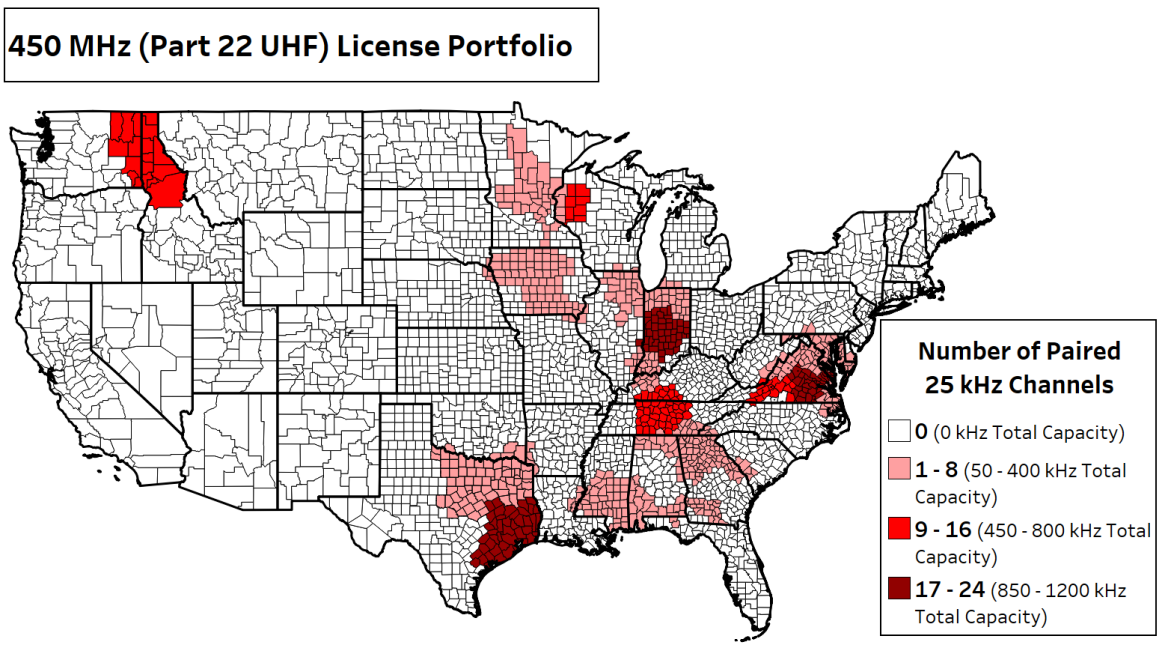
# Wireless Spectrum Licenses in 450 MHz (Part 22 UHF)
# Ideal for Land Mobile Radio & Data Applications
# Available in Texas, Indiana, Virginia, Tennessee & Additional States

Select Spectrum is offering **450 MHz (Part 22 UHF) FCC-licensed spectrum** across portions of twenty-nine states including Alabama, Iowa, Indiana, Tennessee, Texas, Virginia, and the District of Columbia. Collectively, the available frequencies provide coverage in excess of 77 million people located across both rural markets and multiple dense urban metropolitan areas such as Atlanta, Baltimore, Chicago, Houston, Indianapolis, Nashville, and Richmond.

Available licenses are ideal for utility and critical infrastructure industry applications; sophisticated LMR, TETRA, and data networks may be constructed where multiple channels are available. The number of available, paired 25-kHz channels varies by location, with between 50 to 1,200 kHz of bandwidth in each market area.

**Available markets and bandwidth in this offering are shown in the map below:**




Part 22 UHF frequencies are in use for a wide variety of applications and are ideal for utility communications, remote monitoring of critical infrastructure, smart grid, public safety, and private narrowband networks. Common uses include land mobile radio, SCADA systems, Oil & Gas production/pipelines, and transportation. Part 22 UHF spectrum has been acquired by several utilities, to support vital real-time conventional and trunked voice and narrowband data communications for their electric, gas, and water delivery services. The band is ideal for critical infrastructure organizations pursuing an innovative spectrum layering/multi-frequency architecture for their next-generation networks.

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Visit our website at http://selectspectrum.com to learn more.

The 450 MHz band is shown with neighboring service groups below:

| IG /BP Part 90 | 450 MHz Paging Part 22 | VHF Low-Power Part 90 | Unlicensed | Industrial/ Business Pool Part 90 | 450 MHz Paging Part 22 | IG /BP Part 90 |
|---|---|---|---|---|---|---|
| 453 MHz | 454 | 455 | 456 | 457 458 | 459 | 460 |

Paired 450 MHz spectrum can be used for voice or data in 2-way or broadcast modes including fixed and mobile services. The interleaved channel plan allows full duplexing and simultaneous multipoint digital broadcasts from multiple transmitters on either the upper or lower channel blocks. Half-duplex (time-division duplex "TDD") is also allowed. Maximum base station power is 3,500 Watts ERP, while mobile units may transmit at up to 60 watts ERP. The generous rules allow for long-range and high reliability in both high-density urban areas and rural areas. Networks may employ point-to-point, and/or point-multipoint (tall site) architectures.

Subject to FCC Part 22 regulations, the 2 x 25 kHz channel spacing allows for the use of land mobile radio LMR, TETRA, and data transmission systems. Each license permits 2 x 20 kHz of effective bandwidth with an assigned center frequency, allowing for interference protection and compatibility with narrowband technologies. The FCC is considering a proposal (DA 14-1508) to update Part 22 rules, particularly Subpart E, providing more varied use of the paging bands. The new rules would allow for greater flexibility by permitting full use of the channel spacing & frequency offsets by licensees that hold adjacent blocks and allow innovative technologies such as TETRA and 12.5 kHz/6.25 kHz narrowband LMR equipment. Commenters have unanimously supported the measure, but waivers would be required in the interim to satisfy FCC regulatory compliance. Select Spectrum believes waivers are likely to be granted (see FCC Order DA 15-1064) if they correspond to the proposal found in DA 14-1508 and sufficiently meet the stated FCC goals of fostering technological innovation and serving the public interest.

Equipment for the band is made by Ondas Networks www.ondas.com, 4RF www.4rf.com, XetaWave www.xetawave.com, Alligator Communications www.alligatorcom.com, Motorola Solutions www.motorolasolutions.com, ESTeem www.esteem.com, Hytera www.hytera-mobilfunk.com, Kenwood www.kenwood.com, PowerTrunk www.powertrunk.com and Tait Communications www.taitradio.com. For spectrum blocks of 100 kHz or greater, the band is also compatible with a new IEEE wireless standard – 802.16s "GRIDMAN". Basic information about markets in the overall offering is shown below:

| Market | kHz | Max 2022 POPs | MHz POPs | Market | kHz | Max 2022 POPs | MHz POPs |
|---|---|---|---|---|---|---|---|
| Spokane, WA | 600 | 1,090,709 | 654,425 | Nashville, TN | 550 | 3,410,710 | 1,875,891 |
| Dallas, TX | 250 | 10,907,598 | 2,726,900 | Chattanooga, TN | 500 | 867,245 | 433,623 |
| Houston, TX | 1200 | 8,444,244 | 10,133,093 | Dothan, AL | 50 | 366,488 | 18,324 |
| Beaumont, TX | 1000 | 458,141 | 458,141 | Huntsville, AL | 250 | 1,221,137 | 305,284 |
| Sioux City, IA | 200 | 258,403 | 51,681 | Mobile, AL | 250 | 772,818 | 193,205 |
| Des Moines, IA | 150 | 1,855,882 | 278,382 | Albany, GA | 100 | 491,798 | 49,180 |
| Minneapolis, MN | 50-450 | 4,173,680 | 337,966 | Augusta, GA | 100 | 706,680 | 70,668 |
| Elkhart, IN | 400 | 968,395 | 387,358 | Atlanta, GA | 100 | 7,762,667 | 776,267 |
| Evansville, IN | 50 | 871,330 | 43,567 | Staunton, VA | 350 | 373,101 | 130,585 |
| Indianapolis, IN | 950 | 3,592,272 | 3,412,658 | Roanoke, VA | 150-600 | 895,840 | 536,580 |
| Fort Wayne, IN | 200 | 782,103 | 156,421 | Norfolk, VA | 100 | 1,919,570 | 191,957 |
| Chicago, IL | 100 | 10,698,386 | 1,069,839 | Richmond, VA | 150-1100 | 1,807,684 | 1,981,835 |
| Biloxi, MS | 100 | 445,988 | 44,599 | Washington, DC | 50 | 10,119,829 | 505,991 |
| Jackson, MS | 100 | 1,430,147 | 143,015 | Salisbury, MD | 150 | 484,123 | 72,618 |
| Nashville, TN | 550 | 3,410,710 | 1,875,891 | **Total** | **50 – 1200** | **77,176,968** | **27,039,052** |

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