

# **((5G )) Winnipeg Awareness!**

**December 18, 2020**

**First 11 pages - Responses from 5G Winnipeg Awareness  
to questions posed by the City of Winnipeg  
in preparation for today's Interview with City of Winnipeg Staff<sup>1</sup> as  
part of the Public Engagement Process regarding Small Cell Technologies<sup>2</sup>**  
<https://engage.winnipeg.ca/smallcelltechnology>

## **BACKGROUND:**

My name is Margaret Friesen. I represent "5G Winnipeg Awareness" who are residents in all parts of the City of Winnipeg who are deeply concerned about the pervasive expansion of radiofrequency emitting antennas installed close to where people regularly spend much of their lives. We are non-partisan and entirely volunteer-based.

First, we would like to thank you for the opportunity to provide feedback. We very much appreciate the material you have outlined on the Public Engagement website, particularly the "The City of Winnipeg's Role in Small Cell Technology" document.

<https://engage.winnipeg.ca/16800/widgets/65919/documents/40807>

I presented the concerns regarding 5G infrastructure antennas to the Innovation and Economic Development (IED) Committee on June 15 (Appendix Aa), May 13<sup>th</sup>, 2020 (Appendix Ab), and on February 10<sup>th</sup>, 2020 (Appendix B) and to the Property Development, Heritage and Downtown Development (PDHDD) Committee on January 6<sup>th</sup>, 2020 (Appendix C), as well as to various City committees and City Council before the very flawed Winnipeg Antenna Systems Policy (WASP) was passed in 2015.

5G Winnipeg educates on several issues. The most relevant for today are:

- 5G is untested for the harmful health effects of everyday and long-term exposures to humans and the environment.
- Health Canada's "Safety Code 6" is not protective of the health of Canadians.
- There is very little control exercised by the local governments and citizens about the installation of wireless technologies. The federal government has final say but there are actions that can be taken at the Land Use Authority level, e.g. City of Winnipeg.

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<sup>1</sup> The City of Winnipeg is currently undertaking a small cell technology review. As part of the review, the City will be coordinating with cellular providers during their small cell trials of small cell-enabled 5G infrastructure to see how our existing policies, processes, and procedures regarding cellular infrastructure apply to small cells, and determine what, if any, amendments need to be made. [Invitation received by email from City of Winnipeg on December 3, 2020]

<sup>2</sup> The City of Winnipeg is "currently in phase 1 and we are collecting feedback to inform aspects of the trials before they begin".

- Fibre optic infrastructure to and through premises is a safer alternative than wireless connections. Where wireless is deemed essential, strict adherence to the ALARA (As Low As Reasonably Achievable) principle is necessary to minimize potentially harmful exposures.

Thank you for this invitation. Further notices, for new postings on the Public Engagement webpage or when this issue comes to City committees, would be very much appreciated.

Our written comments are below. Please contact me if there are any questions or for clarification.

**Respectfully submitted.**

**Margaret Friesen M.Sc.**

Spokesperson, 5G Winnipeg Awareness, [5g.winnipeg.awareness@gmail.com](mailto:5g.winnipeg.awareness@gmail.com)

## **WRITTEN FEEDBACK FOR REFERENCE DURING TODAY'S INTERVIEW.**

### **CITY OF WINNIPEG, PUBLIC ENGAGEMENT QUESTIONS:**

1. What is your understanding of small cell technology?
2. What are the greatest opportunities for yourself, your organization, and for Winnipeg?
3. What are the biggest challenges with small cell technology?
4. What is your understanding of a municipality's role when it comes to small cell technology?
5. What actions do you think the City of Winnipeg should take when it comes to small cell technology?

### **1. QUESTION BY CITY OF WINNIPEG, PUBLIC ENGAGEMENT:**

What is your understanding of small cell technology?

### **RESPONSE BY 5G WINNIPEG AWARENESS:**

Within our membership we have a comprehensive knowledge of small cell technology and we are aware that there are plans for the installations of thousands of small cellular network antennas throughout Winnipeg—including residential areas—approximately one or more antenna sites per half-block. We see real-world examples, such as in Mission, B.C. where some small antennas are less than 15 meters from homes.

[http://emrabc.ca/?page\\_id=8805](http://emrabc.ca/?page_id=8805)

Canadian experts, such as Dr. Paul Héroux, Professor of Toxicology and Health Effects of Electromagnetism, McGill University of Medicine and others, advise that a minimum safe distance might be 300 to 500 meters (and provided that source antenna power intensity is not increased compared to previously planned intensities).

Subsequent to my presentation on June 15<sup>th</sup>, 2020, a number of publications and reports have come out that support use of wired connections as being superior to wireless:

- See:  
Commission to Study the Environmental and Health Effects of Evolving 5G Technology, State of New Hampshire. (2020). **Final Report**. Pages 97–105.  
<http://www.gencourt.state.nh.us/statstudcomm/committees/1474/reports/5G%20final%20report.pdf>
- Karaboytcheva, M. (2020). **Effects of 5G wireless communication on health**. *European Parliament Briefing*.  
[https://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS\\_BRI\(2020\)646172](https://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI(2020)646172)

## 2. QUESTION BY CITY OF WINNIPEG, PUBLIC ENGAGEMENT:

What are the greatest opportunities for yourself, your organization, and for Winnipeg?

### RESPONSE BY 5G WINNIPEG AWARENESS:

There are no positive opportunities in terms of City of Winnipeg residents' physical exposures to the radiofrequency radiation emissions from these technologies. We will continue our efforts of public education to inform people about the inadequacy of Health Canada's current safety guidelines that the City of Winnipeg has chosen to follow. (Note: the City of Toronto Prudent Avoidance Policy specifies maximum limits at 1% of Health Canada's Safety Code 6 limits).

However, plans for small cell technologies do provide opportunities to bring public awareness to the serious health issue posed by pervasive radiofrequency radiation. There is also the opportunity to inform residents that, although they are the main stakeholders, they seem to have almost zero rights to influence, and almost zero rights to be informed in advance, where cell antennas will be installed in Winnipeg. The City's decision to include this as a Public Engagement issue is important in increasing public awareness and we hope that this will continue.

Radiofrequency energy in the frequency ranges planned and used here was classified by the World Health Organization's International Agency for Research on Cancer (IARC) as a Group 2B *possible* human carcinogen in 2011. Because of the high-quality studies after 2011 (human, animal and mechanistic), many experts believe re-classification for this hazardous physical agent (term used by IARC) will be as a *known* carcinogen.

The health risks will not begin when this agent is re-classified. The risks begin at exposure. It would be prudent to wait at least until this re-evaluation has been conducted before immersing the entire City of Winnipeg's population in a continuous flood of wireless radiation waves.

### 3. QUESTION BY CITY OF WINNIPEG, PUBLIC ENGAGEMENT:

What are the biggest challenges with small cell technology?

#### RESPONSE BY 5G WINNIPEG AWARENESS:

Making emissions safe for people and the environment.

### 4. QUESTION BY CITY OF WINNIPEG, PUBLIC ENGAGEMENT:

What is your understanding of a municipality's role when it comes to small cell technology?

#### RESPONSE BY 5G WINNIPEG AWARENESS:

The municipality has limited control. However, the City of Winnipeg is not entirely powerless. See below for more details.

### 5. QUESTION BY CITY OF WINNIPEG, PUBLIC ENGAGEMENT:

What actions do you think the City of Winnipeg should take when it comes to small cell technology?

#### RESPONSE BY 5G WINNIPEG AWARENESS:

Overall: Opt for fibre optics and other wired connections wherever possible. Follow the emissions principle of "As Low As Reasonably Achievable" (ALARA) for all wireless-emitting equipment.

This is outlined below under the headings provided on the Public Engagement website. Specifically, the following recommendations and comments have been organized according to the list provided in "The City of Winnipeg has Roles" document.

## 5G Winnipeg Awareness Recommendations for City of Winnipeg Actions

**1. An asset owner:** • City-owned/public buildings • City-owned poles (e.g., ornamental street lights) • Transit shelters • Traffic signal poles • City-owned street furniture, etc.

Opt for fibre optics and other connections whenever possible. When not possible, mandate the labelling (see two suggested figures below) of all emitting antennas that are placed on City of Winnipeg assets, and require following ALARA.

#### **2. As the right-of-way owner/custodian**

Do not allow small cell antennas in rights-of-way. If installations proceed, these sites should be clearly labelled. The City can set an example.

### **3. As land use planning authority (outlined in the Winnipeg Antennas Siting Policy (WASP))**

- Amendments as per recommendations in 2015 made independently by Barry Malowanchuk (P. Eng., former telecommunications engineer with Manitoba Hydro) and Margaret Friesen M.Sc. (full text can be provided upon request):
- Include buffer zones (radiation-free zones) for medical and other reasons.
- Provide adequate notification and public consultation (not through the proponents as their diligence has been significantly inadequate).
- Remove the exclusion for public consultations regarding non-tower structures.
- Provide details of all aspects of the trials of small antennas. Request feedback from groups such as ours. The City of Winnipeg residents are the main key stakeholders.
- Ensure adequate set-backs from homes, daycares and schools.
- Mandate measurements of cell network antennas to be presented as W/m<sup>2</sup> and not as an aggregate measurement as a % of Safety code limits.
- Dedicate a webpage on the City of Winnipeg website for information on small cell network projects.

### **4. As building code enforcement authority**

Include reducing or eliminating radiofrequency emissions in new constructions and in retrofits. See this peer-reviewed paper: *Building science and radiofrequency radiation: What makes smart and healthy buildings*

<https://www.sciencedirect.com/science/article/pii/S0360132319305347>

Mandate labelling. See suggestions in figures below.

### **5. As utility**

- 1) Use fibre optic and wired connections whenever possible.
- 2) Conduct a full (cradle-to-grave) cost/benefit analysis of fibre and other connections versus wireless. Include costs of replacement of wireless equipment and energy costs (wireless connections use from 3 to 10x more electricity than wired connections which has implications for climate change considerations).

### **6. As legislator**

- 1) Amend the “Encroachment” By-law No. 12/2019 taking back control of what is placed on utility poles throughout the city. This is currently under the control of Manitoba Hydro, which does not have adequate public accountability or transparency on this issue e.g. placement of small cell antennas on streetlight standards close to home in residential areas.
- 2) Amend WASP as noted above.
- 3) Take actions to obtain more local control over the siting of cell network antennas everywhere in Winnipeg.

4) Support a full study of 5G human and environmental health effects as the US State of New Hampshire has done with perspectives from all views on the issue.

5) Pass resolutions as in Ontario and Quebec municipalities (details in the appendices).

An example not in the appendices: City of Montreal- In its brief it submitted to the CRTC on May 15, 2019, the City acknowledges the impacts on the health of the citizens and its role in protecting its population: Impacts on citizens' health: Municipalities are wondering about the health risks with the advent of 5G technology. Namely, could the proliferation of antennas and the use of new radio frequencies pose health risks for citizens?

Note 1: An “Off-the-table” point (from the City of Winnipeg document): Small cell placement, on utility infrastructure, or indoors – There is no municipal involvement in these decisions. Comment by 5G Winnipeg Awareness: this should change, and the City of Winnipeg should actively pursue to have influence on this matter.

Note 2 : We have concerns that the indemnification, as may have been signed in the agreement (Encroachment By-Law), provides inadequate coverage for lawsuits, e.g. should radiofrequency radiation be identified as harmful to human and environmental health.

## **7. As a user (business application)**

In keeping with the vision of “OurWinnipeg. It's Our City, It's Our Plan, It's Our Time”<sup>3</sup> for a safe and secure city as well as being a “sustainable city,” specifically with regard to energy usage, and a healthy place to live, fibre optics and wired connections should be the first and preferred option. Fibre optics is faster than wireless and in the long run will be more economical.

For more information, see the Urgent Appeal to the Government of Canada to Suspend 5G Rollout and to Choose Safe and Reliable Fibre Connections:

<http://c4st.org/5Gappeal/>

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<sup>3</sup> <https://winnipeg.ca/interhom/CityHall/OurWinnipeg/pdf/CallToAction.pdf>

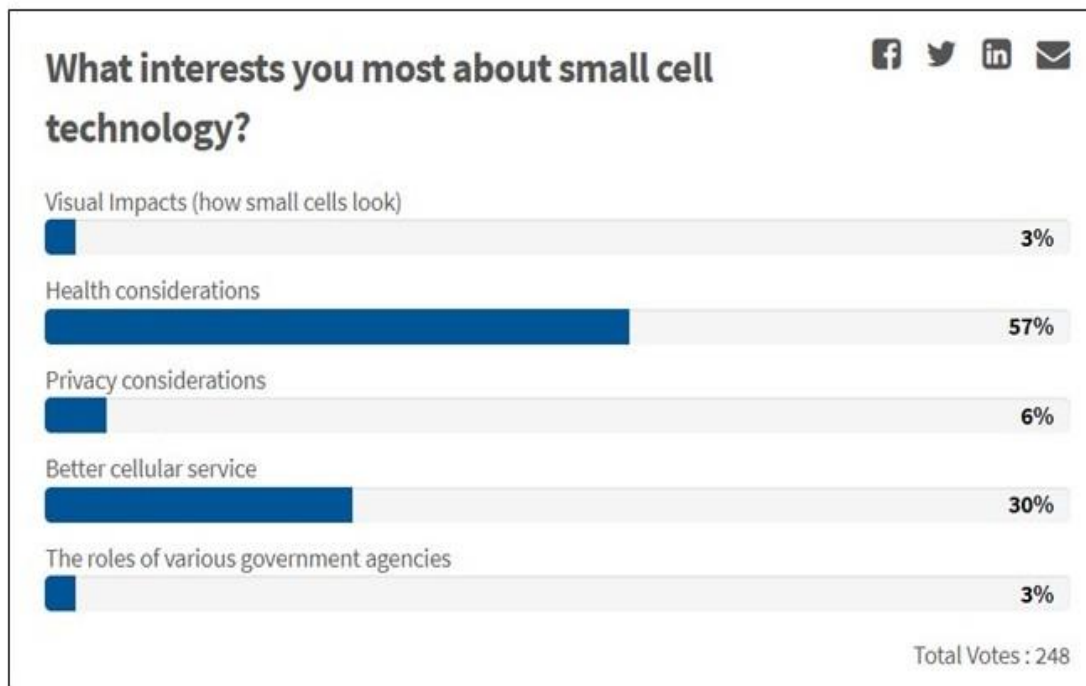
## FEEDBACK

1. City of Winnipeg
2. Feed-back from 5G Winnipeg Awareness Surveys, Petitions and responses from City Councillors and Mayor Bowman
3. Comments from 5G Winnipeg Awareness Members

### 1. City Winnipeg Poll results:

[https://engage.winnipeg.ca/smallcelltechnology?tool=quick\\_poll#tool\\_tab](https://engage.winnipeg.ca/smallcelltechnology?tool=quick_poll#tool_tab)

Of the total 248 responding, 70% had priorities other than better cell reception.



### 2. Feed-back from 5G Winnipeg Awareness Surveys, Petitions and Responses from City Councillors and Mayor Bowman

1. 5G Winnipeg Awareness survey and door-to-door feed-back.
2. 5G Winnipeg Petition hard copy and online: <https://5gwinnipegawareness.ca/>
3. Email responses to our members from City of Winnipeg Councillors and Mayor Bowman's office.

#### Findings:

- Winnipeggers are generally uninformed about the implications of small cell network antennas throughout Winnipeg. When they do learn more about the issue (from our information as well

as their own research), the vast majority are opposed to the widespread deployment of small and big cell antennas throughout our city.

- It is also abundantly clear that Mayor Bowman and City Councillors are not well informed.

### **3. Comments from 5G Winnipeg Awareness Members:**

**Note: 5G Winnipeg Awareness may not endorse all comments.**

- it is dangerous, what we have already is making people sick, huge threat to our ecosystems and life on earth as we know it.
- it can be delivered to the premise via FTTP, more secure, private faster energy efficient
- 5g millimeter waves not ready yet so why the need for the small cells?
- bad for children and pregnant women - women in China need to wear smocks made of lead to block radiation
- concern health considerations on the Public Engagement Poll approximately doubled in numbers that of concern for cell service
- it is only needed for mobile service and mobile speeds are fast enough
- mental health disorders, thyroid cancer, and brain tumors on the rise in our children at an alarming rate
- we must do what we can to stop this or we simply will not have a next generation workforce capable of keeping our city and its economy viable
- massive impacts on our health care system which is already strained
- small cells are going to be an eyesore wherever we look – no matter the direction
- it is a 10+ year contract so once this goes through there is no taking it down once we have signed and cancer has a long latency so the health damage will have been done even if they are taken down upon the end of the contract.
- the vast majority of citizens are unaware that these are going to go up in front of their homes and on major streets/city infrastructure
- In response to today's interview question #2: What the greatest opportunities for yourself, your organization, and for Winnipeg? We have the opportunity to protect the citizens, flora and fauna of Winnipeg from the devastating short and long term effects that mobile 5g will produce while still ensuring them service to their homes and businesses via FTTP. Our greatest opportunity is the one to decide that Winnipeg will be a "smarter" city by adamantly opposing any small cells and investing in FTTP, insisting that big telecoms fit each building with fibre. Only if all avenues for these great opportunities have been exhausted, only then, our greatest opportunity is to have the city allow citizens the right to buffer zones for medical or other reasons (schools, bus stops, hospitals, daycares need to be buffered as well)



-the biggest challenges with small cell technology include:

- regular monitoring of emission levels on all antennas to ensure safety levels are being met
- the health effects and sick days/disability of our work force is going to require once these are in place and start affecting people
- parents will need time off when children get sick
- public safety will be an issue when people who are tired, confused suffering from cognitive issues, mental health disorders , mood disorders, and they will be unable to parent, operate heavy machinery, make decisions

-our future generation(s) will have birth defects, miscarriages, premature births, ADHD, Autism – this installation will largely affect childbearing women, babies, and children to an arguably higher degree. The science is strong that children absorb higher levels of radiation than adults. How do we protect children? Children are vulnerable, they are protected and promised safe living environment to the “highest degree” according to the Declaration on the Rights of the Child signed by Canada in the 1990’s.

#4 They have a role to meet everyone's needs safely

- they are elected by the people for the people
- letter of non-concurrence
- the must demand safe monitoring of levels and at minimum allow buffer zones
- they must tell us where these will be installed, exact locations, inform public of any upgrades (frequency changes and power upgrades)

#5 write a letter of non-concurrence

- insist on the option of FFTP

small cells are murder, children and people are going to be killed by this technology, whether it kills them via cancer, or they take their own life through suicide due to suffering.

-by moving forward without opposition our city elected officials have failed us in the worst possible way. Those responsible will be held accountable at some future point in court.

- All I have to add is how can they allow experimentation on people like guinea pigs, it is completely unethical and immoral? there are international laws established after the second world war against industry experimentation on people, establishing protections like the "Hippocratic Oath" and "informed" and "expressed" consent, and constitutional laws and human rights that are in place to prevent this type of scientific bodily and environmental misconduct.

- Who will be liable for harm to the citizens of Winnipeg? and has the City explained the potential thermal and biological harms caused by this technology to the people, and then, after the people being well informed about the risks, asked for their expressed consent??

- Being that the technology has never been tested for safety, then it is logically considered a "No Go" "IDLH" an immediate danger to life and health until proven otherwise.

- Not on my family, my family is well informed, we do not consent.
- I have some serious concerns about the 5G towers going up. Following the lead from other countries who went before us there were some good studies done to show that there could be some physical altering effects of these towers. Not enough testing has gone on. They are an eyesore. We do not need this.
- For the health and safety of Winnipeg residents, we need: • the City of Winnipeg to write a letter of non-concurrence; • City Committees and City Council to pass motions asking the federal government for a moratorium until there is a scientific consensus of safety to the public, which would include scientists independent of the wireless industry. This and similar motions were passed in Ontario and Quebec by municipalities; • Full and meaningful public consultations by the City of Winnipeg in all parts of the city where there are proposals for installations of small 4G or 5G cell antennas; • A meaningful and influential role of residents in decision-making regarding the small cell technologies project and full transparency of the process; • Clear notification that small cell antennas will be installed, their specifications and where they will be located, to all nearby residents. Also, notifications when the power densities are increased and 5G, or technologies with millimeter waves, are installed; • Maps of where small 4G and 5G antennas are located available on the City of Winnipeg website; • Antennas that are clearly labelled so that people can see where and what they are e.g. in bus shelters, and; • Buffer zones for people requesting them for medical or other reasons.
- The City of Winnipeg has a duty to protect the health of its residents. It must play a key role in raising awareness among key stakeholders so that the full impact of 5G technology deployments is known and understood by all and adequate actions taken.

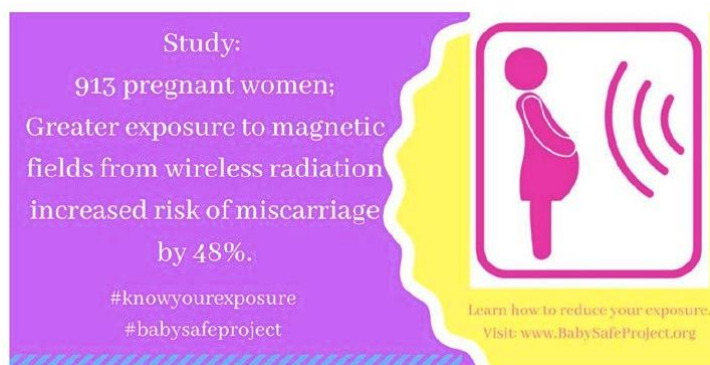
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**Figure. Example of a symbol for use on poles and other structures located in public rights-of-way that hold 5G antennae**

Commission to Study the Environmental and Health Effects of Evolving 5G Technology, State of New Hampshire. (2020). **Final Report**. Page 95.

<http://www.gencourt.state.nh.us/statstudcomm/committees/1474/reports/5G%20final%20report.pdf>



**Figure. Example of an RF radiation warning.**

Commission to Study the Environmental and Health Effects of Evolving 5G Technology, State of New Hampshire. (2020). **Final Report**. Page 94.

<http://www.gencourt.state.nh.us/statstudcomm/committees/1474/reports/5G%20final%20report.pdf>

**Submission (10 pages with appendices)  
to Innovation and Economic Development Committee.  
City of Winnipeg, City Hall – by phone.**

**Monday, June 15, 2020 9:30 am**

By Margaret Friesen on behalf of 5G Winnipeg Awareness

**Item 3: Award of Contract Cellular Wireless & Cellular Data Service**

**Item 4: Cell reception and small Cell Technology Implementation**

**Item 5: Winnipeg Antenna Systems Policy - 5G Network**

**Good morning Councillors Orlikow, Eadie, Lukes and Nason,**

Thank you for the opportunity to present.

My name is Margaret Friesen. I am representing “5G Winnipeg Awareness” who are residents from all parts of the City of Winnipeg who are deeply concerned about the pervasive expansion of radiofrequency emitting antennas installed close to where people spend much of their lives.

I presented about the concerns surrounding 5G antennas to the Innovation and Economic Development (IED) Committee on May 13<sup>th</sup>, 2020 (Appendix A) February 10<sup>th</sup>, 2020 (Appendix B) and Property Development, Heritage and Downtown Development (PDHPD) Committee on January 6<sup>th</sup>, 2020 (Appendix C), as well as to various City committees and City Council before the very flawed Winnipeg Antenna Systems Policy (WASP) was passed in 2015.

**ITEM 3. Award of Contract for the Provision of Cellular Wireless and Cellular Data Services- Material management Reference #1145-2019**

The public should have an opportunity to examine the 9 million dollar contract e.g. to comment if wired connections are at all feasible in some cases. Wired connections use less energy and are more secure from hacking, and do not emit harmful radiofrequency radiation.

**ITEM 4. Cell Reception and Small Cell Technology Implementation**

1. We have been asking questions since the issue of possible installations of small antennas began. Most have been unanswered.

**We request full participation of residents of Winnipeg in the open collaboration for “ Cell Reception and Small Cell Technology Implementation”**

2 An email has been sent letter to Councillors from Dr. J.P Dorst, a biophysicist, requesting additional time to make a submission on the scientific evidence showing adverse effects of radiofrequency

radiation below safety guidelines. Dr. Dorst was instrumental in having asbestos pipes replaced in the City of Winnipeg's water supply in the early 1980s. This was after he and colleagues showed that, contrary to what was then stated by health officials, that asbestos in the pipes could not be a health hazard. (Supplemental Information 1). Asbestos is now classified as a known carcinogen and there is evidence that radiofrequency radiation should be in the same category.

Letters to Dr. Roussin (Chief Provincial Public Health Officer, Province of Manitoba) and one to Mayor Bowman have been sent by me (Environmental Health Association of Manitoba), Dr. Miller regarding cancer and other adverse health effects, and Dr. Bray – electrical sensitivities (Supplementation Information 2,3,4,5 respectively). Also see Supplemental Information 5 for a relevant quote.

**Request that the City of Winnipeg suspend all actions regarding binding commitments for permitting and implementing of small cell antennas until Dr. Roussin's office provides a response to the letters that I and others have sent him on this issue of public health.**

**2. Liability issues** – the City's "Legal Services Department" was consulted as to legal issues for ITEM 3 but not for ITEM 4. Why not? Legal cases awarding damages for radiofrequency radiation exposure have been successful in at least two cases in other countries. A number of other lawsuits are underway around the world.

**We request that the City of Winnipeg provide a full legal opinion as Niagara Falls, Ontario has done.**

**3.** Need for a full public consultation on rollout of 5G small antennas in Winnipeg before any binding commitments are made. This is allowed according the current policy (see Appendices).

**We request, again, that one of the Councillor's, today, makes a motion to have the City hold meaningful public consultations on the "small cell technology implementation" and how "5G" fits into the Winnipeg Antennas Systems Policy.**

#### **ITEM 5. Review of the Winnipeg Antenna Systems Policy – 5G Network**

Public consultation should also be required separate from participation in the input as stakeholders in the review of the current policy. As the Councillors and public service rightly points out, the approval of the siting of cell antennas is federal jurisdiction. Yet, had it not been for me pointing out that notification of the Member of Parliament had been omitted, this would not have been put back into the current policy. Clarification is also needed on which frequencies constitute 5G technologies. Adequate lead time is needed. Seeing an item on the agenda on a Thursday for a presentation on Monday morning may provide not sufficient time.

**We request that the Councillors today make a motion to ensure there is meaningful public consultation on revising the Winnipeg Antenna systems Policy.**

Respectfully submitted.

Margaret Friesen M.Sc.

Spokesperson, 5G Winnipeg Awareness, [5g.winnipeg.awareness@gmail.com](mailto:5g.winnipeg.awareness@gmail.com)

#### **SUPPLEMENTAL INFORMATION:**

##### **SUPPLEMENTAL INFORMATION: 1. Email to Councillor Orlikow, June 12, 2020 from Dr. JP Dorst:**

**Dr. Jean-Paul Dorst.** Ph. D. in Biophysics in 1979 at the Max-Planck-Institut für Biophysik in Frankfurt am Main, Germany. Taught Physics including Biophysics in French at the Saint-Boniface University College from 1984 to 1989. Was instrumental in the removal of asbestos pipes and replacement with safe plastic pipes in 1983/1984 for the delivery of drinking water.

*"I would like to provide you over the next couple of weeks with more scientific evidence of these harmful effects related to 5 G and EMF. Therefore, I respectfully request that your committee puts your promotional efforts for the 5 G technology in Winnipeg temporarily, if not permanently on hold until you have had the chance to review my documented evidence."*

##### **Examples: Two recent reviews on 5G and biological effects:**

- 1) Simkó, Myrtil, and Mats-Olof Mattsson. "5G Wireless Communication and Health Effects—A Pragmatic Review Based on Available Studies Regarding 6 to 100 GHz." *International Journal of Environmental Research and Public Health* 16, no. 18 (January 2019): 3406. <https://doi.org/10.3390/ijerph16183406>.

*"The available studies do not provide adequate and sufficient information for a meaningful safety assessment, or for the question about non-thermal effects. There is a need for research regarding local heat developments on small surfaces, e.g., skin or the eye, and on any environmental impact. Our quality analysis shows that for future studies to be useful for safety assessment, design and implementation need to be significantly improved."*

- 2) Leszczynski, Dariusz. "Physiological Effects of Millimeter-Waves on Skin and Skin Cells: An Overview of the to-Date Published Studies." *Reviews on Environmental Health* In Press (2020): 23. Accepted. June 2020.

*"The currently ongoing deployment of the 5th generation of the wireless communication technology, the 5G technology, has reignited the health debate around the new kind of radiation that will be used/emitted by the 5G devices and networks – the millimeter-waves. The new aspect of the 5G technology, that is of concern to some of the future users, is that both, antennas and devices will be continuously in a very close proximity of the users' bodies. Skin is the only organ of the human body, besides the eyes, that will be directly exposed to the mmwaves of the 5G technology. However, the whole scientific evidence on the possible effects of millimeter-waves on skin and skin cells, currently consists of only some 99 studies. This clearly indicates that the scientific evidence concerning the possible effects of millimeter-waves on humans is insufficient to devise science-based exposure limits and to develop science-based human health policies. The sufficient research has not been done and, therefore, precautionary measures should be considered for the deployment of the 5G, before the sufficient number of quality research studies will be executed and health risk, or lack of it, scientifically established."*

**Comment by Dr. Joel Moskowitz:** *"This review summarizes research on the effects of millimeter waves on the skin. None of these studies has examined 5G millimeter waves. 5G employs specialized technology including phased arrays, beam-forming, and massive MIMO. 5G millimeter waves may be more biologically active and result in more adverse health effects than the earlier millimeter wave studies found."*

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

**SUPPLEMENTAL INFORMATION 2: letter of the Environmental Health Association to Dr. Roussin.**

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**EHA-MB**  
Environmental Health  
Association of  
Manitoba

9 June 2020

Dr. Brent Roussin  
Chief Provincial Public Health Officer, Province of Manitoba  
Via email: [brent.roussin@gov.mb.ca](mailto:brent.roussin@gov.mb.ca)

Dear Dr. Roussin,

**SUBJECT: Urgent request to contact Councillor Orlikow before June 15<sup>th</sup> to ask for a delay in the permitting of thousands of cellular antennas throughout Winnipeg, to allow time to investigate implications of health consequences for some Winnipeg residents**

I am writing on an urgent matter. Please contact City of Winnipeg Councillor John Orlikow before June 15<sup>th</sup> to request more time to investigate a potential public health situation. On June 15<sup>th</sup>, the City of Winnipeg's Standing Committee on Innovation and Economic Development (IED)<sup>4</sup>, chaired by Councillor Orlikow, may<sup>5</sup> take the next step, and may even commit, to the permitting of thousands of new cellular network antenna installations in front of Winnipeg homes and, without exaggeration, everywhere else in the City. The City's estimate is that there would be an antenna (radiofrequency radiation emitter) installed approximately every half-block on lamp posts and hydro poles in residential neighbourhoods. Other antennas would be attached to traffic lights and to other types of "non-tower" structures including buildings<sup>6</sup>.

The pervasive, continuous exposure of radiofrequency (RF) radiation from these antennas (4G LTE and 5G) likely will bring undue hardship to some Winnipeg residents, like myself, who have electrical sensitivities. Estimates from other countries are that 1-3% of the population are adversely affected by exposure to electromagnetic radiation at everyday levels tolerated by most people. We fear that we will have to move to residences away from Winnipeg. We are also concerned that the numbers of adversely affected persons will increase and that the medical profession in Manitoba may not be adequately prepared to provide the appropriate medical care.

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<sup>4</sup> <https://winnipeg.ca/clerks/council/meetings.stm?trumbaEmbed=date%3D20200615&winClose=1>

<sup>5</sup> A meeting has been scheduled but the agenda is not posted. Passing of any motion to proceed would be hard to undo.

<sup>6</sup> City of Winnipeg Report: Item 2. Cell Reception and Small Cell Implementation: 9 pages  
<http://clkapps.winnipeg.ca/dmis/ViewDoc.asp?DocId=19807&SectionId=&InitUrl=>

As you may know, the Ontario Environmental Health Clinic at Women's College Hospital in Toronto held a symposium in May 2019 titled: *Impacts of Wireless Technology on Health: A symposium for Ontario's medical community*. They are concerned that the massive increase in exposure will also increase the number and severity of various health problems associated with wireless radiation, and thereby resulting in increased healthcare costs<sup>7</sup>. I have appended the press release for the symposium to this letter.

I was fortunate to have been assessed at this Clinic for electrical sensitivity about 20 years ago. This assessment added crucial documentation for my successful claim for disability benefits and eventually a return to work, with accommodation.

The City may respond that this is federal jurisdiction and that it is the federal government that provides the approvals. This is true, however, the City can take steps to delay the permitting process, which is under its control. It can also write a letter of "non-concurrence" to the responsible federal Minister of Innovation, Science and Economic Development (ISED). The Minister can then decide whether or not to provide approvals. There are precedents involving cell tower siting disputes, where the federal Minister has passed the dispute back to the communities and telecommunications companies to resolve.

Please send a message to John Orlikow, Chair of the IED committee, asking the Committee to hold off making long-term commitments until your office can fully investigate this issue. Councillor Orlikow's email address is [jorlikow@winnipeg.ca](mailto:jorlikow@winnipeg.ca) and his office phone number is 204.986.5236

Delaying the decision by the IED committee would provide some time for us to provide you with more information, and your office the time to more fully investigate this potential public health problem.

I have contacted several individuals with electrical sensitivities in Winnipeg to support this request and you may be receiving letters from them as well.

We also would like to arrange to meet with you to provide more information relevant to concerns about expected increased exposures from antennas and related applications, as well as the many challenges that people in Manitoba with "lived experience" face, ranging from day-to-day management of this condition, to issues of accessing appropriate healthcare.

Your immediate attention to this matter would be greatly appreciated.

I would be glad to discuss this further and provide more information.

Sincerely,

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<sup>7</sup> *Impacts of Wireless Technology on Health: A symposium for Ontario's medical community*

Approved for: 6.0 Section 1 Royal College of Physicians and Surgeons

6.0 College Family Physicians of Canada Mainpro+ credits

By Continuing Professional Development of the Faculty of Medicine, University of Toronto

<https://www.womenscollegehospital.ca/care-programs/environmental-health-clinic/june-2019-conference-videos>



Margaret Friesen M.Sc.

Environmental Health Association of Manitoba, Director

Phone: 204-261-8591

Email: ehamanitoba@gmail.com

Address: 43 Rutgers Bay, Winnipeg, MB R3T 3C9

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[Press Release May 30, 2019 - Impacts of Wireless Technology on Health: A symposium for Ontario's medical community:]

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## **Ontario Doctors Warn of Rising Health Care Costs after 5G Roll Out.**

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TORONTO, May 30, 2019 /CNW/ - Doctors treating patients from over-exposure to wireless radiation will join scientists at Queen's Park today to recommend the Ontario Government take steps to protect public health before the roll-out of 5G – the next generation of cell phone technology.

"My clinic is already assessing patients from across Ontario who are sensitive to microwave radiation from their wireless devices including cell phones, Wi-Fi, and an increasing number of smart appliances," said Dr. Riina Bray, Medical Director of the Environmental Health Clinic at Women's College Hospital in Toronto. "We expect 5G to add to this burden."

Scientists from 42 countries are now warning their governments about the emerging health problems associated wireless radiation. The initial 5G infrastructure is planned to begin in the Toronto to Montreal corridor. Daily human exposure to microwave radiation is already more than a trillion times higher than it was before cell phones.

Dr. Anthony Miller, Professor Emeritus with the University of Toronto, and adviser to the International Agency for Research on Cancer says, "Many scientists worldwide now believe that radiofrequency radiation should be elevated to a Class One human carcinogen, on the same list as Cigarettes, X-Rays, and Asbestos."

The doctors will advise the Province that increased health care costs can be avoided, if the government takes precautions to protect the public from exposure to 5G technology.

Women's College Hospital will host a medical symposium tomorrow, designed to educate Ontario healthcare practitioners to identify the symptoms of electrical sensitivity and develop treatment plans for their patients.

**SUPPLEMENTAL INFORMATION: 3,4. LETTERS: Dr. Miller to Mayor Bowman with letter sent to Dr. Brent Roussin**

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***Dr. Anthony B. Miller***

136 Charles Street  
Port Hope  
Ontario, L1A 1T3

June 6, 2020

Mayor Brian Bowman  
City of Winnipeg  
[dlorentz@winnipeg.ca](mailto:dlorentz@winnipeg.ca)

**Subject: My letter to Dr. Brent Roussin, Chief Public Health Officer regarding:**

**Urgent request to delay the permitting of small cellular antenna infrastructure in the City of Winnipeg because of scientific evidence supporting radiofrequency radiation as being carcinogenic to humans as well as having other adverse effects**

I am a Canadian physician and epidemiologist deeply concerned about the pervasive expansion across Canada of radiofrequency radiation emitting cellular antennas in neighbourhoods close to homes and schools. There are significant potential adverse consequences for public health.

The City of Winnipeg is about to begin the permitting of thousands of these cellular antennas throughout the City. Although final approval of these antenna installation rests with the federal department of Innovation, Science and Economic Development, the City of Winnipeg can voice its objections to the federal authorities in a number of ways. There is precedence in the changing of the regulations of cellular siting regulations by the federal government.

I have attached my letter to Dr. Brent Roussin outlining my concerns for your consideration.

I would be glad to respond to questions and to provide more information.

Sincerely,



Anthony B. Miller MD, FRCP, CM.

Professor Emeritus, Dalla Lana School of Public Health, University of Toronto  
Telephone 905 885 0253. Email: ab.miller@utoronto.ca

Attachment: Letter to Dr. Brent Roussin, Chief Public Health Officer, Manitoba

cc: Murray Cunningham, President

Environmental Health Association of Manitoba via [ehamanitoba@gmail.com](mailto:ehamanitoba@gmail.com)

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<sup>1</sup> Item2 – Public Service written report :

<http://clkapps.winnipeg.ca/dmis/ViewDoc.asp?DocId=19807&SectionId=&InitUrl=>

<sup>1</sup> Public service verbal report and response to questions: Starts at about 1 hour 30 minutes:

<http://clkapps.winnipeg.ca/dmis/ViewDoc.asp?DocId=19807&SectionId=&InitUrl=>

<sup>1</sup> Miller, Anthony B., L. Lloyd Morgan, Iris Udasin, and Devra Lee Davis. "Cancer Epidemiology Update, Following the 2011 IARC Evaluation of Radiofrequency Electromagnetic Fields (Monograph 102)." *Environmental Research* 167 (July 17, 2018): 673–83. <https://doi.org/10.1016/j.envres.2018.06.043>.

<sup>1</sup> Miller, Anthony B., Margaret E. Sears, L. Lloyd Morgan, Devra L. Davis, Lennart Hardell, Mark Oremus, and Colin L. Soskolne. "Risks to Health and Well-Being From Radio-Frequency Radiation Emitted by Cell Phones and Other Wireless Devices." *Frontiers in Public Health* 7 (2019). <https://doi.org/10.3389/fpubh.2019.00223>.

<sup>1</sup> Russell, Cindy L. "5 G Wireless Telecommunications Expansion: Public Health and Environmental Implications." *Environmental Research* 165 (August 1, 2018): 484–95. <https://doi.org/10.1016/j.envres.2018.01.016>.

<sup>1</sup> Simkó, Myrtil, and Mats-Olof Mattsson. "5G Wireless Communication and Health Effects—A Pragmatic Review Based on Available Studies Regarding 6 to 100 GHz." *International Journal of Environmental Research and Public Health* 16, no. 18 (January 2019): 3406. <https://doi.org/10.3390/ijerph16183406>.

<sup>1</sup> Clegg, Frank M., Margaret Sears, Margaret Friesen, Theodora Scarato, Rob Metzinger, Cindy Lee Russell, Alex Stadtner, and Anthony B. Miller.(2020) "Building Science and Radiofrequency Radiation: What Makes Smart and Healthy Buildings." *Building and Environment*. <https://doi.org/10.1016/j.buildenv.2019.106324>

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## **SUPPLEMENTAL INFORMATION 5. Letter of Dr. Riina Bray to Dr. Roussin.**

June 12<sup>th</sup>, 2020

From:  
Dr. R. I. Bray  
13069 Keele St.  
King City, L7B 1G1  
Ontario

To:  
Dr. Brent Roussin  
Chief Provincial Public Health Officer, Province of Manitoba  
Via email: [brent.roussin@gov.mb.ca](mailto:brent.roussin@gov.mb.ca)

Dear Dr. Roussin

Residents with medical vulnerabilities living in Winnipeg have asked me to reach out to you because of concern that their existing diagnoses of electromagnetic hypersensitivity (EHS) will become intensified and cause further physical impairment and disability.

In my work as Medical Director of the Environmental Health Clinic, Women's College Hospital, University of Toronto, my colleagues and I regularly diagnose patients with electrical sensitivity and are quite aware of the impact on health from microwave and radiofrequency radiation. There is an extensive number of scientific studies confirming physiological impacts on living organisms.

The exposure of more radiofrequency radiation through the deployment 5G will further injure these patients and the population at large, in particular those with chronic illnesses, the very young and the elderly.

In addition, a recent symposium I hosted at Women's College Hospital entitled 'Impacts of Wireless Technology on Health: A Symposium for Ontario's Medical Community' demonstrated that radiofrequency exposure is linked to many other degenerative conditions including cancer. Please see presentations at:  
<https://www.womenscollegehospital.ca/care-programs/environmental-health-clinic/presentation-conference-june2019>

Again, I strongly discourage the implementation of 5G into the city of Winnipeg, as it will injure not only those who have electrical sensitivity but affect the health of all the citizens to varying degrees.

Sincerely,

  
**Dr. Riina I. Bray**  
BASC, MSc, MD, FCFP, MHSc Medical Director Environmental Health Clinic at Women's College Hospital  
Assistant Professor, Department of Family and Community Medicine, University of Toronto  
Dalla Lana School of Public Health

**SUPPLEMENTAL INFORMATION 6:**

**Dr. Beatrice Golomb is Professor of Medicine in the Division of Internal Medicine at the University of California, San Diego School of Medicine.** She is also director of UCSD's Golomb Research Group which focuses on the relation of oxidative stress and mitochondrial function to health, aging, behavior, illness, environmental and medication effects and nutrition. Current research studies are on Gulf War Illness, statin and fluoroquinolone side effects and electrosensitivity. Dr. Golomb completed her undergraduate degree at University of Southern California in Physics. She then went on to obtain her PhD in Biology and her Medical Degree at the University of California San Diego. She was a postdoctoral fellow in the Computational Neurobiology Laboratory at Salk Institute.

*"Let our focus be on safer, wired and well shielded technology – not more wireless. This [USA} legislation, if passed, and the resulting unrestricted roll-out of this technology, will predictably and directly injure and disable a new group, and add depth of suffering to those already affected."*

<https://ehtrust.org/wp-content/uploads/Golomb-SB-649-5G-letter-2017-08-18b.pdf>

## **((5G)) Winnipeg Awareness!**

**Submission (3 pages with appendices)  
to Innovation and Economic Development Committee.**

**City of Winnipeg, City Hall – by phone.**

**Wednesday May 13th, 2020 9:30 am**

By Margaret Friesen on behalf of 5G Winnipeg Awareness

**Item 2: Cell reception and small Cell Technology Implementation**

**Item 3: Winnipeg Antenna Systems Policy - 5G Network**

**Good morning Councillors Orlikow, Eadie, Lukes and Nason,**

Thank you for the opportunity to present on small cell technology implementation and the review of the Winnipeg Antenna systems Policy as presented in the reports submitted by City staff for your consideration today (Items 2 and 3).

My name is Margaret Friesen. I am representing “5G Winnipeg Awareness” who are residents from all parts of the City of Winnipeg who are deeply concerned about the pervasive expansion of radiofrequency emitting antennas installed close to where people spend much of their lives.

I presented about the concerns surrounding 5G antennas to the Innovation and Economic Development (IED) Committee on May 13, 2020 (Appendix A) February 10<sup>th</sup>, 2020 (Appendix B) and Property Development, Heritage and Downtown Development (PDHPD) Committee on January 6<sup>th</sup>, 2020 (see Appendix C), as well as to various City committees and City Council before the very flawed Winnipeg Antenna Systems Policy (WASP) was passed in 2015.

### **Our submission Items:**

1. Need for a full public consultation on rollout of 5G small antennas in Winnipeg.
2. Comments on Item 2 on today’s agenda: Cell Reception and Small Cell Technology Implementation
3. Comments on Item 3 on today’s agenda: Review of the Winnipeg Antenna Systems Policy – 5G Network

### **1. Need for a full public consultation on rollout of 5G small antennas in Winnipeg**

First, I would like to remind Councillor Orlikow that when you met with Eleanor Bond and me, you assured us that the voices of Winnipeggers would be heard on the issue of small cell antennas. This has not yet taken place.

Councillors, I believe, and I think you will agree, that one of your main responsibilities is to the residents of this City. That you and the Mayor have committed to an open and transparent process on issues that matter to Winnipeggers. This is one of those issues. I have heard from many residents of Winnipeg, and I think that you also have heard from only some of them, that we have been left in the dark on this issue. According to the report there will be at least 3,400 antennas, and perhaps more than 7,000 small antennas throughout Winnipeg. There are many questions for which Winnipeggers would like to have fulsome answers.

In case you are not aware, there are provisions in Item 2 report and in the Antenna Systems Policy for public consultations.

### **In the item 2 Report:**

- Page 3, Directive 1: 1<sup>st</sup> paragraph under B.  
“ ... Innovation Science and Economic Development (ISED) is the approval and licensing authority for radiocommunications facilities and encourages municipalities to seek **meaningful local input on antenna and tower siting as part of the federal licensing process.**”
- “The City provides a response to ISED on whether it concerns or does not concur with a proposed facility **based on** a land use review and **results of a consultation process.**”
- The word “stakeholders” is used throughout the report. Are the residents of Winnipeg not also stakeholders?

### **In the Winnipeg Antenna systems Policy:**

#### **Page 1. Objectives**

- (2) “To set out an objective process, criteria and guidelines that are **transparent**...”

#### **Page 2. 2.2. Role of the City**

- “The ultimate role of the city is to issue a statement of concurrence or non-concurrence to the Proponent and to Industry Canada. The statement considers the land use requirement and compatibility of the Antenna System, **the responses of the affected residents** ...The City also guides and facilitates the siting process by:
- **Establishing a community consultation process, where warranted.**

#### **Also:**

- Page 7. Pont 5. “**Pre-consultation** is one of the most important elements in the Antenna siting process...”
- Page 17. Point 8.4. “The City may request the Proponent chair a public information session in cases where there is expected to be **significant public interest** ...”  
Public consultations for macro antenna towers held by Proponents have been shams, as many will attest to. I would be glad to share details from my and others’ experiences. It is important

for the City to host a consultation for the public to be given the opportunity for input and have questions addressed by knowledgeable staff.

**Our first and foremost request is that one of the Councillor's, today, makes a motion to have the City hold meaningful public consultations on the "small cell technology implementation" and how "5G" fits into the Winnipeg Antennas Systems Policy.**

Councillor Orlikow – you have already stated that Winnipeggers' voices will be heard on this. Councillors Lukes and Councillor Nason – I believe that you gave similar indications to me and others that the public should be informed on this issue. Councillor Eadie – We have not had a detailed discussion on this, but I know that you favour informing those in your ward of issues of importance. So, I hope all will support such a motion.

**2. Comments on Item 2 on today's agenda:** Cell Reception and Small Cell Technology Implementation

This report addresses only a few of the questions put forward by us (see Appendix B and C).

Of importance:

**1) What is meant by 5G in the report?** Is it the frequencies (less than 6 GHz) that Rogers is rolling out in major cities across Canada? Is it the 5G that will include the mm waves (above 6 GHz) , many still to auctioned/licenced by the federal government? No one really knows what 5G with mm waves really entails, and if the City does, is it not its responsibility/obligation to inform Councillors and residents what it is?

Note: In the WASP, page 1 Objectives (6): the City is supposed to provide "informed consent" If City staff and City Councillors do not know what 5G is (and no one really knows what 5G technology with mm waves will be because much of it is still in development, or will be developed), then how can the City be providing an "informed statement of concurrence"?

**2) Liability issues** – the World Health Organization – International Agency for Research on Cancer (WHO-IARC) will be evaluating the evidence since 2011 when radiofrequency radiation was classified as a Group 1 *possible* carcinogen (meaning that there was some evidence of carcinogenicity, but not enough to put it into group 2A- *probable* or Group 1 *known* carcinogen). Where does the liability lie, if RF radiation is classified as a *known* carcinogen? Would it not be prudent to wait until that evaluation is complete?

Large insurance companies such as Lloyd's and Swiss Re are averse to insuring injury and damage from electromagnetic fields. What type of insurance is there, should there be injuries?

**A precautionary note about Health Canada and its predecessors:** In the late 1950s early 1960s, the federal health department approved thalidomide for treating morning sickness for pregnant women. Many Canadian babies were born with birth defects because of it. The compensation is just now being settled<sup>8</sup> even though the science was there to indicate precaution. (The USA did not approve the drug

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<sup>8</sup> *Federal settlement for thalidomide survivors gets court's approval*

<https://www.winnipegfreepress.com/arts-and-life/life/health/federal-settlement-for-thalidomide-survivors-gets-courts-approval-570318012.html>



because of lack of sufficient evidence to prove safety.)Health Canada ignored the science then. And, I think the science is there – see Table 1 – that we have early warnings that exposure to radiofrequency radiation, even at very low levels, can lead to harmful outcomes in years to come. Pregnant women trusted their doctors who trusted Health Canada. There is now compelling evidence to indicate that Health Canada cannot be trusted on this issue (see Table 1 for just some of it.).

**Other unanswered questions:** See Appendix B and C.

### **3. Comments on Item 3 on today's agenda: Review of the Winnipeg Antenna Systems Policy – 5G Network**

I could find no report under this item. I suggest that the report be made available for public comment and also that this is part of the public consultation.

Respectfully submitted.

Margaret Friesen M.Sc.

Spokesperson, 5G Winnipeg Awareness

[5g.winnipeg.awareness@gmail.com](mailto:5g.winnipeg.awareness@gmail.com)

Website: <https://5gwinnipegawareness.ca/>

Face Book: [https://www.facebook.com/5GWinnipegAwareness/?modal=admin\\_todo\\_tour](https://www.facebook.com/5GWinnipegAwareness/?modal=admin_todo_tour)

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**Table 1.**

**Adverse health effects of radiation emitted as wireless signals  
from pre-5G technologies:**  
**Scientific Evidence from Publications in Peer-reviewed Journals**  
Numerous frequencies and modulations are used to make wireless signals.  
5G wireless signals include 3G and 4G frequencies plus other frequencies  
of the electromagnetic wavelength "spectrum."  
**5G technology has not had any long term health safety exposure testing.**

Compiled by Margaret Friesen M.Sc., May 13, 2020

**A. CANCER** - Evidence to support a Group 1 "KNOWN HUMAN CARCINOGEN"  
classification [World Health Organization, International Agency for Research  
on Cancer (WHO-IARC)]

#### **EPIDEMIOLOGY UPDATES**

- Miller, A. B.<sup>\*</sup>, Morgan, L. L., Udasin, I., & Davis, D. L. (2018). **Cancer epidemiology update, following the 2011 IARC evaluation of radiofrequency electromagnetic fields (Monograph 102).** *Environmental Research*, 167, 673–683.

<https://doi.org/10.1016/j.envres.2018.06.043>

“Glioma is an important human cancer found to be associated with RFR in 9 case-control studies conducted in Sweden and France, as well as in some other countries. Increasing glioma incidence trends have been reported in the UK and other countries. Non-malignant endpoints linked include acoustic neuroma (vestibular Schwannoma) and meningioma. ... When considered with recent animal experimental evidence, the recent epidemiological studies strengthen and support the conclusion that RFR should be categorized as carcinogenic to humans (IARC Group 1).”

<sup>\*</sup>Anthony B. Miller, MD, FRCP, FRCP(C), FFPH, FACE. Professor Emeritus, Dalla Lana School of Public Health, University of Toronto. A physician-epidemiologist, he was trained in internal medicine, and was a member of the scientific staff of the Tuberculosis and Chest Diseases Research Unit, UK Medical Research Council, 1962-71. He was Director of the Epidemiology Unit of the National Cancer Institute of Canada 1971-86 and Chair of the Department of Preventive Medicine and Biostatistics, University of Toronto, 1992-96. He served as a special expert in the Division of Cancer Prevention, US National Cancer Institute, 1997, Senior Epidemiologist, International Agency for Research on Cancer 1998-99, Head, Division of Epidemiology, German Cancer Research Centre, Heidelberg, 2000-03, Associate Director, Research, Dalla Lana School of Public Health, University of Toronto, 2008-10. He has been a consultant to the World Health Organization. He is Scientific Lead of the OncoSim microsimulation modelling initiative of the Canadian Partnership Against Cancer. His research encompasses cancer etiology, prevention and screening.

- Hardell, L., & Carlberg, M. (2018). **Comments on the US National Toxicology Program technical reports on toxicology and carcinogenesis study in rats exposed to whole-body radiofrequency radiation at 900 MHz and in mice exposed to whole-body radiofrequency radiation at 1,900 MHz.** *International Journal of Oncology*.

<https://doi.org/10.3892/ijo.2018.4606>

“We conclude that there is clear evidence that RF radiation is a human carcinogen, causing glioma and vestibular schwannoma (acoustic neuroma). There is some evidence of an increased risk of developing thyroid cancer, and clear evidence that RF radiation is a multi-site carcinogen. Based on the Preamble to the IARC Monographs, RF radiation should be classified as carcinogenic to humans, Group 1.”

#### **CANADIAN BRAIN CANCER DATA**

2X RISK OF GLIOMAS WITH >558 HOURS OF CELL PHONE USE (APPROX. 10 MINUTES/DAY FOR 10 YEARS) - ADJUSTED FOR SELECTION AND RECALL BIAS.

- Momoli, F., Siemiatycki, J., McBride, M. L., Parent, M.-É., Richardson, L., Bedard, D., ... Krewski, D. (2017). **Probabilistic Multiple-Bias Modeling Applied to the Canadian Data From the Interphone Study of Mobile Phone Use and Risk of Glioma, Meningioma, Acoustic Neuroma, and Parotid Gland Tumors.** *American Journal of Epidemiology*, 186(7), 885–893.

<https://doi.org/10.1093/aje/kwx157>

“For glioma, when comparing those in the highest quartile of use (>558 lifetime hours) to those who were not regular users, the odds ratio was 2.0 (95% confidence interval: 1.2, 3.4). After adjustment for selection and recall biases, the odds ratio was 2.2 (95% limits: 1.3, 4.1).”

#### **BRAIN CANCER INCIDENCE IN ENGLAND**

- Philips, Alisdair, Henshaw, Denis L., Lamburn, Graham, & O’Carroll, Michael. (2018). **Brain tumours:**

**rise in Glioblastoma Muliforme incidence in England 1995-2015 suggests an adverse environmental or lifestyle factor.** *Journal of Environmental and Public Health*, 20.

<https://www.hindawi.com/journals/jep/2018/7910754/>

“UK Office of National Statistics (ONS) data covering 81,135 ICD10 C71 brain tumours diagnosed in England (1995–2015) were used to calculate incidence rates (ASR) per 100k person–years, age–standardised to the European Standard Population (ESP–2013). Results. We report a sustained and highly statistically significant ASR rise in glioblastoma multiforme (GBM) across all ages. The ASR for GBM more than doubled from 2.4 to 5.0, with annual case numbers rising from 983 to 2531. Overall, this rise is mostly hidden in the overall data by a reduced incidence of lower-grade tumours. Conclusions. The rise is of importance for clinical resources and brain tumour aetiology. The rise cannot be fully accounted for by promotion of lower–grade tumours, random chance or improvement in diagnostic techniques as it affects specific areas of the brain and only one type of brain tumour. Despite the large variation in case numbers by age, the percentage rise is similar across the age groups, which suggests widespread environmental or lifestyle factors may be responsible.”

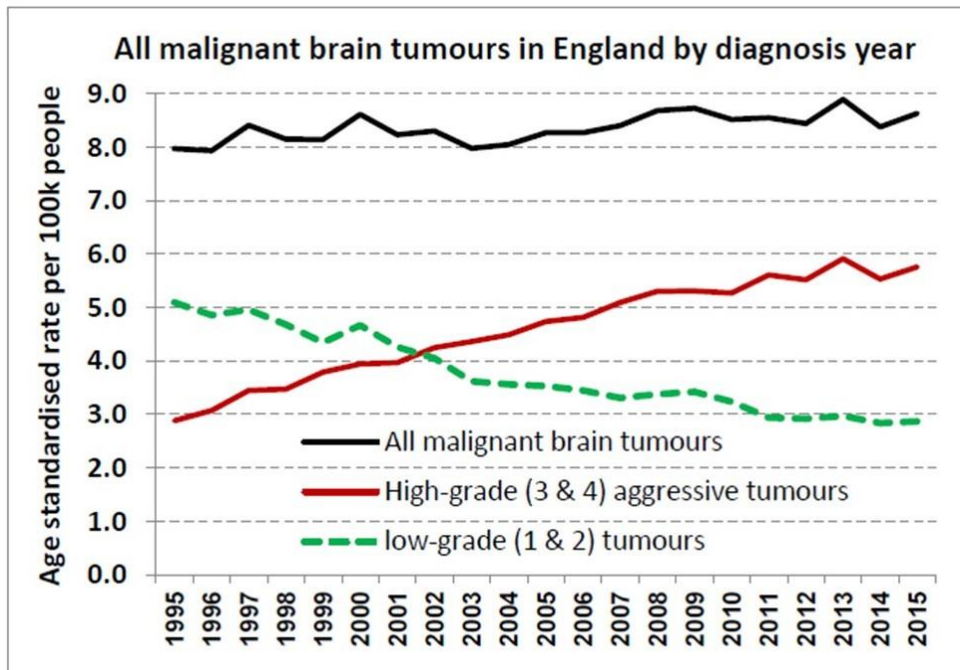


Figure 1. From: Philips A, et al; Rise in GBM incidence, England 1995–2015; Supplementary File. <https://www.hindawi.com/journals/jep/2018/7910754/>

## ANIMAL STUDIES

### CLEAR EVIDENCE OF CARCINOGENICITY

- National Toxicology Program, National Institute of Environmental Health Sciences. (2018). **Toxicology and carcinogenesis studies in Hsd: Sprague Dawley SD rats exposed to whole-body radio frequency radiation at a frequency (900 MHz) and modulations (GSM and CDMA) used by cell phones.** *NTP Technical Report 595*, 384. (This was a multi-million dollar study.)  
 “Under the conditions of this 2-year whole-body exposure study, there was clear evidence of carcinogenic activity of CDMA-modulated cell phone RFR at 900 MHz in male Hsd: Sprague Dawley SD rats based on the incidences of malignant schwannoma of the heart. The incidences of malignant

glioma of the brain were also related to RFR exposure.”

- Falcioni, L., Bua, L., Tibaldi, E., Lauriola, M., De Angelis, L., Gnudi, F., ... Belpoggi, F. (2018). **Report of final results regarding brain and heart tumors in Sprague-Dawley rats exposed from prenatal life until natural death to mobile phone radiofrequency field representative of a 1.8 GHz GSM base station environmental emission.** *Environmental Research*.

<https://doi.org/10.1016/j.envres.2018.01.037>

“[Our] findings on far field exposure to RFR are consistent with and reinforce the results of the NTP study on near field exposure, as both reported an increase in the incidence of tumors of the brain and heart in RFR-exposed Sprague-Dawley rats. These tumors are of the same histotype of those observed in some epidemiological studies on cell phone users.”

- Lerchl, A., Klose, M., Grote, K., Wilhelm, A. F. X., Spathmann, O., Fiedler, T., ... Clemens, M. (2015). **Tumor promotion by exposure to radiofrequency electromagnetic fields below exposure limits for humans.** *Biochemical and Biophysical Research Communications*, 459(4), 585–590.

<https://doi.org/10.1016/j.bbrc.2015.02.151>

“We have performed a replication study ... We could confirm and extend the originally reported findings. Numbers of tumors of the lungs and livers in exposed animals were significantly higher than in sham-exposed controls. In addition, lymphomas were also found to be significantly elevated by exposure ... many of the tumor-promoting effects in our study were seen at low to moderate exposure levels (0.04 and 0.4 W/kg SAR), thus well below exposure limits for the users of mobile phones ... Our findings may help to understand the repeatedly reported increased incidences of brain tumors in heavy users of mobile phones.”

## **B. RADIOFREQUENCY ENERGY ABSORBED IN DEEPER REGIONS IN CHILDREN’S HEADS**

Fernández, C., de Salles, A. A., Sears, M. E., Morris, R. D., & Davis, D. L. (2018). **Absorption of wireless radiation in the child versus adult brain and eye from cell phone conversation or virtual reality.** *Environmental Research*, 167, 694–699. <https://doi.org/10.1016/j.envres.2018.05.013>

“Modeling of a cell phone held to the ear, or of virtual reality devices in front of the eyes, reveals that young eyes and brains absorb substantially higher local radiation doses than adults’. Age-specific simulations indicate the need to apply refined methods for regulatory compliance testing; and for public education regarding manufacturers’ advice to keep phones off the body, and prudent use to limit exposures, particularly to protect the young.”

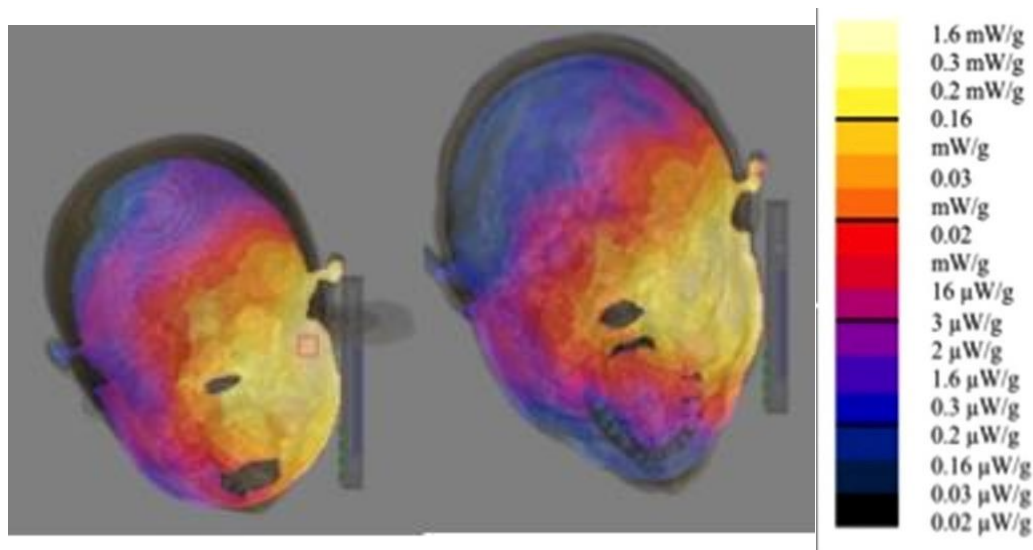


Figure 2. Specific Absorption Rate (SAR) in child (age 6 years) and adult male heads with phone in talk position. The scale is 50 dB with 0 dB = 1.6 mW/kg. From work of Claudio Fernández, 2018 (image used with permission of Environmental Health Trust).

### C. PUBLIC HEALTH RISKS (both Miller and Russell are medical doctors)

- Miller, A. B., Sears, M. E., Morgan, L. L., Davis, D. L., Hardell, L., Oremus, M., & Soskolne, C. L. (2019). **Risks to Health and Well-Being From Radio-Frequency Radiation Emitted by Cell Phones and Other Wireless Devices.** *Frontiers in Public Health*, 7. <https://doi.org/10.3389/fpubh.2019.00223>  
 “Based on the accumulated evidence, we recommend that IARC re-evaluate its 2011 classification of the human carcinogenicity of RFR, and that WHO complete a systematic review of multiple other health effects such as sperm damage. In the interim, current knowledge provides justification for governments, public health authorities, and physicians/allied health professionals to warn the population that having a cell phone next to the body is harmful, and to support measures to reduce all exposures to RFR [radiofrequency radiation].”
- Russell, C. L. (2018). **5 G wireless telecommunications expansion: Public health and environmental implications.** *Environmental Research*, 165, 484–495. <https://doi.org/10.1016/j.envres.2018.01.016>  
 Website: Physicians for Safe Technology - <https://mdsafetech.org/>  
 “Like other common toxic exposures, the effects of radiofrequency electromagnetic radiation (RF EMR) will be problematic if not impossible to sort out epidemiologically as there no longer remains an unexposed control group. This is especially important considering these effects are likely magnified by synergistic toxic exposures and other common health risk behaviors. Effects can also be non-linear. Because this is the first generation to have cradle-to-grave lifespan exposure to this level of man-made microwave (RF EMR) radiofrequencies, it will be years or decades before the true health consequences are known. Precaution in the roll out of this new technology is strongly indicated.”

### D. BEHAVIOURAL PROBLEMS IN CHILDREN

Birks, L., Guxens, M., Papadopoulou, E., Alexander, J., Ballester, F., Estarlich, M., ... Vrijheid, M. (2017). **Maternal cell phone use during pregnancy and child behavioral problems in five birth cohorts.** *Environment International*, 104, 122–131. <https://doi.org/10.1016/j.envint.2017.03.024>

“Overall, 38.8% of mothers, mostly from the Danish cohort, reported no cell phone use during pregnancy and these mothers were less likely to have a child with overall behavioral, hyperactivity/inattention or emotional problems. Evidence for a trend of increasing risk of child behavioral problems through the maternal cell phone use categories was observed for hyperactivity/inattention problems (OR for problems in the clinical range: 1.11, 95%CI 1.01, 1.22; 1.28, 95%CI 1.12, 1.48, among children of medium and high users, respectively). This association was fairly consistent across cohorts and between cohorts with retrospectively and prospectively collected cell phone use data.”

## **E. ADVERSE EFFECTS ON SPERM QUALITY (one of several reviews with similar conclusions)**

Houston, B. J., Nixon, B., King, B. V., De Iuliis, G. N., & Aitken, R. J. (2016). **The effects of radiofrequency electromagnetic radiation on sperm function.** *Reproduction (Cambridge, England)*, 152(6), R263–R276. <https://doi.org/10.1530/REP-16-0126>

“Among a total of 27 studies investigating the effects of RF-EMR on the male reproductive system, negative consequences of exposure were reported in 21. Within these 21 studies, 11 of the 15 that investigated sperm motility reported significant declines, 7 of 7 that measured the production of reactive oxygen species (ROS) documented elevated levels and 4 of 5 studies that probed for DNA damage highlighted increased damage due to RF-EMR exposure. Associated with this, RF-EMR treatment reduced the antioxidant levels in 6 of 6 studies that discussed this phenomenon ....”

## **F. DNA DAMAGE (more than 30 studies)**

Panagopoulos, D. J. (2019). **Comparing DNA damage induced by mobile telephony and other types of man-made electromagnetic fields.** *Mutation Research/Reviews in Mutation Research*, 781, 53–62. <https://doi.org/10.1016/j.mrrev.2019.03.003>  
<https://www.sciencedirect.com/science/article/pii/S1383574218300991>

“The present review - of results published by my group from 2006 until 2016 - compares DNA fragmentation induced by six different EMFs on the same biological system - the oogenesis of *Drosophila melanogaster* - under identical conditions and procedures. Such a direct comparison between different EMFs - especially those employed in daily life - on the same biological endpoint, is very useful for drawing conclusions on their bioactivity, and novel. It shows that real MT EMFs are far more damaging than 50 Hz alternating magnetic field (MF) - similar or much stronger to those of power lines - or a pulsed electric field (PEF) found before to increase fertility. The MT EMFs were significantly more bioactive even for much shorter exposure durations than the other EMFs. Moreover, they were more damaging than previously tested cytotoxic agents like certain chemicals, starvation, dehydration. Individual parameters of the real MT EMFs like intensity, frequency, exposure duration, polarization, pulsing, modulation, are discussed in terms of their role in bioactivity. The crucial parameter for the intense bioactivity seems to be the extreme variability of the polarized MT signals, mainly due to the large unpredictable intensity changes.”

## **G. OXIDATIVE STRESS**

Oxidative stress can lead to many health conditions, including cancer, Alzheimer’s and Parkinson’s Diseases.

Yakymenko, I., Tsybulin, O., Sidorik, E., Henshel, D., Kyrylenko, O., & Kyrylenko, S. (2016). **Oxidative**



**mechanisms of biological activity of low-intensity radiofrequency radiation.** *Electromagnetic Biology and Medicine*, 35(2), 186–202. <https://doi.org/10.3109/15368378.2015.1043557>

“... among 100 currently available peer-reviewed studies dealing with oxidative effects of low-intensity RFR, in general, 93 confirmed that RFR induces oxidative effects in biological systems. A wide pathogenic potential of the induced ROS and their involvement in cell signaling pathways explains a range of biological/health effects of low-intensity RFR, which include both cancer and non-cancer pathologies. In conclusion, our analysis demonstrates that low-intensity RFR is an expressive oxidative agent for living cells with a high pathogenic potential and that the oxidative stress induced by RFR exposure should be recognized as one of the primary mechanisms of the biological activity of this kind of radiation.”

## **H. ELECTROHYPERSENSITIVITY (EHS)**

- Belyaev, I., Dean, A., Eger, H., Hubmann, G., Jandrisovits, R., Kern, M., ... Thill, R. (2016). **EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses.** *Reviews on Environmental Health*, 31(3). <https://doi.org/10.1515/reveh-2016-0011>  
“... the emerging electromagnetic hypersensitivity (EHS) is more and more recognized by health authorities, disability administrators and case workers, politicians, as well as courts of law. We recommend treating EHS clinically as part of the group of chronic multisystem illnesses (CMI), but still recognizing that the underlying cause remains the environment. In the beginning, EHS symptoms occur only occasionally, but over time they may increase in frequency and severity. Common EHS symptoms include headaches, concentration difficulties, sleep problems, depression, a lack of energy, fatigue, and flu-like symptoms. A comprehensive medical history, which should include all symptoms and their occurrences in spatial and temporal terms and in the context of EMF exposures, is the key to making the diagnosis.”
- Havas, M. (2019). **Electrohypersensitivity (EHS) is an Environmentally-Induced Disability that Requires Immediate Attention.** *J. Sci. Discov.*, 3(1), 20. <https://doi.org/jsd18020>  
“A growing number of countries are beginning to acknowledge that electrohypersensitivity (EHS) exists and a few countries have classified it as a disability or a functional impairment attributable to the environment. Epidemiological studies and in vivo experiments show that exposure to non-ionizing radiation (NIR) from extremely low to microwave frequency electromagnetic fields (EMF) at exposure intensities far below the maximum limits in international guidelines increases anxiety, depression, and physiological stress and impairs cognitive functions that include concentration, memory and learning.”

## **I. NON-THERMAL EFFECTS: HEALTH CANADA’S SAFETY CODE 6 GUIDELINES FOR CELL ANTENNA RADIATION ARE SOLEY BASED ON THERMAL (HEATING) EFFECTS**

- Belpomme, D., Hardell, L., Belyaev, I., Burgio, E., & Carpenter, D. O. (2018). **Thermal and non-thermal health effects of low intensity non-ionizing radiation: An international perspective.** *Environmental Pollution*, 242, 643–658. <https://doi.org/10.1016/j.envpol.2018.07.019>  
“Exposure to low frequency and radiofrequency electromagnetic fields at low intensities poses a significant health hazard that has not been adequately addressed by national and international organizations such as the World Health Organization. There is strong evidence that excessive exposure to mobile phone-frequencies over long periods of time increases the risk of brain cancer both in humans and animals. The mechanism(s) responsible include induction of reactive oxygen

species, gene expression alteration and DNA damage through both epigenetic and genetic processes. In vivo and in vitro studies demonstrate adverse effects on male and female reproduction, almost certainly due to generation of reactive oxygen species.”

- Smith-Roe, S. L., Wyde, M. E., Stout, M. D., Winters, J. W., Hobbs, C. A., Shepard, K. G., ... Witt, K. L. (2019). **Evaluation of the genotoxicity of cell phone radiofrequency radiation in male and female rats and mice following subchronic exposure.** *Environmental and Molecular Mutagenesis*. <https://doi.org/10.1002/em.22343>  
“Results of the comet assay showed significant increases in DNA damage in the frontal cortex of male mice (both modulations), leukocytes of female mice (CDMA only), and hippocampus of male rats (CDMA only).”

## J. CELL TOWER EXPOSURE STUDIES

Symptoms, DNA damage, oxidative stress

- Bortkiewicz, A., Gadzicka, E., Szykowska, A., Politański, P., Mamrot, P., Szymczak, W., & Zmyślony, M. (2012). **Subjective complaints of people living near mobile phone base stations in Poland.** *International Journal of Occupational Medicine and Environmental Health*, 25(1), 31–40. <https://doi.org/10.2478/s13382-012-0007-9>  
“Headache was declared by 57% people, most frequently (36.4%) living 100–150 m away from the base station compared to people living at longer distances ( $p = 0.013$ ). 24.4% subjects, mostly living at a distance above 150 m, declared impaired memory. Difference was statistically significant in comparison with people living at other distances ( $p = 0.004$ ).”
- Levitt, B. B., & Lai, H. (2010). **Biological effects from exposure to electromagnetic radiation emitted by cell tower base stations and other antenna arrays.** *Environmental Reviews*, 18, 369–395. <https://doi.org/10.1139/A10-018>  
“Both anecdotal reports and some epidemiology studies have found headaches, skin rashes, sleep disturbances, depression, decreased libido, increased rates of suicide, concentration problems, dizziness, memory changes, increased risk of cancer, tremors, and other neurophysiological effects in populations near base stations.”
- Zothansiam, Zosangzuali, M., Lalramdinpui, M., & Jagetia, G. C. (2017). **Impact of radiofrequency radiation on DNA damage and antioxidants in peripheral blood lymphocytes of humans residing in the vicinity of mobile phone base stations.** *Electromagnetic Biology and Medicine*, 1–11. <https://doi.org/10.1080/15368378.2017.1350584>  
“The analyses of data from the exposed group ( $n = 40$ ), residing within a perimeter of 80 m of mobile base stations, showed significantly ( $p < 0.0001$ ) higher frequency of micronuclei when compared to the control group, residing 300 m away from the mobile base station/s. The analysis of various antioxidants in the plasma of exposed individuals revealed a significant attrition in glutathione (GSH) concentration ( $p < 0.01$ ), activities of catalase (CAT) ( $p < 0.001$ ) and superoxide dismutase (SOD) ( $p < 0.001$ ) and rise in lipid peroxidation (LOO) when compared to controls. Multiple linear regression analyses revealed a significant association among reduced GSH concentration ( $p < 0.05$ ), CAT ( $p < 0.001$ ) and SOD ( $p < 0.001$ ) activities and elevated MN frequency ( $p < 0.001$ ) and LOO ( $p < 0.001$ ) with increasing RF power density.”

## K. HEALTH CANADA’S SAFETY CODE 6 GUIDELINES COMPARED TO RECOMMENDED PRECAUTIONARY LIMITS



<b>PUBLIC EXPOSURE GUIDELINES</b>	<b>INTENSITY (mW/m<sup>2</sup>)</b>
<b>Safety Code 6 (for 6 GHz and higher)</b>	<b>10,000</b>
<b>Belgium, parts of Italy</b>	<b>100</b>
<b>Austrian Sustainable Building Council</b>	<b>1</b>
<b>EUROPAEM* (MDs)</b>	<b>0.1</b>
<b>Natural (all frequencies)</b>	<b>0.001</b>
<b>Cosmic background</b>	<b>0.0000001</b>

\* \*Belyaev, et al. (2016). **EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses**. Modified from Powerwatch  
<https://www.powerwatch.org.uk/science>

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**Brief (4 pages with the remainder being appendices)  
to Innovation and Economic Development Committee.  
City of Winnipeg, City Hall. Monday February 10th, 2020 9:30 am  
By Margaret Friesen on behalf of 5G Winnipeg Awareness**

**Item 2: Winnipeg Antenna Systems Policy - 5G Network**

Good morning Councillors - Thank you for the opportunity to present on this important topic of 5G technologies and associated so-called “small cell” antenna infrastructure.

My name is Margaret Friesen. I am representing “5G Winnipeg Awareness” who are residents from all parts of the City of Winnipeg who are deeply concerned about the pervasive expansion of radiofrequency emitting antennas installed close to where people spend much of their lives.

I presented about the concerns surrounding 5G antennas to the Property Development, Heritage and Downtown Development committee on January 6<sup>th</sup>, 2020 (see Appendix B).

It is not just Winnipeggers who are concerned about 5G roll out. People worldwide are voicing opposition because the standards in their countries, are not protective of human health.

On January 25<sup>th</sup>, 2020 protests were held across Canada and around the world.

- FOR CANADA, at least 14 events in 8 provinces. See - EMR Health Alliance BC:  
<https://emrabc.ca/?p=16197>
- WORLDWIDE:
  - EMR Radiation Safety (Joel Moskowitz, Ph.D., Public Health, University of California, Berkeley)- <https://www.saferemr.com/2020/01/5g-global-protest-1-25-2020.html>
  - Stop 5G International reported 270 Stop 5G events in 38 countries-  
<https://stop5ginternational.org/wp-content/uploads/2020/02/Press-Release-Feb-2020.pdf>

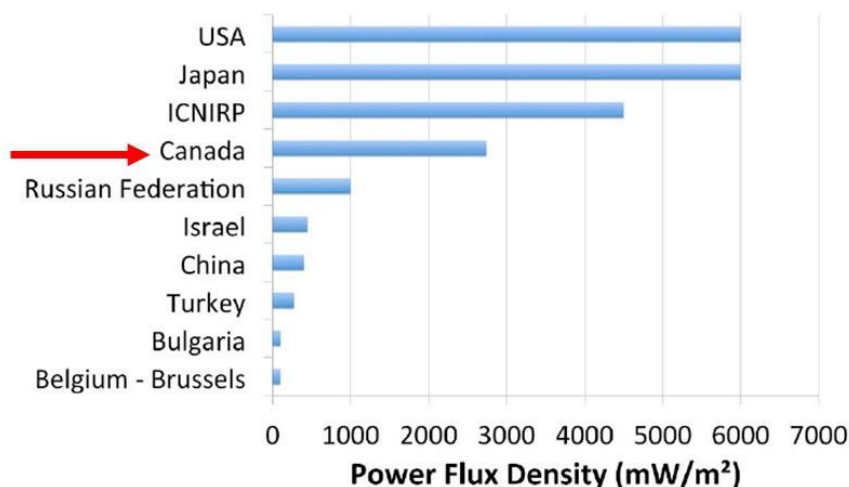
The next information event in Winnipeg called **5G Wireless Forum - Opportunities and Threats: Health, Environment and Rights** will be held on Saturday afternoon , May 2<sup>nd</sup>, 2020. It will be a public meeting open to the public and you are invited.

**HEALTH CONCERNS:**

**There is no scientific evidence to support any claim of safety for long term 5G exposures.  
Health Canada’s Safety Code 6 guidelines are obsolete because they are based on the now disproven assumption that only heating from radiofrequency radiation exposure causes adverse health effects.  
See Appendix B.**

Health Canada's claim that its Safety Code 6 guidelines (adopted as its standard by Innovation, Science and Economic Development which regulates cell antenna emissions) are among the most stringent in the world is simply not true.

## **International guidelines/limits at 900 MHz**



Source: World Health Organization, Global Health Observatory, Exposure limits for radiofrequency fields (public) - data by country, WHO, <http://apps.who.int/gho/data/node.main.EMFLIMITSPUBLICRADIOFREQUENCY?lang=en>, (2017) accessed July 3, 2019.  
H. Mazar, Human radio frequency exposure limits: an update of reference levels in Europe, USA, Canada, China, Japan and Korea, 2016 International Symposium on Electromagnetic Compatibility - EMC EUROPE, IEEE, Wroclaw, Poland, 2016, pp. 467–473,, <https://doi.org/10.1109/EMCEurope.2016.7739164>.

Dr. Anthony Miller (MD, FRCP, FRCP (C), FFPH, FACE) is a specialist in internal medicine and Professor Emeritus of the Dalla Lana School of Public Health, University of Toronto. He is among a group of concerned medical experts and individuals that there are health risks of radio frequency radiation. This comes from all these mobile devices and the myriad towers we already have, and he says the health risks at present are being ignored and that these risks and concerns will only be increased with 5G.<sup>9</sup>

**Dr. Miller's publications are listed in Appendix B and detail the scientific evidence that supports a Class 1 *known* carcinogen classification by the World Health Organization's International Agency for Research on Cancer (Dr. Miller has served as an advisor to the WHO-IARC)**

Dr. Miller was recently interviewed by CBC Radio Canada **5G-In the rush to the internet of things, is human health at risk?** (posted Tuesday, February 4, 2020 12:26).

<https://www.rcinet.ca/en/2020/02/04/5g-in-the-rush-to-the-internet-of-things-is-human-health-at-risk/>

<sup>9</sup> Source of extract: Environmental Health Trust: <https://ehtrust.org/5g-a-human-health-risk-dr-miller-interviewed-on-radio-canada-international/>

Dr. Miller has also recently (February 4, 2020) written his concerns about 5G to the Penticton City council and others (Appendix B.) Dr. Miller outlines the evidence for health concerns and also makes this statement about liability:

**LIABILITY CONCERNS - Extract from Dr. Miller's letter: "Possible liability concerns: Those who support the introduction of 5G should recognize that no insurance agency (including Lloyds of London) will cover them against liability from ill health effects caused by radiofrequency radiation."**

#### **What the City of Winnipeg can do:**

**1. Conduct public consultations on the installation of small cell antennas in residential areas.** This option is open according to the "Winnipeg Systems Antenna Systems Policy" and the federal department whose minister has the ultimate say in cell antenna installations (Industry, innovation, Economic Development) CPC20-03. CPC-2-0-03 — "Radiocommunication and Broadcasting Antenna Systems" <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08777.html>

It is our understanding that as it is now, there will be no public consultations, no notifications nor any signage for the installation of small cellular radiofrequency emitting antennas in neighbourhoods or elsewhere.

2. The City of Winnipeg can amend its policy to include the requirement of having public consultations for the installation of cellular antennas of "non-tower structures" within City limits.

3. The City can issue a letter of non-concurrence. The city's policy states:

#### **2.2 Role of the City**

The ultimate role of the City is to issue a statement of concurrence or non-concurrence to the Proponent and to Industry Canada. The statement considers the land use compatibility of the Antenna System, the responses of the affected residents and the Proponent's adherence to this Policy. The City also guides and facilitates the siting process by:

☐ **Communicating** to Proponents the particular amenities, sensitivities, planning priorities and other relevant characteristics of the area;

☐ **Developing the design guidelines** for Antenna Systems contained in Section 6 of this Policy; and

☐ **Establishing** a community consultation process, where warranted.

By working with Proponents throughout the siting process, beginning with preliminary notification and the site investigation meeting, the City seeks to facilitate Antenna System installations that are sensitive to the needs of the local community.

I am here today to inform you that we, the “affected” residents of Winnipeg, wish to be consulted and that a community consultation process is warranted. We, the residents who will be irradiated by what the scientific evidence is telling us is likely a known carcinogen (as well as having many other adverse effects) are the biggest stakeholders in this process, with our health at stake, and are being left out of this whole process.

**QUESTIONS:**

- -Do you agree that we, the residents of Winnipeg have a “right to know” and be fully informed about the installations of 5G antennas close to our homes and schools?
- -Will you, as our representatives, do what is necessary to hold full public consultation hearings before the 5G rollout begins?

**Furthermore:**

**We, the residents of Winnipeg, do not consent to having radiofrequency radiation emitting antennas installed close to our homes. We urge the City of Winnipeg to do everything within its jurisdiction\* to prevent the development and installations in residential areas of cell antennas of the 4G/5G network until it is deemed safe for the general public\*\*.**

\* Including writing a letter of non-concurrence to the federal department of Innovation, Science and Economic Development.

\*\* By a panel of medical doctors and scientists recommended by the Environmental Health Clinic at Women’s College Hospital in Toronto, Ontario, Canada.

**Respectfully submitted.**

**Margaret Friesen M.Sc.**

**Spokesperson, 5G Awareness Winnipeg**

[5g.winnipeg.awareness@gmail.com](mailto:5g.winnipeg.awareness@gmail.com)

**Website:** <https://5gwinnipegawareness.ca/>

**Face Book:** [https://www.facebook.com/5GWinnipegAwareness/?modal=admin\\_todo\\_tour](https://www.facebook.com/5GWinnipegAwareness/?modal=admin_todo_tour)

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## Brief to Property Development, Heritage, Downtown Development Committee. City of Winnipeg, City Hall.

Monday January 6<sup>th</sup>, 2020 9:30 am

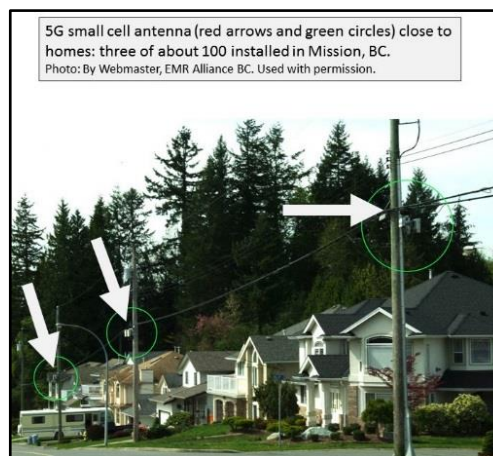
By Margaret Friesen on behalf of 5G Winnipeg Awareness

### Item 22: Review of the Winnipeg Antenna Systems Policy - 5G Network

Good morning Councillors - Thank you for the opportunity to present on this important topic of 5G technologies and associated so-called “small cell” antenna infrastructure.

My name is Margaret Friesen. Today I am representing a newly formed group named “5G Winnipeg Awareness.” We are residents from all parts of the City of Winnipeg who are deeply concerned about the pervasive expansion of radiofrequency emitting antennas installed close to where people spend much of their lives. My background: Master of Science in Entomology/Toxicology and a Bachelor of Science (Honours) degree in Zoology. Most of my 30+ years career in the federal government and University of Manitoba was in original research projects including ecosystem toxicology and DNA population genetics of marine mammals. I have published in peer-reviewed literature, including most recently a paper on radiofrequency radiation and smart and healthy buildings<sup>10</sup>. I presented to City committees in 2015 about the proposed *Winnipeg Antenna Systems Policy* (passed) 27 May 2015: [Winnipeg.ca/ppd/planning/AntennaSystemsPolicy/pdfs/WinnipegAntennaSystemsPolicy.pdf](http://Winnipeg.ca/ppd/planning/AntennaSystemsPolicy/pdfs/WinnipegAntennaSystemsPolicy.pdf)

5G uses newer frequencies – different wave sizes and with higher energy than existing 1G, 2G, 3G and 4G. It will be in addition to the other frequencies already in use AND because the newer wave size cannot as easily penetrate objects (e.g. tree leaves and water droplets), these small cells would be located close to our homes – possibly every 2 to 3 homes in residential areas (see picture from Mission BC). Also, network coverage signal areas are designed to overlap, therefore many, if not all, residences will be swamped by the emissions from more than one nearby small cell. We will be exposed, whether we want to be or not, to radiation emitted from so-called “small cell” antennas installed close to our homes.



Based on what is happening in other parts of Canada, there could be more than one antenna on each lamp pole or hydro pole installation. The actual 5G technology is not yet widely rolled out (there are pilot projects) but antennas emitting the 4G and other frequencies are already being installed close to homes – frequencies where the science has shown potential harm such as cancers and DNA damage. 5G

<sup>10</sup> Clegg et al. (2019) Building science and radiofrequency radiation: What makes smart and healthy buildings. Building and Environment. <https://www.sciencedirect.com/science/article/pii/S0360132319305347>

rollouts plan to require more towers and more antennas on existing towers. Based on information from European countries, such installations increase radiofrequency emissions levels.

### **1. There is an urgent need to delay 5G and 4G antenna installations in residential areas**

Health concerns alone are enough to put the brakes on the rollout of 5G and the 4G antenna installations but there are also serious privacy and cyber-security issues.

### **2. The fundamental problem: *Safety Code 6 (2015)*, *Health Canada's guidelines for safe human exposure* are not protective of human health**

Safety Code 6 (2015) for the frequencies used for common telecommunications, relies only on the adverse effects of the heating of tissue for its guidelines [which had been adopted as its standards by Innovation, Science and Economic Development (ISED)]. This has been shown in many studies to be a false assumption. There are many hundreds of studies showing adverse effects at levels that do not cause heating.

- During the last revision of Safety Code 6 (2015) more than 100 international scientists and Canadian medical doctors wrote to the Minister of Health stating that Safety Code 6 limits were not protective enough.
- The so-called independent review by an expert panel of Safety Code 6 that recommended only minor changes seem to be a rubber-stamp exercise. Some of the controversy was described in several articles in the *Canadian Medical Association Journal*<sup>11</sup>.
- More recently, the EMF (electromagnetic field) Scientists and MDs Appeal <https://www.emfscientist.org/> (as of August 25<sup>th</sup>, 2019 signed by 250 specialists from 42 nations) asks for more protective standards.

### **Speeding analogy:**

Modified from Powerwatch <https://www.powerwatch.org.uk/science/intguidance.asp>

<b>1800 MHz Public Exposure Guidelines</b>	<b>Intensity (mW/m<sup>2</sup>)</b>	<b>Speed Analogy in km/hour</b>
Safety Code 6	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

<sup>11</sup> 1) Webster, Paul Christopher. (2013). **Federal Wi-Fi panel criticized for undisclosed conflict.** *CMAJ: Canadian Medical Association Journal = Journal de l'Association Medicale Canadienne*, 185(11), E515-516. <https://doi.org/10.1503/cmaj.109-4523>

2) Webster, P. (2013). **Chair of Wi-Fi safety panel steps down.** *CMAJ*, 185(12), E573. <https://www.cmaj.ca/content/185/12/E573>

3) Webster, Paul Christopher. (2014). **Federal Wi-Fi safety report is deeply flawed, say experts.** *CMAJ: Canadian Medical Association Journal = Journal de l'Association Medicale Canadienne*, 186(9), E300. <https://doi.org/10.1503/cmaj.109-4785>

4) Webster, Paul Christopher. (2015). **Scientists decry Canada's outdated Wi-Fi safety rules.** *Canadian Medical Association Journal*, 187(9), 639–640. <https://doi.org/10.1503/cmaj.109-5061>

\* Belyaev, et al. (2016). EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses. *Reviews on Environmental Health*, 31(3). <https://doi.org/10.1515/reveh-2016-0011>

- Health Canada has a number of links that go to the World Health Organization (WHO) website. There are at least 2 bodies that have studied health effects of radiofrequency radiation:

1. International EMF Project. Most of the information on this site is not very recent. This project has put a call out for systematic reviews of the health literature on radiofrequency radiation (RFR). This came after much controversy after an earlier review was heavily criticized for bias and conflict of interest. It is heavily influenced by industry friendly scientists.

2. International Agency for Research on Cancer (IARC). In 2011, IARC classified RFR, which would include 5G, as a *possible* carcinogen. RFR is on the list to be re-evaluated based on more recent evidence showing harm. Many scientists, independent of industry influence, consider the scientific evidence to warrant a *known* carcinogen classification, along with asbestos and cigarette smoking.

- Evidence for radiofrequency radiation as a *known* carcinogen. Canadian MD and cancer epidemiologist Dr. Anthony B. Miller published that there is now enough evidence for the upgrading of radiofrequency radiation as a *known* human carcinogen (same category as asbestos and cigarette smoking). In 2011, radiofrequency radiation was classified as a *possible* human carcinogen by the World Health Organization's International Agency for Research on Cancer (IARC). An Advisory Group of 29 scientists from 18 countries met at IARC on 25–27 March 2019 to recommend priorities for the IARC Monographs Programme during 2020–2024.<sup>12</sup>

○ <b>There is no scientific evidence to support any claim of safety for long term 5G exposures.</b>
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- Strong evidence of cancer, DNA damage and sperm damage from 2G, 3G and 4G frequencies (Appendix 1).
- Public health issue is described by Cindy Russel MD. (Appendix 1, Russell 2018).
- Electrosensitivity (EHS) – Article by Magda Havas PhD (see Appendix 1). Press release: *Ontario Doctors Warn of Rising Health Care Costs after 5G Roll Out* (see below).
- We plan to write to the Chief Provincial Public Health Officer (Dr. Brent Roussin) with this and other information.
- *Winnipeg Free Press* article: “Winnipeg should be cautious about 5G antennas” <https://www.winnipegfreepress.com/opinion/analysis/winnipeg-should-be-cautious-about-5g-antennas-564489772.html>
- *Common Ground* article: “Better health safety guidelines imperative before exposing public to 5G” <https://commonground.ca/better-health-safety-guidelines-imperative-before-exposing-public-to-5g/>
- Property Development, Heritage and Downtown Development (PDHDD) Committee passed a motion – May 27<sup>th</sup>. City staff working on a report. MB Hydro in discussions with providers.

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<sup>12</sup> The Lancet. [https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045\(19\)30246-3/fulltext](https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(19)30246-3/fulltext)



### **3. City of Winnipeg and small cell antennas close to homes and schools, etc.**

- Federation of Canadian Municipalities – Press Release June 16, 2019: *Statement by FCM on Supreme Court of Canada decision on telecommunications*  
<https://fcm.ca/en/news-media/news-release/statement-fcm-supreme-court-canada-decision-telecommunications>.
- Some municipalities have said no: a citizen who attended the Maple Ridge BC council meeting emailed to Margaret, “Maple Ridge in 2018 had been approached by TELUS and they [Council] said we need to think about it, need evidence its safe. No small cell antennas were installed.”
- Installation of at least 2 cell towers in Winnipeg halted after letters of non-concurrence were written by Councillors for those Wards. Another was halted after the City Councillor followed up on residents’ complaints and found that the area was not zoned for a tower.
- Sutton, Quebec unanimously passed a resolution in December 2019: TO REQUEST the federal government, following the precautionary principle, to decree a moratorium on the deployment of the 5G cellular network, until the various studies reach a consensus on the absence of risk and impact of 5G cell technology on health and the environment. TO TRANSMIT a copy of this resolution to the Minister of Health, the Minister of Innovation, Science and Economic Development, and the federal member for Brome-Missisquoi.
- [Original wording in French: “DE DEMANDER au gouvernement fédéral, en suivant le principe de précaution, qu’il décrète un moratoire sur le déploiement du réseau cellulaire 5G, et ce, jusqu’à ce que les diverses études dégagent un consensus quant à l’absence de risque et d’impact de la technologie cellulaire 5G sur la santé et l’environnement.”]
- The Bloc Québécois in October 2019: *“in favor of a moratorium on the establishment of the 5G network ... that scientific studies be entrusted to an independent and autonomous commission ... respecting the precautionary principle.”*
- The Green Party of Canada in its 2019 platform stated: *“A green government will strike a parliamentary committee to examine the implications of introducing 5G technologies...”*
- Highly controversial in parts of the USA. New Hampshire, USA has ...

### **4. If small cells may be installed in homes and near schools, need “fulsome” public consultation held by the City of Winnipeg.** Currently can be exempted. In Winnipeg, *“if these antenna installations would be on new towers, public consultation would be required. But most, if not all, 5G antennas, will be exempt from consultation. The Winnipeg Antenna Systems Policy allows the exemption of “antennas on buildings, water towers, lamp posts, etc. ... provided the height above ground of the non-tower structure ... is not increased by more than 25%.”* This loophole is possible because of the federal Innovation, Science and Economic Development’s policy CPC-2-0-03.

### **5. Alternatives must be investigated with full public consultations:**

1. Copper and ethernet (widely used now) to and through the premises – one non-wireless alternative (slower transmission speeds than fiber optics).
2. Fiber optics to and through the premises (FTTP) – Community-owned wired fiber-to-the-premises
  - Community Broadband – Municipal Broadband - Canadian success stories <https://community-broadband.ca/>

- Site from BC: *Connected Communities. Wired Networks for Crossing the Digital Divide*:  
<https://connected-communities.ca/>
  - Wired Smart Cities: <https://connected-communities.ca/wired-smart-cities>
- In Manitoba:
  - St. Frances Xavier (in progress)
  - Maybe Thompson and Hamiota

## **6. Our Requests:**

**1) Put a “pause” on future plans for rollout of 5G and the 4G small antennas that pave the way for 5G.**

**2) Help us get answers to questions to clarify the situation, for example:**

- a) On Sept. 4th, 2019, Margaret asked in an email to the Mayor’s office: “Can you tell me if the City of Winnipeg is legally obligated to accept 5G technology or other radiofrequency emitting installations on its facilities or utilities such as lamp posts, by Manitoba Hydro or telecommunications providers?” As of today, there has been no response. Any suggestions on how to get an answer to this?
- b) Have any legal commitments been made? If so, what are they?
- c) Manitoba Hydro owns the lamp posts on Winnipeg’s streets. Who has say on what they are used for?
- d) Can new poles for small cell placement be erected without Council consent?
- e) Public Rights of Way agreements, what access do the telecommunications companies have?
- f) What are the relevant “Joint Pole” agreements?
- g) Need full scale public consultations (not by the telecommunications providers) if small cell are installed close to homes, daycares and schools. How can the City of Winnipeg do this?
- h) Have alternatives such as fiber-optic networks been fully investigated? For health and cyber-security aspects?

**3) Provide us with guidance in preparing a report to send to the City of Winnipeg – to whom?**

Some questions (still in draft form):

- a) Cost/benefit analysis: Is there a cost/benefit analysis? If so, is it available to the public?
- b) Legal aspects/Liability/ Insurance. London, Ontario has required \$5 million insurance. Insurance policy? What are the monetary factors? Has the subject of compensation been considered? Require proof of liability insurance against harmful effects of RFR on health from all telecommunications companies deploying wireless technologies.

c) Pedestrian safety

Who is measuring (pedestrians may be exposed to a high levels of RF radiation)

d) Monitoring exposure levels/tracking health effects

- a. ISED (formerly Industry Canada) requires that each wireless system owner comply with Safety Code 6. In the case of a structure with cells from more than one provider, (a multiparty structure for 5G) who is calculating the cumulative exposure of having all these antennas active at the same time? Each company files for their system....do the site owners compile the cumulative exposure report?
- b. Will Manitoba Public Health start monitoring and reporting on the exposure to, and related health effects, of RF radiation.

**4) Assist in increasing awareness of Electromagnetic hypersensitivity (EHS),** also commonly called electrosensitivity and electrohypersensitivity. Surveys conducted in Sweden, Taiwan, the United

Kingdom and the U.S. (California) have found that approximately **3 to 13.3% of the population** reported symptoms (Eltiti et al., 2007) (Johansson, 2006) (Levallois, Neutra, Lee, & Hristova, 2002) (Tseng M, Lin, & Cheng, 2011). It is likely that Canada would be within this range because the same wireless technologies (e.g. cell phones, computers, wireless routers, etc.) are commonly used in all of these countries.

In Canada, the Canadian Human Rights Commission has a policy with EHS classified under environmental sensitivities (Canadian Human Rights Commission, 2007) (Sears, 2007) – a health condition that is a consequence of the environment. It must be accommodated under the *Canadian Human Rights Act*. EHS is recognized as a disability in the United States under the *Americans with Disabilities Act*.<sup>13</sup> Sweden recognizes EHS as a functional impairment (Johansson, 2010). Legal cases for compensation and disability pensions have been successful in Australia,<sup>14</sup> France,<sup>15</sup> Spain<sup>16</sup> and U.S.<sup>17</sup>

Symptoms often reported include headaches, concentration difficulties, sleep problems, dizziness, depression, fatigue, skin rashes, tinnitus and flu-like symptoms (Genuis & Lipp, 2012) (Johansson, Hilliges, Björnham, & Hall, 1994). Adverse reactions to emissions from wireless equipment range from mild and readily reversible to severe, when individuals must greatly reduce their exposures to sources of electromagnetic radiation (Carpenter, 2015) (Hedendahl, Carlberg, & Hardell, 2015) (Sears, 2007).

Provocation studies have been uneven in their findings. The need for changing the approach is discussed by Dr. Darius Leszczynski, Adjunct Professor of Biochemistry, University of Helsinki, Finland.<sup>18</sup> Dr. Magda Havas, recently retired from Trent University, Ontario has reviewed the topic in a paper titled “*Electrohypersensitivity (EHS) is an Environmentally-Induced Disability that Requires Immediate Attention*” (Havas, 2019).

On May 31<sup>st</sup>, 2019, Women’s College Hospital (in Toronto) hosted a symposium, approved for various medical credits for physicians: “*Impacts of Wireless Technology on Health: a symposium for Ontario’s medical community.*” This covered a wide range of topics as described in their media release:

Extract from Press Release of May 30, 2019:<sup>19</sup>

**“Ontario Doctors Warn of Rising Health Care Costs after 5G Roll Out**

*Doctors treating patients from over-exposure to wireless radiation will join scientists at Queen’s Park today to recommend the Ontario Government take steps to protect public health before the roll-out of 5G – the next generation of cell phone technology.*

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<sup>13</sup> <https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/ada-accessibility-guidelines-for-recreation-facilities/general-issues>

<sup>14</sup> <https://www.news.com.au/technology/csiro-scientist-dr-david-mcdonald-wins-compensation-for-wifi-pain/news-story/0a2abc1814dca200d9e54b05f810c8f5>

<sup>15</sup> <http://www.journaldelenvironnement.net/article/dans-l-essonne-l-electrosensibilite-reconnue-comme-un-handicap,45060>

<sup>16</sup> <https://www.portalesmedicos.com/publicaciones/>

<sup>17</sup> <https://www.prlog.org/12381499-los-angeles-unified-school-district-accommodates-teacher-who-fell-ill-after-wireless-installation.html>

<sup>18</sup> The end of the road for EHS (IEI-EMF) provocation studies

<https://betweenrockandhardplace.files.wordpress.com/2018/02/open-letter-on-the-ehs-research-dated.pdf>

<sup>19</sup> Video of media briefing: <http://c4st.org/ontario-doctors-warn-of-rising-health-care-costs-after-5g-roll-out/>

*"My clinic is already assessing patients from across Ontario who are sensitive to microwave radiation from their wireless devices including cell phones, Wi-Fi, and an increasing number of smart appliances," said Dr. Riina Bray, Medical Director of the Environmental Health Clinic at Women's College Hospital in Toronto. "We expect 5G to add to this burden."*

*Scientists from 42 countries are now warning their governments about the emerging health problems associated wireless radiation. The initial 5G infrastructure is planned to begin in the Toronto to Montreal corridor. Daily human exposure to microwave radiation is already more than a trillion times higher than it was before cell phones.*

*Dr. Anthony Miller, Professor Emeritus with the University of Toronto, and adviser to the International Agency for Research on Cancer says, "Many scientists worldwide now believe that radiofrequency radiation should be elevated to a Class One human carcinogen, on the same list as Cigarettes, X-Rays, and Asbestos."*

*The doctors will advise the Province that increased health care costs can be avoided, if the government takes precautions to protect the public from exposure to 5G technology."*

International Classification of Diseases (ICD) now has codes for health effects caused by non-ionizing radiation. This was a request from Electromagnetic Hypersensitivity (EHS) Resolution adopted in Belgium in 2015. Doctors can now use this code to characterize health effects associated with radiofrequency radiation and other types of non-ionizing radiation. <https://icd.codes/icd10cm/W90>

It is not only people who are adversely affected. Environmental implications and aspects of public health related to 5G have been recently reviewed by Cindy Russell MD (11, Russell, 2018). This review includes studies showing wildlife, including birds and pollinators, are affected by ambient levels of radiofrequency radiation.

## **7. Possible Actions by the City of Winnipeg:**

1. As our elected officials, you have a responsibility to make the city as healthy and safe as possible for its residents.
2. Please invest the time to learn about 5G and other technologies. How can we get the benefits as safely as possible?
3. It is our understanding that municipal governments can say "no" to the placement of antennas on public property, although this can be overruled by the federal minister of ISED (IC).
4. What is the City's, and your, liability should a definitive link be made to harm from radiofrequency such as that emitted from City-approved antennas in the future?
5. Some municipalities have requested<sup>20</sup>:
  - a) Annual renewal of contracts for small cell antenna installations.
  - b) Ability to have small cell antennas removed with no legal penalty to the City should a link between harm to human health and radiofrequency be made.

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<sup>20</sup> Modified from a presentation by Dr. Magda Havas.

c) Regular monitoring of exposure to radiofrequency emissions before installation and after the antennas are activated, and thereafter at regular intervals.

d) Establishment of a health registry for reporting adverse biological and health effects associated with 5G antennas. Establishment of a process that investigates each complaint/report in a timely manner.

e) Request to the appropriate public health authorities to contact the physicians at the Environmental Health Clinic, Women's College Hospital, Toronto for detailed information on their concerns about increased health care costs and appropriate care for persons reporting adverse effects from exposure to radiofrequency radiation from these antennas and other sources.

f) If the city cannot put a "pause" on 5G, then it should hold "fulsome" public consultations.

## **8. References cited above:**

1. Canadian Human Rights Commission. (2007). **Policy on Environmental Sensitivities. Reviewed 2014.** *Canadian Human Rights Commission*. Retrieved from [https://www.chrc-ccdp.gc.ca/sites/default/files/policy\\_sensitivity\\_0.pdf](https://www.chrc-ccdp.gc.ca/sites/default/files/policy_sensitivity_0.pdf)
2. Carpenter, D. O. (2015). **The microwave syndrome or electro-hypersensitivity: historical background.** *Reviews on Environmental Health*, 30(4), 217–222. <https://doi.org/10.1515/reveh-2015-0016>
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5. Havas, M. (2019). **Electrohypersensitivity (EHS) is an Environmentally-Induced Disability that Requires Immediate Attention.** *J. Sci. Discov.*, 3(1), 20. <https://doi.org/jsd18020>
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9. Johansson, Olle. (2010). **Aspects of studies on the functional impairment electrohypersensitivity.** *IOP Conference Series: Earth and Environmental Science*, 10(1), 012005. <https://doi.org/10.1088/1755-1315/10/1/012005>
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11. Russell, C. L. (2018). **5 G wireless telecommunications expansion: Public health and environmental implications.** *Environmental Research*, 165, 484–495. <https://doi.org/10.1016/j.envres.2018.01.016>
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13. Tseng M, M.-C., Lin, Y.-P., & Cheng, T.-J. (2011). **Prevalence and psychiatric comorbidity of self-reported electromagnetic field sensitivity in Taiwan: A population-based study.** *Journal of the Formosan Medical Association*, 110(10), 634–641. <https://doi.org/10.1016/j.jfma.2011.08.005>

## **APPENDIX 1. Wireless radiation in the radiofrequency range and adverse health effects: Key peer-reviewed papers and videos**

### **PAPERS IN PEER-REVIEWED JOURNALS:**

- L. CANCER – EVIDENCE TO SUPPORT A GROUP 1 KNOWN HUMAN CARCINOGEN CLASSIFICATION (WORLD HEALTH ORGANIZATION, INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (WHO-IARC))**
  - Miller, A. B.<sup>21</sup>, Morgan, L. L., Udasin, I., & Davis, D. L. (2018). **Cancer epidemiology update, following the 2011 IARC evaluation of radiofrequency electromagnetic fields (Monograph 102).** *Environmental Research*, 167, 673–683. <https://doi.org/10.1016/j.envres.2018.06.043> <https://www.ncbi.nlm.nih.gov/pubmed/30196934>
  - Hardell, L., & Carlberg, M. (2018). **Comments on the US National Toxicology Program technical reports on toxicology and carcinogenesis study in rats exposed to whole-body radiofrequency radiation at 900 MHz and in mice exposed to whole-body radiofrequency radiation at 1,900 MHz.** *International Journal of Oncology*. <https://doi.org/10.3892/ijo.2018.4606> <https://www.ncbi.nlm.nih.gov/pubmed/30365129>
- M. CANADIAN BRAIN CANCER DATA – 2X RISK OF GLIOMAS WITH >558 HOURS OF CELL PHONE USE**
  - Momoli, F., Siemiatycki, J., McBride, M. L., Parent, M.-É., Richardson, L., Bedard, D., ...

<sup>21</sup> Anthony B. Miller, MD, FRCP, FRCP(C), FFPH, FACE. Professor Emeritus, Dalla Lana School of Public Health, University of Toronto. A physician-epidemiologist, he was trained in internal medicine, and was a member of the scientific staff of the Tuberculosis and Chest Diseases Research Unit, UK Medical Research Council, 1962-71. He was Director of the Epidemiology Unit of the National Cancer Institute of Canada 1971-86 and Chair of the Department of Preventive Medicine and Biostatistics, University of Toronto, 1992-96. He served as a special expert in the Division of Cancer Prevention, US National Cancer Institute, 1997, Senior Epidemiologist, International Agency for Research on Cancer 1998-99, Head, Division of Epidemiology, German Cancer Research Centre, Heidelberg, 2000-03, Associate Director, Research, Dalla Lana School of Public Health, University of Toronto, 2008-10. He has been a consultant to the World Health Organization. He is Scientific Lead of the OncoSim microsimulation modelling initiative of the Canadian Partnership Against Cancer. His research encompasses cancer etiology, prevention and screening.

Krewski, D. (2017). **Probabilistic Multiple-Bias Modeling Applied to the Canadian Data From the Interphone Study of Mobile Phone Use and Risk of Glioma, Meningioma, Acoustic Neuroma, and Parotid Gland Tumors.** *American Journal of Epidemiology*, 186(7), 885–893. <https://doi.org/10.1093/aje/kwx157>  
<https://www.ncbi.nlm.nih.gov/pubmed/28535174>

#### N. BRAIN CANCER INCIDENCE IN ENGLAND

- Philips, Alisdair, Henshaw, Denis L., Lamburn, Graham, & O'Carroll, Michael. (2018). **Brain tumours: rise in Glioblastoma Muliforme incidence in England 1995-2015 suggests an adverse environmental or lifestyle factor.** *Journal of Environmental and Public Health*, 20.  
<https://www.hindawi.com/journals/jep/2018/7910754/>

#### O. CANADIAN COLORECTAL CANCER INCIDENCE IN YOUNGER ADULTS IS “CONTINUING AND POSSIBLY ACCELERATING”

- Brenner, D. R., Heer, E., Sutherland, R. L., Ruan, Y., Tinmouth, J., Heitman, S. J., & Hilsden, R. J. (2019). **National Trends in Colorectal Cancer Incidence Among Older and Younger Adults in Canada.** *JAMA Network Open*, 2(7), e198090–e198090.  
<https://doi.org/10.1001/jamanetworkopen.2019.8090>

#### P. INCREASED ABSORPTION OF RADIOFREQUENCY ENERGY IN CHILDREN

- Fernández, C., de Salles, A. A., Sears, M. E., Morris, R. D., & Davis, D. L. (2018). **Absorption of wireless radiation in the child versus adult brain and eye from cell phone conversation or virtual reality.** *Environmental Research*, 167, 694–699.  
<https://doi.org/10.1016/j.envres.2018.05.013>  
<https://www.sciencedirect.com/science/article/pii/S0013935118302561>

#### Q. PUBLIC HEALTH RISKS (BOTH MILLER AND RUSSELL ARE MEDICAL DOCTORS)

- Miller, A. B., Sears, M. E., Morgan, L. L., Davis, D. L., Hardell, L., Oremus, M., & Soskolne, C. L. (2019). **Risks to Health and Well-Being From Radio-Frequency Radiation Emitted by Cell Phones and Other Wireless Devices.** *Frontiers in Public Health*, 7.  
<https://doi.org/10.3389/fpubh.2019.00223>  
<https://www.frontiersin.org/articles/10.3389/fpubh.2019.00223/full>
- Russell, C. L. (2018). **5 G wireless telecommunications expansion: Public health and environmental implications.** *Environmental Research*, 165, 484–495.  
<https://doi.org/10.1016/j.envres.2018.01.016>  
 Website: Physicians for Safe Technology - <https://mdsafetech.org/>

#### R. BEHAVIOURAL PROBLEMS IN CHILDREN

- Birks, L., Guxens, M., Papadopoulou, E., Alexander, J., Ballester, F., Estarlich, M., ... Vrijheid, M. (2017). **Maternal cell phone use during pregnancy and child behavioral problems in five birth cohorts.** *Environment International*, 104, 122–131.  
<https://doi.org/10.1016/j.envint.2017.03.024>  
<https://www.ncbi.nlm.nih.gov/pubmed/28392066>

#### S. ADVERSE EFFECTS ON SPERM QUALITY (ONE OF SEVERAL REVIEWS WITH SIMILAR CONCLUSIONS)



- Houston, B. J., Nixon, B., King, B. V., De Iuliis, G. N., & Aitken, R. J. (2016). **The effects of radiofrequency electromagnetic radiation on sperm function.** *Reproduction (Cambridge, England)*, 152(6), R263–R276. <https://doi.org/10.1530/REP-16-0126>  
<https://www.ncbi.nlm.nih.gov/pubmed/27601711>

#### **T. DNA DAMAGE – OVER 30 STUDIES SHOWING DAMAGE AT UNDER SAFETY LEVEL EXPOSURES**

- Panagopoulos, D. J. (2019). **Comparing DNA damage induced by mobile telephony and other types of man-made electromagnetic fields.** *Mutation Research/Reviews in Mutation Research*, 781, 53–62. <https://doi.org/10.1016/j.mrrev.2019.03.003>  
<https://www.sciencedirect.com/science/article/pii/S1383574218300991>

#### **U. OXIDATIVE STRESS (CAN LEAD TO MANY HEALTH CONDITIONS INCLUDING CANCER, ALZHEIMER'S AND PARKINSON'S DISEASE)**

- Yakymenko, I., Tsybulin, O., Sidorik, E., Henshel, D., Kyrylenko, O., & Kyrylenko, S. (2016). **Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation.** *Electromagnetic Biology and Medicine*, 35(2), 186–202.  
<https://doi.org/10.3109/15368378.2015.1043557>  
<https://www.ncbi.nlm.nih.gov/pubmed/26151230>

#### **V. ELECTROHYPERSENSITIVITY (EHS)**

- Belyaev, I., Dean, A., Eger, H., Hubmann, G., Jandrisovits, R., Kern, M., ... Thill, R. (2016). **EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses.** *Reviews on Environmental Health*, 31(3).  
<https://doi.org/10.1515/reveh-2016-0011>
- Havas, M. (2019). **Electrohypersensitivity (EHS) is an Environmentally-Induced Disability that Requires Immediate Attention.** *J. Sci. Discov.*, 3(1), 20.  
<https://doi.org/jsd18020>

#### **W. CELL TOWER EXPOSURE STUDY (DNA DAMAGE, OXIDATIVE STRESS)**

- Zothansiam, null, Zosangzuali, M., Lalramdinpuui, M., & Jagetia, G. C. (2017). **Impact of radiofrequency radiation on DNA damage and antioxidants in peripheral blood lymphocytes of humans residing in the vicinity of mobile phone base stations.** *Electromagnetic Biology and Medicine*, 1–11.  
<https://doi.org/10.1080/15368378.2017.1350584>  
<https://www.ncbi.nlm.nih.gov/pubmed/28777669>

#### **VIDEOS:**

1. Less than 5 minutes: Dr. Anthony B. Miller: **Radio Frequency Radiation, Cancer and Cell Towers Statement to School District. Statement that wireless radiation should be classified as a Class 1 *known* carcinogen.**

<https://www.youtube.com/watch?v=LPs6PAG1H6c>

2. Approximately 24 minutes (2017): Dr. Anthony B. Miller: **Epidemiology of Cell Phones and Other Wireless Transmitting Devices – An Update (describes the evidence supporting an IARC Class 2A**



**probable human carcinogen classification).** Expert Forum: Wireless Radiation and Human Health. Hebrew University Medical School, January 23-26, 2017

<https://ehtrust.org/science/key-scientific-lectures/2017-expert-forum-wireless-radiation-human-health/>

3. Approximately 1 hour: Devra Davis PhD, MPH. (2015) **The truth about mobile phone and wireless radiation.** Dean's Lecture at University of Melbourne, School of Engineering  
<https://ehtrust.org/science/key-scientific-lectures/dr-davis-delivered-the-deans-lecture-at-melbourne-school-of-engineering/>

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#### **SUPPLEMENTAL INFORMATION: A SAMPLE OF CELL TOWER STUDIES**

1. Abdel-Rassoul, G., El-Fateh, O. A., Salem, M. A., Michael, A., Farahat, F., El-Batanouny, M., & Salem, E. (2007). **Neurobehavioral effects among inhabitants around mobile phone base stations.** *Neurotoxicology*, 28(2), 434–440. <https://doi.org/10.1016/j.neuro.2006.07.012>

2. Bortkiewicz, A., Gadzicka, E., Szykowska, A., Politański, P., Mamrot, P., Szymczak, W., & Zmyślony, M. (2012). **Subjective complaints of people living near mobile phone base stations in Poland.** *International Journal of Occupational Medicine and Environmental Health*, 25(1), 31–40.  
<https://doi.org/10.2478/s13382-012-0007-9>

3. Eger, H., Hagen, K. U., Lucas, B., Vogel, P., & Voit, H. (2004). **[The influence of being physically near to a cell phone transmission mast on the incidence of cancer] Einfluss der räumlichen Nähe von Mobilfunkseanlagen auf die Krebsinzidenz (in German).** *Umwelt Medizin Gesellschaft -Verlag-Ges.*, 17(4), 1–7.

4. Hutter, H.-P., Moshhammer, H., Wallner, P., & Kundi, M. (2006). **Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations.** *Occupational and Environmental Medicine*, 63(5), 307–313. <https://doi.org/10.1136/oem.2005.020784>

5. Levitt, Blake, & Lai, Henry. (2010). **Biological effects from exposure to electromagnetic radiation emitted by cell tower base stations and other antenna arrays.** *NRC Press*.

6. Santini, R., Santini, P., Danze, J. M., Le Ruz, P., & Seigne, M. (2003). **[Symptoms experienced by people in vicinity of base stations: II/ Incidences of age, duration of exposure, location of subjects in relation to the antennas and other electromagnetic factors].** *Pathologie-Biologie*, 51(7), 412–415.

7. Santini, Roger. (2002). **Study of The Health of People Living in The Vicinity of Mobile Phone Base Stations.** *Pathol Biol*, 50, 369–73.

8. Wolf, R., & Wolf, D. (2004). **Increased incidence of cancer near a cell-phone transmitter station.** *International Journal of Cancer*, 1(2). Retrieved from  
[http://www.powerwatch.org.uk/news/20050207\\_israel.pdf](http://www.powerwatch.org.uk/news/20050207_israel.pdf)

9. Zothansiamia, Zosangzuali, M., Lalramdinpuui, M., & Jagetia, G. C. (2017). **Impact of radiofrequency radiation on DNA damage and antioxidants in peripheral blood lymphocytes of humans residing in the vicinity of mobile phone base stations.** *Electromagnetic Biology and Medicine*, 1–11.  
<https://doi.org/10.1080/15368378.2017.1350584>

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**APPENDIX B.**

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February 4, 2020

**For the urgent attention of:**

Penticton City Council Mayor John Vassilaki and Councillors  
RDOS Chair Karla Kozakevich and Board of Directors  
Editor of the Penticton Herald Joe Fries  
Editor of the Penticton Western News  
MP Richard Cannings (South Okanagan-West Kootenay)  
MLA Dan Ashton (Penticton)  
Linda Larson, MLA ( Boundary-Similkameen)

CC: Hans Karow (Coalition to Reduce Electropollution, CORE)

**Subject: Exposure of the public to Wireless 3G, 4G, 5G**

It has been brought to my attention, that last summer, in addition to already existing macro cell antennas, one cell antenna tower has been constructed on 1953 Dartmouth Road (near hospital, residential and industrial area) and antennas have also been attached to the top of the Park Place Sun Village Retirement Complex on 1147 Main Street (across the RCMP building) in Penticton.

I have also learned that antennas were previously attached to other living complexes i.e.: Charles Manor on 320 Martin Street; Apartment building on 2401 South Main Street; three cell towers only 200 m apart from each other: two Telus towers Fairview/Calgary Ave with nearest residential homes 60 m away, and one Rogers tower with an output power of 120.23 facing directly to several four stories apartment complexes 80 m away.

It is completely unacceptable that cell towers should be placed on or close to residential buildings, as this results in exposure of humans to a potentially carcinogenic form of radiation.

Radiation exposure has long been a concern for the public, policy makers and health researchers. Beginning with radar during World War II, human exposure to radio-frequency radiation (RFR) and associated technologies has grown more than 100,000-fold. In 2011, a working group of the International Agency for Research on Cancer (IARC) reviewed the published literature and categorized RFR as a possible (Group 2B) human carcinogen. A broad range of adverse human health effects associated with RFR have been reported since the IARC review, including brain cancer, cancers of the vestibular (hearing) nerve (Schwannomas), and sterility. In addition, two large-scale carcinogenicity studies in rodents exposed to levels of RFR that mimic lifetime human exposures have shown significantly increased rates of Schwannomas and malignant gliomas, as well as chromosomal DNA damage.

Of particular concern are the effects of RFR exposure on the developing brain in children. Compared with an adult male, a cell phone held against the head of a child exposes deeper brain structures to greater radiation doses per unit volume, and the young, thin skull's bone marrow absorbs a roughly 10-fold higher local dose. Recent reports also suggest that men who keep cell phones in their trouser pockets have significantly lower sperm counts and significantly impaired sperm motility and morphology, including mitochondrial DNA damage, and increased risk of colon cancer.

Based on the accumulated evidence, I believe that if IARC were to re-evaluate its 2011 classification of the human carcinogenicity of RFR, it would be categorized as Group 1, i.e. carcinogenic to humans. Thus, current knowledge provides justification for governments, public health authorities, and physicians/allied health professionals to support measures to reduce all exposures to RFR to As Low As Reasonably Achievable, something we learnt was necessary for exposures to ionizing radiation (e.g. X-rays) many years ago.

The Telecom industry's fifth generation (5G) wireless service will require the placement of many small antennae/cell towers close to all recipients of the service, because solid structures, rain and foliage block the associated millimeter wave RFR. 5G technology is being developed as it is also being deployed, with large arrays of directional, steerable antennae, operating at higher power than previous technologies. 5G is not stand-alone – it will operate and interface with other (including 3G and 4G) frequencies and modulations to enable diverse devices under continual development for the “internet of things,” driverless vehicles and more.

This novel 5G technology is being rolled out although potential chronic health or environmental impacts have not been evaluated. The range and magnitude of potential impacts of 5G technology are under-researched, although important biological outcomes have been reported with the associated millimeter wavelength exposure to RFR. These include oxidative stress and altered gene expression, effects on skin and systemic effects such as on immune function, all of which highlight the need for more research before population-wide continuous exposures occur.

An individual, if appropriately informed, can reduce her or his exposure to radiofrequency radiation from cell phones, but in the case of cell towers and small cell transmitters of 5G the exposure they receive is outside their control. With the people who manufacture these devices and those who promote small cell technology in front of homes failing to issue

adequate health warnings, we are reaching a situation where homes, schools, and workplaces are being saturated with radiofrequency radiation.

Thus, to avoid an epidemic of cancer and heart damage, brain damage and infertility caused by radiofrequency radiation, we should introduce means to reduce such exposures to As Low As Reasonably Achievable, something we learnt to do many years ago for ionizing radiation (X-rays). Instead use fiber-optic connections to the home, place small cell transmitters away from residential neighborhoods and schools and strengthen the rules that are meant to protect the public.

Those who support the introduction of 5G should recognize that no insurance agency (including Lloyds of London) will cover them against liability from ill health effects caused by radiofrequency radiation.

The removal of cell towers from the top of buildings and a moratorium on the roll-out of 5G is essential.

A handwritten signature in black ink, appearing to read 'A. B. Miller'.

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