

5G COMMISSION RECOMMENDATIONS

The Commission has heard from many experts on both sides of the argument concerning the health and environmental effects of 5G and RF-radiation in general; reviewed countless study reports; attempted to get direct answers to our specific questions from the FCC and other Federal Agencies to no avail; has become aware of a number of lawsuits against the FCC for not accounting for biological effects in the setting of their standards; is still not certain why the standards for acceptable RF-radiation are set so much higher in the United States than other industrialized nations; is concerned that the modulation of frequencies and the combined effect of “the soup” of RF-waves surrounding us today, which will only be growing in the world of if the roll out continues is not known; is aware that the science in many cases is conflicting and thus unresolved; is cognizant that our country historically has been beset by examples of products being declared safe only later to be proven unsafe; and is very aware that the World Health Organization and the whole insurance industry are hedging their bets against RF-radiation because of potential harm. Given these considerations, the majority of the Commission yields to the precautionary principal in formulating many of these recommendations.

RECOMMENDATION 1- Propose a resolution of the House to the US Congress and Executive Branch to require the Federal Communication Commission (FCC) to commission a review of the current radiofrequency (RF) standards of the electromagnetic radiation in the 300MHz to 300GHz microwave spectrum as well as a health study to assess and recommend mitigation for the health risks associated with the use of cellular communications and data transmittal.

The Telecommunications Act (TTA) of 1996 was adopted before the health risks and biological effects of RF-radiation to the human body were fully known to the scientific community as well as the public. The Commission believes that the FCC has not exercised due diligence in its mission to manage the electromagnetic environment, failing to support technical means and investigations aimed at reducing human exposures to electromagnetic radiation (EMR) in telecommunications systems, and optimize wireless modulations to reduce biological and health impacts. Commissioned research should study the health

effects and should be conducted by an independent research organization with standards which have been mutually agreed to by all the stakeholders. The FCC shall then ensure that the findings and recommendations are adequately disseminated to the public.

RECOMMENDATION 2- Establish a State position that protects the State and all its Municipalities from any liability from harm caused by small cell antennae placed on the public rights-of-way. Specifically, liability of the State of New Hampshire and its municipalities connected to harm caused by claims of personal damage or harm from the deployment of 5G small cell towers or the attachment of 5G antennae on telephone poles, electric poles, lamp poles, or other structures on the public right-of-way is by state statute transferred to the Federal Government. The Federal Government shall be required to defend and indemnify the municipality from any liabilities arising from permits and the installation, operation, and maintenance of small cell installations. Since the State of New Hampshire and its municipalities are being forced by Federal Law to deploy 5G small cell towers and antennae on public rights-of-way, the Commission has concluded that that the State and its municipalities should be held harmless from any litigation claiming harm for any reason, including damage to health. The Committee feels that this recommendation should not be of any burden to the Federal Government or to the cellular industry and related industries who support the cellular industry, since they believe that 5G technology is safe and thus there will be no harm caused by having these antennae so closely deployed to the public on the public right-of-way. **DEMOTED TO SOMETHING THE COMMISSION DISCUSSED**

RECOMMENDATION 3- Require that the most appropriate agency (agencies) of the State of New Hampshire include links on its (there) website(s) that contain information and warnings about RF-Radiation from all sources, but specifically from 5G small cells deployed on public rights-of-way as well as showing the proper use of cell phones to minimize exposure to RF-Radiation. In addition, public service announcements on radio, television print media, and internet should periodically appear, warning of the health risks associated with radiation exposure. Of significant importance are warnings concerning the newborn and

young as well as pregnant women. Even without further study, there is compelling evidence that the public should be warned of the potential dangers of RF-radiation and be told simple steps to lessen the risks of unnecessary exposure. Attachment XX shows an example of a simple cell phone warning.

The website must provide an option for visitors to register their concerns about current FCC exposure guidelines. In particular, this registry should provide a convenient and formal mechanism for New Hampshire municipalities and residents to weigh in concerning the contentious 1996 Telecommunications Act Section 704 that disallows using radiation-related health concerns as a reason to challenge cell phone tower siting. The primary use for the data collected on this registry will be to gauge the level of concern about RF-radiation exposure there is on the part of New Hampshire citizens.

RECOMMENDATION 4- Require every pole or other structure in the public rights-of-way that holds a 5G antenna be labeled indicating RF-Radiation being emitted above. This label should be at eye level and legible from nine feet away.

In the view of the Commission, the State of New Hampshire has the right to warn the public of potential harm of 5G antennae deployed in the public rights-of-way. Large cell towers all currently have fencing around them at their base to protect the public. This will not be the case with small cell towers or any pole with an antenna on top in the public-right-of-way. These public rights-of-way are the jurisdiction of our municipalities and not of the Federal Government. The Telecommunication Act of 1996 did not contemplate antennae being placed on the public rights-of way of municipalities. Thus, the State of New Hampshire has the right to warn the public harm by requiring the owners of these antennae to inform the public of potential from RF-radiation harm. See Appendix XX for an example symbol.

RECOMMENDATION 5- Schools and public libraries should migrate from RF wireless connections for computers, laptops, pads, and other devices, to hard wired or optical connections within a five-year period starting when funding becomes available. There is strong evidence that the younger the child the more susceptible they are to the negative impacts of RF-Radiation. Hard-wired connections or optical wireless do not subject children to RF radiation. The Commission is aware that school districts and public libraries have invested much

in wireless infra-structure and that a movement to radiation-less connections would require additional investment of resources.

New optical networking solutions for the classroom and office spaces (such as LiFi) offer faster, healthier, and more secure connections than RF-based WiFi. This technology utilizes visible light, which organisms can withstand without any harm at far higher intensity levels (such as direct sunlight) than required for transmission. Such optical data transmission using visible light offers giga-byte speed, as well as plug-and-play replacement of current RF WiFi routers. The optical wireless system can be incorporated in an upgrade to cost-efficient LED room lighting, which can save schools and public libraries significant energy dollars.

The hard-wiring and/or optical projects should be completed within five years from when the federal funding (via say through the FCC's E-Rate program for telecommunications and IT in schools and public libraries) is procured.

RECOMMENDATION 6-Establish new protocols for performing signal strength measurements in areas around cell tower radiators to ensure compliance with regulatory radiation thresholds and to evaluate signal characteristics known to be deleterious to human health as has been documented through peer-reviewed research efforts (e.g.,[1]). Those new protocols are to take into account the impulsive nature of high-data-rate radiation that a growing body of evidence shows to have a significantly greater negative impact on human health than does continuous radiation. The measurements should be taken in regions surrounding the tower that either are occupied or are accessible to the public. Commissioning measurements are to be performed when the site is installed and at regular intervals if required by state statute or municipal ordinance such as those required by the town of Burlington, MA [2]. Measurements should also be collected when changes are made to the tower that might affect its radiation, such as changes in software controlling it. Measurements should be performed under worst-case scenario conditions when the site is transmitting at its highest levels. It is recognized that theoretical calculations show that existing FCC guidelines will be met by standard cell tower configurations. However, there are cases where the radiation from towers can be focused by buildings, terrain, and antennas, causing signal levels to be considerably higher than would be

expected in theoretical calculations unless those effects are taken into account. Further, if measurements are performed using the protocols that are advocated, they will be sensitive to the impulses and summative effects of other radiation sources such as nearby cell towers. The measurements being advocated will require wideband equipment that is typically not used in the averaged signal measurements that are currently used. Two peer-reviewed articles that address the effects of impulsive radiation on organisms are [3] and [4].

[1] Belyaev I., Dean A., Eger H. et al. EUROPAEM EMF Guideline 2016 for the prevention, diagnosis, and treatment of EMF-related health problems and illnesses. *Rev environ Health*. 2016;31(3):363-397. Doi:10.1515/reveh-2016-0011.

[2] Burlington, MA zoning Bylaw Wireless Facilities Section 8.4.6.2 “Annual RF emissions monitoring is required for all sites by an independent RF engineer to be hired with Planning Board approval and at the applicant’s expense. Test results will be submitted to the Town as soon as available, and not later than the close of the calendar year. Annual testing of electromagnetic emission shall be required to ensure continual compliance with the FCC regulations.

[3] B. W. G. (2012). *Bionitiative 2012: A Rationile for Biologically-based Exposure Standards for Low-Intensity Electromagnetic Radiation*

[4]McCarty, D. E., Carrubba, S., Chesson, A. L., Frilot, C., Gonzalez-Toledo, E., & Marino, A. A. (2011). Electromagnetic hypersensitivity: P Evidence for a novel neurological syndrome. *International Journal of Neuroscience*,121(12), 670-676

RECOMMENDATION 7- Require that any new wireless antennae located on a state or municipal right-of-way or on private property be set back from residences, businesses, and schools. This should be enforceable by the municipality during the permitting process, unless the owners of residences/business or school districts waive this restriction. Given these are local public rights-of-way and under the jurisdiction of a municipality, the Commission feels empowering individuals impacted by these antennae to be within states’ rights to legislate such standards. This statute would return personal freedoms back to the individual in being involved with decisions as to non-essential devices that are being placed in front of their property.

Siting restrictions for cell phone towers already in force in the world were intended to ensure the safety of vulnerable populations, like children and those with illnesses. India already prohibits placement of cell phone towers near schools or hospitals, and Canada (Standing Committee on Health), as well as many European countries, are looking into similar restrictions. In California, firemen have been exempted from the forced placement of towers on their stations, because of radiation health concerns.

There are plans to use higher frequencies in the future. These higher frequency transmitters have to take into account:

1. Less signal penetration into structures
2. The atmospheres oxygen and water absorption of radiation
3. The shrinking antenna apertures
4. The noise from multiple extraneous sources

For human users, this means increased power density exposures. In addition, exposures will become more irregular and originate from multiple sources (Multiple-Input-Multiple Output Architecture). As vulnerable individuals are exposed ever day in society to RF-radiation, limits should be universally applied, and set according to the Largest Observed Adverse Effect Distance (LOADE) using the experience from the past and current uses of 2G, 3G, and 4G technology, since there is no epidemiological experience with 5G.

An engineering practice would use a set-back requirement for new base-station cellular towers, including 5G micro-towers. A conservative LOAED should include all observed health effects. From the 18 papers abstracted in Appendix XX, shown in historical order, this set-back for all new cell towers should be 500 meters which translates to 1,640 feet. The actual set-back requirement should be established by the municipality based upon a balance of the science and reasonable accommodation for these antennae.

RECOMMENDATION 8- Upgrade the educational offerings by the NH Office of Professional Licensure and Certification (OPLC) for Home Inspectors to include RF intensity measurements. Home Inspectors currently operate as private

contractors who may be hired by citizens or enterprises to measure such things as radon, to collect water quality samples, or search for mold or insect damage. Home inspectors routinely supply test results to both their clients and government entities.

The majority of the Commission believes the public has the right to discover the RF power intensity related to radio frequencies at a property which they will be purchasing or renting before the transaction is closed. Also, the proprietors of publicly accessible venues may wish to reassure the public about the RF power intensity within their establishments, by posting the data collected by a state-approved inspector. In addition, such testing should be paid for by the party requesting it and the testing itself should be performed by a professional who owns or rents the test equipment and has met the state requirements for training of Home Inspectors regarding RF measurements.

The majority of the Commission proposes that Home Inspectors be offered training by NH OPLC on how to measure on-site peak and 24-hour average RF intensities. Measurements of frequencies and intensities will be performed using low-cost equipment (such as GQ-390 meters). [Description of existing Home Inspector training offered for radon, mold, etc. may be seen at <https://oplc.nh.gov/home-inspectors/index.htm>]

RECOMMENDATION 8A- The State of New Hampshire should begin an effort to measure RF intensities within frequency ranges throughout the state, with the aim of developing and refining a continually updated map of RF exposure levels across the state, using data submitted by state-trained Home Inspectors. The data should be collected in such a way as to identify geographic areas of notably high RF exposure, places where RF signal for wireless communication is inadequate (dead spots), and places where RF is unusually low (white spots) sought by people who wish to minimize their RF exposure. One possible use of this data will be buyers/renters of property or the public in general using benchmark values to make comparisons and make their own decisions based on their comfort level with RF exposure. After a while, an extensive New Hampshire RF database will exist to provide useful maps and data for future public health investigations. Appendix XX outlines in more detail the technical aspects of this recommendation.

RECOMMENDATION 9- Require all new cell phones sold in New Hampshire come equipped with updated software that can stop the phone from radiating when positioned against the body. The Commission has been made aware that cell phones contain proximity sensors that will allow a cell phone to only radiate signals when a certain distance from the body, for example, held in the fingers, or placed on a table. This does not change the functionality of the device, only the way it is used, specifically not held against the head or body. Implementation is a software update in the cell phone, as these phones already have a proximity detector to turn off the screen and soft keys when an obstacle is present. With this change, the screen and the RF circuit are automatically turned off. This removes the problems of brain cancers (glioblastomas and acoustic neuromas) and the issue of SAR limits for the industry. See Appendix XX for more detail references to the science behind this recommendation. Cell phones should come set with this inhibition, with instructions in the manual on how to disable it. There should be a soft button on then unit to easily re-enable the radiation inhibition, for example if the unit is handed to a child. In all cases, it should be easier to enable the restriction than to disable it. Cellular phones marketed specifically for children should stop radiating when positioned against the body under all circumstances. The installation of such proximity sensors is also encouraged in laptops and tablets.

RECOMMENDATION 10- Promote and adopt a statewide position that would strongly encourage moving forward with the deployment of fiber optic cable connectivity, internal wired connections, and optical wireless to serve all commercial and public properties statewide. The majority of the Commission believes that fiber optic transmission is the infrastructure of the future. When compared, RF wireless transmission lacks fiber optic characteristics: speed, security, signal reliability and biological effects on humans and the environment. The State should encourage partnerships between towns to make this happen and encourage our Federal Delegation to support grant money to assist with such deployments when it comes to funding fiber optic cable deployment especially in rural locations.

RECOMMENDATION 11- Further basic science studies are needed in conjunction with the medical community outlining the characteristics of expressed clinical symptoms related to radio frequency radiation exposure. Further studies are just beginning to explore the quantum mechanical mechanisms which are the fundamental basis for understanding the biological changes occurring during the interaction of radio frequency radiation and molecules. These mechanisms can affect cells, tissues and whole organs, as well as accumulate over time.

The majority of the Commission feels the medical community is in the ideal position to clarify the clinical presentation of symptoms precipitated by the exposure to radio frequency radiation consistent with the Americans with Disabilities Act (ADA) which identifies such a disability. The medical community can also help delineate appropriate protections and protocols for affected individuals.

All of these endeavors (basic science, clinical assessment, epidemiological studies) must be completely independent and outside of commercial influence.

RECOMMENDATION 12- Encourage the use of exposure warning signs to be posted in commercial and public buildings. In addition, encourage commercial and public buildings, especially healthcare facilities, to establish RF-radiation free zones where employees and visitors can seek refuge from the effects of wireless RF emissions. Many NH citizens are sensitive to electromagnetic radiation emitted from devices used in the delivery of in-building cellular, and fixed wireless services. A majority of the Commission suggests owners of commercial and public buildings, especially healthcare facilities, voluntarily place signage at entrances concerning RF-levels and RF-free zones within these structures so those entering the building are aware.

RECOMMENDATION 13- The State of New Hampshire should engage agencies with appropriate scientific expertise, including environmental health, to develop RF-Radiation safety limits that will protect the natural environment; trees, plants, birds, insects, and pollinators. The majority of the Commission understands that current Federal safety limits set twenty-four years ago with the

intention of only protecting humans from short term effects, but not protecting flora or fauna from harm. The State of New Hampshire needs to ensure our natural environment and wildlife are protected by effective safety standards. Tree limbs, birds, and pollinators will be closer than humans to 5G cell antennae and associated 4G densified infrastructure. In fact, the wireless radiation from cell antennae could exceed safe limits when leaves of trees and flying birds and, since they may have higher exposure being in direct line of sight of wireless RF beams. When pollinators are impacted so are all forms of vegetation that depend on them for reproduction. Research on this issue is shown in Appendix XX.

RECOMMENDATION 14- The State of New Hampshire should engage our Federal Delegation to legislate that under the National Environmental Policy Act (NEPA) the FCC do an environmental impact statement as to the effect on New Hampshire and the country as a whole from the expansion of RF wireless technologies. Concern comes from the fact that the FCC is projecting that 140,300 5G satellites, 800,000 small cell antennae plus many additional macro towers will be required for these networks to function. The majority of the Commission is concerned that any new large-scale project that will densify antennae networks to this extent truly requires an environmental impact study. The NEPA statute requires that the agency consider environmental concerns in its decision-making process. NH should be provided documentation of such considerations. Until there is Federal action, NH should take the initiative to protect its environment.