

PRIMER: MICROCELLS & 5G IN CANADA

An Overview of the Issues for Activists, Journalists and Policy Makers

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PRIMER: MICROCELLS & 5G IN CANADA

OVERVIEW

Most of us don't know a thing about microcells, often called "small cells", and that they are, or may soon be, beaming high levels of microwave radiation directly into our homes 24/7. We are largely unaware that the telecom industry plans to install several of these transmitters on most every street in our community, and that as long as they are placed on existing structures, like utility poles, Canadians have no right to weigh in on them. Despite industry's spin, this wireless infrastructure is by no means a necessary public service. It offers dubious benefits and scientifically proven harm.

What are "small cells" for?

"Small cells" in neighbourhoods are not about bringing broadband to underserved communities or filling existing coverage gaps. They are intended to increase available bandwidth for those who subscribe to the 3rd and 4th generations of cellular networks (3G and 4G), and pave the way for the increased data consumption of 5G - the 5th generation of cellular connectivity. We are being told 5th generation microcells will serve as the backbone infrastructure for the Internet of Things, "smart cities," driverless cars, artificial intelligence, and whatever other applications the private sector can dream up. 80% of wireless traffic is generated indoors. We do not need microcells placed by our homes to provide cell service for the 20% of time that usage is mobile. In truth, we must re-think our indiscriminate addiction to wireless tech. Science shows that all wireless technologies consume large amounts of energy and harm our ecosystems and our health. Microcells and 5G are about increasing our consumption of data, energy, and resources. They are not about improving our quality of life.

If time is short, [this Washington DC-based investigative report](#) offers a big picture glimpse of the regulatory corruption, industry deception and hazards inherent to wireless technology and 5G.

Our planet is at a crisis point. We may see this crisis as an invitation, a constitutive moment impelling us to connect truly with one another and ourselves, and to create systems and technologies that mend rather than deplete planetary well-being. 5G, with its emphasis on "machine to machine" connections, threatens to further alienate us from our humanity while damaging our fragile web of life.

WHAT IS 5G? (TECH TALK)

5G has two parts. The first is in what is called the low (600 MHz to 1 GHz) and mid (1 GHz to 6 GHz) bands. The second is in the high or millimeter wave (mmWave) band beginning at roughly 20 GHz and going up to several hundred GHz.

The physical properties of the low and mid band create [a 5G that is 20-50% faster than the best 4G](#) speed now available, but is not as fast as current fiber-to-the-premises networks. This can essentially be called, "enhanced 4G LTE" or "5G-lite", with real-time download speeds of about 40-150 Megabits per second (Mbps) and upload speeds of 30-60 Mbps.

Cell signals in the high or millimeter wave band, on the other hand, are able to transmit data at theoretical maximum speeds of 10,000 Mbps. That is 100 times faster than the 4G cellular networks we currently have. These signals, however, don't travel far and are easily blocked by walls, trees and even rain, moisture and air molecules. 5G in any form is not near as fast as fiber wired directly to the premises can be. Recent developments in fiber optics technology have sent data at speeds of 200,000 Mbps.

The Limitations of Millimeter Waves

To overcome the limiting properties of millimeter waves – to get them through walls - 5G transmitters in the high, mmWave band must use multiple small arrays - 64 or more, that simultaneously send signals that are shaped electronically by phased array in one direction or another. This process is called beam forming. 5G arrays that use beam forming can send signals to multiple cell phones at once, or if only one subscriber is in front of it, that 5G-enabled phone will get all four signals. That would be highly focused energy for the person holding that phone.

Beam-formed 5G signals in the mmWave band work "best" when the 5G-enabled cell phone is stationary inside someone's house. When the phone is moved around, the 5G antenna will shift the connection from one zone to another, or back to a nearby 4G LTE tower, or to the person's indoor Wi-Fi network with data flowing at slower speeds.

Millimeter 5G Signals Are On Demand and Narrow

One important distinction to understand between 4G LTE and 5G technology is that 5G signals in the mmWave band are sent on-demand. 5G beam-formed signals in the mmWave frequency only transmit when a 5G-enabled device calls for a connection.

4G LTE Signals Are Always On, Wide and Strong

4G LTE small cell transmitters bathe a neighborhood with a constant RF signal that is 120 degrees wide and shaped like a cone. Even though these microcells transmit at 10-100 Watts, (while a macro cell tower transmits at 1,000 watts) the 4G LTE signal from a microcell could be as close as 9-30 meters from your house at the second story level. **This makes 4G microcells every bit as troubling as 5G.**



Small Cell Arrays Will Be for 4G/5G Hybrid and 5G Standalone Technology

The small cells being installed will use both 4G LTE and 5G technology. Some will be hybrids with both 4G and 5G, and some will be standalone 5G transmitters. Every 4G/5G hybrid small cell will have two to three 5G standalone transmitters around it.

How can you tell if a small cell is for mmWave 5G?

Once a microcell is activated, if you cannot measure a signal with your standard RF meter, it is transmitting 5G in the mmWave band. If you do measure a strong signal on your RF meter and you know it is coming from that specific microcell, then it has a 4G or a low band 5G transmitter on it.

Why should these technologies concern us?

New 4G LTE Advanced and 5G cell signals are far more modulated than past generations of cell technology. They utilize polarized, pulsed signaling. This modulation and pulsed signaling may account for recent increases in health symptoms in residents living near recently installed microcells.

Reports are emerging that certain individuals are reacting to these new small cells, while they did not react to existing 4G LTE technology used for years. Wise public policy would prohibit 4G LTE and 5G microcells from being placed right by where we live, work, study, play and heal. Prudent and science-savvy leaders would question the wisdom of using any cellular and wireless technologies at all.



Why communities must decide for themselves

If a community wants to protect its residents and environment, and prefers fiber to all homes, it should be able to make that choice. The balance and regulation of both wired and wireless broadband must be determined by local communities - not by telecoms, regulatory bodies, or by provincial or federal governments. We cannot afford to walk into the future with an agenda dictated by corporate greed. The stakes are too high.

Resources for GETTING STARTED

This video by Oona McOuat gives a gentle overview of the issues related to microcells and 5G in Canada. <https://www.youtube.com/watch?v=bMJ9x61f8cc>

This very short video highlights the federal regulatory loophole that allows microcells to be placed by our homes in Canada, co-produced by Grassroots Environmental Education & Citizens for Safe Technology. <https://www.youtube.com/watch?v=PpKBq5XgVqU>

This 26-minute video presentation by former federal scientist Margaret Friesen of Winnipeg offers a great overview of the issues related to Microcells and 5G. <https://www.youtube.com/watch?v=Z9JQyemPsHo>

Wonder how many macro and microcell transmitters there are near you? Type in your address at the link below and a complete list will appear. In many cases, one tower that serves many functions is listed multiple times. <http://www.lestourcellulaires.org/distance.php>

WIRED FIBER: THE SMART CHOICE

Fiber just got faster. About 20 times faster than wireless 5G, which promises theoretical speeds of 10 gigabits per second, and has yet to deliver.

In early January 2020, the Moscow Institute of Physics and Technology transmitted a signal through a fiber optic cable for 323 miles at 200 gigabits per second, due to a breakthrough in fiber optic technology. Forget 5G satellites. Forget beaming signals through wireless transmitters. This breakthrough defines fiber as the solution for rural broadband and all of our internet needs.

Beyond speed, fiber is the most cyber-secure, energy-efficient, and reliable way to move data from point A to point B. The wireless companies know this, which is why they connect every cell tower, microcell, and wireless antenna in the network to fiber.

According to a CommScope survey, 80 percent of wireless data traffic originates or terminates within a building. Connecting fiber right to the premises offers us the option of using a private Wi-Fi network or - better yet - wiring our devices, including Smartphones, to our router, reserving cellular networks for when we are out and about. Wired fiber offers us speed, security *and* symmetrical download and upload speeds, something no wireless system – even 5G – can provide.

The question before us is:

Should the fiber stop at the poles with data being sprayed wirelessly through the air to our homes and businesses? Or,

Should data be sent through fiber optic cables connected directly to the premises?

In Canada, some telecoms are doing both – connecting fiber to our premises (FTTP) and installing microcells on utility poles in our neighbourhoods. This allows them to “corner the market” providing home phone, TV, and internet through the fiber connected directly to the premises, while offering wireless and cellular services from the pole.

When telecoms control the fiber they create proprietary wireless and wired network protocols that oblige consumers to buy special equipment as well as lucrative data plans. They may also monitor our tech usage, harvest and sell our data, and tailor ads and products specifically to us.

What all cities and communities ***should have*** - what is in the best interest of consumers - is community-owned fiber optic broadband connected to each premise. Then the private sector could compete by delivering services through this municipally owned fiber.

Fiber-to-the-home gives people choice. People can choose to connect the devices in their home through wired or wireless technology. If a household chooses WiFi instead of a wired home network, their choice will affect their neighbours to a degree, but not nearly as much as having microcell antennas in front of homes, which indiscriminately radiate everyone.

The bottom line: microcells and 5G will impact Canadians profoundly and will not provide us with the safe, fast connectivity we deserve. We must allow communities to decide for themselves what kind of future they want.

Resources on FIBER

A Fiber Optic Breakthrough Could Beat 5G for Rural Internet Access, Mike Brown
| Inverse | Jan 2, 2020

In early January 2020, a research team from the Moscow Institute of Physics and Technology transmitted a signal through a fiber optic cable for 323 miles at 200 gigabits per second, due to a breakthrough in fiber optic technology. This is 20 times faster than the speeds 5G promises.

<https://thecalm.ca/wp-content/uploads/2020/01/A-Fiber-Optic-Breakthrough-Could-Beat-5G.pdf>

Connected Communities – Wired Networks for Crossing the Digital Divide (Website)

Why Community Owned Fiber is the Smart Choice, from a Canadian perspective

<http://connected-communities.ca>

Re-Inventing Wires: the Future of Landlines and Networks, Dr. Timothy Schoechle |
National Institute of Law and Public Policy | Jan. 2018

"Hard-Wired telecommunications infrastructure to support economic growth, bridge the digital divide and diminish risks to security, privacy, public health and the environment."

<https://thecalm.ca/wp-content/uploads/2020/01/ReInventing-Wires-1-25-18.pdf>

Overview of why we need an alternative to wireless 5G, coined SafeG

<https://safeg.net/home/>

WELLBEING

HEALTH

The Science

The U.S. government first published documents acknowledging the harmful effects of Electric and Magnetic Fields (EMFs) nearly 50 years ago. Since then, the science documenting the health impacts of EMFs has greatly advanced. A recent update to the [BioInitiative Report](#) - a review by 29 authors from 10 countries, including 10 M.D.'s and 21 Ph. D.'s - contains 1,800 new studies within its 650 pages. [Here is one of several online directories](#) of scientific studies that show the biological harm caused by electromagnetic fields. In short, internationally renowned independent scientists have [concluded](#) that the harms of microwave radiation are established.

Nevertheless, microwave radiation in our environment is steadily intensifying. Soon, instead of 2,000 satellites orbiting the Earth, there will be over 100,000 constellations of 5G-generating satellites polluting our night skies. Instead of cell towers every few miles, there will be cell transmitters—small but powerful—in front of every third to fifth home.

These microcell antennas will immediately emit 3G and 4G, and eventually 5G-microwave radiation all at the same time. Telecom reports clearly [document](#) that radiation levels will increase significantly near microcell antennas. How then do industry and government justify denying the science that shows proof of harm?

Beyond [the well-documented conflict of interest](#) of those who sit on the radiation exposure regulatory boards (wireless is the new tobacco), tech and government assume they can ignore the many causal links between wireless radiation and health as long there is no recognized mechanism explaining how artificial electromagnetic radiation causes its many biological effects. Biochemistry professor Dr. Martin Pall has uncovered a key mechanism of harm, cited in numerous research papers and described below, but the final proof of his hypothesis has yet to be officially recognized.

The Mechanism of Harm

Dr. Pall links the harm caused by EMFs to the way they affect the calcium levels in our cells and the channels that allow calcium to flow in and out. Calcium plays many important roles in our bodies, including cell signaling, muscle contraction, cell growth, nerve function, blood clotting, and learning and memory.

The role calcium plays as a biological signaling molecule is what is affected by EMF exposure. EMFs damage cells by increasing calcium levels inside them, which leads to heightened cellular oxidative stress.

On a molecular level, the excess calcium released inside your cells causes an enormous increase in both nitric oxide and superoxide, **which spontaneously combine to form one of the most damaging molecules in our bodies — peroxynitrite.**

Once formed, peroxyne attacks key molecules and damages cells, including our DNA, and can cause disease. Research has linked EMFs to many illnesses, including cancer, neurodegenerative diseases like Alzheimer's Parkinson's and ALS, neuropsychiatric disorders, and infertility.

The story gets worse before it will get better. :) Humans aren't the only species with channels that allow calcium to flow in and out of cells. Animals, plants, food crops, insects and even microbes are affected. EMFs harm everything with DNA. Clearly, a massive public awareness campaign is essential if we are going to protect public health and promote planetary well-being.

Resources on HEALTH

Grassroots Environmental Education has put together a very useful PDF compilation of studies showing adverse health effects from wireless radiation. The studies are organized by effects:

- I. Effects on Fetal and Newborn Development
- II. Effects on Young Children
- III. Brain Tumors
- IV. Parotid Gland Tumors
- V. Other Malignancies
- VI. Effects on DNA
- VII. Neurological/Cognitive Effects
- VIII. Effects on Male Fertility
- IX. Electromagnetic Sensitivity
- X. Effects on Implanted Medical Devices
- XI. Miscellaneous Articles

https://thecalm.ca/wp-content/uploads/2020/01/wireless_science_2019.pdf

5G: Great risk for EU, U.S. and International Health! Compelling Evidence for Eight Distinct Types of Great Harm Caused by Electromagnetic Field (EMF) Exposures and the Mechanism that Causes Them, Martin L. Pall Martin L. Pall Ph.D. Professor Emeritus of Biochemistry and Basic Medical Sciences | May 17th, 2018

This paper is a summary of the eight pathophysiological effects caused by non-thermal microwave frequency EMF exposures and a review of the scientific literature that provides a substantial body of evidence on the existence of each effect.

<https://thecalm.ca/wp-content/uploads/2020/01/5g-emf-hazards-dr-martin-l.-pall-eu-emf2018-6-11us3.pdf>

5G Wireless Technology: Millimeter Wave Health Effects, Joel Moskowitz Ph.D. | Feb. 22, 2019

Dr. Joel Moskowitz, Ph.D. Director Center for Family and Community Health School of Public Health University of California, Berkeley

"With the deployment of fifth generation wireless infrastructure (aka 5G), much of the nation will be exposed to mmWaves for the first time on a continuous basis....

Unfortunately, few studies have examined prolonged exposure to low-intensity mmWaves,

and no research that I am aware of, has focused on exposure to mmWaves **combined** with other radiofrequency radiation."

https://thecalm.ca/wp-content/uploads/2020/01/5G-Wireless-Technology_Millimeter-Wave-Health-Effects.pdf

Scientific Research on Wireless Health Effects, Environmental Health Trust

<https://ehtrust.org/science/research-on-wireless-health-effects/>

Peer Reviewed Published Science on Radiation from 4G/5G “Small” Cell Wireless Antennas, Environmental Health Trust

<https://ehtrust.org/peer-reviewed-published-science-on-radiation-from-4g-5g-small-cell-wireless-antennas/>

Physicians for Safe Technology - Succinct, knowledge-based information

<https://mdsafetech.org> (Website)

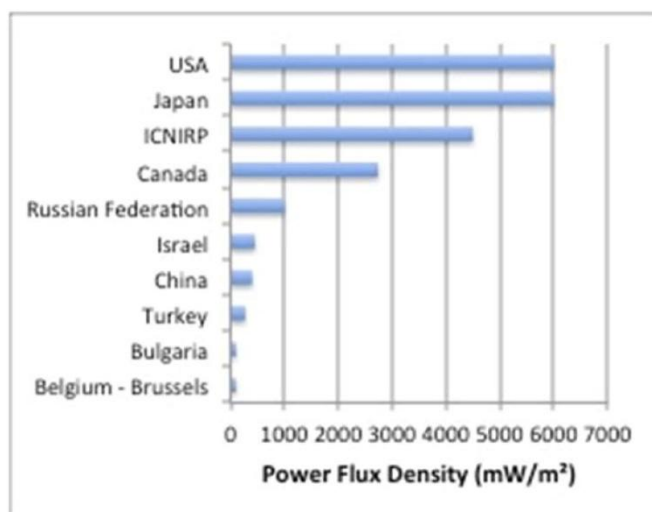
<https://mdsafetech.org/5g-telecommunications-science/> (Overview of 5G-related issues)

CANADA’S SAFETY CODE 6: AN INADEQUATE GUIDELINE

FACT: There Are No Safety Standards

Currently there are no national or international standards for safe levels of the radiation emitted by wireless devices and cell antennas. Instead, the Canadian government adopted “guidelines” developed by industry, [based on the assumption made in 1929](#) that tissue must be heated to be harmed. There is [substantial peer-reviewed evidence](#) that this assumption is wrong. Safety Code 6 was written in 1979, and Health Canada’s claim that this guideline is among the most protective in the world is simply not true. **China, Russia, and parts of Italy and Switzerland have guidelines that are 50 times safer.**

International Exposure Limits at 900 MHz



Sources:

World Health Organization, Global Health Observatory, [Exposure limits for radio-frequency fields \(public\) - data by country](#), 2017

H. Mazar, [Human radio frequency exposure limits: an update of reference levels in Europe, USA, Canada, China, Japan and Korea](#), 2016

Further, the Canadian government relies upon the telecom industry to monitor itself. In cases such as Phonegate, (resulting in this [class action suit](#) filed in Quebec) Safety Code 6 limits are being exceeded by millions of devices, and yet [the violation is being ignored](#).

When it comes to 5G, and even 2G to 4G, no independent, long-term safety testing has been done to ensure the public is protected from all possible harm. Plus, there are serious conflicts of interest between industry and international radiation protection bodies like ICNIRP and the World Health Organization (WHO), whose guidelines Canada emulates. Think big tobacco or asbestos and connect the dots...

In 2011, the WHO classified radiofrequency radiation as a Group 2B possible carcinogen. Lead and DDT are in this same category. Based on recent scientific research, including studies by the National Toxicology Program and the Ramazzini Institute, many independent experts are now urging the WHO to strengthen the carcinogenic rating of RF.

Resources on SAFETY CODE 6 & Industry's Influence on Radiation Protection Guidelines

Why We Should Not Rely on Current Safety Code 6 Guidelines, Canadian for Safe Technology

An in-depth review of why Safety Code 6 does not adequately protect Canadians.

<https://thecalm.ca/wp-content/uploads/2019/02/Safety-Code-6-Fact-Sheet.pdf>

How Big Wireless Made Us Think That Cell Phones Are Safe: A Special Investigation, Mark Hertsgaard and Mark Dowie | The Nation | March, 2018

The disinformation campaign—and massive radiation increase—behind the 5G rollout.

<https://thecalm.ca/wp-content/uploads/2020/01/How-Big-Wireless-Made-Us-Think-That-Cell-Phones-Are-Safe.pdf>

Captured Agency: How the Federal Communications Commission is Dominated by the Industries it Presumably Regulates, by investigative journalist Norm Alster in collaboration with the Harvard Centre for Ethics | 2015

“It is these hardball tactics that recall 20th century Big Tobacco tactics. It is these tactics that heighten suspicion that the wireless industry does indeed have a dirty secret.”

https://thecalm.ca/wp-content/uploads/2020/01/capturedagency_alster.pdf

World Health Organization: setting the standard for a wireless world of harm, Olga Sheean | Jan 2017

“The World Health Organization should be the ultimate authority on health-related matters. Nations and institutions look to you for guidance...but you have failed to live up to your mandate. You claim to be promoting health yet, with regard to EMFs, you are promoting harm.”

<https://thecalm.ca/wp-content/uploads/2020/01/WHO-setting-the-standard-for-a-wireless-world-of-harm.pdf>

HEALTH EFFECTS OF MILLIMETER WAVE FREQUENCIES AND PHASED ARRAY ANTENNAS

5G is using high frequency millimeter waves (mmWs) which have never before been used for public telecommunications technology. [This September 2019 review of 94 studies done on mmW frequencies](#) concludes there is insufficient research for us to assess 5G's safety. Therefore, industry and government claims that 5G is safe are completely disingenuous.

[This November 2020 paper](#) found that the intensity of radiation from millimeter wave 5G is greater than that from either 3G or 4G. Its authors state that the current belief that high-frequency EMF is not dangerous because it cannot penetrate deep into human skin is wrong. Some health effects of mmWs are already quite familiar to military and defense agencies around the world, which use them [as crowd control weapon systems](#) causing targeted individuals to "[feel like \[their\] body is on fire](#)." Researchers have also warned that "the same parts of the human skin that allow us to sweat also respond to 5G radiation [much like an antenna](#) that can receive signals." Scientists also warn of DNA damage and [tissue-heating effects](#).

Along with millimeter waves, 5G will also use Phased Arrays - hundreds of tiny cell antennas working together to strengthen the mmW frequencies. While microwaves cover the body like a blanket, phased array millimeter waves penetrate us like bullets.

Resources on MILLIMETER WAVES and PHASED ARRAYS

5G – FROM BLANKETS TO BULLETS, Arthur Firstenberg | Cellular Phone Task Force | January 2018

"The single most important fact about 5G that nobody is talking about is called "phased array." It will totally change the way cell towers and cell phones are constructed and will transform the blanket of radiation which has enveloped our world for two decades into a million powerful beams whizzing by us at all times. "

<https://thecalm.ca/wp-content/uploads/2020/01/5G-from-Blankets-to-Bullets.pdf>

5G Wireless Technology: Millimeter Wave Health Effects, Joel Moskowitz Ph.D. | August 2017

"MmWaves can transmit large amounts of data over short distances. The transmissions can be directed into narrow beams that travel by line-of-sight and can move data at high rates.... Although antennas can be as small as a few millimeters, 'small cell' antenna arrays may consist of dozens or even hundreds of antenna elements."

https://thecalm.ca/wp-content/uploads/2020/01/5G-Wireless-Technology_Millimeter-Wave-Health-Effects.pdf

Scientific Research on 5G, Small Cells and Health, Environmental Health Trust
Studies on millimeter wave (mmW) frequencies to be used in 5G

<https://ehtrust.org/scientific-research-on-5g-and-health/>

MENTAL HEALTH

What parent thinks their child needs more screen time and technology? Brains hooked on tech look like brains hooked on drugs, which is why Dr. Peter Whybrow, director of neuroscience at UCLA, [calls screens “electronic cocaine”](#). Based on data from over a million U.S. teens, [research found](#) that the happiest teens use digital media for less than an hour a day. Young people are on the brink of the worst mental health crisis in decades, [says Professor Jean Twenge](#) of San Diego State University. Suicide, loneliness, depression, and tech addiction are skyrocketing.

Resources on MENTAL HEALTH

Eliminating the Human, by David Byrne of the Talking Heads | MIT Technology Review | August 2017

“When interaction becomes a strange and unfamiliar thing, then we will have changed who and what we are as a species.”

<https://thecalm.ca/wp-content/uploads/2020/01/Eliminating-the-Human.pdf>

'Our minds can be hijacked': the tech insiders who fear a Smartphone dystopia, Paul Lewis | The Guardian | October 2017

“Google, Twitter and Facebook workers who helped make technology so addictive are disconnecting themselves from the internet. **Paul Lewis** reports on the Silicon Valley refuseniks alarmed by a race for human attention.”

<https://thecalm.ca/wp-content/uploads/2020/01/Our-Minds-can-be-Hijacked.pdf>

Humanity at a Crossroads, Dr. Nicholas Kardaras

A Presentation on The effects of screen time on the brain.

<https://vimeo.com/381941081> 33 min

ENVIRONMENT

WILDLIFE, PLANTS & EARTH'S ATMOSPHERE

All of life is bio-electric – a complex network of subtle electrical activity. A growing body of evidence shows that wireless devices and the electromagnetic frequencies they produce negatively impact all living things.

Radiofrequency radiation poses a serious threat to plant health. [A 2017 review of 49 studies](#) done on the effects of mobile phone radiation on plants found **90% of the research showed that non-thermal radiation has physiological and/or morphological effects on living plants.** [This 2013 Armenian-based study](#) suggests low-intensity mmWs cause “peroxidase isoenzyme spectrum changes” in wheat shoots – a stress protein in plants. [Experts have also found](#) that exposure to microwave radiation causes an increase in terpene production in monocots, or flowering plants and trees. [Other scientists](#) have linked these increased terpene levels to forest fires.

5G will potentially threaten natural ecosystems. According to several reports over the last two decades—some of which are summarized [here](#)—low-level, non-ionizing microwave radiation affects bird and bee health. It drives birds from their nests and causes plume deterioration, locomotion problems, reduced survivorship and death. Exposure to microwave radiation has been linked to reduced egg-laying abilities of queen bees, as well as smaller colony sizes. Just 6 minutes a day of weak wireless exposure caused cell-death in insects [in this 2016 study](#).

5G infrastructure also poses a threat to our planet's atmosphere. Network implementation will require the deployment of many, short-lifespan satellites via suborbital rockets propelled by hydrocarbon rocket engines. According to [this 2010 California study](#), launching them will spew enough black carbon into the atmosphere to pollute global atmospheric conditions, affecting distribution of ozone and temperature.

5G satellites in space will [interfere with meteorologists' weather detecting equipment](#). Plus, [the work of astronomers will be disrupted](#) by the constant light these satellites will cast in the night sky. Worse, solid-state rocket exhaust contains chlorine, an ozone-destroying chemical. How can any government seriously concerned about climate change allow this?

Resources on WILDLIFE and PLANTS

Cell Tower Radiation Affects Wildlife: Dept. of Interior Attacks FCC, Joel Moskowitz Ph.D.
| March 2014

In this post, Joel Moskowitz shares a 2014 letter to CTIA, America's wireless industry organization, from the U.S. Department of Interior that states that the U.S. Federal Communications Commissions' (FCC's) standards for cell phone radiation are outmoded and do not adequately protect wildlife.

<https://thecalm.ca/wp-content/uploads/2020/01/Cell-Tower-Radiation-Affects-Wildlife.pdf>

Environmental and Wildlife Effects, Physicians for Safe Technology | May 1st, 2020
<https://mdsafetech.org/environmental-and-wildlife-effects/>

Wireless Silent Spring, Dr. Cindy Russell MD | VP Community Health SCCMA | Oct. 2018
Dr. Cindy Russell examines the effects biologists have found wireless technology has on wildlife and then compares the histories, mechanisms and impacts of pesticides and wireless radiation. "Our ill-fated desire to control nature as well as our tendency to ignore our own complicity in its destruction for profit was the focus of a seminal 1962 book, 'Silent Spring.' This publication is widely credited with ushering in the modern environmental movement...There are many similarities between the silent spring created in cities and farms from pesticides and that of wireless technology with the rapid and widespread adoption of cell towers."
<https://thecalm.ca/wp-content/uploads/2020/01/Wireless-Silent-Spring.pdf>

Bees, Butterflies and Wildlife: Research on Electromagnetic Fields and the Environment, Environmental Health Trust
<https://ehtrust.org/science/bees-butterflies-wildlife-research-electromagnetic-fields-environment/>

Human Generated Radiation is Harming Wildlife, Whatis5G
<https://whatis5g.info/environmental-impacts/>

Electromagnetic Fields Impact Tree and Plant Growth, Environmental Health Trust
<https://ehtrust.org/electromagnetic-fields-impact-tree-plant-growth/>

ENERGY CONSUMPTION, NOT CONSERVATION

Scholar Richard Maxwell says that your Smartphone should have a tailpipe on it, so you understand that it is connected to the physical infrastructure that affects our planet. It's not just a magical box. Your phone uses more than a refrigerator's worth of electricity every year.

[This 2019 report](#) by the climate think tank *The Shift Project* shows the serious environmental impact of our digital revolution and calls for urgent action to reduce our use of cell phones, digital devices and the internet of things (IOT). [This December 2020 report](#) by France's independent *Haut Conseil pour le Climat (HCC)* has found that deploying 5G is likely to cause a 'significant increase' in greenhouse gas emissions. In short, experts warn that [the manufacturing of new wireless devices](#), as well as the data centers and networks central to the digital revolution will contribute to global warming more than they will help to prevent it. The highly touted next-generation 5G wireless technology has serious climate impacts.

[Experts warn](#) that the energy footprint of the digital world will double, or even triple, over the next 15 years. In an age of climate catastrophe, they tell us it is imperative to rein in this unbridled growth and practice "digital sobriety."

Resources on ENERGY

The Wireless Cloud, CEET, University of Melbourne

The energy consumption of the "wireless cloud" (the sending of data by wireless means) exceeds the energy consumption of data centers by 10X, as shown in this report from the Centre for Energy Efficient Telecommunications.

<https://thecalm.ca/wp-content/uploads/2020/01/ceet-white-paper-wireless-cloud.pdf>

How smartphones are heating up the planet | The Conversation | March 2018 | Lotfi Belkhir, Associate Professor & Chair of Eco-Entrepreneurship, McMaster University

A report on a recent study showing how computer technologies are contributing to climate change.

<https://thecalm.ca/wp-content/uploads/2020/01/How-smartphones-are-heating-up-the.pdf>

4 reasons Cisco's IoT forecast is right, and 2 why it's wrong, Steven Max Patterson | NetworkWorld | April 2017

An article on the Internet of Things and energy consumption from industry's perspective.

<https://thecalm.ca/wp-content/uploads/2020/01/4-reasons-Cisco%E2%80%99s-IoT-forecast-is-right-and-2-why-it%E2%80%99s-wrong.pdf>

Climate Change, 5G and the Internet of Things, Environmental Health Trust

A printable one-page flyer

<https://thecalm.ca/wp-content/uploads/2020/01/5G-and-Climate-Change-Flyer-EHT.pdf>

Letters to Greta, Katie Singer and Miguel Coma | 2020

An informative, informal series of blog posts dedicated to demystifying the link between wireless technology and climate change.

<https://www.ourwebofinconvenienttruths.com/letters/>

5G – BURIED DEEP IN E-WASTE

What will happen when the Internet of Things produces even more e-waste than what we already generate? In 2016, a study by Statistics Canada showed that electronic waste across Canada had nearly tripled in four years. According to this [Electronics TakeBack Coalition report](#), in 2010 Americans disposed of 142,000 computers and over 416,000 mobile devices each day.

With 5G/IoT, every "smart" item we dispose of, including clothing, pacifiers, diapers, and more will join the ranks of e-waste. These items will all be embedded with toxic chips and upon their disposal will release heavy metals such as mercury, lead, and cadmium, plus harmful chemicals such as CFCs and flame-retardants into the environment. Planned obsolescence and cyber vulnerabilities that cannot be patched will create an ongoing "need" for new products – leaving us mired in yet more e-waste.

However, e-waste from discarded products is only part of the problem. A far more significant contributor to e-waste is the release of toxins from the mining and manufacturing of electronics.

Resources on E-WASTE

Almost everything you know about e-waste is wrong, Josh Lepawsky | The Conversation | May 2018

“No amount of post-consumer recycling can recoup the waste generated before consumers purchase their devices.”

<https://thecalm.ca/wp-content/uploads/2020/01/Almost-everything-you-know-about-e-waste-is-wrong.pdf>

Electronic waste skyrockets in Canada, Nicole Mortillaro | May 2016

Where will all this e-waste go, and can our earth “digest” this amount of toxic waste?

<https://globalnews.ca/news/2718497/electronic-waste-skyrockets-in-canada/>

E-Waste and Toxins, Whatis5G

<http://whatis5g.info/e-waste/>

PUBLIC SAFETY AND ECONOMIC COSTS

PRIVACY

Mass data theft. Foreign cyber-interventions in elections. Smartphones doubling as surveillance devices that track your every move. Corporations peering into your personal information to exploit your online activities to advertise to you — and even try to influence your behavior. It sounds like a sci-fi thriller, but it's real life. **And it's affecting you.**

[Facebook CEO Mark Zuckerberg has admitted](#) that **one hundred percent** of Facebook users have **likely had their privacy compromised by "malicious actors"**.

Canada's privacy laws are so weak and out of date that [our Privacy Commissioner is raising the alarm](#) and calling on lawmakers to strengthen the law to stop companies from mining our personal data to influence behavior and turn a profit.

If we stay on our current trajectory, protecting our privacy may be a lost cause. The Internet of Things, "smart" cities and autonomous cars will depend on massive, 24/7 data collection to function. Wireless networks are much more vulnerable to data theft than wired ones are. And privacy laws won't stop hackers.

As we become increasingly dependent on wireless tech, we usher in a completely new era of surveillance capitalism, a world where technology normalizes what we once considered immoral and invasive - Big Brother and Big Business harvesting our personal data for financial gain and control.

Resources on PRIVACY

O.K., Google: How Much Money Have I Made for You Today? Jennifer Szalai | January 2019

A New York Times Book Review on Shoshana Zuboff's *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*.

<https://thecalm.ca/wp-content/uploads/2020/01/OK-Google-How-Much-Money-Have-I-made-for-You-Today.pdf>

Twelve Million Phones, One Dataset, Zero Privacy Stuart A. Thompson and Charlie Warzel | The New York Times | December 2019

"We are living in the world's most advanced surveillance system. This system wasn't created deliberately. It was built through the interplay of technological advance and the profit motive. It was built to make money. The greatest trick technology companies ever played was persuading society to surveil itself."

<https://thecalm.ca/wp-content/uploads/2020/02/Twelve-Million-Phones-One-Dataset-Zero-Privacy.pdf>

Report: Without safeguards, Internet and IoT may create surveillance states in near future, Bradley Barth | SC Media | September 2017

A catastrophic worldwide cyberattack, the emergence of an IoT-enabled surveillance state, and the weakening of encryption were among the chief security and privacy fears expressed by experts who were polled for a sweeping new report about the internet and its future impact on humankind.

<https://thecalm.ca/wp-content/uploads/2020/01/Without-safeguards-Internet-and-IoT-may-create-surveillance-states-in-near-future.pdf>

CYBERSECURITY

All wireless systems are vulnerable to cyber attacks. In 2017, a group of Finnish technicians [laid out](#) the security risks posed by 5G. As more and more devices are connected, they noted, “A security breach in the online power supply systems can be catastrophic for all the electrical and electronic systems that society depends upon.”

In 2018, the World Global Research Report ranked cyber-security as the [third greatest global risk](#)0 superseded only by natural disasters and extreme weather events. Canada has the third most cyber incidents in the world. With the arrival of 5G, the IoT and billions of new Internet-connected devices, cyber attacks will become inevitable.

Consider for a moment what the precise, always-on tracking 5G will facilitate might mean. Even if the companies storing every move governments and citizens make are operating with the highest moral scruples, there is ultimately no foolproof way they can secure the data from falling into the hands of a “malicious actor” or a foreign security service.

Says [journalist Andrew Nikiforuk](#): “the imposition of 5G technology suggest that the technical noose on human affairs has just grown tighter. We should call 5G technology by what it will make possible: “technology-enhanced authoritarian control with global consequences.”

Resources on CYBERSECURITY

Huawei, Big Brother and Technological Destruction, Andrew Nikiforuk | The Tyee | February 2019

“5G is just the latest innovation giving powerful forces more ability to monitor and control our lives.”

<https://thecalm.ca/wp-content/uploads/2020/01/Huawei-Big-Brother-and-Technological-Self-Destruction.pdf>

5G hackers: These eight groups will try to break into the networks of tomorrow | Steve Ranger, ZDNet, December 2019

European computer security agency [Enisa](#) has listed the groups it thinks are most likely to attempt to hack into 5G networks, warning that security threats to telecoms infrastructure and beyond will expand with the arrival of next-generation mobile connectivity.

<https://thecalm.ca/wp-content/uploads/2020/01/5G-hackers-These-eight-groups-will-try-to-break-into-the-networks-of-tomorrow.pdf>

Cyber-attacks are among top three risk to society, alongside natural disaster and extreme weather, Danny Palmer | Computer Business Review | January 2018

"Nations' reliance on the internet and connected services means the potential damage from cyber-attacks is one of the biggest risks facing the world today, according to a report from the World Economic Forum (WEF)."

<https://thecalm.ca/wp-content/uploads/2020/01/Cyberattacks-ranked-THIRD-greatest-global-risk-in-2018.pdf>

CELL ANTENNAS LOWER PROPERTY VALUES

According to the National Institute for Science, Law and Public Policy, 94 percent of people surveyed in 2014 would not buy or rent a home next to a cell tower. [The New York Times reported](#) that real estate agents have difficulty selling homes next to cell towers.

What 5G could mean for real estate.



4 bdr, 2 bath, EIK, LR, FR w/fireplace, all new appliances, great 5G wireless reception!

\$ 340,000



4 bdr, 2 bath, EIK, LR, FR w/fireplace, all new appliances, fully wired with fiber optic!

\$ 425,000

Nobody wants to buy a home with a radiation-emitting 5G transmitter on the property, especially now that the National Institutes of Health has found "clear evidence" of cancer from exposure to wireless radiation.*

Americans have a right to protect their property values and to the peaceful enjoyment of their homes without constant involuntary exposure to radiation from nearby transmitters.

Please join us in our effort to stop the deployment of millions of new 5G antennas in residential neighborhoods across America.

TELECOMPOWERGRAB.ORG

* "High Exposure to Radio Frequency Radiation Associated With Cancer in Male Rats"
<https://ntp.niehs.nih.gov/results/areas/cellphones/> November, 2018

Resources on DECLINING PROPERTY VALUES

Impact on Property Values, On the Proliferation of Cell Towers in the Eastern Townships|Canadians for Responsible Placement of Cell Towers
ISED Canada and the telecommunications companies refuse to accept that several factors decrease the values of property where wireless antennas are placed

<https://thecalm.ca/wp-content/uploads/2020/01/Impact-on-Property-Values.pdf>

Property Values Declining Near Cell Towers, Jeromy Johnson
<https://www.emfanalysis.com/property-values-declining-cell-towers/>

Cell Antennas Lower Property Values, Environmental Health Trust
<https://ehtrust.org/cell-phone-towers-lower-property-values-documentation-research/>

PUBLIC SAFETY

Traffic safety should be a top priority. We know that poles are susceptible to falling and causing damage and power outages during windstorms. This photo was taken after the 2018 windstorm in Baltimore, Maryland, which took down numerous poles in the city. Imagine if this were a pole outfitted with a “small cell” atop, and all the accessory equipment, which includes a refrigerator-sized power supply with a cadmium nickel battery, radio units, fans, wires, and a smart meter.



Resources on PUBLIC SAFETY

The Hazards Microcell, Wireless Transmitters, & 5G pose to Utility Line Workers, Citizens for Safe Technology | September, 2017

Submitted to the BC Chapter of the International Brotherhood of Electrical workers, with no response received

[https://thecalm.ca/wp-content/uploads/2020/01/Letter CST-to-IBEW.pdf](https://thecalm.ca/wp-content/uploads/2020/01/Letter_CST-to-IBEW.pdf)

Small Cells Endanger Electrical Worker Safety and Public Safety, a letter written by Nina Beety to the International Brotherhood of Electrical Workers | August 2017

<https://thecalm.ca/wp-content/uploads/2020/01/Small-Cells-endanger-electrical-worker-safety-and-public-safety.pdf>

Increasing incidence of burnout due to magnetic and electromagnetic fields of cell phone networks and other wireless communication technologies, Ulrich Warnke and Peter Hensing | umwelt-medizin-gesellschaft | January 2013

This scientific paper documents the risks to utility line workers of increases in multisystem chronic diseases.

https://bouwbiologie-zwolle.nl/wp-content/uploads/2019/05/Warnke_Hensinger_UMG_1_2013_Engl_DF.pdf

EXTREME WEATHER AND EMERGENCY RESPONSE – WILL CELL TOWERS SERVE US?

Cell towers don't hold up under disaster conditions. They failed in the tornadoes in Ottawa, the fires in California, and the hurricanes in Puerto Rico and Texas.

Resources on WIRELESS NETWORKS and EMERGENCY SERVICES

Canada's Cellphone System Vulnerable in Disasters, say Experts, Elizabeth Thompson | CBC News | September 2018

With cell tower backup batteries only lasting a few hours, thousands were left with little or no cell phone service after tornadoes swept through the Ottawa area.

<https://thecalm.ca/wp-content/uploads/2020/01/Canadas-Cellphone-System-Vulnerable-in-Disasters-say-Experts.pdf>

77 Cell Towers Failed in the First Hours of the October 2017 Fires in northern California, Whatis5G

In this video, a Crown Castle/Verizon representative explains that residents with copper, legacy landline phones received the reverse-911 warnings to evacuate. The wireless alerts failed to get through.

https://www.youtube.com/watch?v=6bh0SvkBcTo&feature=em-upload_owner

Presently, Over 86% of Cell Sites in Puerto Rico Are Still Not Operating in Aftermath of Hurricane Maria, Cision PR Newswire | October 2017

Published about 10 days after Hurricane Maria, and still 86% of cell sites were not functioning.

<https://thecalm.ca/wp-content/uploads/2020/01/Presently-Over-86-of-Cell-Sites-in-Puerto-Rico-Are-Still-Not-Operating-in-Aftermath-of-Hurricane-Maria.pdf>

Cell Networks Suffer Outages in Harvey's Wake, Ryan Knutson | The Wall Street Journal | August 2017

Wireless networks along the Texas coast suffered outages as a result of Hurricane Harvey, U.S. federal regulators said, leaving customers in some counties with limited or no cell phone service."

<https://thecalm.ca/wp-content/uploads/2020/01/Cell-Networks-Suffer-Outages-in-Harvey%E2%80%99s-Wake.pdf>

LIABILITY – WHO WILL BE HELD ACCOUNTABLE?

What happens and exactly who is liable when a utility pole or lamppost heavily laden with hundreds of pounds of wireless equipment comes down, injuring someone or damaging a resident's home or property? Who will assume financial liability for fire, loss of line workers', public and environmental health, personal data breaches, and property devaluation caused by placing many microcells on our streets? When the city of Santa Fe, New Mexico decided to install small cells, the Mayor received [this letter about liability](#) from a lawyer.

No Assurance of Insurance

If the telecoms are indemnified, then the city is left holding the bag. And it is unlikely the city's insurance policy will cover any wireless health-related claims. Insurance companies now categorize wireless radiation as [one of the top risks for insurers](#) worldwide, and many companies, including Lloyds of London, will not cover claims resulting in injury or harm caused by radiation.

Informed Integrity

The **Model Municipal Access Agreement** (found [here](#)) was negotiated by the *Canadian Radio and Telecommunications Commission* (CRTC) and the *Federation of Canadian Municipalities* (FCM) in 2013 to facilitate telecom's access to our rights-of-way. The *Environment and Liability* section of this agreement establishes that if municipal governments know that telecommunications equipment may cause environmental harm, but allow it to be installed anyway, they may be found negligent and held liable for damages.

Once elected officials are made aware of the dangers posed by wireless tech, continuing to promote it may even result in charges of colluding in the suppression of information. Are leaders willing to trade their integrity, their objectivity, and ultimately their reputation for industry's agenda?

Risky Business

Telecom providers know that wireless technologies are risky business, and [their annual reports](#) admit their fears. In [this excerpt](#) from their 2019 [Management Discussion and Analysis](#), TELUS warns shareholder that litigation due to data theft, electromagnetic radiation, microcell siting issues, and more could eat into their profits and that "Readers are cautioned not to place undue reliance on forward-looking statements."

Risk Management

Risk management from a health and safety perspective has the primary objective of eliminating or minimizing the risks of harm. Drawing on data from over 3000 scientific research papers on non-ionizing electromagnetic radiation, scientist Steve Weller created a power-packed [presentation on wireless technology and Risk Management](#) in 2018. The takeaway - there is sufficient evidence of harm to support governments in taking a precautionary approach to installing wireless transmitters on our streets.

Resources on LIABILITY, WIRELESS HARM & INSURANCE

Telecom and Insurance Companies Warn Of Liability and Risk, Environmental Health Trust
<https://ehtrust.org/key-issues/cell-phoneswireless/telecom-insurance-companies-warn-liability-risk-go-key-issues/>

Swiss Re Institute ~ SONAR 2019: New Emerging Risk Insights

The SONAR report identifies new, changing and not-yet envisioned risks that the insurance industry needs to have on its radar. Two of the top five emerging risks in the SONAR 2019 report are digital technology's clash with legacy hardware and potential threats from the spread of 5G mobile networks.

<https://www.swissre.com/institute/research/sonar/sonar2019.html>

Notification of Wireless Harm for Municipal Governments in Canada, Citizens for Safe Technology | October 2017

This document was sent to every municipality in British Columbia in 2017 as a precautionary note against installing microcells. Should lawsuits occur due to damages incurred from microcells installed on city-owned streets, these local governments can't say they were not warned!

https://thecalm.ca/wp-content/uploads/2020/01/Notification-of-Wireless-Harm_Municipal_Nov_17.pdf

NO BUSINESS CASE FOR 5G

Although telecoms expect to put billions into the economy and to profit handsomely from 5G, many experts question whether this will indeed be the case. In truth, so far, 5G is not living up to its hype. [In November 2020](#), China's former national finance minister, Lou Jiwei, called existing 5G technology in China immature and quite expensive. He warned that increased electricity costs to fuel 5G in 2019 appeared to be 10 times the profit of China Telecom -- one of the nation's three state telecom companies.

Resources on THE BUSINESS OF 5G

Upgrade to 5G Costs \$200 Billion a Year, May Not Be Worth It, Olga Kharif and Scott Moritz | Bloomberg | December 2017

5G is being escorted in with much hype and fanfare, but where's the business case? According to Bloomberg Technology, 5G "may not be worth it".

<https://thecalm.ca/wp-content/uploads/2020/01/Upgrade-to-5G-Costs-May-Not-Be-Worth-It.pdf>

Why the Race to 5G is a Mirage, Devra Davis | International Business Times | December 2020

Dr. Devra Davis asks why we should be proceeding with 5G technology when China admits that the costs appear to outweigh the benefits.

<https://www.ibtimes.com/why-race-5g-mirage-3101033>

5G Wireless is the New Fiber Optic, Bait-and-Switch Scandal, Bruce Kushnick | Medium | March 2018

According to a Deloitte study, in order to build 5G in the United States, there will need to be a \$130-\$150 billion dollar investment in fiber to the poles over the next 5-7 years. How and if this will be financed is not yet clear.

<https://thecalm.ca/wp-content/uploads/2020/01/%E2%80%9C5G%E2%80%9D-Wireless-Is-the-New-Fiber-Optic-Bait-and-Switch-Scandal.pdf>

If they build 5G, the money will come ... right? Colin Gibbs | Fierce Wireless | November 2017

"Carriers are plotting their strategies and densifying their networks as they prepare for the highly anticipated arrival of 5G. But how they'll actually make money from next-generation technologies and services is about as clear as the air in New Delhi."

<https://thecalm.ca/wp-content/uploads/2020/01/If-they-build-5G-the-money-will-come-...-right.pdf>

WILL SMALL CELL FACILITIES HELP “BRIDGE THE DIGITAL DIVIDE”?

Nope. In order for wireless “small cell” facilities to function, they need fiber to the pole, and much of rural Canada is without fiber. The 2018 report from the Standing Committee on Industry, Science and Technology, [Broadband Connectivity in Rural Canada: Overcoming the Digital Divide](#) confirmed that current financial commitments from government, communities, and the private sector serve only a fraction of what is needed to achieve equitable connectivity.

This report suggested an investment of **\$7 billion** is needed to address the rural broadband shortfall in Canada. So, in order to “bridge the digital divide”, Telecom or government would have to lay out billions for fiber, an expenditure they are not likely to make in the foreseeable future. And if they do, that fiber should go all the way to the home and not stop at the utility poles.

JOB LOSS

Telecoms say 5G will bring jobs and boost the economy, but many studies tell us otherwise. Jobs may be added as the infrastructure for 5G is built, but once it is up and running, those jobs will disappear. Of greater concern is that 5G and the Internet of Things will enable robots to replace humans in the workforce.

Resources on JOB LOSS

Rapid growth of automation threatening jobs in Canada, David Hodges | Canadian Press | October 2017

A 2017 report suggests the speed of technological advances is outpacing the rate at which large Canadian businesses and government institutions can adapt, with 35 to 42 per cent of jobs threatened by automation.

<https://thecalm.ca/wp-content/uploads/2020/01/Rapid-growth-of-automation-threatening-jobs-in-Canada.pdf>

Study: Robots set to displace millions of U.S. workers by 2025, Christopher Matthews | AXIOS | March 2017

A 2017 U.S. research study predicts that if automation proceeds at predicted rates, millions of jobs could be lost while wage growth is reduced by up to 2.6% between 2015 and 2025.

<https://thecalm.ca/wp-content/uploads/2020/01/Study-Robots-set-to-displace-millions-of-U.S.-workers-by-2025.pdf>

Robots will destroy our jobs – and we're not ready for it, Dan Shewan | The Guardian | January 2017

"Two-thirds of Americans believe robots will soon perform most of the work done by humans, but 80% also believe their jobs will be unaffected. Time to think again."

<https://thecalm.ca/wp-content/uploads/2020/01/Robots-will-destroy-our-jobs-%E2%80%93-and-were-not-ready-for-it.pdf>

REGULATORY

HOW ARE COMMUNITIES DEALING WITH 5G?

Heads in the Sand?

At the 2017 Union of BC Municipalities' convention, BC local governments voted in favour of a resolution mandating that land use authorities and the public be consulted when microcells are placed within 100 meters of schools, hospitals, and residences, even when they are placed on existing structures.

This resolution should have been voted on by every local government in the nation at the 2018 Federation of Canadian Municipalities (FCM) Convention, but unfortunately the FCM Board of Directors rejected the resolution declaring it was not in accordance with existing FCM policy.

This decision is perplexing to say the least; given that the FCM's [current focus areas](#) include broadband, infrastructure, telecommunications and public safety. Clearly, the FCM does not recognize what a hot issue microcell placement already is south of the border as small cells are being pushed on communities in anticipation of 5G.

Not on My Fire Hall

On health grounds, the International Association of Fire Fighters (IAFF) has [officially opposed having antennas placed on fire stations](#) throughout the U.S. and Canada. In 2017, the State of [California granted firefighters an unprecedented exemption](#) from small cell installations on fire halls. The IAFF states they will hold their position until "a study with the highest scientific merit and integrity...is conducted and it is proven that such sitings are not hazardous to the health of our members."

South of the Border

State governments in the U.S. are awakening to the gravity of the wireless radiation issue. In 2019, [Massachusetts](#) and [New Hampshire](#) proposed bills to establish commissions to study the environmental and health effects of 5G. Even though telecommunications and radiofrequency exposure guidelines also fall under federal jurisdiction in the United States, the New Hampshire Commission issued [a landmark report](#) discussing 5G Health Risks.

Meanwhile, [Montana passed a Joint Resolution](#) urging Congress to amend the 1996 Telecommunications Act to account for health effects. These examples illustrate that local and provincial governments can and must take a proactive and precautionary position on microwave radiation and 5G in Canada.

Cities and counties across the United States are also grappling with how to protect residents while not being out of compliance with their federal or state regulations. Some local governments are creating ordinances – typically called bylaws in Canada – to prohibit 5G. For example, driven by community concerns over the health effects of 5G wireless transmitters, Mill Valley, California has passed an urgency ordinance blocking deployments of small-cell 5G wireless towers in that city's residential areas. Malibu, California has established the "Front Door Rule" which prohibits cell antennas from being placed where

they can be seen from a resident's front door or window. Although U.S. federal law may preempt local ordinances, these efforts by local governments will at the very least slow down the deployment of 5G.

Bylaws and Municipal Regulation of Microcells in Canada

If we write bylaws like the one passed in Mill Valley here in Canada, would they be enforceable? It is highly unlikely. In Canada, municipal governments are generally prohibited from creating bylaws or ordinances that allow them to regulate anything to do with antennas or telecommunications. [Several legal precedents](#) support this and help pave the way for microcells and 5G.

[Innovation, Science and Economic Development says](#), “municipal, governments do not have lawful jurisdiction to create enforceable rules which relate directly to radiocommunications, but a properly framed by-law relating only incidentally to radiocommunications may co-exist with federal legislation provided such by-laws do not prohibit nor unduly restrict the conduct of radio services.” Most significantly, municipal bylaws may not set limits on how much radiation citizens are exposed to.

That said, in 1999, the [city of Toronto adopted its Prudent Avoidance policy](#), which requested that companies applying to install new cell transmitters in Toronto keep radiofrequency emission levels 100 times below Safety Code 6, Health Canada's public exposure guideline. This policy is still in place. Although officially compliance is voluntary, as the authority to regulate cell antennas (including siting and radiation exposure levels) rests with the federal government, the City of Toronto does demand that proponents comply. Salt Spring Island, British Columbia also requires that antennas emit approximately 60-75 times less radiation than currently allowed by Safety Code 6.

WHO HAS THE POWER TO PLACE MICROCELLS BY OUR HOMES?

At the Federal Level:

Innovation, Science, and Economic Development Canada (ISED) [has the final say](#) over microcell placement in Canada. Their rules allow microcells to be placed on existing structures by our homes without any public consultation. Installations may also be placed on existing towers without seeking local government consent

ISED requires telecoms to *notify* local governments of any radio communications facility they plan to install and they say “**it may be prudent for the proponent to consult even though the proposal meets an exclusion**”. **ISED does not currently have the right** to force public or private landowners to allow small cell antennas on their property.

At the Local Level:

Telecoms are required to notify whoever owns the street you live on – either your local government or the provincial government – when they want to install a microcell there. They must provide government officials with some details of their plans.

If the proposal meets all local requirements, then your municipal government is required to agree to the plan, and it's a done deal. At that point, site permits giving the telecom authorization to install the microcell on your street will be signed. If the microcell will be attached to a utility pole, street lamp or other structure, permission must also be obtained from whoever owns that. Both the owner(s) of the right-of-way and the structure usually charge an annual fee to the telecom for each microcell installed.

Note: Pole-leasing and blanket permitting agreements between the owner(s) of the public rights-of-way, the utility poles or lampposts, and telecommunications providers may already be in place *before* microcell applications are submitted. Contact whoever is in charge of antenna applications where you live to find out what agreements exist, permits are in process, and antenna siting policies are in place.

Could a local government refuse to sign any permits, thus prohibiting microcells from being placed on publicly owned streets?

Some towns in the United States are having success with denying small cell permits based on technicalities. After receiving [this detailed letter from the village of Western Springs, Illinois](#), Crown Castle withdrew their application to install small cells.

In Canada, if a local government refused to allow microcells, the telecom would likely turn to ISED for arbitration, as revealed in [this letter written to the mayor of the County of Renfrew, Ontario in 2014 by the Canadian Wireless Telecommunications Association](#) (CWTA). Some Canadian municipalities are speaking out against 5G. ([Here is a list](#) of Canadian municipalities that have adopted Resolutions calling for a moratorium on 5G). If towns across the nation refused small cells, it could push ISED to re-evaluate their policies and consider safer technological alternatives.

CREATING A PROACTIVE MICROCELL SITING PROTOCOL IN CANADA

ISED calls any wireless telecommunications policies, guidelines, or processes a local government creates a "Protocol". In [Point 45 of this document ISED states](#): "that municipalities have the ability to include reasonable requirements in their own protocols to meet their local needs and that these may include the requirement to notify the municipality of antenna installations that are excluded from consultation."

Must a telecom comply with a local government's request to consult before 4G and 5G transmitters are placed on structures like lampposts by our homes?

If a municipality uses all or part of [this Antenna Siting Template](#) co-created by the Federation of Canadian Municipalities (FCM) and the Canadian Wireless Telecommunications Association (CWTA) in their Antenna Siting Protocol, providers that are CWTA members have agreed to consult on excluded antenna systems. However not all telecoms installing microcells in Canada belong to CWTA.

What else is a local Antenna Siting Protocol "allowed" to say about microcells being placed on existing structures?

- Local governments *may* state their most and least preferred locations for wireless sites and give some specifics related to aesthetics or design, but the telecom is not obligated to abide by these preferences.

However

- Local governments *may not* place weight on the potential effects a proposed *antenna system* will have on property values or municipal taxes. Other than insisting installations “comply with Safety code 6”, local antenna siting protocols may not include any stipulations relating to radiofrequency exposure or human health. (Although as mentioned above, Toronto and Salt Spring Island, BC do have exposure limits in their policies.)

It is highly recommended that local governments across Canada draft the most protective Antenna Siting Protocols possible. This document - [Creating a Proactive Antenna Siting Protocol & Small Cell Licensing Agreement](#) will show you how.

[TAKING THIS ISSUE TO COURT](#)

For a Detailed Summary of the Law, EMF and 5G in Canada click [here](#).

A Legal Precedent that Supports Local Bylaws

Legal precedents in Canada generally point towards local governments’ jurisdictional limitations when it comes to antenna siting, the underlying argument being that a municipality cannot interfere with a telecom’s right to do business. However, this 1965 and yet uncontested [BC Court of Appeal ruling](#) (the highest appeals court in BC) allowed a local bylaw regulating telecommunications to win out over a cablevision company’s claim that they could ignore the bylaw because they were under federal jurisdiction.

Telecoms do not Have Unlimited Access to our Infrastructure

Microcells and 5G need fiber to function. Aerial cable – the most common way of deploying fiber – requires support structures like utility poles and lampposts. In Canada, the [Telecommunications Act](#) gives the Canadian Radio and Telecommunications Commission (the CRTC) jurisdiction over where transmission lines like fiber are placed. However, two Canadian legal precedents have ruled that [Section 43\(5\)](#) of the Act does not give the CRTC absolute control over where equipment needed for networks like 5G is placed:

- 1) [The first](#) says the CRTC is not authorized to mandate that telecoms may place equipment on utility poles used for distributing electricity.
- 2) [The second](#) negates the CRTC's overriding right to force owners of multidwelling units to allow Telecoms to place telecommunications equipment on their premises.

Canadians may soon be losing the limited ability the Telecommunications Act now gives us to say no to wireless and cellular equipment being placed wherever a telecom and the CRTC deem fit. [In their January 2020 report](#), the Broadcasting and Legislative Review Panel recommends the Telecommunications Act be changed in ways that would consolidate federal authority over the infrastructure that will support microcells and 5G.

Learn more here: Section 5.2 of ISED's "[Antenna Sites and Structures](#)"
Here: Section 2.4 of the Broadcasting and Telecommunications
Legislative Review Panel's Report:
["Unlocking the advanced networks of tomorrow"](#)
And Here: [CRTC wants more power over 5G infrastructure placement](#)

A Noteworthy US Federal Court Decision

In Canada, ISED exempts microcells placed on existing structures from public consultation or review, calling them "low impact." In the US, the Federal Communications Commission (FCC) had come to a similar conclusion, reasoning that even though the industry plans to deploy as many as 800,000 fifty-foot (possibly taller) towers in neighborhoods and historic districts across their nation by 2026, it is not in the public interest to review their potential impacts.

In August 2019, the US Court of Appeals [issued a decision](#) substantially setting back the efforts of the FCC to expedite the deployment of 5G.

The Court of Appeal observed that the FCC had failed to address:

- The cumulative harms that may result from "densification," i.e. crowding of multiple cell towers in a limited area;
- The potential harms from co-location of multiple cell facilities on a single pole; and
- The concern that the FCC was speeding deployment of cell towers when it had not completed its ongoing investigation into the potential health effects of low-intensity radiofrequency radiation.

TAKING ACTION

ACTIVISTS TAKE HEART

“People’s first reaction to the idea that 5G may be an existential threat to all life on Earth is usually disbelief and/or cognitive dissonance. Once they examine the facts, however, their second reaction is often terror. We need to transcend this in order to see 5G as an opportunity to empower ourselves, take responsibility and take action.” Claire Edwards, UN whistleblower and co-publisher of the [International Appeal to Stop 5G on Earth and in Space](#).

We are at a crisis point on planet Earth, one where issues like 5G and global climate change are interwoven. Overconsumption, corporate greed, and a deep disconnect from the natural systems that support us now threaten all of life. (For a fast-paced, fact-filled look at the underside of our production and consumption patterns, watch [The Story of Stuff](#).)

Many of us are aware that being tethered to our digital devices leaves us numb, distracted and time impoverished. We long for true leisure, and the space needed to create a meaningful life. Our planet, our psyches and our souls cannot support unlimited technological growth. With so much at stake, reducing our tech appetite and carbon footprint by using energy-efficient, life-enhancing wired technology *when truly needed* is the only sane choice.

“Some people, some companies, some decision makers in particular know exactly what priceless values they have been sacrificing to continue making unimaginable amounts of money... With today’s technology, designing a world with 50 per cent less carbon emissions will be very costly.” [Greta Thunberg, climate activist](#).

At this moment, most of us don’t have to live next to a cellular transmitter, but once 4G LTE Advanced and 5G are in place, they will be everywhere. Thousands of satellite-based systems in the sky will supplement 5G networks on the ground. [These satellites will send “tightly focused beams of intense microwave radiation](#) at each specific 5G device that is on the Earth, with each device then sending a beam of radiation back to the satellite. There will be nowhere to hide.

In real terms, this means that even if we don’t own a 5G-enabled device, in crowded locations like shopping malls our bodies will be penetrated by numerous beams of radiation from other people’s 5G phones and gadgets. 5G will add to the radioactive soup with which we are blanketing our planet and ourselves, exposing all life forms to unprecedented types and amounts of what retired U.S. government physicist Dr. Ronald Powell calls “mandatory irradiation”.

Do we want technology that harms and depletes us, or sustainable practices that nourish life?

ACT NOW

"Hope is a verb with its sleeves rolled up." ~ Dr. David Orr

How do we best awaken others and promote engagement?

The work of psychologist and economist [Per Espen Stoknes](#), director for the Center for Green Growth at the Norwegian Business School in Oslo, Norway, tells us the most successful strategies will be:

- **Social** – Sharing information directly with friends, family, colleagues and neighbours, and inspiring and influencing them with our actions
- **Simple** – making safe tech behaviors convenient and accessible
- **Supportive** – framing the issue to be about human health, new opportunities, safety, and environmental well-being.
- They will create [new restorative Stories](#), and
- They will send clear **Signals** to others that positive change and outcomes are taking place.

The most successful framing of this issue will focus on:

1. The **Health** of our families and our environment
2. The issues of **Risk** Management and Liability
3. The **Opportunities** created by changing our current trajectory.

Hint: For every threat mentioned, mention three opportunities change will create.

Effective Movements transform:

- **Cognition:** the way we think about something
- **Behavior:** the way we live, and
- Most importantly, they **Affect** the way we feel about an issue, moving us closer to the heart of social change.

Get Started:

- 1 **Educate yourself and others on this issue.** Connect with those around you to build a movement. Get creative - write letters, make music, do street theater. Capture the public imagination. [Find the tools you need here.](#)
- 2 **Insure your local councils have the most precautionary Antenna Siting Protocols permitted.** ([Find protocol content suggestions here.](#))
- 3 **Tell ISED to remove the policy loophole** that exempts microcells placed on existing structures from public consultation. Learn more from [this short video.](#)

4 **Call for a more protective Safety Code 6.** If Safety Code 6 were a speed limit....

Safety Code 6 Guidelines are Much Too High		
PUBLIC EXPOSURE GUIDELINES	INTENSITY (mW/m ²)	SPEED ANALOGY in km/hour
→ Safety Code 6 (for 6 GHz and higher)	10,000	4,800
Belgium, parts of Italy	100	480
Austrian Sustainable Building Council	1	50
EUROPAEM* (MDs)	0.1	15
Natural (all frequencies)	0.001	< 1
Cosmic background	0.00000001	< 1

(Chart by Margaret Friesen)

A precautionary radiation exposure guideline, combined with approval processes that required public input and consent could put the brakes on microcell densification and 5G.

- 5 **Promote community-owned wired-to-the-premises fiber optics** – which is safer and faster than 5G – where you live. Visit connected-communities.ca to learn how.
- 6 **Boycott all 5G products and services.** Encourage others to do the same and share this intention with wireless companies. If we don't buy 5G, it won't have a market. Reduce inessential tech use by practicing "[Digital sobriety](#)". Believe in your power as a consumer and a creator. Seize the opportunity to live in balance and well-being.

