverage that users enjoy.

A TRADITION OF INNOVATION

From the telephone (Alexander Graham Bell was a Canadian resident when he conceived the basic operation of the device) to the groundbreaking BlackBerry, forerunner of the ubiquitous smartphone, innovation has long been engrained in Canada's DNA. These and other inventions have had a lasting impact internationally and beyond.

Canada is poised to become a world leader in the 5G revolution

With 5G, Canada is again positioning itself to be at the forefront of technological advancement. When game-changing 5G rolls out over the next two to three years, wireless is primed to make its greatest leap forward yet with everything from cars to agriculture to cities connected in ways never before imagined. Canada's leadership role in this arena includes the world-ranking work now being done on connected and autonomous vehicles at the BlackBerry Autonomous Vehicle Innovation Centre in Kanata, Ontario.

The new 5G Canada Council is another part of the country's innovative national thrust, especially in research. Established to educate, promote and advocate, the Council is situated to be a key player in facilitating the growth of this critical, emerging technology.

A WIRELESS-FRIENDLY POLITICAL & ACADEMIC ENVIRONMENT

Public policy in Canada is increasingly turning its attention to wireless as both a service to its growing, financially stable population and as a driver of the country's robust economy.

The extraordinary potential of 5G technology is attracting the attention of forward-thinking officials at the federal government level, while the wireless sector stands to benefit from financial incentives in the government's recently announced Innovation Superclusters Initiative. Industry thrives in this sort of environment.

Provinces and municipalities are also onboard. Eager to cultivate ever-more efficient wireless services for expectant residents, these levels of government are working with

technology developers through direct funding, trial projects and the like.

And it's no surprise to learn that Canadian universities are at the leading edge of technology research and innovation. For example, the University of Ottawa's School of Information Technology and Engineering is engaged in 5G research, and earlier this year the university shared with other post-secondary institutions in \$41 million in research funding from the Natural Sciences and Engineering Research Council of Canada (NSERC).

WHAT IT ALL MEANS

Competition ignites creativity, and in Canada that's meant a continually expanding wireless infrastructure, a drive toward ever-better consumer service, and a culture of innovation among industry, academic and government leaders. ■

Canada is a global leader in wireless innovation, reach and reliability.

CANADA & WIRELESS TECHNOLOGY SOME FACTS

Total economic contribution in GDP to the Canadian economy in 2016:
\$25.2 billion

Wireless phone subscribers in Canada in the first quarter of 2017:
30,437,561

Percentage of Canadians with a smartphone: **73%**

Canada's international ranking for average wireless mobile connection speeds: **2nd**

Predicted mobile data traffic growth in Canada between 2016 and 2021:
FIVEFOLD

Proportion of digital time that Canadians spend on mobile devices:
TWO-THIRDS

1901	1985	1995	2001	2002	2003	2007	2008	2009	2013	2017
First one-way transatlantic wireless signal received at Signal Hill, near St. John's, Newfoundland.	First cellular networks turned on (Analog/AMPS). The first cell phone call was between then mayor of Toronto Art Eggleton and then mayor of Montréal Jean Drapeau.	National and regional PCS licences are awarded, paving the way for voice and data services over 2G (GSM and CDMA).	First 3G networks are introduced with faster and more advanced digital features.	Introduction of cross-carrier text messaging, a first in North America. Text message volumes double in the first year.	Common Short Codes are introduced, allowing users to interact with media outlets, brands, retailers, governments and all kinds of other organizations via text messaging.	Cell phone industry introduces wireless number portability.	AWS licence auction results in an increased number of facilities-based wireless competitors.	CRTC mandates carriers to complete implementation of Phase II Enhanced 9-1-1 service (E9-1-1), allowing a wireless phone to be located during an emergency call.	Industry begins rollout of a text-to-9-1-1 service for deaf, hard of hearing and speech impaired persons.	CRTC directs carriers to update their networks in preparation for next generation 9-1-1 voice and text messaging services (NG9-1-1) for all Canadians.



A CONVERSATION WITH ROBERT GHIZ PRESIDENT & CEO OF CWTA

WHEN ROBERT GHIZ ASSUMED LEADERSHIP OF CWTA IN 2017, HE BROUGHT WITH HIM TWO DECADES OF DIVERSE EXPERIENCE IN GOVERNMENT AFFAIRS AND PUBLIC POLICY. A TWICE-ELECTED PREMIER OF PRINCE EDWARD ISLAND, FROM 2007 TO 2015 HE STEERED THE MARITIME PROVINCE THROUGH A PERIOD OF CHALLENGE AND CHANGE AND FORGED IMPORTANT RELATIONSHIPS AT THE NATIONAL LEVEL. AFTER LEAVING POLITICS, MR. GHIZ SERVED AS BUSINESS ADVISER AT THE MULTINATIONAL LAW FIRM GOWLING WLG, WHERE HE REMAINED UNTIL JOINING CWTA.

ROBERT GHIZ SOME FACTS

- President & CEO of CWTA since January 2017
- Premier of Prince Edward Island from 2007 to 2015
- Active board member of three national Canadian charities
- Follow him on Twitter: @RobertGhiz

What makes Canada a world leader in the wireless sector?

It's a country where innovation and investment are necessities, and our companies are leading the way on both fronts. For example, when you have a relatively small population with a large land base such as we do, infrastructure

investment is expensive, but our companies are making the investment. There's more to do, but if you look at our connection speeds – we already have the fastest 4G download speeds among the G7 – and the money that telecommunications companies put into infrastructure, we are leaders.

What are the biggest challenges the wireless industry faces globally and here in Canada?

In both cases, it's keeping up with demand. The estimate was that mobile data usage would increase by 500 percent between 2016 and 2021 in Canada, so if you look at what people are going to be using wireless for, it's endless.

The big challenge from the Canadian perspective is to make sure everyone gets connected. We have rural and northern parts of the country, and putting that infrastructure in there has a tremendous cost, but you see governments of all levels looking to partner to make sure it happens.

How should government be doing that?

That's where public policy comes into play. Protecting support for facilities-based providers is extremely important because those providers supply the infrastructure that everyone relies on. You need to look at the long term. We're now seeing an array of programs at the

federal, provincial and municipal levels. But it's complicated: in Canada, for example, wireless spectrum is regulated federally, but control of land for towers is a municipal matter. At some point, I'd like to see everyone at the table.

Talk a little about Canada and 5G, if you would.

Our vision is for Canada to be a world leader in 5G, and to make sure that Canadians – individuals, business, government – are the most connected because it's going to help drive economies.

Connection is the new infrastructure. Fifty years ago, we talked about getting goods to market with roads and trucks. Now it's towers and spectrum delivering digital goods and services. That's where 5G comes into play: giving us the best infrastructure possible.

Based on your experience in politics, where do you see wireless fitting into democracy?

It's changed the way democracy works and how political leaders connect with

voters. You can find your elected official instantly. Also, it gets young people involved. What led the charge was when Barack Obama ran for president and connected with people through Facebook and Twitter.

Do you remember your first cell phone?

I do. It was a Motorola Personal Communicator, the original flip phone. I also remember later, a few years later, having a flip phone in one holster on my hip and a BlackBerry in the other holster because they hadn't been combined yet – just think about that!

Last question: What do you want others to know about the wireless ecosystem in Canada?

That you can be located anywhere in Canada and your connectivity will be as good as it is anywhere else in the world. That it's a good place to invest and partner and collaborate. And that Canada is rapidly becoming a world leader in 5G. ■



Recycle My Cell is a national industry initiative led by CWTA along with its Members (wireless manufacturers and service providers). The goal of this program is to minimize the number of handsets entering Canada's landfills by operating an easy-to-use recycling solution for all stakeholders.

www.recyclemycell.ca



The Mobile Giving Foundation Canada brings the technology and reach of mobile phones to registered charities as an innovative fundraising tool. Mobile giving allows you to make a donation to a registered charity via your mobile device, and have the convenience of the donation appear on your monthly wireless phone bill.

www.mobilegiving.ca



WirelessAccessibility.ca offers a searchable database for consumers with sensory or physical limitations. Users can find particular devices based on criteria that match features they need.

www.wirelessaccessibility.ca

TEXT with 9-1-1

Text with 911 (T9-1-1) provides the capability for a person who is deaf, deafened, hard of hearing or speech impaired to communicate with 9-1-1 service using text messaging in Canada.

www.textwith911.ca

DeviceCheck Canada

Device Check is an industry-led initiative home to the National Stolen Phone Database, where Canadian businesses, law enforcement and consumers can check the status of a pre-owned mobile device. The site has also been designed to educate Canadian wireless users on how to keep their personal information safe and secure, and how to protect themselves from becoming a victim of device theft.

www.devicecheck.ca

txt.ca

CANADIAN COMMON SHORT CODES

TXT.ca is Canada's source for all information relating to Common Short Codes. Short Codes are the foundation of mobile marketing. They allow consumers to interact with media outlets, brands, retailers, governments and all kinds of other organizations via text messaging.

www.txt.ca



Wireless AMBER Alerts are text messages that are issued by Canadian Law Enforcement Agencies and received by Canadian subscribers on their mobile devices. Consumers opt-in to receive FREE Wireless AMBER Alerts by texting "AMBER" to Short Code 26237 (AMBER).

www.wirelessamber.ca



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