

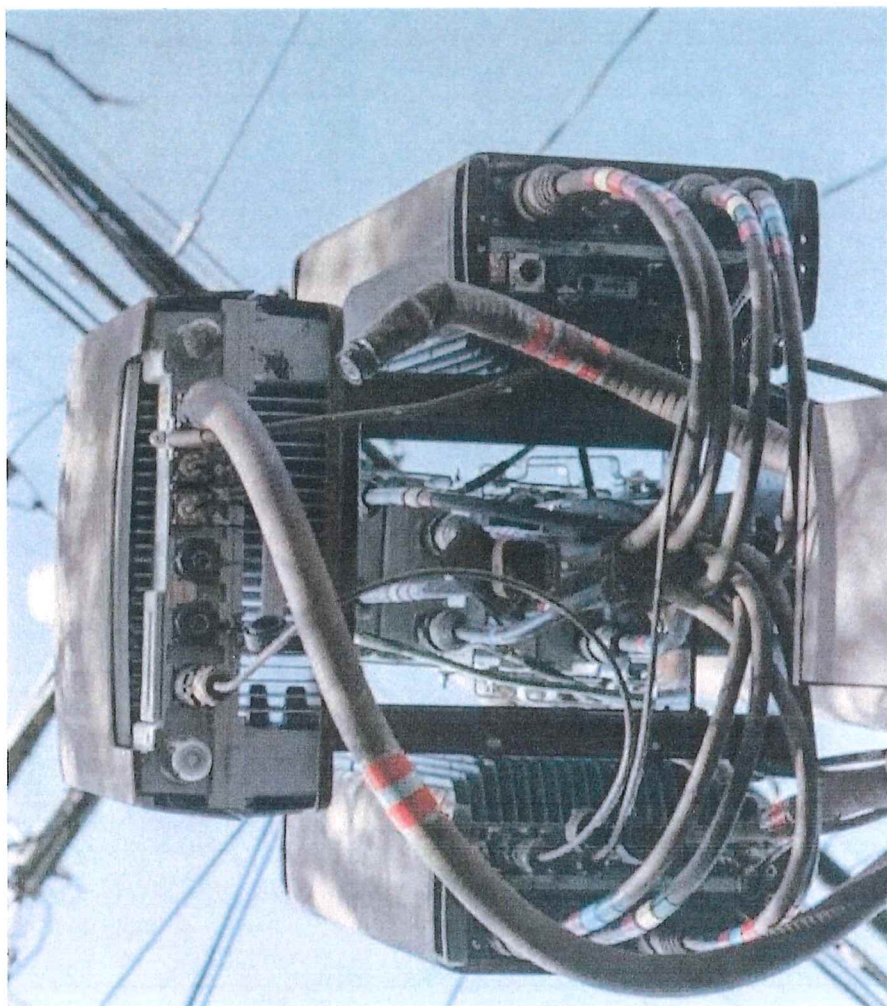
To: Board of Public Works

From: LISA Wedtke & Seth

Re: Small Cell installations

Date: July 17, 2019

While state and federal regulations have restricted local oversight of small cells to some degree, localities still have more latitude than they may realize to draft their own ordinances. The attached documents reiterate the importance of enacting those ordinances and provide one example (from Larimer County Colorado) of a locality grappling with these issues and formulating rules to protect their citizens. State and federal statutes may change. We need to be prepared to avail ourselves of whatever pengatives present themselves, going forward, since it's not only aesthetics that are at stake!



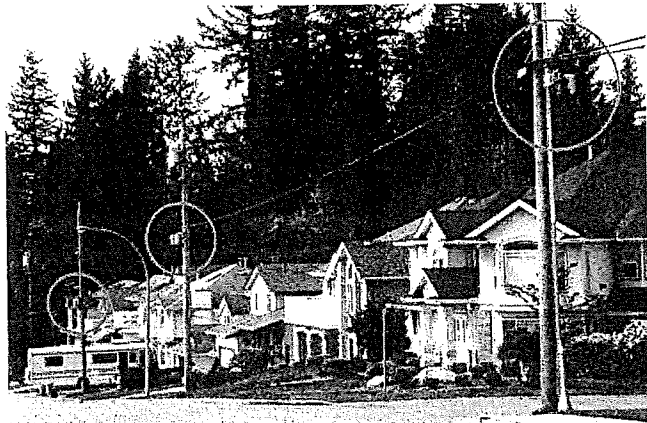
Typical 5G Small Cell
Antenna

5th Generation (5G) Wireless Communications Fact Sheet

The Federal Communications Commission has allocated a high-frequency spectrum for 5G communications utilizing millimeter waves (mmW), the next phase in wireless cellular technology. But critical questions about the safety of this technology remain.

Thousands of published studies over the past fifty years have established indisputable evidence of harmful health effects from exposure to microwave or radio-frequency (RF) radiation.

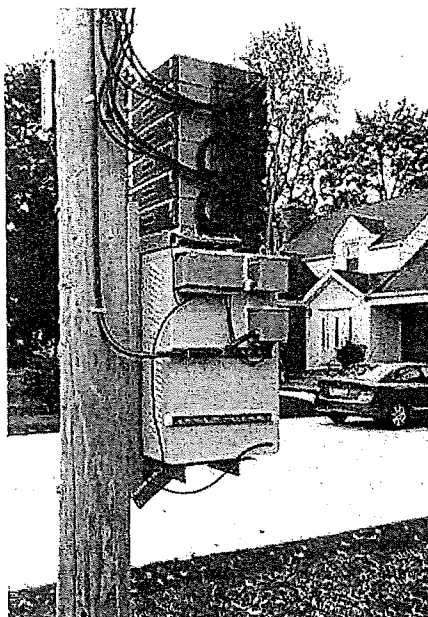
5G technology will require a dense network of millions of RF antennas, deployed in neighborhoods in towns and cities across the country, resulting in continuous, involuntary exposure for Americans in their homes, schools and businesses.



Concurrent with the rollout, telecom companies are aggressively promoting state legislation that eliminates the rights of local governments to control the installation of "small cell" 5G antennas in public "rights of way." This unprecedented appropriation of local control would override FCC regulations and the Telecommunications Act, and would prevent local authorities from exercising their duty to consider property values, safety or aesthetic issues related to 5G technology.

Additional Facts about 5G

- **5G mobile wireless networks** can deliver large amounts of data over short distances, resulting in faster internet speeds. The primary purpose of 5G is to allow telecom companies to compete directly with cable companies, and increase the capacity of "smart devices" and machine-to-machine communications - the "Internet of Things" (IOT). **5G is not necessary for public safety.**



- **5G wireless networks will utilize millimeter waves (mmWaves).** Current cellular and WiFi networks rely on microwaves that employ frequencies up to 6 gigahertz (GHz). 5G technology will use millimeter and sub-millimeter waves in higher frequency ranges (between 30 GHz and 300 GHz). This technology has not been widely deployed before.

- **5G antennas will be placed on millions of utility poles, lamp posts and commercial buildings.** 5G networks require many closely-spaced antennas in order for the short wavelength mmWaves to travel through buildings or other obstacles, including foliage on trees. This will require a very dense network of antennas.

- **"Small Cell" does not mean small, unobtrusive equipment.** It means that every cell provider will hang its own antennae enclosure (up to 6 cubic feet each) on the pole, with other associated equipment (up to 28 cubic feet - the size of a large refrigerator) located nearby.

- **Exposure to all types of wireless radiation is associated with cancer and other health effects.** The World Health Organization has classified wireless radiation as a Group 2B “possible human carcinogen,” and a recent study conducted by the National Institutes of Health has corroborated this finding. Studies have also found that typical exposures to RF radiation can cause disruption of normal brain development in fetuses and learning disabilities, heart abnormalities and electro-hypersensitivity. Populations especially at risk from this type of radiation include pregnant women, children, the elderly, and individuals with implanted medical devices, cardiac and neurological problems.
- **mmWaves have unique health impacts on the human body.** Sweat ducts within our skin, the largest organ in the human body, act as antennae when in contact with mmWaves. The waves penetrate 1 to 2 millimeters of human skin tissue and are also absorbed by the surface layers of the eye’s cornea.
- **Plants and animals are also harmed by wireless radiation.** Studies have found that electromagnetic radiation from mobile phone cell sites damages trees, and several studies have clearly demonstrated that radio-frequency radiation changes the makeup and structure of plants. Many research analyses also cite wireless technology as a contributing factor in the decline of bird, frog, bat, and honeybee populations.
- **mmWaves could make bacteria resistant to antibiotics.** One study analyzing mmWave interaction with bacteria found that the waves can cause changes in bacteria’s sensitivity to different biologically active chemicals, such as antibiotics. This study suggests that mmWaves may have the ability to create antibiotic resistance in bacteria, creating concern in the medical community.
- **The FCC is pushing for implementation of 5G without considering its potential impacts on public health.** To date, the U.S. government has failed to update its exposure standards for wireless radiation, despite warnings from other branches of government, including the Department of the Interior (DOI), that the FCC safety standards are 30 years out of date. These standards consider only thermal (heat) effects, not other biological effects below the heating threshold which are now well-established scientifically.

PARTIAL LIST OF REFERENCES:

- Massey University; “Could Future Wireless Communications Be Harmful?” (2016) http://www.massey.ac.nz/massey/about-massey/news/article.cfm?mnarticle_uuid=238A1039-989F-C67F-4DA1-FFD7FF123DBB
- Soghomonyan et al, “Millimeter waves or extremely high frequency electromagnetic fields in the environment: what are their effects on bacteria?.” *Applied Microbiology and Biotechnology* 100.11 (2016): 4761-4771.
- Pakhomov, et al, “Current state and implications of research on biological effects of millimeter waves: a review of the literature.” *Bioelectromagnetics*. 1998;19(7):393-413.
- Stein, Yael, MD of the Hadassah Medical Center, Jerusalem, Israel, “Letter to the FCC in Opposition to 5G Spectrum Frontiers Millimeter Wave Technology.” <https://ehtrust.org/letter-fcc-dr-yael-stein-md-opposition-5g-spectrum-frontiers/>
- Wu, Ting, Theodore S. Rappaport, and Christopher M. Collins. “The human body and millimeter-wave wireless communication systems: Interactions and implications.” *Communications (ICC), 2015 IEEE International Conference*
- Osseiran, Afif, et al. “Scenarios for 5G mobile and wireless communications: the vision of the METIS project.” *IEEE Communications Magazine* 52.5 (2014): 26-35.
- Waldmann-Selsam, Cornelia, et al. “Radio-frequency radiation injures trees around mobile phone base stations.” *Science of The Total Environment* 572 (2016): 554-569.
- International Agency for Research on Cancer (World Health Organization); http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf
- Ryam et al, “Radio frequency radiation of millimeter wavelength: potential occupational safety issues related to surface heating.” *Health Phys.* 2000; 78 (2): 170-81.

For a more complete listing of recent scientific studies on health impacts from wireless radiation, please visit <http://grassrootsinfo.org/emergingscience.php>

Children's bedroom is in the main
RFR beam or close to it.



05/25/2019 17:19

RADIOFREQUENCY / MICROWAVE EXPOSURE GUIDELINES

(High Frequency Electromagnetic Waves)

1> BUILDING BIOLOGY PRECAUTIONARY GUIDELINES (SBM-2015) For Sleeping Areas

Power density	No Concern	Slight Concern	Severe Concern	Extreme Concern
microWatts per square meter $\mu\text{W}/\text{m}^2$	< 0.1	0.1 - 10	10 - 1000	> 1000
microWatts per square cm $\mu\text{W}/\text{cm}^2$	< 0.000,01	0.000,01 - 0.001	0.001 - 0.1	> 0.1
milliWatts per square meter mW/m^2	< 0.000,1	0.000,1 - 0.01	0.01 - 1	> 1
Signal strength				
Volts per meter V/m	< 0.006,14	0.006,14 - 0.061,4	0.061,4 - 0.614	> 0.614

2> BIOINITIATIVE REPORT PRECAUTIONARY GUIDELINES (2007 - 2012) www.bioinitiative.org/

Dr. Martin Blank - Columbia University

Biologically Based Precautionary Levels $1,000 \mu\text{W}/\text{m}^2$ or $0.1 \mu\text{W}/\text{cm}^2$

3> CANADA AND USA GOVERNMENT GUIDELINES (1999, 2009, 2015)

In Canada, guidelines for Radio Frequency Wave exposure lay under the jurisdiction of Health Canada. Safety code 6 was developed in 1999 and offers federal guidelines for safe RF exposure levels. These are in the range of $2,000,000$ to $10,000,000 \mu\text{W}/\text{m}^2$ or 200 to $1000 \mu\text{W}/\text{cm}^2$ and are based solely on the short term thermal effects or the heating of body tissue. Adverse biological effects have been documented at levels far below Safety Code 6 guidelines. No Canadian biological exposure guidelines exist for long term exposure to low level Radio Frequency Radiation. This also holds true for the USA.

What You Need To Know About 5G Wireless and “Small” Cells

“We recommend a moratorium on the roll-out of the fifth generation, 5G, for telecommunication until potential hazards for human health and the environment have been fully investigated by scientists independent from industry...RF-EMF has been proven to be harmful for humans and the environment.”

— 2017 5G Scientific Appeal (signed by more than 200 scientists and doctors from 35 countries)

Nationwide, communities are being told by wireless companies that it is necessary to build “small cell” wireless facilities in neighborhoods on streetlight and utility poles in order to offer 5G, a new technology that will connect the Internet of Things (IoT). At the local, state, and federal level, new legislation and new zoning aim to streamline the installation of these 5G “small cell” antennas in public rights-of-way.

The radiation from small cells is not small: Wireless antennas emit microwaves — non-ionizing radiofrequency radiation — and essentially function as cell towers. Each installation can have over a thousand antennas that are transmitting simultaneously.

Millions of small cells to be built in front yards: The Federal Communications Commission estimates that millions of these wireless transmitters will be built in our rights-of-way, directly in front of our homes.

5G will add to — not replace — our current wireless technology: 5G will not only utilize current 3G and 4G wireless frequencies already in use but also add higher frequency — submillimeter and millimeter waves — in order to transmit data at superfast speeds.

Community authority is overruled: Communities are being stripped of their right to make decisions about this new technology. “Streamlining” means almost automatic approval. Public notice and public hearings are being eliminated. Even if every homeowner on the block opposes the antennas on their street, the opposition will be disregarded.

Scientists worldwide are calling for a halt to the 5G Roll-out: Over 200 scientists and doctors issued a declaration calling for a moratorium on the increase of 5G cell antennas citing human health effects and impacts to wildlife.

Read the 2017 Scientific Appeal on 5G To the European Commission

Read the 2015 EMF Scientist Appeal to the United Nations

Read Letters From Dozens of Scientists on Health Risks of 5G

Cumulative daily radiation exposure poses serious public health risks: Peer reviewed, published science indicates that exposures to wireless radiation can increase cancer risk, alter brain development and damage sperm. Most people are unaware that wireless technology was never tested for long-term safety, that children are more vulnerable and that the accumulated scientific evidence shows harm.

Decreased property values: Studies show property values drop up to 20% on homes near cell towers. Would you buy a home with a mini cell tower in the yard? Read research showing decreased property value from cell towers near homes.

Microwave antennas in front yards present several worker and public safety issues: Unions have already filed comments that workers were injured, unaware they were working near transmitting antennas. How will HVAC workers, window washers, and tree cutters be protected? The heavy large equipment cabinets mounted on poles along our sidewalks also present new hazards. Cars run into utility poles, often, what then? US Dept of Labor letters on cell tower safety

Fiber is the safe alternative: Worldwide, many regions are investing in wired fiberoptic connections which are safer, faster, more reliable, provide greater capacity, and are more cyber-secure. Read “Re-Inventing Wires: The Future of Landlines and Networks,” by the National Institute for Science, Law & Public Policy

www.ehtrust.org

All text in this document in blue is hyperlinked to resources for more information.

Please also see <https://ehtrust.org/factsheet-need-know-5g-small-cells-science-policy-public-health/> for additional resources.

KEY RESEARCH AND REPORTS

5G Frequencies Are Absorbed Into the Skin

Physicists found that the higher millimeter frequencies intended for 5G use are preferentially absorbed into the sweat duct at much higher rates than other organ tissues. Read two published studies "The Modeling of the Absorbance of the Sub-THz Radiation by Human Skin." The human skin as a sub-THz receiver – Does 5G pose a danger to it or not? Paul Ben-Ishai, PhD Lecture.

5G Frequencies Are Used As Weapons

Millimeter frequencies have the capacity to cause a severe burning sensation in the skin and are used by the U.S. Department of Defense in crowd control guns called Active Denial Systems.

Landmark US National Toxicology Program (NTP) Study Finds "Clear Evidence of Cancer" and DNA Damage

The NTP studies found male rats exposed for two years to cell phone radiation developed significantly increased gliomas (brain cancer) and schwann cell tumors, the very same types of tumors increased in long-term human cell phone users. NIH/ NTP presentation on DNA results states "exposure to RFR has the potential to induce measurable DNA damage under certain exposure conditions." Press Coverage, Peer Review Report

Cell Tower Radiation is Linked To Damage in Human Blood

A published study compared people living close and far from cell antennas and found people living closer to cellular antennas had changes in blood that predicts cancer development. Read Zothansiana et al, 2017. Read a Compilation of Research on Cell Tower Radiation

Published Scientific Review on 5G Finds Adverse Effects

Scientific literature documents evidence of nonthermal 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. Russell 2018

Cellular Radiation Negatively Impacts Birds and Bees

Published research finds the frequencies alter bird navigation and disturb honeybee colonies. Research on EMF and Bees. Research on Wildlife

RESOURCES

Research on 5G and Cell Tower Radiation

A 5G Wireless Future: Will it give us a smart nation or contribute to an unhealthy one?" Santa Clara Medical Association Bulletin, Cindy Russell MD, 2017

Letters by Scientists in Opposition To 5G Research on Cell Tower Radiation, 2017

Biological Effects from Exposure to Electromagnetic Radiation Emitted by Cell Tower Base Stations and Other Antenna Arrays, Levitt and Lai, 2010

Radiofrequency radiation injures trees around mobile phone base stations, Waldmann-Selsam et al., 2016

Department of Interior Letter on the Impact of Cell Towers on Migratory Birds, Willie R. Taylor Director, Office of Environmental Policy and Compliance, 2014

Anthropogenic radiofrequency electromagnetic fields as an emerging threat to wildlife orientation, Balmori, 2015

Briefing Memorandum On The Impacts from Thermal and Non-thermal Non-ionizing Radiation to Birds and Other Wildlife, Manville, 2016

Database of Worldwide International Policy To Reduce EMF

Youtube Scientific Videos on 5G

TAKE ACTION

Contact local, state and federal elected officials in person.

Share this information with your friends, family and community.

Ask for government policy that reduces RFR exposure to the public.

Citizens in all states must organize and take action to halt legislation that increases cell antennas in neighborhoods.

LEARN MORE

Federal Legislation To Know

US States With Streamlining Bills

5G Small Cell Antennas To Be Placed On:

- Street lights
- Trashcans
- Utility poles
- Bus stops
- Sides of buildings

5 Reasons Why Small Cells Are Not Small

- Increased radiation near homes
- Refrigerator-sized equipment cabinet
- Drop in property values
- Taller poles
- Fixtures weigh hundreds of pounds

Crown Castle's 2016 10-K Annual Report says:

"If radio frequency emissions from wireless handsets or equipment on our wireless infrastructure are demonstrated to cause negative health effects, potential future claims could adversely affect our operations, costs or revenues... We currently do not maintain any significant insurance with respect to these matters."

Read warnings from Crown Castle, Verizon and other wireless companies.

The American Academy of Pediatrics says:

"An Egyptian study confirmed concerns that living nearby mobile phone base stations increased the risk for developing:

- Headaches
- Memory problems
- Dizziness
- Depression
- Sleep problems"

AAP on Cell Towers

Letter from oncologist Lennart Hardell MD & Colleagues:

"There is a substantial body of evidence that this technology is harmful to humans and the environment. The 5G millimeter wave is known to heat the eyes, skin and testes... Of particular concern are the most vulnerable among us — the unborn, children, the infirm, the elderly and the disabled. It is also expected that populations of bees and birds will drastically decline."

2017 Scientific Letter

Peer Reviewed Research Studies on Radiofrequency Radiation Have Found:

- Headaches
- Sperm damage
- Altered brain development
- Depression
- Neurological symptoms
- Hormone changes
- Memory problems
- Sleep problems
- Cancer

Science:

BioInitiative 2012 Report by Independent Scientists
Dr. Moskowitz, University of California at Berkeley
Dr. Lennart Hardell Örebro University Sweden
The Baby Safe Project
WhatIs5g.info
Physicians for Safe Technology
Environmental Health Trust 5G Resources

www.ehtrust.org

 ENVIRONMENTAL
HEALTH TRUST

5G - FROM BLANKETS TO BULLETS

5G - FROM BLANKETS TO BULLETS

by Arthur Firstenberg

The single most important fact about 5G that nobody is talking about is called "phased array." It will totally change the way cell towers and cell phones are constructed and will transform the blanket of radiation which has enveloped our world for two decades into a million powerful beams whizzing by us at all times. Blake Levitt, author of *Electromagnetic Fields: A Consumer's Guide to the Issues and How to Protect Ourselves* (Harcourt Brace, 1995), brought this to my attention. A mutual friend, with whom I was speaking during the campaign to defeat S.B. 649 in California, passed on a message from Blake: "5G antennas will be phased arrays; Arthur will know what that means." And I did.

Phased arrays were one of the first things I learned about in the very beginning of my long, involuntary journey from medical student to campaigner against wireless technology. After I was injured by X-rays in 1980, I began to read everything I could get my hands on that had to do with electromagnetic radiation and its effects on life. And one of the first books I read was Paul Brodeur's *The Zapping of America* (W.W. Norton, 1977).

Early warnings

Brodeur was a staff writer for the *New Yorker* who had purchased property on Cape Cod, Massachusetts, only to discover that 30 miles inland, across the bay from his future home, the Air Force was planning to construct the world's most powerful radar station. It was going to scan the Atlantic Ocean as a key early warning element protecting us against the threat of sea-launched ballistic missiles from the Soviet Union. Although it emitted an average power of only 145,000 watts, similar to some FM radio stations, it did not broadcast that energy from only a single antenna and it did not spread that energy out uniformly in all directions. Instead, it had 3,600 antennas arranged in two "phased arrays" of 1,800 antennas each. The antennas in each array worked together as a unit to focus all their energy into a narrow, steerable beam. Each beam had an effective power of four billion watts, and the peak radiation level exceeded one milliwatt per square centimeter—the FCC's safety limit today—at a distance of three miles in front of the radar station. The facility was called PAVE PAWS (Precision Acquisition of Vehicle Entry Phased Array Warning System).

The Defense Department acknowledged in a 1975 report, quoted by Brodeur, that such systems "energize thousands of operational elements, are electronically steered at high search rates, and operate at a frequency range having a maximum whole body energy transfer to man and for which little bioeffects data exists."^[1]

Shortly after I read this, I discovered firsthand what some of the bioeffects were. Attempting to finish my M.D. almost cost me my life. I collapsed one day with all the symptoms of a heart attack, whereupon I resigned from school and moved up to Mendocino to recover. There I was in the path of the other PAVE PAWS, the one that scanned the Pacific Ocean. This PAVE PAWS was due east of Mendocino, in California's Central Valley at Beale Air Force Base. And for nine months, every evening at precisely 7:00 p.m., no matter where I was or what I was doing, my chest would tighten and I would be unable to catch my breath for the next two hours. At precisely 9:00 p.m., my body would relax and I could breathe. I lived in Mendocino from 1982 through 1984, and although I eventually recovered my health, I was always aware of an uncomfortable pressure in my chest whenever I was on the coast. I also lived in Mendocino from 1999 to 2004, and felt that same discomfort whenever I was there, and always felt it suddenly vanish when I drove out of range of PAVE PAWS, and suddenly return at the same point on my journey home.

Directed beams

5G is going to be at a much higher frequency range, which means the antennas are going to be much smaller—small enough to fit inside a smartphone—but like in PAVE PAWS they are going to work together in a phased array, and like in PAVE PAWS they are going to concentrate their energy in narrow, steerable high power beams.^[2] The arrays are going to track each other, so that wherever you are, a beam from your smartphone is going to be aimed directly at the base station (cell tower), and a beam from the base station is going to be aimed directly at you. If you walk between someone's phone and the base station, both beams will go right through your body. The beam from the tower will hit you even if you are in the general vicinity of someone who is on a smart phone. And if you are in a crowd, multiple beams will overlap and be unavoidable.

At present, smartphones emit a maximum of about two watts, and usually operate at a power of less than a watt. That will still be true of 5G phones, however inside a 5G phone there may be 8 tiny arrays of 16 tiny antennas each,^[3] all working together to track the nearest cell tower and aim a narrowly focused beam at it. The FCC has recently adopted rules^[4] allowing the effective power of those beams to be as much as 20 watts. Now if a handheld smartphone sent a 20-watt beam through your body, it would far exceed the exposure limit set by the FCC. What the FCC is counting on is that there is going to be a metal shield between the display side of a 5G phone and the side with all the circuitry and antennas. That shield will be there to protect the circuitry from electronic interference that would otherwise be caused by the display and make the phone useless. But it will also function to keep most of the radiation from traveling directly into your head or body,^[5] and therefore the FCC is allowing 5G phones to come to market that will have an effective radiated power that is ten times as high as for 4G phones. What this will do to the user's hands, the FCC does not say. And who is going to make sure that when you stick a phone in your pocket, the correct side is facing your body? And who is going to protect all the bystanders from radiation that is coming in *their* direction that is ten times as strong as it used to be?

And what about all the other 5G equipment that is going to be installed in all your computers, appliances, and automobiles? The FCC calls handheld phones "mobile stations." Transmitters in cars are also "mobile stations." But the FCC has also issued rules for what it calls

"transportable stations," which it defines as transmitting equipment that is used in stationary locations and not in motion, such as local hubs for wireless broadband in your home or business.[6] The FCC's new rules allow an effective radiated power of 300 watts for such equipment.[7]

Enormous power

The situation with cell towers is, if anything, worse. So far the FCC has approved bands of frequencies around 24 GHz, 28 GHz, 38 GHz, 39 GHz, and 48 GHz for use in 5G stations, and is proposing to add 32 GHz, 42 GHz, 50 GHz, 71-76 GHz, 81-86 GHz, and above 95 GHz to the soup.[8] These have tiny wavelengths and require tiny antennas. At 50 GHz, an array of 1,024 antennas will measure only 4 inches square.[9] And the maximum radiated power per array will probably not be that large—tens or hundreds of watts. But just as with PAVE PAWS, arrays containing such large numbers of antennas will be able to channel the energy into highly focused beams, and the *effective* radiated power will be enormous. The rules adopted by the FCC allow a 5G base station operating in the millimeter range to emit an effective radiated power of up to 30,000 watts per 100 MHz of spectrum.[10] And when you consider that some of the frequency bands the FCC is making available will allow telecom companies to buy up to 3 GHz of contiguous spectrum at auction, they will legally be allowed to emit an effective radiated power of up to 900,000 watts if they own that much spectrum. The base stations emitting power like that will be located on the sidewalk. They will be small rectangular structures mounted on top of utility poles.

The reason the companies want so much power is because millimeter waves are easily blocked by objects and walls and require tremendous power to penetrate inside buildings and communicate with all the devices that we own that are going to part of the Internet of Things. The reason such tiny wavelengths are required is because of the need for an enormous amount of bandwidth—a hundred times as much bandwidth as we formerly used—in order to have smart homes, smart businesses, smart cars, and smart cities, i.e. in order to connect so many of our possessions, big and small, to the Internet, and make them do everything we want them to do as fast as we want them to do it. The higher the frequency, the greater the bandwidth—but the smaller the waves. Base stations have to be very close together—100 meters apart in cities—and they have to blast out their signals in order to get them inside homes and buildings. And the only way to do this economically is with phased arrays and focused beams that are aimed directly at their targets. What happens to birds that fly through the beams, the FCC does not say. What happens to workers who climb utility poles? A 30,000-watt beam will cook an egg, or an eye, at a distance of a few feet.

And the power from a base station will be distributed among as many devices as are connected at the same time.[11] When a lot of people are using their phones simultaneously, everyone's phone will slow down but also the amount of radiation in each beam will be less. When you are the only person using your phone—for example, late at night—your data speed will be blisteringly fast but most of the radiation from the cell tower will be aimed at you.

Deep penetration into the body

Another important fact about radiation from phased array antennas is this: it penetrates much deeper into the human body and the assumptions that the FCC's exposure limits are based on do not apply. This was brought to everyone's attention by Dr. Richard Albanese of Brooks Air Force Base in connection with PAVE PAWS and was reported on in *Microwave News* in 2002.[12] When an ordinary electromagnetic field enters the body, it causes charges to move and currents to flow. But when extremely short electromagnetic pulses enter the body, something else happens: the moving charges themselves become little antennas that re-radiate the electromagnetic field and send it deeper into the body. These re-radiated waves are called Brillouin precursors.[13] They become significant when either the power or the phase of the waves changes rapidly enough.[14] 5G will probably satisfy both requirements. This means that the reassurance we are being given—that these millimeter waves are too short to penetrate far into the body—is not true.

In the United States, AT&T, Verizon, Sprint, and T-Mobile are all competing to have 5G towers, phones, and other devices commercially available as early as the end of 2018. AT&T already has experimental licenses and has been testing 5G-type base stations and user equipment at millimeter wave frequencies in Middletown, New Jersey; Waco, Austin, Dallas, Plano, and Grapevine, Texas; Kalamazoo, Michigan; and South Bend, Indiana. Verizon has experimental licenses and has been conducting trials in Houston, Euless, and Cypress, Texas; South Plainfield and Bernardsville, New Jersey; Arlington, Chantilly, Falls Church, and Bailey's Crossroads, Virginia; Washington, DC; Ann Arbor, Michigan; Brockton and Natick, Massachusetts; Atlanta; and Sacramento. Sprint has experimental licenses in Bridgewater, New Brunswick, and South Plainfield, New Jersey; and San Diego. T-Mobile has experimental licenses in Bellevue and Bothell, Washington; and San Francisco.

January 17, 2018



52 Main Street • Port Washington • New York • 11050 • www.AmericansForResponsibleTech.org

January 11, 2019

Governor Tony Evers
115 E Capitol # 1,
Madison, WI 53702

Dear Governor Evers,

Americans for Responsible Technology is a national coalition of more than fifty-five organizations from across the country concerned about the manner in which new wireless technologies are being deployed in our nation. We write to you with particular concern regarding the deployment of the next generation of wireless, known as "5G" in Wisconsin.

The deployment of 5G and its dependence on a vast new network of wireless antennas located in close proximity to residential dwellings raises many serious issues, none which have not yet been fully addressed by the wireless industry. These include issues of safety, security, privacy and property values, as well as the health and well-being of citizens.

Despite the robust and growing body of independent, peer-reviewed, academic science indicating serious biological harm from chronic exposure to wireless radiation, including the U.S. National Toxicology Program's recent \$30 million-dollar, 10-year study that found "clear evidence" of cancer from exposure, the Federal Communications Commission has not updated its wireless radiation safety standards since 1996.

Moreover, current wireless safety standards only consider *thermal* impacts from exposure to wireless radiation and do not address biological impacts that have now been proven to be caused by such chronic, low-level exposures – exactly the kind of exposures that will result for anyone living near a powerful wireless antenna.

This type of involuntary exposure of citizens to a known health risk without their informed consent crosses a line government must hold against any industry purveying a dangerous product. Pregnant women, children, the elderly, and people with implanted medical devices are particularly vulnerable to the impacts of chronic exposure to wireless radiation. Why should they be required to shoulder all of the risk?

We believe wireless companies, anxious to reap huge profits from 5G, are pushing federal, state and local officials to fast-track approvals for their new technology before it has actually been proven safe. We urge you to join with a growing list of thoughtful government leaders asking for documentation to support claims by the wireless industry and the FCC that wireless antennas and

related equipment cause no harm to humans or the environment before signing legislation that pre-empts local control, limits the ability of local decision makers to decide how to best integrate this technology into their communities, or otherwise contributes to the industry-generated "race to 5G."

This is a critical issue that demands immediate attention and action from our leaders across the country.

Thank you for your consideration and concern.

Sincerely,

A handwritten signature in black ink, appearing to read "D. A. Wood", with a long horizontal stroke extending to the right.

Douglas A. Wood
Lead Organizer



AMERICANS for
RESPONSIBLE
TECHNOLOGY



ISSUES

We are Americans who believe in the implementation of safe, reliable and responsible technology. We believe in the democratic process, and in our right to determine how new technologies will be integrated into our neighborhoods, our homes and our lives. We believe the issues that surround the widespread deployment of new wireless 4G/5G technologies must be addressed before taxpayer money is used to expand them.

No vague promise of future benefits is worth jeopardizing our democratic principles, our freedom of choice, or our health, safety, security and privacy.

- **There is no justification for this massive wireless densification.** The build-out of millions of new wireless antennas is not necessary for coverage or public safety. It will not improve emergency responsiveness, or magically close the "digital divide." This is not a public service or a vital utility.

We believe the primary purpose of 4G/5G densification is simply profit. It will allow telecoms to compete with cable companies by selling wireless video subscriptions that deliver television without having to invest the money to lay cable. Billions in profits will result from charging consumers to watch movies, play online games and surf the internet, and by mining and marketing the resulting customer data.

- **The build-out of new wireless networks will exacerbate existing energy and safety problems.** According to the Institute of Electrical and Electronics Engineers (IEEE), wireless infrastructure consumes at least ten times as much energy as wired technologies. A massive build-out of 5G will significantly increase demand for power, resulting in greater greenhouse gas emissions and pollution.

Extreme weather events now routinely occur around the country – wildfires, hurricanes, flash floods, mudslides, drought. What happens when telecoms install hundreds of pounds of wireless transmission equipment on telephone poles in residential neighborhoods? Recent events have proven wireless systems to be unreliable and potentially hazardous in an emergency.

- **Proposed legislation guts democratic norms, local control and sources of revenue.** Americans elect local leaders to represent their interests and respond to their needs, including a clean and healthy environment and the unique aesthetic of their community. Telecom-sponsored national legislation that takes away local control over the deployment of 4G/5G equipment violates basic democratic norms.

Public rights-of-way are public property. Providing private businesses with access to public property generates income for a municipality's general fund, which pays for road repairs and other basic services.

Legislation that eliminates or limits a municipality's right to receive income from leasing its own property, and empowers private interests to reap billions in profit without compensation is not acceptable.

• **Regulations to protect public health and safety are inadequate and outdated.** Published science proves harmful health effects from exposure to RF microwave radiation; studies show a wide range of biological effects at levels far below current FCC exposure guidelines. RF microwave radiation affects everyone, and with 4G/5G installations in every neighborhood, Americans will not be able to escape continuous, involuntary exposures in their own homes. The unborn child, small children, the elderly, and people with chronic illnesses, microwave sickness, or compromised immune systems are particularly vulnerable.

Telecoms admit they do not know if their wireless technology is safe, and warn that their revenues could be negatively impacted by health claims. Insurance companies will not insure telecoms against liability for exposure-related health claims or other damages; taxpayers may be forced to bail out telecoms in future class-action lawsuits.

• **Human health is already being compromised by wireless radiation.** The recent \$25 million NTP study provides conclusive evidence that exposure to wireless radiation causes cancer. Oxidative stress, a proven result of microwave exposure, is a well-established mechanism that can lead to cancer, non-cancer conditions and DNA damage. Microwave sickness is a recognized medical condition in the U.S. and many other parts of the developed world.

• **There is an existing solution for internet connectivity: Fiber-optic To The Premises ("FTTP").** Fiber-optic is faster, thousands of times more energy-efficient, and much more secure and reliable compared to wireless. It is more easily defended and resilient in the face of natural disasters and/or direct attacks, and is not hazardous to human health.

* * *

The telecom industry and the commissioners of the FCC are rushing to deploy the next generation of wireless before these issues have been addressed. The "race" to be first in 5G technology is one not worth winning if the cost exceeds the benefits.

We call on our elected representatives in Washington to reject any proposal to use public funds or public property to facilitate the deployment of expanded wireless networks until these issues have been fully, publicly and satisfactorily addressed.

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See Also :

ehtrust.org

win19.org

whatis5g.info

5g-spaceappeal.org

electricalpollution.com

EMFscientist.org

saferemr.com

generationzapped.com

broinitiative.org

cellphonetaskforce.org

CITIZEN COMMENT ON LARIMER COUNTY PROPOSED WIRELESS REGULATIONS

(Colorado)

offices 1-970-498-7010; 7012

Board 3 Commissioners

Johnson - 7002

Donnelly - 7003

Gefalles - 7001

MAY 29, 2019

May 29, 2019

Dear Commissioner Johnson:

Please find enclosed the work of a citizen committee asking you to ensure that Larimer County's new wireless regulations maximize local control in the siting of wireless communications facilities. The urgency with which the County has been required to revise the wireless regulations is occurring among a tumultuous state and federal landscape. There are multiple aspects important to understand.

Our concern is with the complexity of the issues needing to be addressed in the regulations and the time allotted you to examine these complexities. We hoped to facilitate in-depth examination of the issues to prevent the County from falling prey to the prevailing marketing messages promulgated by the wireless industry. We hope this report provides facts and insight into these issues for you. We do not want the high-powered pulsed frequencies of cellular antennas with 4G and 5G in our neighborhoods or near our homes where we sleep, heal and restore. We learned from other communities this preference is possible. We ask you not to submit to the "we are hopeless to assert local control" mantra we have been hearing. There are legally viable options as other local governments have found.

Please take the time to read our committee's research and response. We have spent hundreds of hours collecting and conferring with towns and counties across the country, collecting their staff reports to identify model approaches to respond legally to FCC rulemaking. Since there may very well be a reversal of the FCC's rules in the U.S. Ninth District Court of Appeals, our regulations must be flexible and not codify those rules. Many of the models we found did a stellar job of flushing out the issues and crafting regulations that protected the health, safety and beauty of their communities. The policies in their regulations reflected leadership in addressing the health concerns of their citizens while complying with FCC rules.

We believe this is one of the most critical decisions you will make for decades to come. Thank you for your willingness to examine our report and all aspects of the issues therein.

Respectfully submitted,

David Hoffman
Richard Shane
Cynthia Peck
Dr. Nola MacDonald
Aaron and Jenise Moats
Greg Timmer
Heather Lahdenpera
Jenny Zeller
You Ma
Cris Zipps
Amber Schaible
Kim Simpson
Tom Niichel
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SECTION 1

Introduction to Citizen Comment

This comment is submitted by a committee of concerned citizens that met multiple times following the May 8, 2019 Open House when the proposed wireless regulations were released. Several of the residents had been providing model policies and legal opinions from other civic entities to County staff since March 2019. Aware of the FCC September 2018 rulemaking and CO HB 17-1193 limiting local control in the siting of WCFs and in anticipation of the County's plans to update wireless regulations, these citizens desired to identify as many examples of comprehensive regulations protecting the public health, welfare, aesthetics and property values of residents used by other towns and counties across the country to bring these examples to Larimer County's efforts. Following the Open House, the committee met to review Larimer County's draft of proposed regulations and compare it to the dozens of regulations collected by the committee.

We realize the issue surrounding the use of wireless radiation for increased connectivity, while addressing community autonomy for aesthetic and health reasons is a complicated issue. We are aware what restrictions on local control in siting wireless communications facilities (WCF) exist in the legislative and federal arenas. These comments were constructed with full awareness of the FCC's Rulemaking and Colorado's HB 17-1193.

Upon an in-depth review of the draft regulations, we commend the staff's dedication to navigate new regulatory terrain amongst the legal landscape which has placed restrictions on local control. 

We submit this document with the full belief there is more the Larimer County regulations can do for the health, safety, welfare and property values of Larimer residents and the exercise of local control.

We ask County leaders to take on an action-oriented process and avoid the prevailing atmosphere that we are somehow helpless in the siting of WCFs. Follow the example set by jurisdictions like Danville, CA and Marin County, CA, Petaluma, CA, Burlington, Vermont, Fairfax County, VA and make comprehensive regulations that do indeed spell out beforehand the published requirements for the application, siting and monitoring of WCFs still within the rules required but overtly worded in the best interest of Larimer residents.

Updating Wireless Regulations is a Two Stage Process

Given the potential changes on the national and state levels regarding local control on the siting of WCFs, we believe the updating of the wireless regulations may be a two-stage process. The updating of the current wireless regulations in the first phase needs to meet current FCC rulemaking and state legislation requirements. The second phase however, is careful wording in the regulations to allow updates without having to engage in lengthy updating process to rewrite the regulations when legislative and legal changes anticipated both at the national and state level occur. Taking the advice of many legal teams involved in federal court actions, and implement a flexible regime, one that can be updated quickly while regulating WCFs to the maximum extent allowable by law. 

Summary of Requested Changes to Draft of Wireless Regulations

This section is a summary of our request the County improve the draft regulations for reasons more fully explained in Section 3 and 4 of this document and the referenced attachments by:

1. Adding a General Provisions section to address all certifications needed by the county for the WCF to be in compliance with county, federal or state requirements of RF transmissions and exposures. While required in the submittal section of the current draft, the more detailed list in a section of general provisions would include the county's right to contract at the applicant's expense for services of a communications consulate if needed to review the application; examine potential safety violations of RF emissions and exposure; and identify any interference with County communications systems. The general provisions would also define the remedies afforded the County for violations and enforcement of general provision violations. General provisions would also note the Director may modify them general from time to time. And the potential licensee is encouraged to review the county licensing agreement prior to embarking on the application process.
2. Disclosing up front in the application the liability insurance that will be required for all WCFs in the public ROW and on private property. The liability insurance must hold the County of Larimer harmless for all claims on siting of WCFs and any health claims as a result of exposure to electromagnetic radio frequencies (RF), fires and other claims.
3. Separating the "submittal requirements" into a permit process with two defined phases: (1) permit application (2) permit approval.
4. Consider retaining consultation with an experienced WCF safety and RF engineer to define the detailed technical descriptions, cut sheets, site plans and engineering certifications required for a WCF which is more than a "building permit" affords. Addressing the complicated nature of WCFs construction, wind loads, equipment, electrical and radio supply, undergrounding, siting, design and safety issues is more complex. From that consultation fortify the regulations to be as specific as the FCC rules require in publishing all requirements ahead of time.
5. Requiring safety certification of all manufactured equipment used on the WCF by the appropriate national safety standards body (UL, CSA ASTM).
6. Creating an application permit checklist by type of WCF addressing all aspects of the wireless code requirements siting, design, operation and maintenance, general provisions for each type of WCF to improve both staff, applicant and public awareness of the WCFs permitting requirements and approval processes.
7. Improved public notice during the permit application for any WCF and when any upgrade to existing WCFs is applied for or an administrative waiver is being considered.
8. Limit the amount of work the "Director" conducts after the application is prepared, by listing items of information the director may ask for in the application for each type of WCF.
9. Improve compliance with community preferences for siting of WCFs through addition of these new sections:

- a. most preferred locations; require applicant provide technical justification for not using most preferred in their application to site a WCF.
 - b. prohibited support structures,
 - c. additional placement requirements (including prohibiting encroachment on private property, increase distance of attached WCF antennas in already populated WCF areas, prohibit placement of antennas in street furniture, and at pedestrian height levels)
 - d. establish as much separation as possible between WCFs without effectively prohibiting them. That could be, 1,000-foot distance between cell facilities based on other regulations whose staff reports include legal opinions this distance suffices to not prohibit deployment. 5G is what is called midspectrum frequency and its antennas actually work up to and perhaps beyond 3,000 feet, so many could go on the same towers that current cell phone antennas are.
10. Improve design standards by addressing:
- a. More required specifications for concealment of non- antenna equipment on poles including cables, utility connections and electric meter for each type of WCFs to clearly disallow pole clutter and not leave it to the discretion of the Director. See Figure 1 on page 11. See samples of equipment and esthetic codes in Attachment 1.
 - b. List most preferred concealments to least preferred for each type of WCF and require applicant provide technical justification for not using most preferred in their application.
 - c. Noise abatement materials installed for WCF exceeding 25 dB at ten-foot radius
 - d. Prohibit installation of any new wood poles.
11. Add a new section in the regulations on RF Measurement and Monitoring requiring all WCFs to be in compliance with local, state and federal standards of safety. Applicant must provide NEIR report prior to going live and produce updated reports available to the public every two years. Give the County the right to contract for RF monitoring of all facilities installed by applicant should an applicant's WCF be found out of compliance. State the County's remedies for exceeding RF transmission or exposure limits. Include in master license agreement the actions taken by Syracuse, NY to ensure compliance with safety standards in an ongoing fashion. Include with each additional WCF in a dense area of WCFs that the each added WCF not cause a cumulative RF exceeding safety standard. Make it incumbent on the applicant to provide the third-party independent measurement of compliance at their expense. These reports should be made available to the public.
12. Require signage (1) for roof top installations of WCFs where maintenance personnel will service other rooftop equipment; (2) for all WCFs located over pedestrian walkways and within 200 feet of schools, child care centers, hospitals, medical centers and inhabited dwellings; (3) on all antennas as required by the FCC. Signs warn of the presence of RF emissions and exposure potential in accordance with FCC standards set to protect workers and the public.

13. Publish in the regulations all fee structures for WCFs up front in the permit application, including but not limited to non-recurring fees for new pole, trench cut fee if applicable, and top allowed annual fee for use of ROW. Describe the right of County to do a cost recovery for other expenses per FCC rules. Attachment 2. Legal briefing to San Rafael City Council on FCC allowable fees.
14. Disclose the Master Licensing Agreement (MLA) for WCFs to the public now in the regulation revision process and open comment prior to sending the wireless regulations to the Planning Commission. Keep all MLAs open to the public thereafter without need to do a public records request.
15. No MLA should be issued for longer than 10 years.
16. All permits for WCFs should expire in ten years and must be renewed.
17. Ensure that any WCF permit granted in the ROW requires them to conduct a new permit process for additional uses in the ROW.
18. Do not allow equipment upgrades without notification or permit. Including software upgrades on equipment. This is where the consultant noted in Item 4 above would be helpful. Upgrades to equipment can increase the RF emissions without public notice. For those who are electromagnetic hypersensitivity (EHS)*, an upgrade can transform an antenna that is not affecting them into a power density they cannot tolerate. Public access to this information is important. Sacramento's applications require emissions reports. County staff have received an email of a sample application from Sacramento with its extensive technical details.
19. The County should establish a data base of all WCFs with pertinent information related to the data collected in the permit application and approval process.
20. The County should protect our firefighters and do everything they can to avoid deployments of WCFs in and around fire stations. WCFs should not be deployed on or near fire stations. These should be listed as the least preferred siting.
21. Create a severability clause in the regulations in order to maintain the bulk of the regulations in case of legal challenges. ←
22. Include qualifying language if any rules by the FCC are overturned or invalidated or if other substantial legal changes occur. Including termination of the permit, increasing fees for ROW use and other public property rates beyond the maximum established by the FCC rules.
23. Create a telecommunications infrastructure committee with engineers, lawyers, interests parties to monitor the development, implementation and revision of rules and guidelines governing wireless facilities. ←
24. Adopt administrative guidelines based on an issued policy of the County.

*When looking up Electromagnetic hypersensitivity to learn more— examine the medical literature of PubMed, a data base of scientific publications maintained by the National Institute of Health <https://www.ncbi.nlm.nih.gov/pubmed/>. The Wikipedia site is managed by wireless industry interests cruelly dismissive of those who suffer from EHS. Any edits attempted by physicians researching and publishing on EHS to the Wikipedia site get their citations edited off the site.

SECTION 2

Section 2 describes the background information driving our comments and how local control came to be the target of wireless lobbyist leaving us with a narrow path to navigate. We felt this was important to understand as context for requesting the most comprehensive and strictest regulations possible.

FCC Rules and HB17-1193 Shutting Down Public Discourse.

Democracies thrive with public discourse and the saying all politics is local may have been true in the past. But the trend by industry lobbyist and captured agencies like the FCC is to shut down public discourse and eliminate local discourse and control. How local control was wrestled away from Larimer County in a one two punch illuminates why Larimer County should take leadership in addressing the outside influences to the fullest extent possible. It serves us all to know where the push is coming from and perhaps therein what we can do about returning public discourse and choice to our community. We do not believe as Americans we should shut down discourse on our concerns about health effects and decreased property values that will occur as a result of densely deployed wireless radiation solely because the FCC made a rule prohibiting these considerations.

CO HB 17-1193 was a template bill sponsored by ALEC. The American Legislative Exchange Council is not a lobby; does not have to register as lobbyist, and it is not a front group. Along with legislators, corporations have membership in ALEC. Corporations sit on ALEC task forces and vote with legislators to approve "model" bills. HB 17-1193 was a model bill brought to and approved in 22 states, with hotly contested battles in several states including California where Governor Brown vetoed it. In the event FCC rulemaking was overturned, local state bills were a solid back up. One can easily see how the CO bill mirrors the FCC rulemaking and perhaps why ALEC felt this model bill was important to the industry. The repeal of many portions of HB 17-1193 is important to retaining local control should the FCC rules be overturned.

We ask the County take leadership to protect our homes, wildlife and property values to the best of your ability given the current legal climate and be ready with the wording in the updated regulations to easily allow the county to update local controls when the courts make their rulings. We are requesting County leadership to keep in mind that the Tenth Amendment of the U.S. Constitution guarantees States an autonomy from overreaching federal rulemaking and laws through the anticommandeering doctrine therein. Thus, the rulemaking by the FCC taking away local control of siting WCFs and examining environmental and health effects of wireless radiation (AKA microwave radiation) in the placement of WCFs is now being challenged in the courts at multiple levels across the country. Here are a few.

- Larimer County through its membership in the Colorado Communications and Utility Association (CCUA) has represented interests along with nearly 100 cities, towns counties, and associations of localities in the Ninth District Court of Appeals case against the FCC. This appeal challenges the federal overreach of the FCC's rulemaking in September 2018 that unnecessarily benefited one industry at the expense of communities. Attachment 3 briefly describes the issues of the FCC rulemaking for all local jurisdictions across the country.

- The Natural Resources Defense Council (NRDC) has also challenged the FCC's rulemaking applied to the 1996 Telecommunications Act excluding health and environmental reviews. A decision on the NRDC case may come before the Ninth Circuit Appeals noted above makes its way through the court.
- U.S. HR 530 proposed by Congresswoman Eshoo (CA) legislation to overturn Federal Communications Commission (FCC) regulations limiting the ability of local governments to regulate the deployment of 5G wireless infrastructure. As a member of the CCUA, Larimer County joined other CCUA members in a unanimous endorsement of HR 530.

The FCC as a non-health regulatory agency has a revolving door with the wireless industry leaders and their attorneys. The current Chairman of the FCC is a former Verizon lawyer. The actions of the past few years to open up an untested spectrum of frequencies and pass rules of minimal regulated proliferation on its use have taken their blatant disregard for local control to new levels. *Captured Agency, How the Federal Communications Commission is Dominated by the Industries it Presumably Regulates*, published by the Edmond J. Safra Center for Ethics Harvard University and written by Howard Alster, is a well-documented book explaining how local municipalities were placed into this tyrannical position for the benefit of shareholders in wireless industry stocks. 

There is a deeper story about consumer rights and the regulatory oversight of the telecoms for several decades. America's households and businesses have been overcharged at least nine times for broadband/fiber optic services that were to be placed into households, including the wiring of schools, libraries, and hospitals— about \$4000-\$7000 per household, and the total is way over ½ trillion dollars by 2016. We have fiber, it just goes to the Macro cell towers of the wireless industry and no further unless we pay again. The abuse of consumers allowed by regulatory agencies is described in the free e-book, *The Book of Broken Promises* <https://newnetworks.com/trilogy/> by author and respected telecommunications analyst Bruce Kushnick. If we had fiber to our doors today, we would not need a proliferation of wireless. 

In *Re-Inventing Wires: The Future of Landlines and Networks*, published by the National Institute for Science, Law & Public Policy, 2018, Dr. Tim Schoechle examines the public policy choices and opportunities confronting us. Why are existing copper phone lines being abandoned when current protocols allow them to deliver data at gigabit speeds faster than wireless? Why are we not being led nationally to a more secure, faster and reliable network of fiber? 

Campaigns by the wireless industry would have us equate 5G with the Internet. 5G is an access network to the service network of the Internet. Fiber is the backbone of Internet access and the most reliable, most secure and most sustainable over time making it less costly to maintain. Our imaginations should have moved towards the fastest most secure fiber solutions and relied on edge network access of wireless when we are moving about, not sitting at home streaming a movie. The removal of protections from deploying WCFs in residential areas was to allow the wireless industry to compete in residential neighborhoods for what fiber should have provided. 

Is 5G Safe?

There is no research being sponsored or conducted by the industry on 5G's safety. Since the September 2018 rulemaking by the FCC granting explosive deployments of 5G wireless frequencies, Congress continues to request proof from the FCC that 5G is safe. In December, wireless industry leaders appeared before the Senate Commerce Committee. Asked if there is any scientific studies by the industry on 5G safety, the response was none. <https://www.youtube.com/watch?v=ekNC0J3xx1w>

Further requests of the FCC were made by the Senate Commerce Committee in writing and the answers are still not coming. <https://www.activistpost.com/2019/05/another-congressman-asking-fcc-for-proof-that-5g-is-biologically-safe-have-any-of-yours.html>.

→ Left with no federal leadership on the safety of 5G, states are initiating their own examination on the health effects of 5G.

- Louisiana House Resolution No. 145 requested the Department of Environmental Quality and Board of Health to Study Effects of 5G.
<http://www.legis.la.gov/Legis/ViewDocument.aspx?d=1134441>
- Massachusetts bills addressing the study of or opting out by residents to exposure to electromagnetic frequencies are numerous
<https://sites.google.com/site/understandingemfs/massachusetts-emf-bills-2019-20>
- Montana Representative David Dunn introduced House Joint Resolution No. 13: A joint resolution of the Senate and House of Representatives of the State of Montana urging Congress to amend the Federal Telecommunications Act to account for health effects of siting small cell network equipment in residential areas.
- New Hampshire Representative Patrick Abrami introduced HB 522 to establish a commission to study the health and environmental effects of 5G technology:
http://gencourt.state.nh.us/bill_status/Results.aspx?q=1&txtbillnumber=hb522&txtsessionyear=2019
- Some cities have banned 5G. Portland, Oregon and Brussels, Belgium, put the brakes on 5G projects over concerns about the potential impact on human health or inadequate government oversight. Celine Fremault, Belgium's environment minister, cited a study that found 5G could not be deployed unless Brussels granted the telecommunications industry an exemption to its strict radiation limits.

→ Will Larimer County Commissioners consider using the expertise of their Environmental and Science Advisory Board to examine the health effects of EMFs, particularly 5G on residents for this and future regulations instituted by the county? Will the Advisory Board look at what policies would benefit consumers of telecom and Internet services in Larimer County going forward?

Should Local Governments Require RF Measurements and Monitoring?

The wireless industry itself is publishing Industry white papers included in Attachment 4

expressing their concern that RF safety limits may hinder 5G deployment. Who in all this uncertainty will protect us? Knowing the FCC standards for RF are ten times higher than Russia, China, Paris, Switzerland and other countries who by regulatory processes enforce exposure guidelines, we are left with high limits, no measurements and monitoring and no recourse when the limits are exceeded. We are asking our county leaders to protect us by including RF measurements and monitoring in the wireless regulations. If exposure standards are changed in the future the regulations will already have language requiring compliance with safety standards. The FCC has stated they do not have the resources to monitor RF emissions on licensed towers. Much of the deployments under the small cell legislation are not licensed facilities anyway. We found other governing entities had added this section to their regulations and requested it in their applications with explicit requirements for measurement and recourse for violations.

Protect the Vulnerable

The examples of other cities and counties who took the time to identify the remaining local control they could include in their regulations is contained in the documents we have provided the county staff and in this citizen comment paper. These examples illuminate a path worth taking the time to write and implement here in Larimer County. It is evident in the documents of these other municipalities they are addressing their citizens concerns about the health effects of wireless radiation.

Wireless microwave radiation permeates our homes as trespass without our consent. Microwaves are those frequencies on the electromagnetic spectrum used for all things “wireless”. They are pulsed frequencies unlike non pulsed AM and FM frequencies. The World Health Organization has classified microwave radiation as a Class 2B carcinogen, “possibly carcinogenic to humans” along with arsenic and asbestos.

Studies worldwide have found serious health effects from exposure to pulsed microwave frequencies known as wireless radiation in a wide range of power densities well below the FCC’s current safety standards. <https://bioinitiative.org/wp-content/uploads/pdfs/BioInitiativeReport-RF-Color-Charts.pdf>.

We ask you to examine these studies and the prolific You Tubes of scientific presentations by scientist on their peer reviewed papers published in reputable journals on the health effects of EMFs.

Attachment 5 contains a list of the sources where these scientific research papers on EMF health effects can be found.

Children and young adults are (obviously) still growing. That means that they are undergoing higher rates of cellular mitosis (the process by which cells divide and multiply). According to Dr. Martin Blank of Columbia University, and other studies the pulsed frequencies of microwave radiation have been shown to lead to genetic mutation (sometimes irreparable; so-called “double-strand breaks” of DNA). Any damage to the DNA in the cells of children will replicate more rapidly, than in adults where the rates of cellular mitosis are much lower. Persons suffering from compromised immune systems, immune disorders, the elderly and chronically ill experience adverse effects exposed to the pulsed frequency used by WCFs. Could the five cases of cancer at Rocky Mountain High School be a cancer cluster similar to the Rippon, CA school that had a similar cluster and subsequently removed its cell towers.

For the 5-8% of the population that is reported to suffer from electro hyper sensitivity (EHS), the placement of a WCF in front of their home could render them homeless.

<http://wearetheevidence.org/adults-who-developed-electro-sensitivity/>

EHS is recognized by the Americans with Disabilities ACT as a disability. There is opportunity to help those who suffer from EHS in the Larimer County wireless regulations through strong advocacy to not place WCFs in residential areas, and by taking an open and supportive stance on public notice and signage notifying them of RF emissions.

WCFs Affect Residential Property Valuations

Changing the name of the equipment previously located on cell towers along interstates and in industrial zoning to wireless communications facilities (WCF) doesn't change the nature of the antennas and its pulsed RF. CO state law brought the antennas previously kept by zoning out of residential areas into any zone the wireless industry wanted. To be clear, these changes have brought 4G antennas  previously housed on cell towers along the I-25 and industrial areas into residential neighborhoods.

They will be placed outside the windows of homes, attached to buildings we occupy every day, and in close proximity in ways we would never have tolerated before. It is not just about 5G. It's a real estate grab of our public right of ways in favor of one industry. There is more investment going into 4G than 5G. What effect will this proliferation of WCFs in residential neighborhoods have on property values and the subsequent valuations for property taxes?

The National Association of Realtors found that the placement of a cell tower and antennas near one's home decreased property values by 20% <https://magainze.realtor/daily-news/2014/07/25cell-towers-antennas-problematic-for-buyers>. The National Institute for Science, Law and Public Policy's survey "*Neighborhood Cell Towers & Antennas—Do They Impact a Property's Desirability*" found the overwhelming majority of respondents (94%) reported that cell towers and antennas in a neighborhood or on a building would impact interest in a property and the price they would be willing to pay for it. And 79% said under no circumstances would they ever purchase or rent a property within a few blocks of a cell tower or antenna.

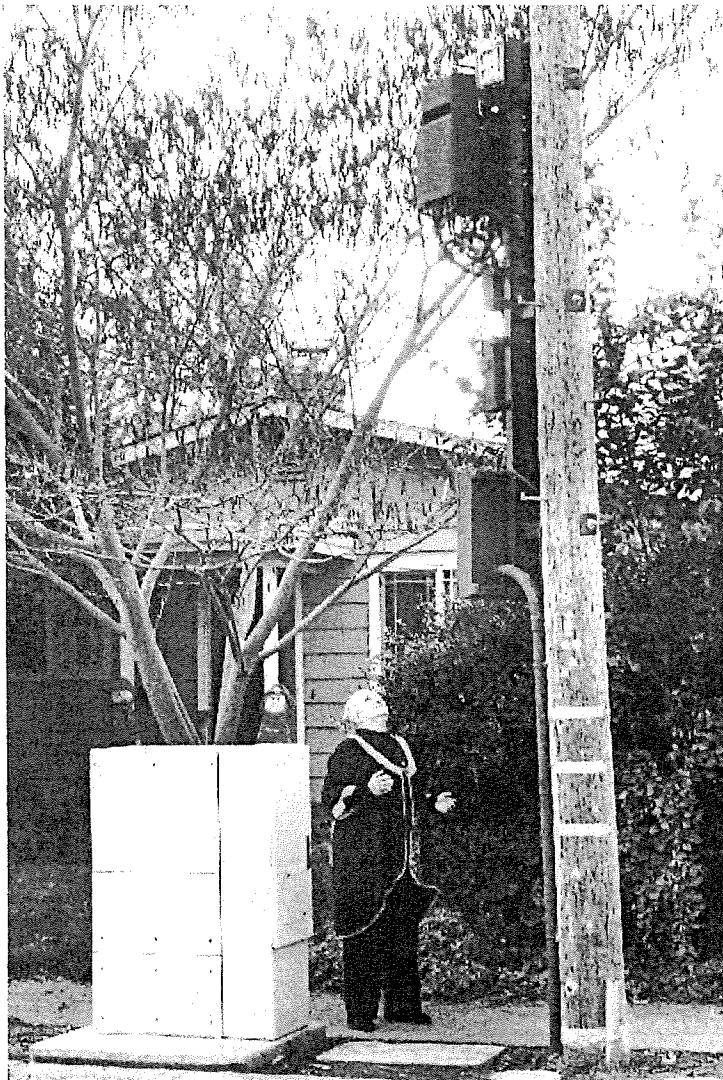
Other surveys and real estate ethical boards are finding the effect of a cell tower near residences to be required disclosure affecting property value. <https://ehtrust.org/cell-phone-towers-lower-property-values-documentation-research/> <http://www.emfsa.co.za/news/property-values-desirability-cell-towers/>.

Will the County be prepared to reassess the property values of those homes who win the lottery so to speak and find a WCF in front of their home? What will be the revenue loss to the county for decreased property values as a result of WCFs placed in residential areas? The code as drafted would be strengthened in the use of preferred locations described on page 19 to limit deployments in residential areas. Locating WCFs between two houses or on a corner offers no protection in residential areas. We ask that siting of WCFs in residential areas discourage to the fullest extent of the law.

Small Cell is Not Small

Technically, the deployment of the "small cell" facility is not small, nor is it ubiquitous or congruent with our residential neighborhoods and the natural environment of our county. Visualize what the "small cell" wireless deployment will look like. Read the size of the antenna equipment 17 cu. Ft, the antenna 3 cu. Ft, and any additional equipment not include in any size limit? Nothing small about it. Now multiply by the number of WCFs needed for coverage in one mile. In a February 10, 2019 Larimer County Staff Memo from Drew Davis he noted [wireless] facility density to support the four major carriers could be as high as 240 towers per square mile. How many additional poles, how many RF emitting antennas? What about boosters? The current rulemaking dominated by the wireless industry lobby is so outrageous if the citizens of Larimer County could see it now, there would be an outpouring of shock and dismay for the clutter it involves in our public spaces and residential neighborhoods. Concealing isn't the only solution to protect resident's property values.

Figure 1. Wireless Communications Facility in residential neighborhood on existing pole (4G).



SECTION 3

Addressing Draft Regulations by Paragraph

16.1.1 Intent and Purpose

A. Purpose – Add these two additional sentences.

12. Manage the public notification on the placement of WCFs to inform citizens timely of their installations.

13. Enforce and manage the compliance of the wireless regulations of the County.

B. Applicability

3. b. Pre-existing WCFs should not be given blanket approval to continue operating under old safety guidelines if and when the safety guidelines are updated. It is understandable that they should not have to reconstruct their facilities to meet siting and aesthetic guidelines in updated codes, however, implementation of measurements of RF to not exceed FCC guidelines and compliance therein along with remedies should be applicable to all WCFs. Also, any updates to the code to address health and environment compliance should be adhered to. It will be a dramatically changing landscape over the next decade. Wherever Larimer can update as the laws and rulemaking change, then the wireless industry should keep step. 

3.e. A temporary WCF installed for providing coverage of a special event such as Larimer County Fair is excluded BUT should be subject to the monitoring and limits of RF radiation as described in Section XX (see proposed new section Compliance and Monitoring of RF limits) and to the placement that prohibits any antenna from within a certain number of feet of identified property boundaries in Section XX.

NOTE: The definition of WCF under definitions on the last pages of the regulations states mid paragraph "A WCF does not include a facility entirely enclosed within a permitted building where the installation does not require a modification of the exterior of the building; nor does it include a device attached to a building serving that building; nor does it include a device attached to a building, used for serving that building only and that is otherwise permitted under the other provisions of the Code".

This sentence should be deleted in the definition of WCF as it is not included in the definition contained in 47 U.S.C. Section 332 (c)(7)(C). All RF emitting WCF should be under the requirements of Larimer County concealed in an existing building or not. Here are the definitions from 47 U.S.C. Section 332 (c)(7)(C):

(C) Definitions

For purposes of this paragraph—

(i) the term "personal wireless services"

means commercial mobile services, unlicensed wireless services, and common carrier wireless exchange access services;

(ii) the term "personal wireless service

facilities” means facilities for the provision of personal wireless services; and
(iii) the term “unlicensed wireless service” means the offering of telecommunications services using duly authorized devices which do not require individual licenses, but does not mean the provision of direct-to-home satellite services (as defined in section 303(v) of this title).

C. Permit Required

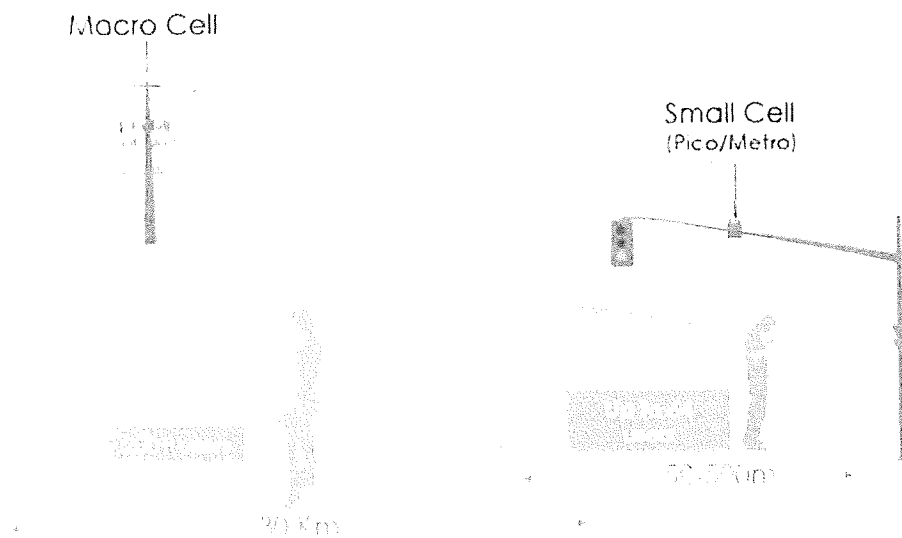
Clarification on type of WCF permit being applied for is needed and the type of equipment that will be included in the WCF permit. Each type of WCF has different siting needs, whether in the public right of way as a free-standing facility, or as a WCF on an existing light pole. The applicability section of the regulations lists base stations, alternative tower structures, towers, micro cells and small cells. But the classification of WCFs defines three types of WCFs. (1) Small Wireless Facility; (2) Attached Wireless Communications Facility and (3) Free Standing Wireless Facility. With so many different names used in describing the applicability of the regulations, it is difficult to decipher what requirements for each of these types of WCF apply and with what equipment. For example, is a microcell allowed on an attached existing structure such as a detached garage in a residential area? The land use code, concealments and aesthetic requirements, setbacks, height and size allowances differ if they are in the public right of way (ROW) or on private property. Permitting by type of WCF in the ROW or on private property would more clearly spell out the requirements for all applicants and the public to understand.

Furthermore, recognizing telecommunications equipment is very different from a normal building permit, we proposed the regulations clearly define a twostep process in siting WCFs. A (1) permit application and (2) approval process. Separating the permit application and the approval process according to the type of WCF from the very beginning of the regulations will provide clarity on the siting process and the application of the regulations by the County to each type of WCF. Clearly spelling out for the applicant and the public all pre published requirements and the recourse therein to address public concerns will save the county staff tremendous amount of time explaining the different permit requirements and approval processes for each type of WCFs. Attachment 6 contains samples of small cell application check list used by other entities.

Creating two phases the (1) permit and (2) permit approval process will have two positive impacts. One, it will ensure the applicants and county staff have fully defined the underlying issues involved in building and operating wireless facilities with their wide range of installation requirements in compliance with land use and aesthetic requirements, whether a small cell or macro cell. Secondly, it stages the permitting process for future updates on regulations allowed for different WCFs as the legal and legislative landscape changes. In such events, the whole code will not have to be rewritten.

The illustration in Figure 2 helps to see good cause to separate out the type of WCF and the equipment required for each in the application and permit processing phases when you examine the scale and environments these facilities are placed within. What is not pictured in the illustration is the often-required boosters and distributed antenna systems (DAS) to make the 5G network function.

Figure 2. Macro Cell (free standing WCF) and Small Cell (attached WCF) pictured herein



All other permits required should be listed in the application, and not relegated to the submission of a "building permit". Ensure that all related permits from other agencies such as public utilities, FAA, encroachment permits etc. are complete before the application is deemed complete and the shot clock begins. Permit application documents should verify that industry standards of certification on the electrical and antenna equipment meet safety standards of UL, CSA and ASTM appropriately. There is equipment used in the wireless industry not compliant with these industry safety standards manufactured overseas and a risk to public safety. ✓

The permit application must include compliance with all requirements of SB 18-167 concerning increased enforcement of requirements related to the location of underground facilities, and, in connection therewith the requirements for future location of underground facilities and cost recovery for damages incurred by contractors working in the ROW. Some counties required that undergrounding not damage any nearby tree's root system.

Fire safety review. Does Larimer County need a new permit process created in consultation with its fire protection services to ensure the WCFs have adequate access to or their own fire suppression supplies when hydrants are not nearby? It seems very important to examine and make any necessary modifications in the fire protection statutes concerning WCFs. WCFs burn down every year due to malfunctioning equipment <https://www.youtube.com/watch?v=89sJIIADLD0>. Many of these WCFs will be attached to existing structures, and co-location requirements will double up antenna's and power supply equipment on existing structures. What are the vulnerable areas where WCFs will be deployed that fire suppression equipment should be co-located as part of the permit? For example, in the ←

mountains and high fire hazard areas. Should there be fire deterrence strategies required in high risk areas by the clearing of shrubs and trees to appropriate distances?

Site visits as part of permit process.

As part of the application process a site visit needs to be conducted by County staff and documented in the application approval process regardless of the type of WCF. Antennas could be focused directly at close proximity of human exposure, (see worker protections of cell tower workers and OSHA standards); out of scale to nearby buildings and structures or other conflicts. These often cannot be assessed on paper, only a site visit would determine exactly how all the criteria of an application will be met. Site visits are also important to determine if the "readily apparent" requirement of the design standard will in fact be met.

16.1.2 Classification of Wireless Communications Facilities. It is not clear if a "small wireless facility" includes antenna micro cells used in distributed antenna systems (DAS) <https://www.repeaterstore.com/pages/das-distributed-antenna-systems>. What size defines a small micro cell to classify in the regulations as a WCF? It is confusing to read the design standards as written and applied to the equipment of the WCF and the type of WCF. The classifications/definitions of WCFs might benefit from a technical review by an engineer to be sure the regulations include all necessary wireless antennas and boosters in the definitions of the regulations.

16.1.2. B. Definition of Attached Wireless Communications Facility is written as an "Attached WCF if it is affixed to an existing permanent structure (including buildings water tanks, light poles, traffic signals, flag poles and communications towers..... ADD, specific language what an existing permanent structure means in residential zones. Can it be a barn, a detached garage, a pump station? Attached WCFs in residential areas need more definition to avoid confusion in what is eligible for attaching WCFs to and then specify the setbacks elsewhere in the regulations specifying safe distances of antennas to human exposure. In what proximity is an antenna allowed to second story living areas and windows? A pulsing antenna of microwave frequencies cannot be within a certain distance for human exposure and be safe for RF exposure. These exposures are contained in numerous FCC documents <https://www.fcc.gov/general/radio-frequency-safety-0>. Cell tower workers must power down a tower to be near an antenna for their safety and standards of RF exposure are set by OSHA. What are the setbacks for these antennas from human sleeping, working and walking areas? While there is one paragraph addressing how to install WCFs adjacent to residential uses, it would be strengthened by stating the safe distance of antennas.

16.1.3 Use Table. The Use Table is used to describe the type of review needed for each type of WCF and public notice. Also, to illustrate what type of WCFs are allowed per land use code. The table is very good as a summative review, but lacks a detailed narrative to describe all the processes included in the table. Descriptive paragraphs should be included in the regulations of the criteria for administrative reviews and waivers and described in the application permit and permit approval process discussed above.

Public Notice. Public notice is embedded in the table. The notice process for the public and to applicants should be its own section in the regulations including appeal processes available to the public. Public notice when mentioned in the regulations is too late in the permit process. Public notice should include the placement of a sign similar to the Fort Collins yellow signs on the properties announcing that a developmental review is underway for a WCF. Mailings for attached WCF on existing structure should occur within 7 days of a completed application and be sent to all property addresses within 600' of the proposed attached WCF. For notice of freestanding concealed and non concealed WCF, notice should go to all addresses within 1500'. Notices shall be made by mail with cost reimbursement provided by the applicant. The envelope of the notice shall state on the exterior of the envelope, "Notice of wireless facility installation near you."



Administrative review. Re-examine the use of administrative review for free standing WCFs. The deployment of free standing WCFs impact the public and property values. An open public process is better.

16.1.4 - 16.1.11

As described above, in the current draft of the regulations combining the siting requirements for all WCFs in the design standards is difficult to decipher exactly what is required for each type of WCF siting. This results in a lack of specificity other counties used to tightly control the siting of WCFs, and assisting to keep them out of residential areas. Separating siting and design requirements for WCF's would provide a clearer picture of the requirements and meet the FCC requirement to publish clear standards ahead of time. The design standards written were well done. There were other design standards language that clarified details the county may want to consider particularly for pole mounted assessor equipment, underground vaulting and other cosmetic treatments. This language is contained in Attachment 7 design standards samples and attachment 1, equipment and esthetic samples.

16.1.6. A. 3 Colocation. Add for all colocations, the applicant will be responsible to certify that the cumulative RF produced by the sum of all WCFs in the area will not exceed safety limits or the applicant's WCF will need to be removed.



16.1.6. A. 4. Lighting. Include compliance on other county code regarding lighting and night sky pollution.

16.1.6 8. c. and 9. a. Add to both sections "no new wood poles". Avoid the installation of wood poles. Use of metal poles only.

16.1.6.5 Noise. Noise levels above 25 dB at ten feet radius shall be enclosed in noise abatement materials.

16.1.6A.7 Adjacent to residential areas is contained in this Section of Camouflage, Concealment and Camouflage Design Techniques and does maximize the regulations to make residential areas the last place for WCFs. We recommend adding a section as other models have of preferred sittings for WCFs.

Simply putting WCFs in-between property lines or on a corner does nothing to protect major clutter in the residential neighborhoods or second story bedrooms from excessive RF exposure. Reiterate no new wood poles. The County can specify that a pole antenna cannot be within a certain number of feet for second story windows. We would suggest 600 ft. Attachment 8 which is an RF measurement of a house in Sacramento, CA where 5 G was deployed last year. Measurements of RF higher at second story window where the child slept. This family is moving after a year of health challenges, anxiety and difficulty sleeping.

16.1.7 Administrative Waiver.

5. The waiver request for attached WCF and freestanding WCFs shall be subject to public notice.

6. The waiver does not increase the cumulative RF exposure beyond safety limits as measured by a third-party independent contractor certified to calculate cumulative RF as required in Section ____XX of the regulations. Applicant will be responsible for all costs to certify potential cumulative RF from WCFs in the area with the addition of the applicant's WCF.

16.1.11 - Submittal Requirements

Using the application checklist for type of WCF will help to make a step by step process clear for each type of WCF with the appropriate land use. Samples of checklist are in Attachment 6.

Other Items for Consideration or Clarification

Conditional Use Permits. It is not clear when a conditional use permit should be applied for and under what criteria it could be approved.

IGA. It is not clear what properties located in IGA will be regulated by concerning deployments of WCFs.

Enhancing Permit Application Details

Earlier we suggested that a two-step process be deployed in the submittal process. The permit application and the permit approval process. Here is a sample of permit application details to consider. The application should assure and describe that the project has examined all parts of the regulations and completes a checklist to include but not exclusive of these items:

- (1) complies with the American s with Disabilities Acts;
- (2) complies with FCC regulations and guidelines for exposure to RF emissions. Applicants agree to provide the RF emissions reports as outlined in Section XX, a new section we propose be added.
- (3) applicant has exhausted all reasonable measures to co-locate their communications facilities on existing towers or with or within existing ancillary support equipment facilities prior to applying for new communication facility sites. The service provider shall provide evidence that the provider has contacted all other potential providers who have, or who are reasonably likely to be, installing facilities within the vicinity of the proposed facility and has offered to participate in a joint installation project on reasonable terms. In order to facilitate co-location, conditions of approval for conditional use permits for new facilities shall require all service providers to

cooperate in the siting of equipment and antennas to accommodate the maximum number of operators at a given site where found to be feasible and aesthetically desirable.

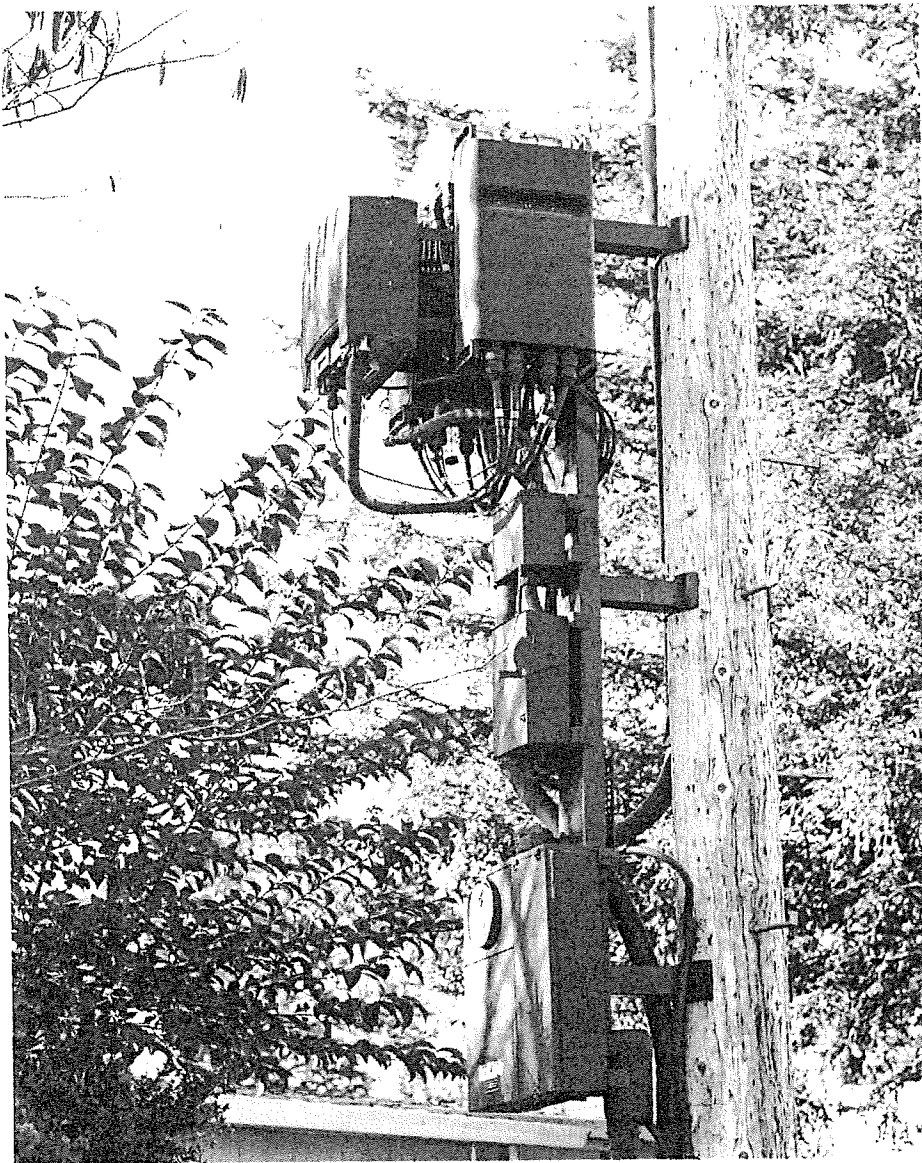
(4) applicant will post signage of presence of RF whenever pedestrian traffic can occur within 10' of the WCF consistent with OSHA warnings for RF exposure to communications antenna.

(5) applicant has listed all other applicant owned WCFs within 600' of the new WCF.

(6) applicant has chosen the most preferred locations for siting of the WCFs. (A new section we request be added is described below)

(7) The County shall have the authority to require special design of the telecommunication facilities where findings of particular sensitivity are made (e.g., proximity to historic or aesthetically significant structures, ridgelines, views and/or community features).

Figure 3. Equipment Clutter on Pole (4G)



SECTION 4

Request New Sections Be Added to the Wireless Regulations

Most Preferred Location.

“Most preferred location” is used in many codes the committee examined. In the application forms, the project should be noted as located in a most preferred location, or demonstrate that an alternative location within 250 feet is technically infeasible.

Example of a preferred location text is below:

Preface to Location Requirements. This subsection (a) provides guidance as to how to interpret and apply the location requirements. To better assist applicants, residents and decision makers understand and respond to the community’s aesthetic preferences and values, subsection (b) and (c) set out listed preferences for locations and support structures to be used in connection with small wireless facilities in ordered hierarchies. The Director of Planning will prioritize the location preferences in subsection (b) over the support structure preferences in subsection (c). Applications that involve lesser-preferred locations or structures may be approved so long as the applicant demonstrates by clear and convincing evidence in the written record that either (1) no more preferred locations or structures exist within 250 feet from the proposed site; or (2) any more preferred locations or structures within 250 feet from the proposed site would be technically infeasible. 

(b) Location Preferences. The County prefers small wireless facilities in the public rights-of-way to be installed in locations, ordered from most preferred to least preferred, as follows:

- (1) locations on or along major arterials;
- (2) locations on or along minor arterials;
- (3) locations on or along major collectors;
- (4) locations on or along minor collectors;
- (5) locations on or along neighborhood access streets;
- (6) locations within 600 feet from any residential dwelling;

(c) Preferred Support Structures. The County prefers small wireless facilities to be installed on support structures in the public rights-of-way, ordered from most preferred to least preferred, as follows:

- (1) existing or replacement streetlight poles;
- (2) existing or replacement traffic signal poles;
- (3) existing or replacement wood utility poles;
- (4) new, non-replacement streetlight poles;
- (5) new, non-replacement poles for small wireless facilities.

Prohibited Support Structures. The County prohibits small wireless facilities to be installed on the following support structures:

- (1) decorative poles at county facilities;

- (2) any utility pole scheduled for removal or relocation within 12 months from the time the approval authority acts on the small cell permit application;
- (3) new, non-replacement wood poles.
- (4) ancillary or accessory buildings in residential neighborhoods

Additional Placement Requirements. In addition to all other requirements in this policy, small wireless facilities and all related equipment and improvements shall:

- (1) when possible, be placed along rear or secondary front yard property lines that abut the public rights-of-way;
- (2) be placed as close as possible to the property line between two parcels that abut the public rights-of-way;
- (3) not be placed directly in front of any door or window;
- (4) not be placed within any sight distance triangles at any intersections;
- (5) not be placed in any location that obstructs view lines for traveling vehicles, bicycles and pedestrian;
- (6) not be placed in any location that obstructs views of any traffic signs or signals;
- (7) not be placed in any location that obstructs illumination patterns for existing streetlights;
- (8) be placed at least 10 feet away from any driveway or established pedestrian pathway between a residential structure and the public rights-of-way;
- (9) be placed at least 500 feet away from any driveways for police stations, fire stations or other emergency responder facilities;
- (10) when possible, be placed in a right-of-way median.

General Provisions

Below is sample text of general provisions:

1. Each facility shall comply with any and all applicable provisions of the Larimer County Code and any state or federal agency including, but not limited to, the Federal Communications Commission (FCC) and the Federal Aviation Administration (FAA).
2. Certification must be provided that the proposed facility will at all times comply with all applicable health requirements and standards pertaining to electromagnetic and/or radio frequency radiation.
3. Interference with County communication systems or communication systems for emergency services, such as hospitals, is prohibited. All proposed facility applications shall include reports, as required by the Police and Fire Departments, to evaluate for potential interference (e.g., HF, UHF, VHF, eight hundred (800) MHz). The applicant shall be responsible for any costs incurred by the County, including the costs of retaining consultants, to review and analyze the reports.
4. Approval for the establishment of facilities improved with an existing microwave band or other public service use or facility, which creates interference or interference is anticipated as a result of said establishment of additional facilities, shall include provisions for the relocation of said existing public use facilities. All costs associated with said relocation shall be borne by the applicant for the additional facilities.
5. A communication facility shall not adversely affect the public health, peace, safety or welfare.

6. In the event that the Director or Planning needs assistance in understanding the technical aspects of a particular proposal, services of a communications consultant may be requested to determine the engineering or screening requirements of establishing a specific WCF. This service will be at the applicant's expense.



Monitoring and Measuring RF Emissions.

The FCC rules require that WCF do not exceed RF exposure and emission limits as set by the FCC. For reference these emission standards have not been updated in twenty years and the limits are embroiled in significant challenges by the scientific and medical communities. The RF exposure limits set by the FCC defines the Maximum Permissible Exposure (MPE) limits for electric and magnetic field strength and power density for transmitters operating at frequencies from 300 kHz to 100 GHz. These limits also represent the highest allowable limits of human exposure to RF in the world; ten times more than China, Russia, Paris, Switzerland, Belgium and other countries.

The MPE limits set by the FCC have been regularly exceeded even before the introduction of 5G. According to the Wall Street Journal investigative report the number of towers out of compliance was one in ten. <https://www.wsj.com/articles/cellphone-boom-spurs-antenna-safety-worries-1412293055>. The FCC has stated it does not have the resources to monitor the currently licensed facilities. However, many 4G and 5G deployments are unlicensed by the FCC so if the County does not monitor the RF emissions no one will.



It is very important to understand that deployment of 5G is testing the safety limits of RF. Industry white papers express serious concerns that the limits of RF exposure which are often exceeded in 5G threaten 5G deployments, these industry articles enclosed in Attachment 4.

Independent third-party certification services for RF emissions exist and are currently used by the industry when needed. Here is an example of one. <https://www.sitesafe.com/our-services/rf-emissions-studies/>

If radiation is not monitored, regulations are irrelevant. Applicants should be required to meet RF measurement requirements and pay the cost recovery fee of monitoring. Below are two samples of ways to include monitoring and measuring RF emissions and consequences for code violations. Through inclusion in the regulation and by inclusion in the Master License Agreement any changes in safety standards will easily be implemented. Exceeding safety limit exposures is increased by the proximity to the antenna and the length of time of exposure. Also whether it is whole body exposure or partial.

Sample 1. Telecommunications facilities — NIER exposure

- A. No telecommunication facility shall be sited or operated in such a manner that it poses, either by itself or in combination with other such facilities, a potential threat to public health. To that end no telecommunication facility or combination of facilities shall produce at any time power densities in any inhabited area as this term is defined in Section XXX (Larimer County should add definition of inhabited areas, does it include workplaces, schools, residences,

churches, hospitals ??) , that exceed the ANSI (American National Standards Institute) C95.1-1992 standard for human exposure or any more restrictive standard subsequently adopted or promulgated by the county, the state of Colorado, or the federal government.

B. Initial compliance with this requirement shall be demonstrated for any facility within four hundred feet of residential uses or sensitive receptors such as schools, child care centers, churches, hospitals, etc. and all broadcast radio and television facilities, regardless of adjacent land uses, through submission, at the time of application for the necessary permit or entitlement, of NIER (Nonionizing Electromagnetic Radiation calculations) specifying NIER levels in the inhabited area where the levels produced are projected to be highest. If these calculated NIER levels exceed eighty percent of the NIER standard established by this section, the applicant shall hire a qualified electrical engineer licensed by the state of Colorado to measure NIER levels at said location after the facility is in operation. A report of these measurements and his/her findings with respect to compliance with the established NIER standard shall be submitted to the planning director. Said facility shall not commence normal operations until it complies with, or has been modified, to comply with this standard. Proof of said compliance shall be a certification provided by the engineer who prepared the original report. In order to assure the objectivity of the analysis, the county may require, at the applicant's expense, independent verification of the results of the analysis.

C. Every WCF within four hundred feet of an inhabited area and all broadcast radio and television facilities shall demonstrate continued compliance with the NIER standard established by this section. Every two years a report listing each transmitter and antenna present at the facility and the effective radiated power radiated shall be submitted to the planning director. If either the equipment or effective radiated power has changed, calculations specifying NIER levels in the inhabited areas where said levels are projected to be highest shall be prepared. NIER calculations shall also be prepared every time the adopted NIER standard changes. If calculated levels in either of these cases exceed eighty percent of the standard established by this section, the operator of the facility shall hire a qualified electrical engineer licensed by the state of Colorado to measure the actual NIER levels produced. A report of these calculations, required measurements, if any, and the author's/engineer's findings with respect to compliance with the current NIER standard shall be submitted to the planning director within two years of facility approval and every two years thereafter. In the case of a change in the standard, the required report shall be submitted within ninety days of the date said change becomes effective.

D. Failure to supply the required reports or to remain in continued compliance with the NIER standard established by this section shall be grounds for revocation of the use permit or other entitlement.

Sample 2. Master License Agreement Requiring RF measurements and monitoring.

Syracuse New York has taken a stronger stand through its Master License Agreement.

<https://www.syracuse.com/news/2019/05/syracuse-takes-steps-to-address-uncertainty-over-5g-wireless-network.html>

“Recognizing that any new technology can bring uncertainty, the city has negotiated an agreement with Verizon that provides the city additional oversight to protect the health and safety of residents,” Loh said.

The deal allows Syracuse to test a random sample of Verizon’s 5G transmission antennas each year, Loh said. The small cell antennas are about the size of a back pack and mounted to light poles.

“If any are out of compliance with federal health, safety, and radio frequency regulations, Verizon must immediately shut down the site and remedy the situation,” Loh said. “Verizon will then be required to test a larger sample of small wireless facilities.”

He said Syracuse also negotiated the right to test any of Verizon’s 5G equipment at any time, above and beyond the existing requirements of state and federal law.

The FCC states they do not have the resources to monitor RF emissions. The FCC also states that a cost recovery model can be employed therefore monitoring and compliance costs can be determined by the County and charged in a cost recovery model.

We recommend a third party independent qualified contractor be retained for all WCFs and monitoring be implemented similar to Syracuse, New York.

Signage

Signage warning of close proximity RF is reasonable and should be included in the County’s regulations whether or not siting of WCFs can include health considerations. Concealed antennas prohibit vulnerable populations from avoiding the exposure in public places. Potential interference with medical devices isn’t fully known since 5G frequencies have not been fully tested for interference by medical manufacturers. Picture children, pregnant women, immune compromised persons walking about clueless they are exposed to the pulsed bioactive frequencies of an untested frequency used in 5G or the high-power density of a 4G antenna outside one’s bedroom window. For those who wish to know it should be evident. Since EHS has been recognized by the American Disabilities Act as a disability. EHS sufferers are entitled to some accommodations, minimum notice is what EHS person needs.

Cellular tower workers are protected under OSHA regulations. Signage is posted and warning occur next to the enclosures of macro towers. These macro towers are now called free standing WCFs and should be labeled with signage same as before. OSHA signage warnings are generated in accordance with time

and proximity standards for part or whole body exposure to non ionizing radiation. Their website contains multiple resources for creating signage.

Requirements for Liability Insurance that Indemnify the County.

To protect taxpayers from the anticipated onslaught of lawsuits on the health effects of RF and the loss of property values and other claims Liability Insurance requirements should be well spelled out. Years ago, Swiss RE and Lloyds of London removed from their underwriting any health effects from exposure to electromagnetic fields. A recent Swiss RE report contained in Attachment 9 illustrated that risk for EMF health effects is considered an insurance risk eminent in less than three years. Verizon has self-insured and warned stockholders that litigation for health effects of EMF may have a financial impact on the company's returns. The County should make sure residents of the county are not self-insuring for EMFs and put strong language in the MLA to ensure the County is indemnified from all future claims as a result of WCFs including fires caused by faulty equipment.

Other Public Safety Issues

Electrical Inspections. The County relies on state electrical inspections. Going forward there should be better understanding by the county of the state to approve electrical permits issued by the state. What is the state's expertise to ensure the safety of electrical supply to WCF's? Especially as the numbers of antenna's increase exponentially to be attached to existing county owned structures. It is unclear if the state of Colorado's Dept of Regulatory Agencies which issues electrical permits has done any updating of their inspectors' capacity in this area. California wildfires were attributed to overloads on the electrical system from arcs attributed to high demand during the hot season on electrical equipment. Cell towers burn down often enough to warrant attention to the prevention of fires on them.

Safety Certification of Equipment on WCFs. The equipment used on the WCF should be required to be UL, CSA and ASTM certified. The testing of the materials, their fire and electrical risks, presence and disposal of hazardous materials should be addressed in these certifications and where they are not, added to the wireless regulations specifically. Especially when the equipment is deployed in the public right of way (ROW) or attached to an existing structure in a wall or roof mount.

Firefighter Protection. The setback of 600 ft from WCFs from fire stations recommended in the previous sections is to protect firefighters whose alert and healthy lives we depend on. The International Association of Fire Fighters in 2004 issued a policy statement banning cell towers on fire stations due to the known health impacts. Attachment 10 contains a critical study on the effects of brain functioning for firefighters exposed to cellular frequencies. There are many other studies that have led cities like Los Angeles, CA to pull out of programs deploying cell towers on fire stations. <https://abc7.com/news/la-supervisors-stop-cell-tower-construction-at-fire-stations/571612/>.

The International Association of Firefighters issued a lengthy policy statement in 2004 essentially banning cell towers on fire stations. <http://www.iaff.org/hs/Facts/CellTowerFinal.asp>

Site Security Measures. Small wireless facilities may incorporate reasonable and appropriate site security measures, such as locks and anti-climbing devices, to prevent unauthorized access, theft or

vandalism. The approval authority shall not approve any barbed wire, razor ribbon, electrified fences or any similarly dangerous security measures. All exterior surfaces on small wireless facilities shall be constructed from or coated with graffiti-resistant materials.

Respectfully submitted this 29th day of May, 2019

David Hoffman
Richard Shane
Cynthia Peck
Dr. Nola MacDonald
Jenise Moats
Greg Temmer
Heather Lahdenpera
Michael Moats
Jenny Zeller
You Ma
Cris Zipps
Amber Schaible
Kim Simpson
Tom Niichel
Mary Berg
John Weins
Virginia Farver
Tricia Diehl
Cindy MacMaster
Nancy Eason
Rosemary Niichel
Craig Farver
Paul Zipps
Camilla Rees
Dr. Tim Schoechle
Matt Townsend
David Diehl
Todd and Julie Metcalf
Lisa and John McMahon
Craig and Melissa Seager
Meghan and Matt Townsend

ANNOUNCEMENT: Maryland Public Television airs first TV programs devoted entirely to the impact of wireless technologies on health.

Maryland Public Television (MPT) is in the process of presenting two programs on wireless technologies, addressing cell phones, cell towers, tablet computers, laptop computers, Wi-Fi, Smart Meters, and screen time. These programs will interest those who care about their health and the health of their children and grandchildren.

These programs are episodes of Burt Wolf's "Travels and Traditions" series. Interviews are included with some of the world's leading experts on the impact of wireless technologies on health. The programs are also posted on the Internet. Here is where you can see each of them.

"A Short Guide to Cell Phone Safety"

MPT's description: "Burt takes a quick look at the history of communication from the cavemen to the alphon, to the telephone and finally the cellphone. He traces how the cellphone has changed his work and family life as he travels around the world. He also tracks down a series of stories in the United States and Europe that suggests that the cellphone may not be as safe as most of us thought. He meets with experts in England, Italy, France and the United States to find out how we can deal with the problems that are emerging. And finally, Burt follows an Apple developer's conference where they are working on apps to limit your use of their own products."

Included are update on brain tumors, industry avoidance of warning the public, and steps to reduce harm from cell phone exposure. Interviewed are Erica Mallery-Blythe, MD (United Kingdom); Annie J. Sasco, MD, MPH, PhD (France); and Martin Pall, PhD (USA).

(1) MPT Television (May 25, Saturday, 11:00 am)

This date has passed, but this program can still be seen on the Internet. See below.

(a) Over the Air: Channels 67.1, 62.1, 36.1, 31.1, 28.1, and 22.1.

(b) Cable: Verizon FIOS Channel 522 and Comcast Channels 802, 810, and 812, and other cable channels carrying MPT (full list here <http://www.mpt.org/about/channels>).

(c) Satellite: Direct TV channels 22 and 28, and Dish Network channels 22 and 28.

(2) On the Internet

(a) On Burt Wolf's own web site (<http://www.burtwolf.com/>). Under "Season 18" click on the eighth picture which is a giant telephone dial.

(b) On YouTube (<https://www.youtube.com/watch?v=5t2pdDYHtnY>).

"Travel and the Danger of Radio Frequency Radiation"

MPT's description: "As Burt and his family travel around the world they are constantly confronted with the newest advances in wireless communication. Cellphones, pads, computers, earphones, and sleep monitors were well-known to him. But in Hong Kong he saw a Jump Rope connect to a mobile app. A doctor in New York suggested a wireless blood pressure monitor. In Chicago he saw a wireless device to improve your posture and a friend's house in Florida has a wireless smart water controller. At the same time, he began to see more and more research about the dangers of the radio frequency radiation that is associated with these devices. Of special interest were the antennas, cell towers and street poles that empower the system. This program explains what he saw and how to protect yourself."

Included are Wi-Fi in schools versus hardwiring, video games, and screen addiction. Interviewed are Erica Mallery-Blythe, MD (United Kingdom); Nicolas Kardaras, PhD (USA); Camilla Rees, MBA (USA); and Alasdair Philips BSc(Eng) (United Kingdom).

(1) MPT Television (**June 22, Saturday, 11:00 am**)

Channels are the same as listed for the first episode above.

(2) On the Internet

(a) On Burt Wolf's own web site (<http://www.burtwolf.com/>). Under "Season 18" click on the ninth picture which is a cell tower.

(b) On YouTube (<https://www.youtube.com/watch?v=mf-Efnk7g4k>).

Share this message with anyone you wish.

Regards,

Ronald M. Powell, Ph.D.
20316 Highland Hall Drive
Montgomery Village, MD 20886-4007
United States of America
E-mail: ronpowell@verizon.net
Tel: (301) 926-7568



Sep. 2019 - San Jose - EMF Conference for MD's, Medical Professionals. Register before July 12 for \$175 off

From: "Catherine Kleiber" <webmaster@electricalpollution.com>
To: "Catherine Kleiber" <webmaster@electricalpollution.com>
Date: Jul 10, 2019 12:03:55 PM

Please take a moment and pass this information on to all the physicians you know. All doctors need to be aware of the fact that wireless radiation has biological effects and how to recognize the effects in patients. The number of people becoming over-exposed to wireless radiation and exhibiting symptoms is growing, but if physicians are not aware of what is causing those symptoms, people will continue to be treated inappropriately. This is a tragedy for the patient and horribly expensive for us all as the burden on the healthcare system grows. More doctors need to become aware of what microwave/radiofrequency sickness is and how to treat it - avoiding exposure continues to be the single most important thing to do. Steps for minimizing exposure can be found on the Solutions page at www.ElectricalPollution.com.

If you have time, pass this on to all the medical societies in your state.

Thank you,
 Catherine

Protecting our health and the environment by using a hardwired computer in a low RF environment. For more information, see www.electricalpollution.com

Begin forwarded message:

From: A Tsiang <tsiangaw@gmail.com>
Date: July 6, 2019 5:26:46 PM CDT
To: undisclosed-recipients;
Bcc: emfcontacts@googlegroups.com
Subject: Sep. 2019 - San Jose - EMF Conference for MD's, Medical Professionals.
Register before July 12 for \$175 off

Lisa Nagy, MD <https://emfconference.com/lisa-nagy> and Lyn Patrick, ND <https://emfconference.com/lyn-patrick> are the co-chairs of the FIRST major medical conference in the USA <https://emfconference.com/> about diagnosing and treating microwave sickness and health problems related to EMF exposure. It will be held in September 6-8, 2019 near San Jose. **Up to 16.0 CME credits will be offered.** Register before July 12 to receive \$175 off the full \$695 registration

Dr. Lisa Nagy was interviewed on the CBS Emmy award-winning daytime talk show "The Doctors" in July 2016 in an episode called "Allergic to Wi-Fi?" <https://www.youtube.com/watch?v=66HgGj364Y8>
She explains that electromagnetic sensitivity is caused by cell membrane damage and damage to the autonomic nervous system. Among those affected are children exposed to Wi-Fi at school.

Study by Fragopoulou et al, 2018 found that cell phone radiation caused statistically significant changes ($p < 0.05$) in the phospholipid composition of the cell membrane, making it more permeable and affecting the expression of 178 genes, including those involved in critical biological processes, such as cell cycle, DNA replication and repair, cell death, cell signaling, nervous system development and function, immune system response, lipid metabolism, and carcinogenesis. <https://onlinelibrary.wiley.com/doi/epdf/10.1002/brb3.1001>
 In this study, mice were exposed to 2hr of 1800 MHz radiation from an actual cell phone in talk mode at a distance of 3 cm (exposure was well within government exposure limits; exposure was 0.02-0.366 W/kg to the head in the experiment, and phones sold in the US cannot exceed a SAR of 1.6 W/kg <http://content.time.com/time/magazine/article/0,9171,2029493,00.html>)

Merriam-Webster Medical Dictionary: <https://www.merriam-webster.com/medical/microwave%20sickness>

Microwave Sickness: a condition of impaired health reported especially in the Russian medical literature that is characterized by headaches, anxiety, sleep disturbances, fatigue, and difficulty in concentrating and by changes in the cardiovascular and central nervous systems and that is held to be caused by prolonged exposure to low-intensity microwave radiation.

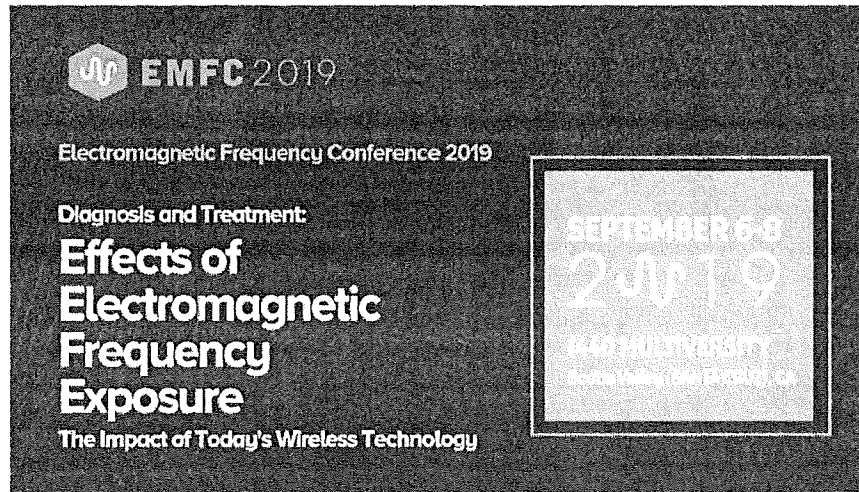
An international expert panel of doctors and scientists from around the world will be presenting at this conference, including:

- Dominique Belpomme MD (France)
- Devra Davis, PhD, MPH (USA)
- Victoria L. Dunckley MD (USA)
- Sharon Goldberg MD (USA)
- Magda Havas, PhD (Canada)
- Gunnar Heuser MD, PhD, FACP (USA)
- Toril Jelter MD (USA)
- Olle Johansson PhD (Sweden)
- Erica Mallery-Blythe MD (U.K.)
- Stephanie McCarter MD (USA)
- Pilar Muñoz-Calero MD (Spain)
- Lisa Nagy MD (USA)
- Cindy Russell MD (USA)
- Elizabeth Seymour MD (USA),
- Kalpana Patel MD (USA)

To read their full biographies: <https://emfconference.com/speakers>

Begin forwarded message:

From: EHT <info@ehtrust.org>
Date: May 30, 2019 11:02:26 AM CDT
Subject: EMF Conference for Health Professionals
Reply-To: info@ehtrust.org



Join Us at the EMF Conference 2019

September 6-8, 2019
 Santa Cruz, CA
 1440 Multiversity

This is the first major medical conference for health professionals in the U.S. to address the health effects of EMF/EMR exposure.

- **Learn** from global medical experts in this field who diagnose and treat EMF-related conditions.
- **Learn** how to protect yourself and your patients from electromagnetic radiation exposure.
- **Learn** how to diagnose and treat EMF/EMR-related problems in your complex mold, Lyme-infected, and metal toxic patients so that they can recover.
- **Earn** up to 17.0 CME Credits

Experts include Magda Havas, PhD, Erica Mallery-Blythe MD, Olle Johansson PhD, Dominique Belpomme MD, Victoria L. Dunckley MD, Lisa Nagy MD, Pilar Muñoz-Calero MD, Stephanie McCarter MD, Elizabeth Seymour MD, Toril Jelter MD, Gunnar Heuser MD, PhD, FACP, Sharon Goldberg MD, Kalpana Patel MD and more.



Devra Davis, PhD, MPH

Devra Davis, PhD, MPH Visiting Professor of Medicine at Hebrew University Hadassah Medical School, Israel, and at Ondokuz Mayıs University Medical School, Turkey and President of Environmental Health Trust.



Theodora Scarato

Theodora Scarato is Executive Director of Environmental Health Trust (EHT). She maintains a comprehensive database on international policy that documents the 20+ nations that have EMF reduction policy.

Click [here](#) to see the full schedule of speakers.

Other speakers include:

- Physicians (MDs, NDs, DOs) interested in environmental medicine, functional medicine, complementary and alternative medicine;
- Integrative practitioners wanting additional education in the Environmental Medicine arena;
- PAs, NPs, DCs, RNs, LAcS, DDS, RDs, CCNs, nutritionists;
- Medical students

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