

# 4G/5G Wireless & “Small Antennas” Fact Sheet

## Children, Pregnant Women, and Adolescents Harm

- Children and adolescents are considered **a population at risk** in all matters relating to the health effects of exposure to radiation. The mental and physical characteristics of the young differ from those of adults. Therefore, exposure to radiation may affect their health in a different way.<sup>1</sup>
- The **President of the American Academy of Pediatrics** wrote to the Federal Communications Commission and the U.S. Food and Drug Administration in 2013 that “Current FCC standards do not account for the unique vulnerability and use patterns specific to pregnant women and children.” The AAP also said, “The current metric of RF exposure available to consumers, the Specific Absorption Rate, is not an accurate predictor of actual exposure.”<sup>2</sup> AAP represents 60,000 pediatricians. The FCC has yet to respond and propose standards appropriate to children, pregnant women for actual use.
- The **World Health Organization (WHO)** declared in 2010 that high priority should be given to research on the effect of radiofrequency radiation on the health of children. Accordingly, a number of large population studies are being conducted throughout the world, aimed at detecting potential effects of exposure of children to non-ionizing radiation emitted by various technologies.
- **Harvard Medical School** professor Dr. Martha Herbert, PhD, MD, a leading neuroscientist and autism expert: “EMF/RFR from Wi-Fi and cell towers can exert a **disorganizing effect on the ability to learn and remember**, and can also be destabilizing to immune and metabolic function. This will make it harder for some children to learn, particularly those who are already having problems in the first place.” **Autism Spectrum Disorders** are consistent with physiological impacts of EMF and Radiofrequency Radiation exposure.<sup>3</sup>
- **Depression and widespread neuropsychiatric effects** – “26 studies have EMFs associated with neuropsychiatric effects,” with 5 criteria showing causality. “EMFs cause at least 13 neuropsychiatric effects...”<sup>4</sup> due to voltage-gated calcium channel (VGCC) activation in the brain which controls neurotransmitters and neuroendocrine hormones. **ADHD** symptoms were documented in a study under the supervision of Hugh Taylor, MD, Yale University Chair of Obstetrics, **Yale School of Medicine** in mice exposed to cell phone radiation prenatally. The Yale study found “experimental evidence of neuropathology due to in-utero cellular telephone radiation.”<sup>5</sup>
- **Children absorb more microwave radiation (MWR)** than adults because their brain tissues are more absorbent, their skulls are thinner and their relative size is smaller. MWR from wireless devices has been declared a possible human carcinogen. Children are at greater risk than adults when exposed to any carcinogen. **Because the average latency time between first exposure and diagnosis of a tumor can be decades, tumors induced in children may not be diagnosed until well into adulthood. The fetus is particularly vulnerable to microwave radiation.**<sup>6</sup>

The **American Academy of Environmental Medicine** has issued an Open Letter to School Superintendents that it “strongly supports the use of wired Internet connections, and encourages avoidance of radiofrequency such as from Wi-Fi, cellular and mobile phones and towers, and “smart meters.” **The AAEM letter said, “The evidence is irrefutable.”**<sup>7</sup>

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- Dizziness, headaches, nausea
- Fatigue, weakness
- Anxiety, depression
- Insomnia
- Numbness, tingling, joint pain
- Muscle spasms
- Skin rashes, allergies, asthma
- Blurred vision, impaired vision
- Nose bleeds, impaired sense of smell
- Shortness of breath
- Concentration problems, memory loss
- Behavioral problems, learning problems, ADHD  
Hyperactivity, heart palpitation

### Potential long-term health effects from microwave radiation as indicated in scientific studies

- Brain cancers, acoustic neuromas and other tumors
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- Lymphoma
- Melanoma
- Reduced production of Melatonin
- Impaired fertility
- DNA damage
- Pre-natal damage, miscarriages, birth defects
- Immune dysfunction, chronic allergic responses and inflammatory responses
- Neurological and behavioral effects
- Dementia and Alzheimer's Disease
- Epilepsy

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<sup>1</sup> Electromagnetics expert Dr. Om Ghandi published in IEEE [ Institute of Electrical and Electronic Engineers ] Access, "Yes the Children Are More Exposed to Radiofrequency Energy From Mobile Telephones Than Adults":

<http://ieeexplore.ieee.org/document/7131429/?reload=true&arnumber=7131429&contentType=Journals%20%26%20Magazines>

<sup>2</sup> Letter from American Academy of Pediatrics (President Dr. Thomas McInerney) to FCC (Acting Commissioner Clyburn) and U.S. FDA (Commissioner Hamburg), August 29, 2013. <https://ecfsapi.fcc.gov/file/7520941318.pdf>

<sup>3</sup> [https://bioinitiative.org/wp-content/uploads/pdfs/sec20\\_2012\\_Findings\\_in\\_Autism.pdf](https://bioinitiative.org/wp-content/uploads/pdfs/sec20_2012_Findings_in_Autism.pdf)

<sup>4</sup> Pall, M. L. (2016). Microwave frequency electromagnetic fields (EMFs) produce widespread neuropsychiatric effects including depression. Journal of Chemical Neuroanatomy, 75(Pt B), 43–51. <https://doi.org/10.1016/j.jchemneu.2015.08.001>

<sup>5</sup> <https://www.ncbi.nlm.nih.gov/pubmed/22428084>

<sup>6</sup> Why Children Absorb More Microwave Radiation than Adults: The Consequences. Morgan, Kesari, et al. Journal of Microscopy and Ultrastructure 2(4):196-204 (2014). <http://www.jmau.org/article.asp?issn=2213-879X;year=2014;volume=2;issue=4;spage=197;epage=204;aulast=Morgan;type=0>

<sup>7</sup> <https://www.aemonline.org/pdf/WiredSchools.pdf>

<sup>8</sup> <http://www.wifi-in-schools-australia.org/p/emr.html>

SEPTEMBER 04, 2020

# 5G “Small Cell” Proliferation Takes a Hit in Cambridge MA

By Scott McCollough, McCollough Law Firm, PC

(Mr. McCollough is CHD's attorney in its [Case against the Federal Communications Commission](#)).

In an important win for those who are concerned about 5G and small cell wireless proliferation, on August 26, 2020 the U.S. District Court for the District of Massachusetts dismissed a lawsuit by “neutral host” provider ExteNet Systems, Inc. against the City of Cambridge, MA.

The case could have far-reaching impacts when “neutral host providers” like American Tower, Crown Castle and ExteNet try to secure approval to occupy municipal rights-of-way. Neutral host providers build wireless infrastructure and then lease space to the wireless companies (like AT&T, T-Mobile and Verizon) that provide the wireless service.

ExteNet filed several applications in Cambridge to replace utility light poles with new ones that housed equipment to be leased to AT&T. AT&T, not ExteNet, would supply the fiber connections and electric power. Cambridge's Pole and Conduit Siting Policy requires applicants working on a proposed project with other companies to designate a lead company for the application.

***In practical terms this means the local authority can identify deficiencies at any time and/or deny the application because of a deficiency at the very end.***

The lead company has responsibility for coordinating the applications, permitting, constructions, wiring, and operation and acts as the point of contact. As such, the lead company must obtain all the necessary information and provide it to the planning commission as part of the application. In this case, ExteNet did not obtain or provide any information about how the facilities would obtain power or fiber connections, even though the policy expressly required that information. Nor was ExteNet able to provide sufficient information to demonstrate actual need for the wireless coverage that would be supported by the facility, which was another substantive Cambridge requirement.

The City denied ExteNet's permit applications because of the missing information. ExteNet contended the City's procedure was unlawful because it unreasonably waited until the end of the allowed period for the review of the application (shot clock) before it advised ExteNet of the deficiencies. ExteNet also challenged the substantive requirement that ExteNet provide information that only its customer (AT&T) could provide.

The district court rejected ExteNet's procedural and substantive claims.

First, the court ruled that the FCC's procedural shot clock rules do not require a local permitting authority to provide notice of any deficiencies to the applicant within 10 days. It interpreted the rules to say that notice of deficiency within 10 days is only required if the local authority wants to stop or reset the shot clock. In practical terms, this means the local authority can identify deficiencies at any time and/or deny the application because of a deficiency at the very end.

***. . . Will require that the wireless companies who will be leasing from the neutral host provider be named participants and provide the necessary information, whereas until now they have been able to avoid the***

*need to do so while also keeping important information away from cities and concerned citizens.*

The district court approved Cambridge's substantive requirement for all relevant information. The Cambridge policy required that the "applications include evidence that the proposed installation is needed to prevent a material inhibition of wireless services." ExteNet did not (and claimed it could not) make this showing since AT&T was the customer and the one with the information necessary to prove the facilities were needed to fill a significant gap in coverage, would in fact be used to fill any gap that did exist, and there were no viable alternative locations. The court held, however, that ExteNet had a burden of proof and failed to meet it. "Where ExteNet's complaint and its original applications fail to show the existence of a coverage gap, it is impossible to infer that the denial of ExteNet's applications has the effect of prohibiting the provision of wireless services". The court ruled that ExteNet did not allege sufficient facts to show that Cambridge's *application information* requirements did or could materially inhibit the provision of service.

The court readily accepted Cambridge's argument that the information it required was relevant to and necessary for any intelligent and reasonable assessment of the application's merits. The court stated: "Because a wireless facility could not function without power and data, requiring information concerning that power and data is not an effective prohibition of the provision of wireless services. . . . Further, ExteNet has not alleged that forcing joint applications would, in all circumstances, "materially inhibit or limit the ability of any competitor . . . to compete in a fair and balanced legal and regulatory environment."

This decision has major implications for applications by neutral host providers. The now-affirmed information requirements will – as a practical matter – require that the wireless companies who will be leasing from the neutral host provider be named participants and provide the necessary information, whereas until now they have been able to avoid the

need to do so while also keeping important information away from cities and concerned citizens. It may also, in the long term, eliminate some of the business case justifications for the neutral host business. This is important since a very large portion of the small cell deployments are planned, permitted, and constructed by the neutral host providers. Cities can now justifiably demand to know who will be using the wireless infrastructure and in position to obtain more information and commitments from them. Finally, it will allow cities to better determine whether and where wireless facilities are actually needed, and the services they will support.

**Documentation:**

- [MOTION TO DISMISS AND TO TAKE NOTICE OF MATERIALS CITED IN COMPLAINT, AND REQUEST FOR ORAL ARGUMENT](#)
- [DEFENDANTS' MEMORANDUM IN SUPPORT OF MOTION TO DISMISS AMENDED COMPLAINT](#)
- [CITY OF CAMBRIDGE POLE AND CONDUIT COMMISSION'S POLICY REGARDING SMALL CELL WIRELESS](#)
- [CITY OF CAMBRIDGE POLE AND CONDUIT SITING POLICY RELATING TO GRANTS OF LOCATION FOR TELECOMMUNICATIONS SERVICES NETWORKS.](#)
- [AMENDED COMPLAINT FOR DECLARATORY AND INJUNCTIVE RELIEF AND EXPEDITED REVIEW PURSUANT TO 47 U.S.C. § 332\(c\)\(7\)\(B\)\(v\)](#)
- [PLAINTIFF'S OPPOSITION TO DEFENDANTS' MOTION TO DISMISS PLAINTIFF'S AMENDED COMPLAINT](#)
- [MEMORANDUM AND ORDER ON DEFENDANTS' MOTION TO DISMISS](#)
- [ORDER OF DISMISSAL](#)
- <https://childrenshealthdefense.org/protecting-our-future/5g-small-cell-proliferation-takes-a-hit-in-cambridge-ma/>

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## Cyber Security Vulnerabilities and National Security

- “The currently proposed 4G/5G dense deployment will result in **personal privacy impairments from ubiquitous surveillance as never previously experienced in United States**”<sup>1</sup>
- Massive data **hacking will become a much simpler thing** to pull off if this untested 5G system is set up as currently envisioned.<sup>1</sup>
- While current cell phone/tablet break-ins are not very common due to the substantial amount of equipment a hacker would need to be able to test a device “over the air”, the flatter design of **5G networks will remove many barriers to cellular security hacking.**<sup>2</sup>
- “With 5G’s decentralised [design] the technology will be opened up to scrutiny by a much wider range of threat actors. For example, an intelligent, low-budget and amateur hacker with the skill to crack software might lack the cash for cellular testing equipment but will be able to afford a budget 5G picocell.” This will then give them a route to 5G devices for cellular security break in.<sup>2</sup>
- “As 5G technology is designed for dense Internet of Things (IoT) networks in the order of **one million devices per square kilometre**, the sheer number of projected and insecure devices using 5G means an exponential increase in attack surface and potential vulnerabilities”<sup>2</sup>
- As 5G is forecast to become the dominant method of wireless communications, not only will many eggs be placed in one basket, but they will be reachable from one another. When just one of these devices is compromised, dozens more are then reachable. Fixing this kind of scenario would be an enormous undertaking, which is exactly why the security of UE [User Equipment] devices and the cloud infrastructure will be critical.<sup>2</sup>
- The **erosion of anonymity** is another concern related to 5G’s million-devices-per kilometer plan. 5G precision could reveal the specific floor within a building where a device is located, because the macro cells used in deployment are substantially smaller than in cellular networks.<sup>2</sup>

### NATIONAL SECURITY IMPLICATIONS

- “Due to the ease of inevitable hacking the “every block” 4G/5G **deployment would allow foreign powers to track the day to day details of virtually all human life in the United States** including location and movement of military assets and personnel, thereby with indelible national security impairment.”<sup>1</sup>
- The Department of Homeland Security and the State Department hold the position that the greatest risk of 5G to national security would be the potential for China to use Huawei –made products for espionage. China could easily compel its tech firms to act against the interests of citizens of any other country. They are already working with authoritarian regimes to suppress freedoms. All products made by Huawei pose great risk of espionage.<sup>3</sup>
- Tom Wheeler, former FCC chairman, states that “Effective progress toward achieving minimally satisfactory 5G cyber risk outcomes is compromised by a hyper focus on legitimate concerns regarding Huawei equipment in U.S. networks ... it is only one of the many important 5G risk factors. **The hyperbolic rhetoric surrounding the Chinese equipment issues is drowning out what should be a strong national focus on the full breadth of cybersecurity risk factors facing 5G.**”<sup>4</sup>
- The world’s hackers (good and bad) are already turning to the 5G ecosystem, as the just concluded DEFCON 2019 (the annual ethical “hacker Olympics”) illustrated. The targets of this year’s hacker villages included key parts of the 5G ecosystem such as: **aviation, automobiles, infrastructure control systems, privacy, retail call centers and help desks, hardware in general, drones, IoT, and voting machines.**<sup>4</sup>
- Across the country, consumers, companies, and cities seeking to use 5G are ill-equipped to assess, let alone address, its threats. “**The 5G cybersecurity threat is a whole-of-the-nation peril. We should not be lulled into complacency because the newness of the network has masked the threat.**”<sup>4</sup>

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## Cyber Security Vulnerabilities and National Security

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### References

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<sup>1</sup> Harry V. Lehmann, An attorney and engineer who served President Reagan, urges the Senate to suspend its approval of a national close proximity microwave radiating system underlying 5G. In his [letter](#) to Senator Feinstein dated March 8, 2018 <https://ehtrust.org/national-security-threat-from-5g-attorney-harry-v-lehmann-warns-senator-dianne-feinstein-in-march-22-2018-letter/>

<sup>2</sup> “5G and the Security Challenge” by Alex Farrant. Published: Land Mobile, November 21, 2019 <http://landmobile.co.uk/indepth/the-5g-security-challenge/>

<sup>3</sup> Senate Judiciary Committee “Hearing on 5G Security Risks” May 14, 2019 Presenters: Christopher Krebs, Dir. Cyber Security , Infrastructure Security Agency, under Dept. of Homeland Security and Robert Strayer, Dep. Asst. Secretary Cyber & Int’l Communications, US State Department. <https://www.c-span.org/video/?460706-1/state-department-official-raises-concerns-reliance-chinese-vendors-5g-networks#>

<sup>4</sup> Brookings Institution [REPORT](#) : Why 5G requires new approaches to cybersecurity: Racing to protect the most important network of the 21st century [https://www.brookings.edu/research/why-5g-requires-new-approaches-to-cybersecurity/?wpisrc=nl\\_cybersecurity202&wpmm=1](https://www.brookings.edu/research/why-5g-requires-new-approaches-to-cybersecurity/?wpisrc=nl_cybersecurity202&wpmm=1)

By [Tom Wheeler](#) and [David Simpson](#) Tuesday, September 3, 2019. Tom Wheeler was the 31st Chair of the FCC. He represented the industry for 12 years as president of the Cellular Telecommunications and Internet Association (CTIA) before being appointed chair of the FCC.



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## Health Effects

There already exists an extensive body of scientific studies showing that microwave radiation causes harm.<sup>1</sup> All wireless devices communicate via pulsations. Pulsed electro-magnetic fields (EMFs) are much more biologically active than non-pulsed. In order to transmit vast amounts of information, 5G will be extremely highly pulsed, far more than 2G, 3G and 4G, leading to harm to all living organisms.<sup>2</sup> **5G implementation will be in addition to the current use of 3G and 4G, creating an exponential increase in radiation exposure than we now have.** Like most medical studies done to test drugs or evaluate chemicals and pesticides, the studies below were performed using rodents or other mammals. Mammal cell physiology is directly applicable to humans.<sup>3</sup>

- 2008-2018 Landmark \$30 Million 10-year study conducted by the US. National Toxicology Program (NTP) of the NIH finds “Clear Evidence of Cancer” and DNA damage in rats and mice exposed to 2 and 3G radiation. This was based on evidence of **malignant gliomas in the brain and malignant schwannomas of the heart.** The study also showed **benign adrenal gland tumors, degeneration of heart tissue, decreased birth weights of rats exposed prenatally, and DNA damage.** This study was designed to determine whether radio-frequency radiation from cell phones and other wireless devices could cause cancer. Published November, 2018.<sup>4</sup>
- The Italian Ramazzini Institute Study found that lab animals exposed to the radio-frequency radiation emitted by distant cell towers had a greater chance of developing **heart and brain tumors** than those which were not exposed,. This study funded in part by the U.S. Government was the first large –scale study to show “**clear evidence**” of cancer risk from far-field exposures. **Published in 2018.**<sup>5</sup>
- More than 240 scientists who have published peer-reviewed research on the biological and health effects of non-ionizing EMFs “have shown that EMF affects living organisms at levels well below most international and national guidelines. Effects include **increased cancer risk, cellular stress, increase in harmful free radicals, genetic damages, structural and functional changes of the reproductive system, learning and memory deficits, neurological disorders, and negative impacts on general well-being in humans...**there is (also) growing evidence of harmful effects to both plant and animal life.”<sup>6</sup>
- According to Dr. Cindy Russell, creator of the website, “Physicians for Safe Technology,” “Scientific literature documents evidence of non-thermal cellular damage from wireless radiation used in telecommunications to **DNA integrity, cellular membranes, gene expression, protein synthesis, neuronal function, the blood brain barrier, melatonin production, sperm damage and immune dysfunction.**”<sup>6</sup>
- Joel M. Moskowitz, Ph.D., Director of the Center for Family and Community Health in the School of Public Health at the University of California, Berkeley writes that while the FCC adopted radiofrequency radiation (RFR) exposure limits based largely on research from the 1980’s focused on short-term heating risks due to RFR exposure, the preponderance of peer-reviewed research, **more than 500 studies, have found harmful biologic or health effects from exposure to RFR at intensities too low to cause significant heating.**”<sup>7</sup>
- In addition, “The **FCC’s RFR exposure limits** regulate the intensity of exposure, taking into account the frequency of the carrier waves **but ignoring the signaling properties of the RFR.** Along with the patterning and duration of exposures, certain characteristics of the signal (e.g., pulsing, polarization) increase the biologic and health impacts of the exposure.”<sup>7</sup>

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## Health Effects

- According to biochemist Dr. Martin Pall, the highly pulsed millimeter waves of 5G are much more dangerous than the less-pulsed electro-magnetic fields that we are used to. Many of the harmful effects are due to **increased intracellular calcium** throughout our bodies, and when combined with the effects of highly pulsed millimeter waves, the results are super-additive, potentially leading to very serious health problems.<sup>8</sup>
- Instances of sickness from 5G activation or close proximity to cell phone towers, 5G towers :
  - 1) **Firefighters experienced changes in brain structure and function resulting in delayed reaction time, lack of impulse control, difficulty maintaining mental focus, all validated by diagnostic studies.** Consequently, the International Association of Fire Fighters has taken a position opposing the use of fire station as base stations for telecommunications towers.<sup>9</sup>
  - 2) A new 2019 study shows that nearby cell tower radiation **harms children’s brains, resulting in significant decline in cognitive scores.**<sup>9</sup>
  - 3) The first reported injury from 5G comes from Geneva, Switzerland , where 5G was launched in 102 locations. **Residents “experienced loud ringing in the ear, intense headaches, unbearable earaches, insomnia, chest pains.”** July 2019<sup>10</sup> Even though the Swiss canton (state) to which Geneva belongs has banned 5G, the antennas had already been installed and the telecom company activated them anyway.<sup>11</sup>

### References

<sup>1</sup> <https://www.5gcrisis.com/scientific-studies>

<sup>2</sup> “Electromagnetic fields act via activation of voltage-gated calcium channels to produce beneficial or adverse effects” by Martin Pall J Cell Mol Med 8/2013

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3780531/>

<sup>3</sup> “Science on 5G and Wireless Radiation” Interview with Dr. Devra Davis, 8/2019 president and founder of the Environmental Health Trust, award winning internationally renowned scientist and founding director of the board on environmental studies and toxicology of the National Academy of Sciences. She’s also current Visiting Professor of Medicine in Israel and Turkey. Based on her book : *Disconnect*, Environmental Health Trust 2013

<https://www.amazon.com/Disconnect-Truth-About-Phone-Radiation/dp/0991219902>

<sup>4</sup> <https://ehtrust.org/wp-content/uploads/NTP-Factsheet.pdf>, and at

<https://www.ncbi.nlm.nih.gov/pubmen/316338/39>

<sup>5</sup> <https://www.ncbi.nlm.nih.gov/pubmed/29530389> and <https://www.ewg.org/release/italian>

<sup>6</sup> <https://mdsafetech.files.wordpress.com/2016/11/a-5g-future-article-sccma-with-references-61617-pdf.pdf>

Includes extensive references to scientific studies

<sup>7</sup> “We Have No Reason to Believe 5G is Safe”, Joel M. Moskowitz, Ph.D., Scientific American, October 17, 2019.

<https://blogs.scientificamerican.com/observations/we-have-no-reason-to-believe-5g-is-safe/>

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<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3780531/>

<sup>9</sup> <https://mdsafetech.org/2019/09/28/firefighters-fighting-fires-and-now-cell-towers/>

<sup>10</sup> <https://mdsafetech.org/2019/07/20/the-first-report-of-5g-injury-from-switzerland/>

<sup>11</sup> Regional Governments Standing Against 5G, Interview with Rapael Mahaim, Member of Parliament in Vaud, Switzerland. [www.5g.org.nz/2019/08/31/free-online-5g-crisis-summit-august-26-september-1-2019](http://www.5g.org.nz/2019/08/31/free-online-5g-crisis-summit-august-26-september-1-2019)

NOTE: All journal-published medical studies listed above are peer-reviewed and therefore Supreme Court admissible.

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- Blurred vision, impaired vision
- Nose bleeds, impaired sense of smell
- Shortness of breath
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- Behavioral problems, learning problems, ADHD
- Hyperactivity, heart palpitation

### Potential long term health effects from microwave radiation as indicated in scientific studies

- Brain cancers, acoustic neuromas and other tumors
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- Lymphoma
- Melanoma
- Reduced production of Melatonin
- Impaired fertility
- DNA damage
- Pre-natal damage, miscarriages, birth defects
- Immune dysfunction, chronic allergic responses and inflammatory responses
- Neurological and behavioral effects
- Dementia and Alzheimer's Disease
- Epilepsy

## References

- <sup>1</sup>Electromagnetics expert Dr. Om Ghandi published in IEEE Access, "Yes the Children Are More Exposed to Radiofrequency Energy From Mobile Telephones Than Adults":  
<http://ieeexplore.ieee.org/document/7131429?reload=true&arnumber=7131429&contentType=Journals%20%26%20Magazines>  
IEEE is Institute of Electrical and Electronic Engineers
- <sup>2</sup>Letter from American Academy of Pediatrics (President Dr. Thomas McInerney) to FCC (Acting Commissioner Clyburn) and U.S. FDA (Commissioner Hamburg), August 29, 2013. <https://ecfsapi.fcc.gov/file/7520941318.pdf>
- <sup>3</sup>[https://bioinitiative.org/wp-content/uploads/pdfs/sec20\\_2012\\_Findings\\_in\\_Autism.pdf](https://bioinitiative.org/wp-content/uploads/pdfs/sec20_2012_Findings_in_Autism.pdf)
- <sup>4</sup>Pall, M. L. (2016). Microwave frequency electromagnetic fields (EMFs) produce widespread neuropsychiatric effects including depression. Journal of Chemical Neuroanatomy, 75(Pt B), 43–51.  
<https://doi.org/10.1016/j.jchemneu.2015.08.001>
- <sup>5</sup><https://www.ncbi.nlm.nih.gov/pubmed/22428084>
- <sup>6</sup>Why Children Absorb More Microwave Radiation than Adults: The Consequences. Morgan, Kesari, et al. Journal of Microscopy and Ultrastructure 2(4):196-204 (2014). <http://www.jmau.org/article.asp?issn=2213-879X;year=2014;volume=2;issue=4;epage=197;epage=204;aualast=Morgan:type=0>
- <sup>7</sup><https://www.aemonline.org/pdf/WiredSchools.pdf>
- <sup>8</sup><http://www.wifi-in-schools-australia.org/p/emr.html>

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## Property Values Reduction

- **Montgomery County Government States Cell Towers Near Homes Decrease Property Values**  
In a filing in a lawsuit against the Federal Communications Commission, the County said through its experts that “...the placement of small cells – depending on their size and visibility – may affect neighboring property values....even as small reduction in value of homes in a neighborhood may have a multi-million dollar effect.” Expert testimony states that “studies have concluded that a visible antenna up to 1,000 feet away results in property value reduction of 1.82% for a residential home or \$3,342 in the market studied.”<sup>1</sup>
- **94% of People Said a Nearby Cell Tower ... Would Negatively Impact Interest In A Property Or The Price**  
“A survey conducted in June 2014 by the National Institute for Science, Law and Public Policy (NISLAPP) in Washington, D.C....shows home buyers and renters are less interested in properties located near cell towers and antennas, as well as in properties where a cell tower or group of antennas are placed on top of or attached to a building. And **79% said under no circumstances would they ever purchase or rent a property within a few blocks of a cell tower or antennas.** And almost 90% of respondents said they were concerned about the increasing number of cell towers and antennas in their residential neighborhood, generally.”<sup>2 3</sup>
- **Reduction in Tax Assessment by Montgomery Co. Appeals Board for Probable Cell Tower**  
The Property Tax Assessment Appeal Board for Montgomery County lowered a Rockville home’s assessment: “Comparables warrant a reduction in value. Probability of neighboring cell tower also affects value negatively. April 2011, reversing determination by the Department of Assessments and Taxation.”<sup>4</sup>
- **Wireless Towers in Visual Range**  
“values declining ... up to 9.78% for homes within tower visibility range compared to homes outside tower visibility range”<sup>5</sup>
- **20-25% Devaluation Found in Peer-Reviewed Study for Homes Near Cell Towers**  
“The Impact of Cell Phone Towers on House Prices in Residential Neighborhoods <sup>6</sup> by Sandy Bond, PhD, and Ko-Kang Wang. A peer-reviewed study found Homes near cell phone towers were devalued 20% to 25%.
- **5G Requires Cutting Down Trees in Yards – Reduces Value By Several Thousand Dollars <sup>7</sup>**  
5G requires direct “line of sight” from the cell antenna in front of the house, or from several houses away, to each house. So many thousands of trees in Montgomery County would need major branches removed or cutting down.
- **Two Reasons Buyers May Refuse to Buy Near “Small” Antennas–Health Risk and Aesthetics**  
This will translate into lower home values. This site lists articles, videos and studies showing declining property values around cell tower installations.<sup>8</sup>

# 4G/5G Wireless & “Small” Antennas Fact Sheet

## Property Values Reduction

### References

<sup>1</sup> “Comments of Smart Communities Siting Coalition” (of which Montgomery County is one) before the FCC. March 8, 2017. “Streamlining Deployment of Small Cell Infrastructure by Improving Wireless Facilities/WT Docket No. 16-421)” See Exhibit 3.

[https://montgomerycountymd.gov/cable/resources/files/towers/documents/mobilitie%20comments%20-%20Smart%20communities%20siting%20coalition%20\(2017\).pdf](https://montgomerycountymd.gov/cable/resources/files/towers/documents/mobilitie%20comments%20-%20Smart%20communities%20siting%20coalition%20(2017).pdf)

<sup>2</sup> <https://www.businesswire.com/news/home/20140703005726/en/Survey-National-Institute-Science-Law-Public-Policy#.VNRBPp3F-So>

<sup>3</sup> <https://electromagnetichealth.org/electromagnetic-health-blog/survey-property-desirability/>

<sup>4</sup> <https://www.scribd.com/document/64222439/Probability-of-neighborng-cell-tower-also-affects-value-negatively> ( Parents' Coalition of Montgomery County, Maryland ) See photocopy below.

<sup>5</sup> [Wireless Towers and Home Values: An Alternative Valuation Approach Using a Spatial Econometric Analysis](#) (*Journal of Real Estate Finance & Economics*, May 1, 2018)

<sup>6</sup> <https://www.emfanalysis.com/wp-content/uploads/2016/04/Impact-of-Cell-Towers-on-House-Prices.pdf>

<sup>7</sup> <https://www.greenblue.com/na/how-trees-increase-property-values/>

<sup>8</sup> <https://www.emfanalysis.com/property-values-declining-cell-towers/>

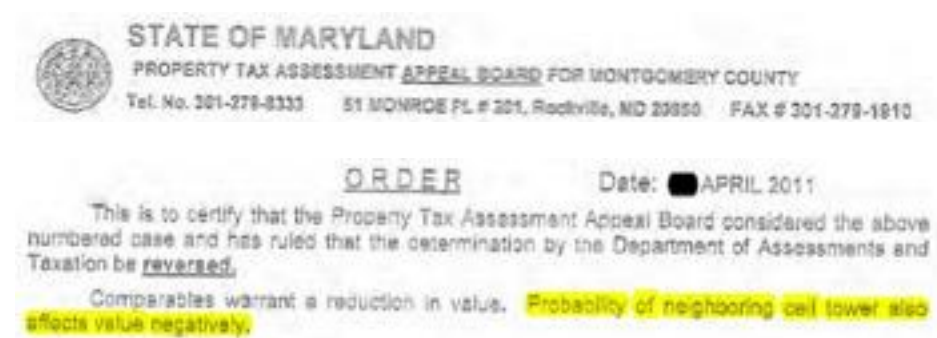
Johnson, Jeromy/EMF Solutions, “Protect Your Family from EMF Pollution: Property Values Declining Near Cell Towers.” (EMF Solutions) 2011-2019.

<https://www.emfanalysis.com/property-values-declining-cell-towers/>

Scientists for Wired Technology, “Cell Tower Installation Plans Lower Property Values” (Scientists for Wired Technology) 2017-2019.

<https://scientists4wiredtech.com/what-are-4g-5g/cell-tower-installation-plans-lower-property-values/>

Photocopy of reduction in tax assessment for a house in Montgomery County by the Appeals Board for Montgomery County:



# 4G/5G Wireless & “Small” Antennas Fact Sheet

## Climate Change Impact

5G would facilitate a massive shift from wired and fiber-optic communication, to wireless communication. It is much more efficient to send data through copper wires or fibers than through air. An exhaustive study published in the professional journal of the Institute of Electronic and Electronics Engineers (IEEE) said: **“wireless technologies will continue to consume at least ten times more power than wired technologies, when providing comparable access rates and traffic volumes.”**<sup>1</sup> Other estimates are even higher.<sup>2</sup>

**Higher energy consumption inevitably means higher greenhouse gas emissions.** We are still getting most of our energy from fossil fuels and other forms of combustion. Less than 4% of PEPCO’s energy comes from wind and solar. Yet even wind and solar need major amounts of energy for their high-end manufacturing.

Historically, data transmission has been only a small part of overall energy consumption. But this is changing very fast. The Shift Project, an international team of scientists, engineers and telecommunications experts based in Paris, recently published a report saying that global digital energy demand is now increasing by 9% every year.<sup>3</sup> The Shift Project says that **digital technologies now emit 4% of greenhouse gases (GHG), more than civil aviation. Under the industry proposals, these emissions would double before 2025 to 8%, the amount that car emissions emitted worldwide in 2019.**

Swedish energy expert Anders Andrae estimated that **internet communications technologies could be responsible for 14% of global greenhouse gas emissions by 2040, undermining our efforts to combat climate change.**<sup>4</sup>

The Internet’s main energy demand is for data centers of thousands of servers, that never stop and must have many backups. Natural Resources Defense Council (NRDC) said the 2 million servers in data centers annually use the same amount as “electricity to power all of New York City’s households for 2 years.”

The use of the devices is the second major increase energy demand by 5G. **The industry is proposing 3,000,000 devices per square mile**<sup>5</sup> Streaming 52 hours of video consumes more electricity than running two refrigerators for a year.<sup>6</sup> The tsunami of data produced as the industry proposes to digitalize all our machines, appliances and devices would also warp the economy to dependence on this inefficient, huge energy demand far into the future.

A rollout of 5g will also result in a **major loss of tree canopy**, due to “line of sight” requirements for the higher-spectrum millimeter wavelengths. Tree canopy is essential for local cooling and increased rainwater absorption, two important ecological mitigations for increased warming and drought. While the global climate movement is beginning massive tree planting projects, 5G would reverse this effort. The “line of sight” cutting would also **remove carbon sequestration by thousands of trees.** The 5G permitting process would also eliminate the forest conservation review and other standards currently required for cell towers.

5G is not part of any safe or sustainable solution to climate change.

# 4G/5G Wireless & “Small” Antennas Fact Sheet

## Climate Change Impact

### References

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<sup>1</sup> “Energy consumption in wired and wireless access networks” Jayant Baliga ; Robert Ayre ; Kerry Hinton ; Rodney S. Tucker, IEEE Communications Magazine ( Volume: 49, Issue: 6, June 2011 ), [https://web.archive.org/web/20171114021923if\\_/http://ieeexplore.ieee.org/abstract/document/5783987/](https://web.archive.org/web/20171114021923if_/http://ieeexplore.ieee.org/abstract/document/5783987/) (paid)

<sup>2</sup> “Energy Consumption from the Internet of Things and Wireless Technology” <http://whatis5g.info/energy-consumption>

<sup>3</sup> “Lean ICT: Towards Digital Sobriety” by Hugues Ferreboeuf for the Think Tank The Shift Project, March 2019, p.17, [https://theshiftproject.org/wp-content/uploads/2019/03/Lean-ICT-Report\\_The-Shift-Project\\_2019.pdf](https://theshiftproject.org/wp-content/uploads/2019/03/Lean-ICT-Report_The-Shift-Project_2019.pdf)

<sup>4</sup> “‘Tsunami of data’ could consume one fifth of global electricity by 2025” <https://www.theguardian.com/environment/2017/dec/11/tsunami-of-data-could-consume-fifth-global-electricity-by-2025>

<sup>5</sup> “5G and Massive IoT: legacy technologies will bridge the gap for now”, Feb 13, 2019, by Christian Kim <https://technology.ihs.com/611104/5g-and-massive-iot>

<sup>6</sup> Singer, Kate. The Electronic Silent Spring (2014) and Limits to Electronic Growth (forthcoming). In “The Real Amount of Energy Used to Power the Internet”, Singer wrote on the importance of reducing the Internet’s footprint through her work for the EMR Policy Institute.



# Understanding EMFs

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## Introduction

Thank you for seeking information on the issues surrounding electromagnetic fields (EMFs) of man-made radiation pulsed by wireless devices and

infrastructure. All of the following use this form of man-made two-way microwave radiation to send and receive data: cell phones, cordless phones, Bluetooth, laptops, iPads and other tablets, iPods, wi-fi routers, classroom access points, smartboards, wearable devices, baby monitors, smart speakers, security systems, gaming systems, hearing aids, vehicles, etc., as well as utility "smart" meters, cell towers, and 4G/5G small cells/distributed antenna systems. With the Internet of Things (IoT) the wireless industry plans to put radiation antennas in many more consumer products.

Note: Other terms often used in association with EMFs are radiofrequency radiation (RF), electromagnetic radiation (EMR) and millimeter waves (MMW). They are all in the microwave segment of the electromagnetic radiation spectrum, and there has never been a safe level of microwave radiation determined in the scientific literature.

Many of the health issues associated with wireless technologies can also occur with electrical systems and devices that operate in the ELF (extremely low frequency) range.

This site represents one concerned citizen's attempt to organize the information available on this issue. To help me get my head around an issue I couldn't see, smell, touch or taste, after doing much research I took a deep breath and purchased an Acoustimeter, a \$400 scientific instrument to measure wireless radiation. With gratitude to my local cable station, WACA-TV, the following public service video provides a 23-minute demonstration of the EMFs in many homes today and solutions to lower radiation exposure:

<https://vimeo.com/159873631>

Please feel free to peruse this site as a launch point and begin your own investigation as new information comes out frequently. See the [Science](#) and [Doubts](#) pages for additional information.

Below is a summary of the issues, and the site navigation panel provides sources for more in-depth inquiry.

### **Global EMF Monitoring**

EMF scientist, Dr. Magda Havas, professor emeritus of Trent University who taught electromagnetics for 25 years, has launched the Global EMF Monitoring

project. Governments have failed to do post-market surveillance so citizens around the world are taking real-time EMF measurements. Dr. Havas has built a database to map what the levels are. This will help public servants see the risks in their districts, and help those who cannot or choose not to live in a high EMF environment to find lower exposure areas in which to live.

Please see the [Global EMF Monitoring](#) website and let Dr. Havas know if you would like to take readings in your area. Safe Living Technologies, which makes the Safe & Sound Pro II meter used for the study, is generously offering a discount to those participating. Dr. Havas will share the code with you.

### Quick Training

If you are short on time, the non-profit **Wireless Education** has distilled this information into an on-line course that can be completed in about a half hour for less than the cost of a movie ticket. This is appropriate for parents, educators, mature students and others who wish to come up to speed together quickly. There is a second low-cost 30-minute e-learning course for businesses to educate and safeguard their employees in the work environment. Please see:

- Schools & Families  
Course:  
<https://www.wirelesseducation.org/store/l2/>
- Corporate Induction  
Safety Awareness Course:  
<https://www.wirelesseducation.org/store/c2/>

### The Issues

In short, we adopted wireless technology without taking into consideration its potential impact on health. The [Federal Communication Commission \(FCC\)](#) guidelines in place today were developed in 1996. These address only the thermal (heat) impact which boils down to how much radiation it would take to heat the skin of a six-foot 220-pound military man. The limits are very high and they do not address the much lower non-thermal impacts that come with use of today's devices. Science has since proven there are many harmful non-thermal effects.

Today's FCC standards also do not address the impact on children and fetuses who absorb significantly more radiation in their underdeveloped immune systems, DNA, bones, brains and other organs. Nor do our FCC standards address the cognitive impact on the elderly, or the immune system impact on those with existing health conditions. Our current standards were set in place by recommendations from electronics and electrical engineers, not by qualified doctors and scientists who understand the biological effects of exposing humans and other living organisms to microwave radiation.

The FCC, an agency captured by industry, is being sued for ignoring thousands of pages of scientific evidence entered into the public record. See the [Legal Issues](#) page for additional information.

### **The Impact**

We have erected millions of cell towers and wi-fi hotspots that continually bathe our planet and its inhabitants in man-made radiation. We have installed wi-fi routers in our homes, offices, schools and elsewhere. These signals interfere with our own bodies' electrical circuitry and we are absorbing constant radiation into our organs. Our municipalities are now allowing wireless "smart utility meters" on our homes and 5G small cell antennas inside our neighborhoods that pulse constant radiation signals. The result is that we are now seeing both children and adults present with symptoms ranging from headaches, nausea, anxiety, depression, sleep disorders and behavior issues, to cancers, heart problems, chronic illnesses, DNA mutations and infertility.

Thousands of studies have been done. Many countries have already banned or restricted the use of wi-fi and cell phones for children, and put provisions in place to protect pregnant women. The United States, however, is wonderful with innovation but slow to own up to the detrimental health impact this technology is causing.

In June 2015, Harvard University published a [Captured Agency](#) report detailing how the FCC is run by the industry it presumably regulates. Click [here](#) to hear the history from **Dr. George Carlo** of how industry was able to get this technology to market before it was properly tested and how research findings have been suppressed since. You may also wish to read his book, "[Cell Phones: Invisible Hazards in a Wireless Age \(Avalon, 2001\)](#)". The [Moscow Signal Experiment](#) also indicates our military was knowledgeable of the harm caused by EMFs as early as

1962, long before this technology was deployed in the commercial sector. See the [Military Experts](#) page for more.

## **Solutions**

There are two types of solutions. The first is to do what you can to remediate wireless radiation impact where you live, work, learn and play today and protect your loved ones.

The second is to speak to your towns and local legislators to ensure our government policies are changed. See the [For Municipal Leaders](#) page and [Bills in Other States](#) page for suggestions. Thank you.

*Note: The information provided here is publicly available on the Internet.*

*It is intended to provide a starting point to inform you of EMF dangers.*

*Please do your own research, draw your own conclusions, and act accordingly to protect those you love.*

<http://tinyurl.com/Understanding-EMFs>