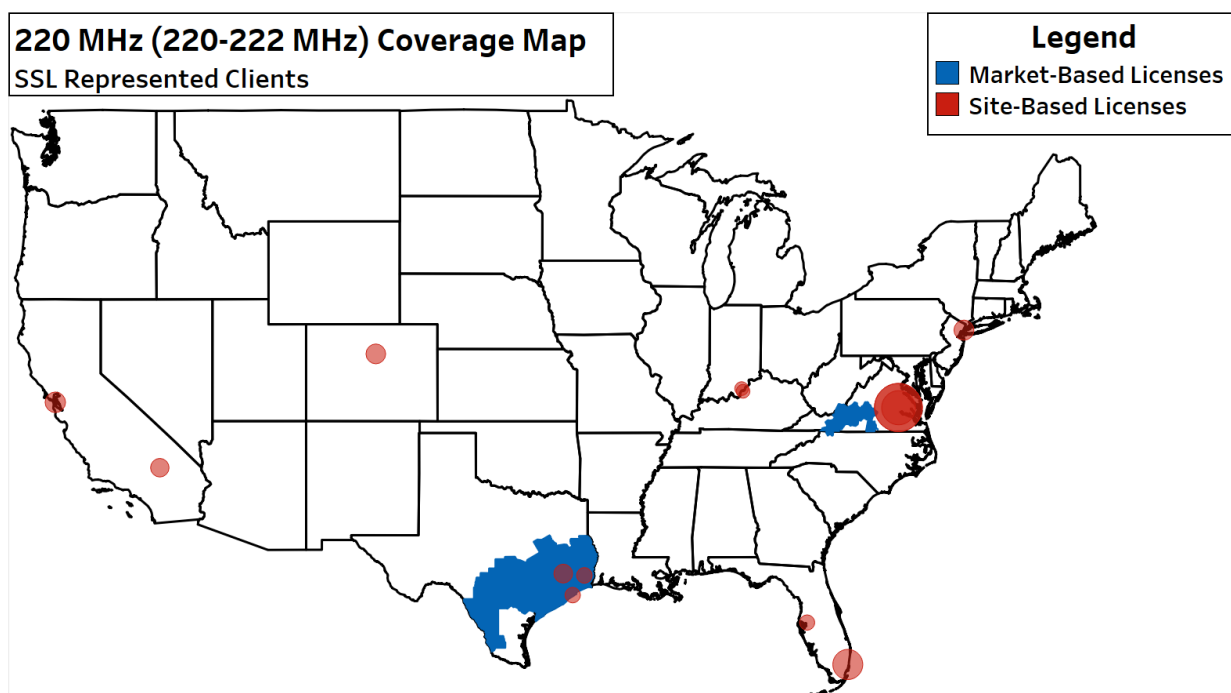# Wireless Spectrum Licenses in the 220 MHz Services (220-222 MHz) Band Ideal for Passenger & Freight Rail Safety and PTC Applications Available in San Francisco CA, East TX, and Key East Coast Markets

Select Spectrum is offering twenty-two **220 MHz Services Phase I Site-Based and Phase II Area-Based FCC licensed spectrum,** with licenses collectively providing coverage over a population of nearly 50 million, or 15.1% 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 positive train control (PTC) and other mission-critical 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 MHz (220-222 MHz) Coverage Map
SSL Represented Clients

Legend
■ Market-Based Licenses
■ Site-Based Licenses

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 for passenger & freight rail communications for rail safety and positive train control (PTC) applications, including I-ETMS (25 kHz of bandwidth, attainable via aggregation of five contiguous 5 kHz channels) and ACSES (12.5 kHz of bandwidth, attainable via aggregation of three contiguous 5 kHz channels).

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	B	A			
		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.

The 220 MHz band has been identified for use by freight rail organizations such as **Canadian Pacific**, **BNSF**, **Norfolk Southern**, and **CSX** as well as passenger rail organizations such as **Amtrak**, **Conrail**, **Massachusetts Bay Transportation Authority**, **Metro-North**, and the **Southern California Regional Rail Authority** for PTC and a variety of rail management 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 where numerous rail lines intersect. These characteristics make the spectrum ideal for both I-ETMS (Freight) and ACSES (Passenger) channelization for PTC, with specific FCC waivers on the power limits.

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 MDS www.gedigitalenergy.com, CalAmp http://www.calamp.com, XetaWave ww.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.