

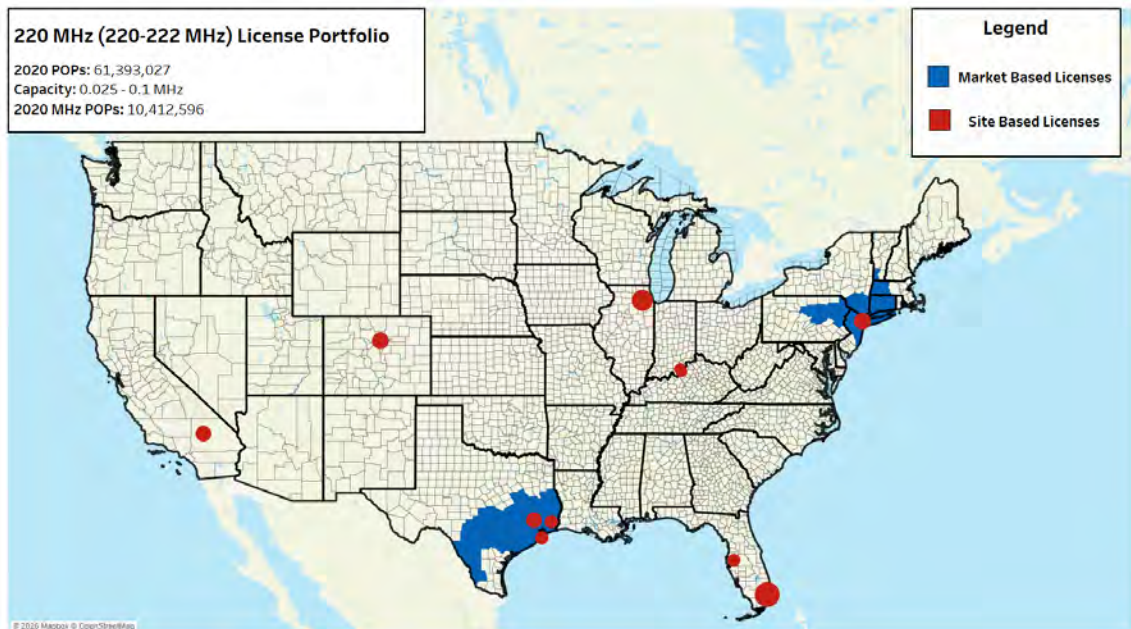


Wireless Spectrum Licenses in the 220 MHz Services (220-222 MHz) Band Ideal for Utility, Critical Infrastructure, IoT, M2M, and Rail Applications Available in New York, Chicago, Houston, Miami, and Denver

Select Spectrum is offering eighteen **220 MHz Services Phase I Site-Based and Phase II Area-Based FCC-licensed spectrum**, with licenses collectively providing coverage over a population of over 61 million, or 18.4% of the total U.S. population.

The 220 MHz Band is composed of 5 kHz wide, paired, channel frequencies, with each channel offering a total of 10 kHz capacity. FCC regulations permit aggregation of adjacent channels so that operators may utilize 10 or 15+ kHz wide channels that can support a wide variety of voice and data applications. Please inquire for details on the availability of adjacent channel opportunities.

Available 220 MHz license coverage is shown below; with area-based Phase II “QA” licenses shown as blue, site-based Phase I “QT” licenses in red.



220-222 MHz spectrum has excellent propagation and can be used for a broad range of applications including fixed & mobile data, voice, and video. Licenses are held and in use by utilities, passenger/freight rail lines, and others for a wide range of applications, including positive train control (PTC), land mobile radio (LMR), M2M/Internet of Things (IoT), supervisory control and data acquisition (SCADA), distribution automation (DA), and Oil/Gas applications.

The 220 MHz band is shown with its neighboring service groups below:

216 MHz	217 MHz	218 MHz	219 MHz	220 MHz	222 MHz	225 MHz
Low-Power Radio Service (Unlicensed)	AMTS		218-219 MHz	AMTS	220 MHz	Amateur
	B	A	A	B		
	217.5 MHz		218.5 MHz	219.5 MHz		

220 MHz licenses provide excellent propagation, and the FCC has approved the 220 MHz band for a broad range of uses. The mixed 5 kHz interleaved and contiguous channel plan is suitable for broadcast or two-way; mobile or fixed; voice or narrowband data. Licenses can be aggregated to use wider carriers of 12.5, 25 or more kHz. Maximum base power is based on height above average terrain. FCC Part 90 rules allow up to 125 Watts ERP from the base station with maximum mobile power of 50 Watts ERP. Networks may employ point-to-point, point-multipoint (tall site) and/or cellular architectures. These limits, along with the excellent propagation in the band, allow long range and high reliability in urban and rural areas. Systems have been shown to perform well in the presence of multiple large obstacles including skyscrapers, forested areas and mountains.

220 MHz spectrum is held by a combination of utilities, critical infrastructure, and rail organizations, including **Orange & Rockland Utilities/Consolidated Edison, Pepco/Exelon**, a variety of Utility Co-ops and the **National Rural Telecommunications Cooperative, Alaska Railroad Corporation**, railroad consortium **PTC-220, Amtrak, Massachusetts Bay Transportation Authority**, and others for a variety of applications.

The band is characterized by a combination of wide geographical area licenses with operational flexibility, allowing frequency reuse at multiple sites within the licensed areas, and priority site licenses over dense metropolitan areas. These characteristics make the spectrum ideal for meeting utility and critical infrastructure network requirements, where operators need excellent propagation over wide geographic operating areas and/or have increased need for additional capacity over urban hubs.

For LPWAN/IoT deployments, the 220-222 MHz band channels support a wide variety of sensor ecosystems and IoT-oriented applications serving industries ranging from critical infrastructure, industrial, enterprise, agriculture, etc.

Equipment for the band is made by Ondas Networks www.ondas.com, 4RF www.4rf.com, GE Vernova www.gedigitalenergy.com, CalAmp <http://www.calamp.com>, XetaWave www.xetawave.com, Cambium <http://www.cambiumnetworks.com>, Alligator Communications www.alligatorcom.com, Tait Communications www.taitradio.com, L3Harris www.harris.com and Hytera <http://www.hytera.com>. The band is also compatible with a new IEEE wireless standard – 802.16s “GRIDMAN”. This high reliability standard is intended for use by utilities and other critical infrastructure operators.