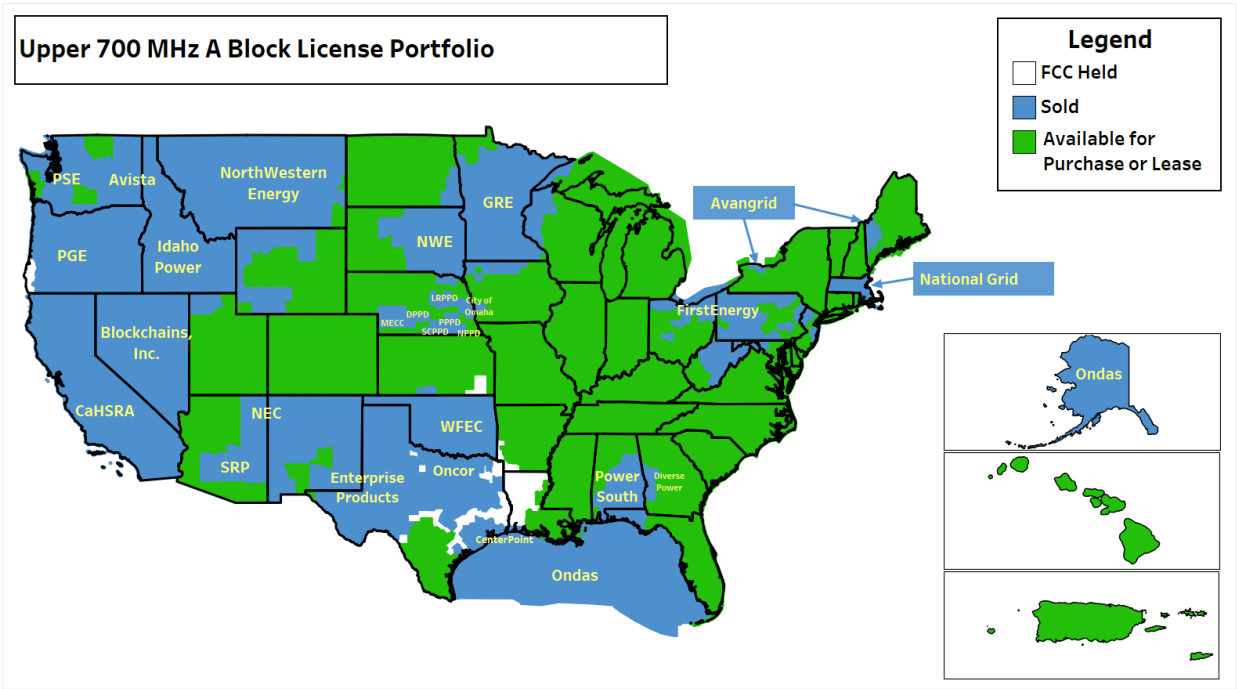
Wireless Spectrum Licenses in the Upper 700 MHz A Block Ideal for Utility and Critical Infrastructure Industry Applications Available Semi-Nationwide Covering 207+ Million People

Select Spectrum represents Beach Point Capital (BPC) and Access 700 (A7L), which collectively hold 2 x 1 MHz of **Upper 700 MHz A Block (Band 103) FCC licensed spectrum.** The Utilities Telecom Council (UTC) recommends this band to utility companies for a wide variety of critical infrastructure applications; Select Spectrum can provide a copy of the relevant UTC White Paper upon request. Coverage is presently available for purchase via Select Spectrum in key markets across the Midwest, Northeast, and Southeast Regions and portions of the Rocky Mountains. Coverage additionally includes Hawaii and Puerto Rico.

The map below shows spectrum available for purchase in green, with spectrum previously sold being reflected in blue. **License holders will partition the licenses to match utility operating areas to the county level.**



Upper 700 MHz A Block spectrum has excellent propagation and can be used for a broad range of applications including fixed & mobile data, voice, and video. Licenses are in use by, and recommended for, utility and other critical infrastructure communications, including Private LTE NB-IoT (Band 103), Distribution Automation (DA), Surveillance Control and Data Acquisition (SCADA), and Land Mobile Radio (LMR).

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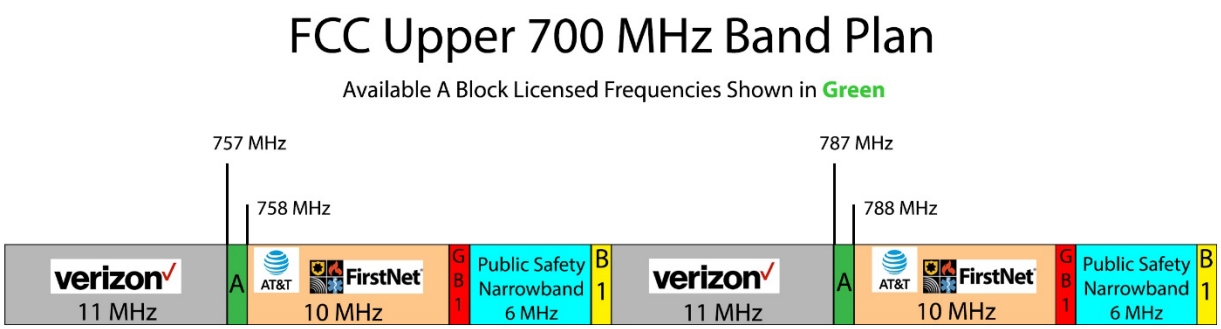
The Upper 700 MHz A Block is shown with neighboring service groups below:



Maximum downlink power is 1000 Watts ERP at 1000 feet, and maximum uplink power is 30 Watts ERP. Networks may employ point-to-point, point-to-multipoint (tall site) and/or cellular architectures. Engineers recommend small-cell deployments for superior building penetration.

Maximum out of band emissions limits of 43 + 10log (P) dB apply to the A Block and the adjacent 11 x 11 MHz Upper 700 MHz C Block where Verizon operates a nearly nationwide 10 MHz paired LTE network. The A Block, located between 757-758 MHz / 787-788 MHz, is similarly protected from interference from the adjacent FirstNet/AT&T channels at 758-768 MHz and 788-798 MHz.

In total, **twenty-three utilities** across the nation have acquired spectrum rights. **FirstEnergy** is replacing its cancelled copper SCADA Links; **Great River Energy** of Minnesota is currently using the band for point-multipoint data collection; **National Grid** is using the spectrum for recloser communications; and **NorthWestern Energy** has deployed point-to-point links across Montana, North and South Dakota. Through successful field trials **Salt River Project, Puget Sound Energy, and Avista Corporation** found 700 MHz highly effective. Other buyers include **Avangrid, Portland General Electric**, **PowerSouth Energy Cooperative**, **Diverse Power**, **Idaho Power Company**, **Oncor Electric Delivery**, **Navopache Cooperative**, **CenterPoint Energy**, **Western Farmers Electric Cooperative, Midwest Electric Cooperative Corporation, City of Omaha NE,** and the **Dawson, South Central, Norris, Loup River, and Perennial Public Power Districts.** Many of these utilities, along with others that are considering the band, have formed a **Utility Users Group**.

The 3GPP standards organization, per Release 17.5, has officially designated the Upper 700 MHz A Block as **Band 103** for 4G or 5G networks. The designation, the first in the world of its kind, adds the frequencies to the list of E-UTRA operating bands, for NB-IoT operations only. The Electric Power Research Institute, WiMAX Forum, UTC and various manufacturers all support the implementation of the IEEE approved **802.16s GRIDMAN standard** with compatible equipment in the band.

Pt-Multipoint and Pt-Pt Wireless Equipment is offered by 14 manufacturers, including Ondas Networks www.ondas.com, 4RF www.4rf.com, GE Vernova www.gedigitalenergy.com, XetaWave www.xetawave.com, ABB www.abb.com/, MiMOMax www.mimomax.com, Cambium www.cambiumnetworks.com, PowerTrunk www.powertrunk.com/, SAF Tehnika www.saftehnika.com, CableFree www.cablefree.net, Puloli www.puloli.com and Tait Communications www.taitradio.com. Other manufacturers are considering upgrading their existing lines of equipment to make use of this band.

Band 103 LTE Narrowband Internet of Things (IoT) deployments provide long range, deep indoor penetration for intermittent low data rate use cases. Long-range IoT connections support a variety of low bandwidth remote applications at very low-cost per remote device. Chipsets and modules for LTE NB-IoT devices in Band 103 are available from Qualcomm (9205 LTE Modem), Sequans (Monarch), Quectel, Pycom, Telit and Ubiik/Realtek. Additionally, a number of endpoint solutions are available, such as Mobilogix (MT4X00), Shoreline IoT, Puloli (RU700A), Option CloudGate and Apollo Metro's Smart Streetlight.

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