

Getting it wrong in “Getting it right: Preparing for 5G deployment in your municipality”

In February 2020, the Federation of Canadian Municipalities (FCM) published [Getting it Right: Preparing for 5G deployment in your municipality](#), a guide designed to help municipalities deal with the practical, policy and logistical implications of 5G technology in local communities.

This FCM document contains several half-truths, mistruths and framing tactics – listed below – which result in a biased, misleading and generally inaccurate guide.

The document did, however, get *some* things right. Part 2 of this summary outlines those points.

Part 1: Getting it Wrong

Misconception 1 The fifth generation of wireless technology (is) a necessity if Canada is to remain competitive on the world stage. (p.4)

Fact The benefits of 5G are dubious at best, and are they worth the costs?

There has been no cost-benefit analysis of 5G to see if its consequences and risks, including the costs stemming from security and data breaches, environmental damage, liability claims, lost productivity due to radiofrequency radiation-induced illness, and increased healthcare requirements, outweigh its benefits.

Driven by the belief that digital technology is neutral and therefore carries no unintended consequences or risks, politicians, policy makers, and society are ignoring the science-backed evidence that urges us to exercise precaution when investing in infrastructure that is wireless-dependent.

Learn more here:

1. Women’s College Hospital, Toronto, [Impacts of Wireless Technology on Health: A symposium for Ontario’s medical community](#), 31 May 2019
Video of Presentation by Dr. Magda Havas: [Impacts of EMFs on health in the community](#)
2. Schneier, B. (2019, September 25). [Essays: Every Part of the Supply Chain Can Be Attacked – Schneier on Security](#) – as published in the New York Times
3. Zarrett, David. (2020, February 19). [Threats to security, health, public infrastructure and other potential costs of Canada’s 5G rollout](#). Macleans

Misconception 2 5G is key to profiting and benefiting from enhanced connectivity and “Smart Cities.”

“Connectivity has become essential for any community’s economic, cultural and social development.” President’s Message (p.4)

“For municipal officials, the IoT translates into “smart cities” where countless data points generated by citizens, sensors and assets allow you to monitor traffic and parking, water, wastewater, storm water, bus and rail stops, etc. This would also allow municipalities to make adjustments, or allow systems to make adjustments on their own, as needed.” (p.8)

Fact 5G is not the pinnacle of connectivity; wired fiber optic networks are.

From resource and energy monitoring and management to improved emergency, educational and health care services, most of the smart city applications 5G promises can be provided by fiber optic cables connected directly to each premise - without the threats wireless 5G poses to privacy, national security, energy consumption, the environment and public health. A few of 5G’s purported perks - like autonomous vehicles - cannot be delivered by wired fiber networks. However, experts warn that self-driving cars are risk and liability laden, and that 5G will likely not be able to support them.

Learn more here:

1. The Benefits of [Wired Smart Cities](#), Connected Communities
2. Schoechle, Timothy. (2018). [Reinventing Wires: The Future of Landlines and Networks](#). The National Institute of Law and Public Policy
3. Dawson, Doug. (2019). [The Myth of 5G and Driverless Cars](#). CircleID
4. Jones Day law firm. (2017, November). [Legal issues Related to the Development of Automated, Autonomous and Connected Cars](#). A White Paper

Misconception 3 5G is the wireless industry’s solution to our ever-increasing wireless data consumption.

“The trend toward greater connectivity will only accelerate. The use of wireless Internet connected devices in our communities is exploding. The advent of fifth generation (5G) wireless networks is the industry’s response to this growth and the desire to further leverage the potential of the Internet.” (p.6)

Fact The main industry drivers behind 5G – Huawei, Ericsson and Qualcomm – admit they developed 5G by recognizing trends and opportunities. Consumers would not be consuming more and more data if an endless stream of wireless products were not being marketed and sold. Our growing wireless data consumption has serious environmental implications.

Which came first – our skyrocketing data usage or industry’s plan to sell us a wireless world that is dependent upon us consuming more and more data? Wireless technology uses 10 times more energy than wired technology does. Experts warn our environment cannot support unlimited digital consumption.

Industry is not providing 5G as a public service. When asked about the motivation driving 5G at a December 2016 meeting of *The Institute of Electrical and Electronics Engineers* (IEEE), respected industry expert and Senior Huawei Researcher Dr. H. Anthony Chan stated: “...if technology does not change, the company will die...it is about more jobs...engineering and manufacturing... People must buy a new phone.”

Learn more here:

1. A GSA Executive Report from Ericsson, Huawei and Qualcomm. (2015, November). [The Road to 5G: Drivers, Applications, Requirements and Technical Development](#)
2. The Shift Project. (2019, March). [Lean ICT: Towards “Digital Sobriety”: Our New Report on the Environmental Impact of ICT](#)
3. The Shift Project. (2019, July). [Climate Crisis: The Unsustainable use of Online Video: Our new Report on the Environmental Impact of ICT](#)

Misconception 4 5G will bring us the fastest Internet possible.

“Once fully deployed, 5G technology promises maximum theoretical speeds in the 10 Gbps range, at least 100 times faster than top theoretical speeds for existing 4G technology (up to 1,000 times faster than actual speeds in some circumstances). To get a sense of this change, downloading a two-hour movie will take less than four seconds versus approximately six minutes on existing 4G networks. Note that consumer technology will also have to catch up as many existing devices are not 5G capable.” (p.7)

Fact New breakthroughs in fiber optics offers real-time transmission of 200 Gbps. *This is 20 times faster* than the maximum theoretical speed of wireless 5G.

Learn more here:

Brown, Mike. (2020, January 2). [A Fiber Optic Breakthrough Could Beat 5G for Rural Internet Access](#). Inverse

Misconception 5 “5G technology will outperform traditional land connections in some cases, making home routers a thing of the past.” (p.7)

Fact 5G may be faster than Internet provided through copper wires or coaxial cable, but it will never be faster than fiber wired directly to the premises.

Networks that use wireless components and signals will never transport data as fast – or be as secure - as networks that wire fiber optic cable directly to the home router.

Learn more here:

Schoechle, Timothy. (2018). [Reinventing Wires: The Future of Landlines and Networks](#). The National Institute of Law and Public Policy

Misconception 6 “More significantly, 5G networks are key to opening up the potential of the “Internet of Things” (IoT).” (p.7)

Fact A balanced and informed discussion of the IoT will include its potential, as well as its pitfalls. This discussion would include:

Privacy and National Security issues related to the IoT:

- Smart devices are easily hacked and controlled,
- They allow for increased surveillance, and potentially nefarious military and paramilitary capabilities such as “swarming” and robotic attack missions,
- They permit our personal data to be tracked and sold.

Environmental and Social Costs of the IoT:

- Powering , manufacturing and storing the data from trillions of sensor-equipped and chipped devices demands huge amounts of energy and resources,
- Massive amounts of e-waste will be generated due to planned obsolescence,
- An increasingly automated world threatens job security and heightens tech addiction,
- Mining for the rare minerals needed to make these devices is causing untold human suffering.

Learn more here:

1. Halpern, Sue. (2019, April 26). [The Terrifying Potential of the 5G Network](#). The New Yorker
2. Congressional Research Service. (2020, May 22). [National Security Implications of 5th Generation \(5G\) Mobile Technologies](#). A Report from the U.S. Congressional Research Service
3. Bordage, Frederic. (2019, October). [The Environmental Footprint of the Digital World Summary](#). A Report from Green IT.fr
4. McLelland, Callum. (2020, January 15). [The Impact of Artificial Intelligence - Widespread Job Losses](#). Retrieved from IoT for all
5. Annie Kelley. (2019, December 16). [Apple and Google named in US lawsuit over Congolese child cobalt mining deaths](#). The Guardian

Misconception 7 There are no Health Risks associated with 5G.

“Health Canada ensures that 5G installations comply with all existing safety regulations, including Safety Code 6 (SC6), which determines exposure limits for wireless devices and their associated infrastructure. Canada’s limits are consistent with the science-based standards used in other countries. Large safety margins have been incorporated into these limits to provide a significant level of protection for the general public and personnel working near radio frequency sources.” (p.23)

Fact There is ample peer-reviewed science linking non-thermal radio frequency radiation (RFR) to biological harm. Countries such as Italy, Switzerland and Russia have radiation exposure limits many times more protective than ours.

In 1976, the [US Naval Medical Research Institute](#) published a [bibliography of 3,700 scientific papers](#) on the thermal and non-thermal biological effects of RFR. The body of scientific evidence on the health implications of the non-thermal effects of RFR has grown exponentially since.

“Health Canada’s 2015 guidelines for human exposure to non-ionizing radiation (Safety Code 6) were out of date before they were published, and the review process was flawed,” says Dr. Meg Sears, PhD, Chair of Ottawa-based *Prevent Cancer Now*. “Hundreds of peer-reviewed, published studies show that radiofrequency (RF) radiation can cause cancers, damage sperm and DNA, impair reproduction, learning and memory, and more. We should be limiting public exposure, not increasing it.”

“We have sufficient data to classify RF radiation as a Group 1, known human carcinogen, along with, for example, asbestos and tobacco smoke,” states Dr. Anthony Miller MD, Professor Emeritus of the Dalla Lana School of Public Health, University of Toronto, who worked with the International Agency for Research on Cancer on the 2011 scientific review.

When the U.S. Naval Medical Research Institute identified the risks in 1976, governments should have limited the scope of technological change, and created radiation exposure standards that protected the public from harm. Instead, the evidence was hidden and ignored, and industry-influenced bodies like ICNIRP created the standards that Health Canada still emulates today.

Learn more here:

1. [Peer Reviewed Scientific Research on Wireless Health Effects](#) - Environmental Health Trust
2. [5G Telecommunications Science](#) - Physicians for Safe Technology
3. Lai, Henry. (2019). [Research Summaries of RFR scientific Literature](#). Retrieved from Bioinitiative.org

Misconception 8 Innovation Science and Economic Development Canada (ISED) regularly audits antenna sites to make sure they are safe.

“ISED’s regulatory framework, including market surveillance and compliance audits, provides safeguards to protect Canadians against overexposure from wireless devices and antenna installations.” (p. 23)

Fact ISED relies on cell tower operators to monitor the safety of their own sites. The monitoring methods they now use are insufficient. Given how 5G and the IoT work, new and complex measurement systems are required. The onus for taking these involved measurements will likely fall upon local governments.

Much like the fox watching the henhouse, ISED asks cell tower operators to self-monitor how much radiofrequency radiation their antenna sites are emitting. The tests these telecoms do are often software generated, and prone to inaccuracies.

ISED requires operators to “consider, in addition to their own radio system, the contributions of all existing radiocommunication installations within the local radio environment”. Given that 5G requires potentially dozens of small cell antennas on one street, and that millimetre wave 5G works “on demand”, it is impossible for an operator

to take an accurate and consistent field measurement of the RF exposure residents are receiving on a daily basis.

For software-generated audits of 5G RF exposure to be accurate, operators would need to assess an ever-changing IoT “smart” landscape that includes multiple antenna sites owned by multiple operators as well as the RF-emitting smart infrastructure that 5G is purportedly there to support.

For the past six years, academics have been preparing for the increase in radiofrequency radiation exposure inherent to smart cities, and have been developing potential measurement tools. These measurement systems are much more involved and complex than what ISED now requires, and would likely put the onus on municipalities to monitor and regulate emissions and protect residents’ health.

Learn more here:

1. ISED. (2015, March 19). TN-261 [Safety Code 6 Radio Frequency Exposure Compliance Evaluation Template](#)
2. Diez, L., Agüero, R. and Muñoz, L. (2017, June). [Electromagnetic Field Assessment as a Smart City Service: The SmartSantander Use-Case](#). Retrieved from [Sensors \(Basel\)](#). 17(6): 1250

Part 2: Getting it Right

The FCM’s “Preparing for 5G deployment in your municipality” outlines several 5G-related planning and regulatory issues that all municipal governments in Canada should be aware of.

Planning Concerns

“Clusters of small cells can be visually unappealing and create unique safety concerns. They can, in particular, detract from the qualities and integrity of areas such as historical or heritage districts as well as some planned urban environments.” (p.24)

Regulatory Concerns

“For stand-alone tower structures, regardless of height, the procedure provides for formal consultations with the municipality as the local land-use planning authority. However, 5G small cell installations on existing structures (towers and non-tower structures such as a building or power pole) are excluded from this requirement as long as the height of the structure is not increased by more than 25 percent.” (p.14)

“In practical terms, this means that if the power poles are owned by the provincial utility in your jurisdiction, a carrier could enter into an agreement to install 5G small cell antennas on these poles and not even have to notify your municipality (even if the small cell is added at the top of the pole, as long as the addition is less than 25% of the existing height).” (p.14)

“A grey zone exists with respect to pre-emptive pole replacements by utilities. If a utility were to replace a pole with a much taller one, and then add antennas to it, it would likely fall outside the consultation requirements.” (p.16)

Liability Concerns

“... a number of municipalities, even those with comprehensive MAAs in place, are reporting the installation of 5G small cell antennas without their knowledge. Even if they are affixed to someone else’s asset—like a power pole—if the antenna is located within the ROW space, it could raise issues of interest to the municipality such as safety concerns for the public and municipal workers.” (p.14)

Municipal Rights in Jeopardy

Current Rights

“If a carrier has identified municipal assets (light poles, traffic lights, transit shelters, etc.) as one of its preferred options to install small cell antennas, it has to negotiate with the municipality and come to an agreement. As asset owners, municipalities have the right to refuse access.” (p.24)

“Municipalities can refuse antennas on their property, but they cannot refuse the installation of equipment required to connect antennas located on other assets. Municipalities cannot charge occupancy fees for the connecting cables and other equipment installed within the ROW, but they can charge market value for an antenna located on their assets.” (p.25)

“Some municipalities have been misinformed by carriers into believing that small cells deployment is already covered in MAA’s and that, as a result, carriers enjoy the same conditional right of access for antennas as they do for their cables, etc. This is not the case.” (p.25)

Potential Loss of Rights

Telecommunications in Canada is currently under two review processes:

1. The Report of the Broadcasting and Telecommunications Legislative Review Panel

In its January 2020 report, the Panel reviewed the governance framework for antennas and the issue of access to municipal infrastructure for network deployment.

2. The CRTC Telecom Notice 2019-57 – Review of Wireless Services

In this national consultation regarding the future of wireless services in Canada, access to municipal infrastructure is an important theme.

How These Two Review Processes May Affect Municipal Governments in Canada:

1) If Recommendations 22, and 34-37 of the Legislative Review Panel’s Report are passed:

- Jurisdiction over antenna siting—including small cells for 5G—will be transferred from ISED to the CRTC. (p.11)
- The right of access that carriers currently enjoy within the right-of-way will be extended to encompass all potential support structures. These structures are referred to as “passive infrastructure” in the report, terminology that inaccurately portrays the functionality of a municipality’s assets. (p.11)
- Local governments’ current ability to refuse telecoms access to municipal assets and property would be lost. (p.11)

2) If the recommendations made by telecommunication carriers to the CRTC Wireless Review are adopted:

- The CRTC will have absolute authority over siting small cells antennas (p.26)
- The CRTC will impose time limits for municipalities to process 5G applications, as well as fee caps, and more. (p.26)

Note on Cost Recovery:

“To date, municipalities have been identifying direct costs (related to the deployment of 5G) such as engineering studies, electricity supply and workforce time, and billing them back to carriers. This seems to be the accepted best practice in Canada for the moment, a practice based in the sound public policy principle that **taxpayers should not be subsidizing the for-profit ventures of the carriers**”. (p.23)