Frequently asked questions about cellular collocations.

Do radio towers with cellular collocations pose a safety risk for humans?

The Federal Communications Commission's Radio Frequency (RF) exposure guidelines recommend a maximum permissible exposure level to the general public of approximately 580 microwatts per square centimeter from cellular and Personal Communication Service (PCS) antennas. Cellular antennas are usually collocated over 150 ft.; an individual would essentially have to remain in the main transmitting beam and within a few feet of the antenna for several minutes or longer to receive levels of RF near the FCC's guidelines. *(FCC Consumer Guide: Human Exposure to Radio Frequency Fields: Guidelines for Cellular Antenna Sites: For more information on consumer issues, visit the FCC's Consumer Help Center at www.fcc.gov/consumers.)*

What are the primary factors affecting the exposure levels?

Radio Frequency exposure is not a fixed quantity, it depends on several factors:

- Type of cellular site or PCS system/station.
- Type and the number of antennas transmitting at the same time.
- Power transmitted to the antennas.
- Height and tilt angle of the antennas.
- Distance from the antenna.

As with all forms of electromagnetic energy, the further we are from the antennas, the lower the power density from a cellular or PCS system.

Are there guidelines for human exposure to RF field?

The Federal Communications Commission (FCC) has jurisdiction over all registered transmitting services except those operated by the Federal Government. It follows recommendations from several non-government organizations, such as the American National Standards Institute (ANSI), the Institute of Electrical and Electronics Engineers, Inc. (IEEE), and the National Council on Radiation Protection and Measurements (NCRP).

The following figure shows the electromagnetic spectrum and the regulatory agencies.

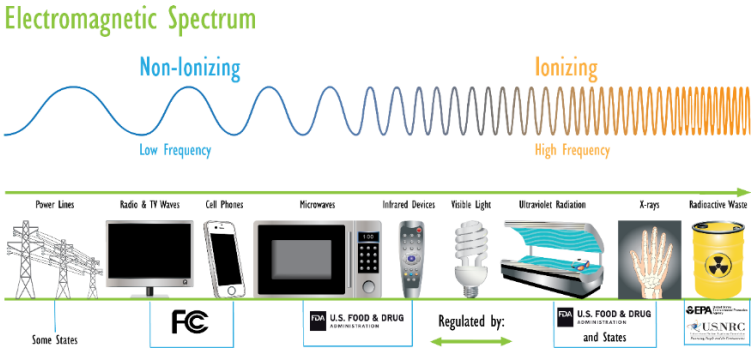

Figure 1: Electromagnetic Spectrum from United States Environmental Protection Agency | US EPA

Can the frequencies use by personal wireless services cause ionization?

No, the CDC defines ionizing radiation as: "A form of energy that acts by removing electrons from atoms and molecules of materials that include air, water, and living tissue." The following image shows that only frequencies over the visible light can affect the atoms in living things, like tissue and DNA genes. The radio frequency spectrum lies between 30 Hz and 300 GHz.

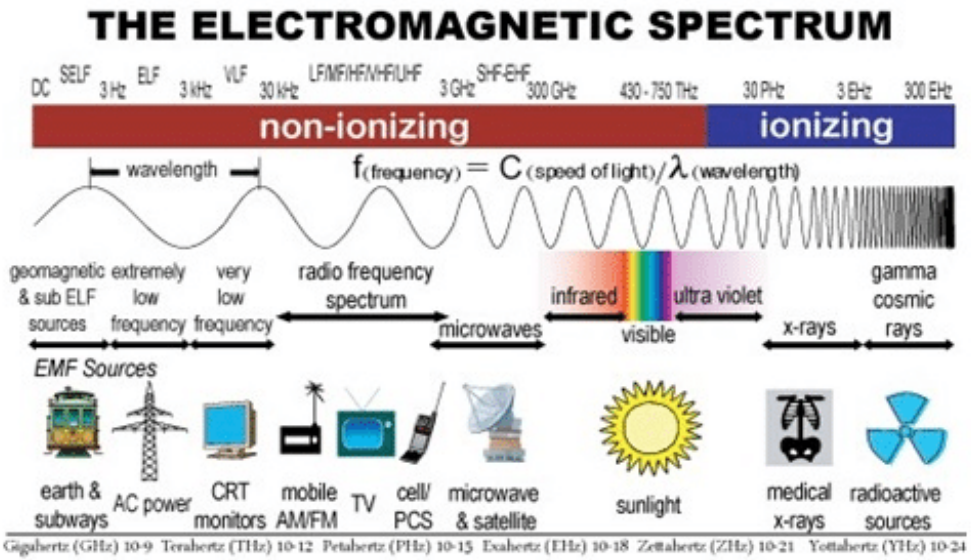

Figure 2: Wireless industry emission: From an Electromagnetic field monitoring and analysis study-2015

What are the state and local government limitations regarding personal wireless services?

The Communications Act prohibits local and state governments from discriminating or regulating in a manner that limits the provision of personal wireless services and to act on permits within a reasonable time.

By Section 332(c)(7)(B)(iv) of the Communications Act:

> *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.*

By Section 1455 (a)(7) of the Communications Act:

> *A state or local government may not deny and shall approve any eligible facility request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station, and defines eligible facility requests as including requests for the collocation, removal, or replacement of transmission equipment.*

Can local authorities deny a request for tower sitting?

Yes, local zoning authorities have all the authority over the placement of wireless facilities; **but, they cannot deny any new facility based on RF emissions** if the licensee has complied with the FCC's regulations. (Section 332(c)(7)(B)(iv) of the Communications Act).

Who establishes and regulates the licensing of personal wireless systems and antenna structures in the United States and its Possessions and Territories?

The Federal Communication Commission (FCC).

A new tower construction requires:

1. Approval from the Local Authority Having Jurisdiction (AHJ).
2. Compliance with FCC rules implementing the National Environmental Policy Act (NEPA).
3. Depending on its height and location, it may also require:
    - Federal Aviation Administration (FAA) notification
    - Antenna Structure Registrations (ASR) with the FCC

Are the tower locations selected randomly?

The short answer is no. Communication towers are not isolated silos; they are part of a network that provides wireless services to an area that integrates at higher levels. A lot of planning goes into determining the locations of towers for wireless communication systems. New tower structures are needed to extend the coverage and/or the capacity of the networks in an effective manner. The RF engineers determine the new optimal location and integrate the new site into the existing network, utilizing the type of sites based on the network's needs:

- Cell Tower Site: Coverage .5 to 25 miles.
- Rooftop Site: Coverage 1.5 to 25 miles.
- Small Cell: Coverage 1/10th of a mile to 2 miles per node.
- Outdoor Distributed Antenna System (DAS) Coverage: 1/10th of a mile to 1 mile per node.
- Indoor Distributed Antenna System (DAS) Coverage: In-Building.

Does Brevard County have a colocation process in place?

Yes, Administrative Order-60 (AO-60) outlines the process which involves several County departments: Planning & Development, Emergency Management, and Purchasing. Each collocation opportunity is taken to the Board of County Commissioners for approval and follows the County's procurement process.

Who receives the benefits for the cellular colocations in County-owned towers?

The first responders, the residents, and visitors of Brevard County receive the benefits of each collocation by gaining better county-wide coverage and wireless service. At the same time, we reduce the proliferation of new towers within the same area. The revenues received from the licensing of County towers are dedicated to the maintenance/upgrade of the public safety radio system, or as directed by the County Manager, with final authorization from the Board of County Commissioners, to specific Capital Improvement Projects like the new Emergency Operations Center.

How many County-owned towers have cellular collocations?

Although the main purpose of County-owned towers is to serve as the County's public safety radio system, Brevard County currently has seven active agreements with an average of $44,000/year per collocation.

Definitions

Collocation/Co-Location/cell tower colocation: The mounting of an antenna on an existing tower, building, or structure for communications purpose.

Tower: Any structure built for the sole and primary purpose of supporting antennas to provide FCC licensed services.

Personal wireless services: Include commercial mobile services, unlicensed wireless services, and common carriers wireless exchange access services. 47 U.S.C. §332(c)(7)(C)(i)