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Wireless Transmissions Health Concerns

SB 637 Opposition

Internet of Things Uses by Industry

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HOME
- Smart Temperature Control
- Optimized Energy Use

INDUSTRIAL
- Machine-to-Machine Communication
- Quality Control

AUTOMOTIVE
- Vehicle Auto-Diagnosis
- Optimized Traffic Flow
- Smart Parking

AGRICULTURE
- Offspring Care
- Crop Management
- Soil Analysis

MILITARY
- Situational Awareness
- Threat Analysis

MEDICAL
- Optimized Patient Care
- Wearable Fitness Devices
- Quality Data Reporting

ENVIRONMENTAL
- Forest Fire Detection
- Species Tracking
- Weather Prediction

RETAIL
- Theft Protection
- Inventory Control
- Focused Marketing

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5G Wireless Technology

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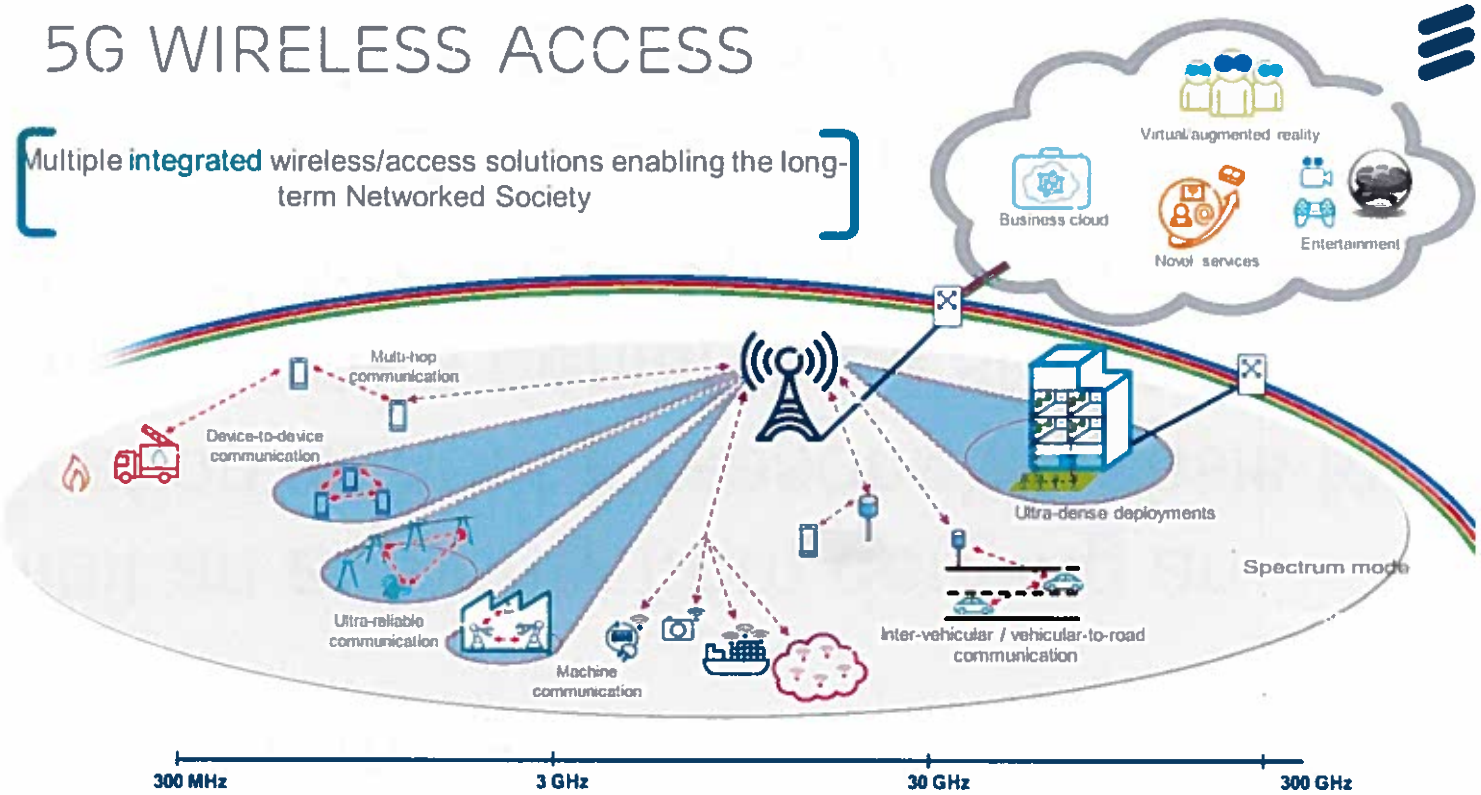
5G WIRELESS ACCESS

Multiple **integrated** wireless/access solutions enabling the long-term Networked Society



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SB 637 Summary

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Prohibit an authority from denying an application without a reasonable basis for the denial, require a denial to be supported by substantial evidence, and *prohibit a denial from discriminating with respect to the placement of facilities or other wireless providers*.

Adverse Health Impacts

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Stress proteins, HSP, disrupted immune function	Reproduction/fertility effects	Oxidative damage/ROS/DNA damage/DNA repair failure	Disrupted Calcium metabolism
Brain Tumors and blood-brain barrier	Sleep, neuron firing rate, EEG, memory, learning, behavior	Cancer (other than brain), cell proliferation	Cardiac, heart muscle, blood-pressure, vascular effects

3,600 Studies

Tumors from Cell Phone Usage

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"High exposure to radiofrequency radiation (RFR) in rodents resulted in tumors in tissues surrounding nerves in the hearts of male rats, but not female rats or any mice, according to draft studies from the National Toxicology Program (NTP). The exposure levels used in the studies were equal to and higher than the highest level permitted for local tissue exposure in cell phone emissions today. Cell phones typically emit lower levels of RFR than the maximum level allowed.

"The levels and duration of exposure to RFR were much greater than what people experience with even the highest level of cell phone use, and exposed the rodents' whole bodies. So, these findings should not be directly extrapolated to human cell phone usage," said John Bucher, Ph.D., NTP senior scientist. "We note, however, that the tumors we saw in these studies are similar to tumors previously reported in some studies of frequent cell phone users.""

- National Institute for Environmental Health Sciences, February 2, 2018

Tumors from Cell Towers

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"Our findings of cancerous tumors in rats exposed to environmental levels of RF are consistent with and reinforce the results of the US NTP studies on cell phone radiation, as both reported increases in the same types of tumors of the brain and heart in Sprague-Dawley rats. Together, these studies provide sufficient evidence to call for the International Agency for Research on Cancer (IARC) to re-evaluate and re-classify their conclusions regarding the carcinogenic potential of RFR in humans,"

– Fiorella Belpoggi PhD, Italian study author and RI Director of Research.

Oxidative Stress

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"The analysis of modern data on biological effects of low intensity RFR leads to a firm conclusion that this physical agent is a powerful oxidative stressor for living cell. The oxidative efficiency of RFR can be mediated via changes in activities of key ROS-generating systems, including mitochondria and non-phagocytic NADH oxidases, via direct effects on water molecules, and via induction of conformation changes in biologically important macromolecules. In turn, a broad biological potential of ROS and other free radicals, including both their mutagenic effects and their signaling regulatory potential, makes RFR a potentially hazardous factor for human health. We suggest minimizing the intensity and time of RFR exposures, and taking a precautionary approach towards wireless technologies in everyday human life."

SOURCE: Oxidative Mechanisms of Biological Activity of Low Intensity Radio Frequency Radiation, Published July 7, 2015 by Electromagnetic Biology and Medicine

FCC on Biological Effects

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Thermal

- Biological effects can result from exposure to RF energy. Biological effects that result from heating of tissue by RF energy are often referred to as "thermal" effects. It has been known for many years that exposure to very high levels of RF radiation can be harmful due to the ability of RF energy to heat biological tissue rapidly. This is the principle by which microwave ovens cook food. Exposure to very high RF intensities can result in heating of biological tissue and an increase in body temperature. Tissue damage in humans could occur during exposure to high RF levels because of the body's inability to cope with or dissipate the excessive heat that could be generated. Two areas of the body, the eyes and the testes, are particularly vulnerable to RF heating because of the relative lack of available blood flow to dissipate the excess heat load.

Non-Thermal

- At relatively low levels of exposure to RF radiation, *i.e.*, levels lower than those that would produce significant heating, the evidence for production of harmful biological effects is ambiguous and unproven. Such effects, if they exist, have been referred to as "non-thermal" effects. A number of reports have appeared in the scientific literature describing the observation of a range of biological effects resulting from exposure to low levels of RF energy. However, in most cases, further experimental research has been unable to reproduce these effects. Furthermore, since much of the research is not done on whole bodies (*in vivo*), there has been no determination that such effects constitute a human health hazard. It is generally agreed that further research is needed to determine the generality of such effects and their possible relevance, if any, to human health. In the meantime, standards-setting organizations and government agencies continue to monitor the latest experimental findings to confirm their validity and determine whether changes in safety limits are needed to protect human health.

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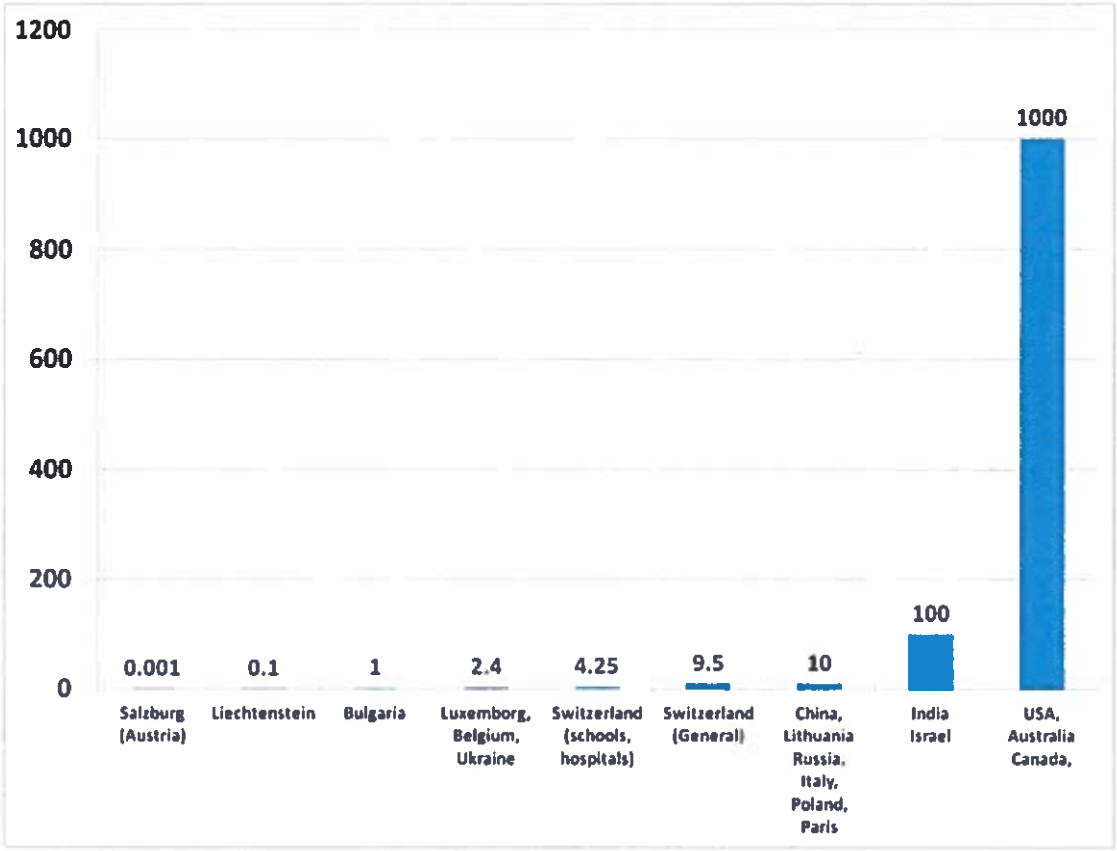
Outdoor Pulsed RF Radiation Exposure Limits

Country Comparison (uW/cm2)



Issues

- Environmental Effects Liability
  - Section 704 of Telecom Act of 1996
    - `(iv) No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions
    - (b) RADIO FREQUENCY EMISSIONS- Within 180 days after the enactment of this Act, the Commission shall complete action in ET Docket 93-62 to prescribe and make effective rules regarding the environmental effects of radio frequency emissions
  - The FCC not CDC responsible for definition of human exposure standards
    - FCC Chair is typically a former executive within the telecommunications industry
    - Having RF Emissions standards at levels orders of magnitude in excess of power density thresholds for adverse health impacts effectively indemnifies wireless network providers
- Autonomous Vehicles Dependency
  - 5G networks have been selected as the future infrastructure backbone of autonomous vehicles

Constitutional Requirements

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"The public health and general welfare of the people of the state are hereby declared to be matters of primary public concern. The legislature shall pass suitable laws for the protection and promotion of the public health."

- Article IV Section 51 of Michigan Constitution states

Goals

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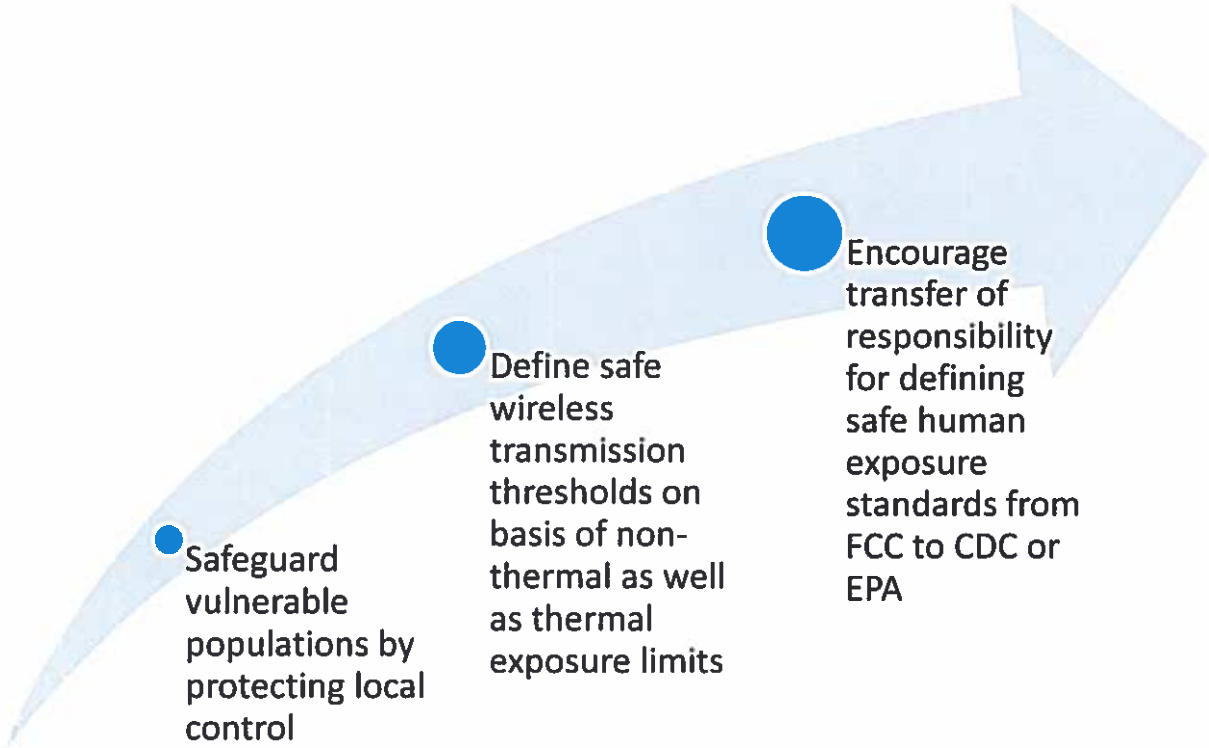
- Safeguard citizens from adverse health impacts due to wireless transmissions
- Do no harm: Promote safe deployment of the Internet of Things

Solution Strategy

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