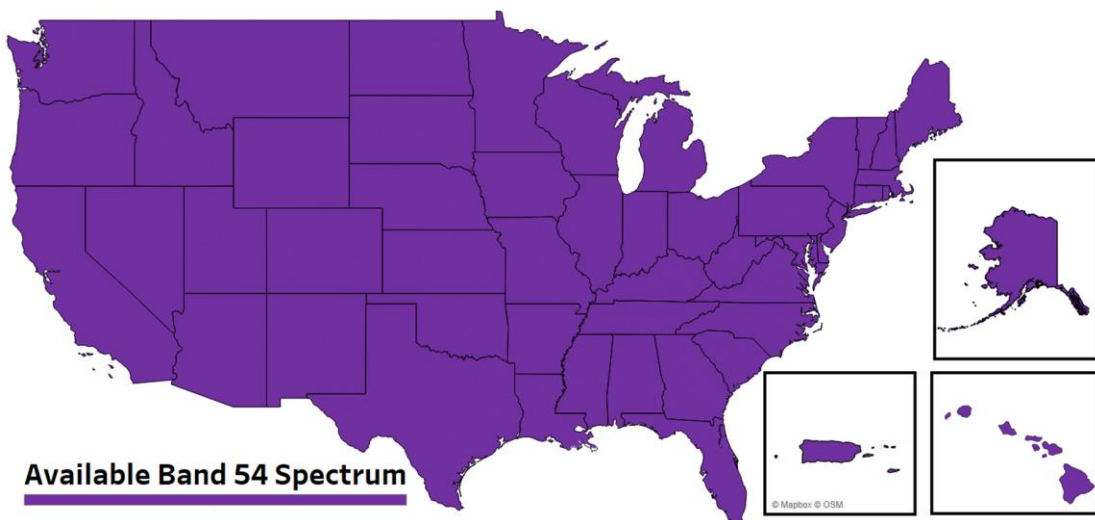


Wireless Spectrum Licenses in Band 54 (1670-1675 MHz)
Ideal for Private 4G/5G Broadband Networks, NB-IoT and LTE-M
Utility and Critical Infrastructure Applications
5 MHz of Broadband Capacity Available Nationwide

On behalf of Ligado Networks, Select Spectrum offers 5 MHz of **contiguous FCC licensed broadband spectrum between 1670-1675 MHz, standardized by 3GPP for 4G as Band 54 and 5G (n54)**. Band 54 spectrum is the ideal choice for companies in the **Utility and Critical Infrastructure Industry (UCII) sector** that are deploying private networks to support applications that require 4G-LTE, 5G NR, LTE-M and NB-IoT technologies. Band 54's prime mid-band frequencies are available on a nationwide basis for localized leasing to match UCII organization operator areas and requirements.

The Band 54 frequency range and availability map is shown below:

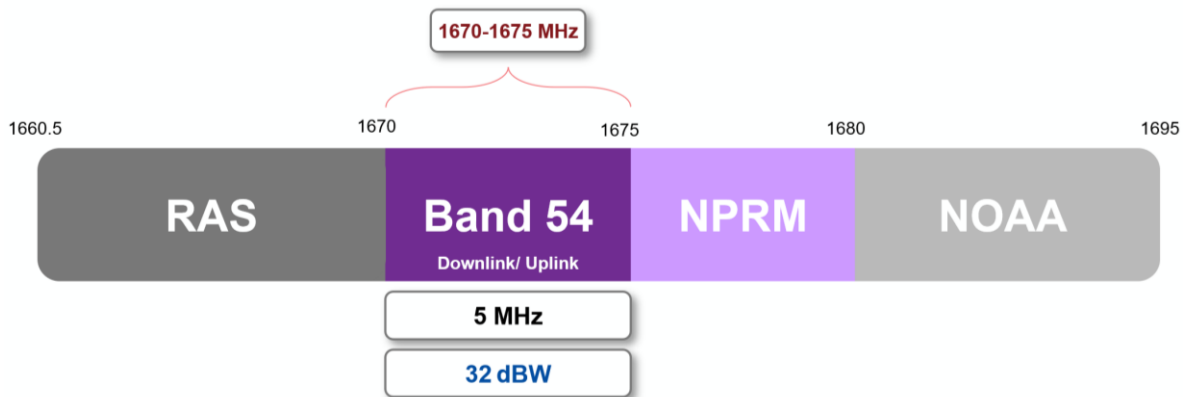


Band 54 spectrum offers the ideal combination of capacity and coverage characteristics that deliver cost-effective and superior performance for private 4G-LTE & 5G NR networks, creating the opportunity to decrease operating expenses while delivering broadband capacity. 4G/5G standardization allows UCII users to leverage an expanded range of interoperable and compatible device types, along with exceptionally low latency and extremely high throughput speeds. UCII organizations can leverage Band 54 spectrum for a wide array of power grid modernization projects including Smart Metering/AMI, Smart City and Internet of Things (IoT) initiatives, business operations monitoring and control requirements cases, etc. – all on dedicated, secure licensed spectrum supporting Private 4G and 5G network deployments.

Band 54 is the *only* option available to UCII entities that provides the unique constellation of benefits, including: private access (direct lease), a suite of 3GPP standardized compatibility (4G-LTE, 5G NR, LTE-M and NB-IoT), optimal capacity/propagation via its location in the lower mid-band 1-2 GHz range, efficient Time Division Duplex (TDD) operations with uplink or downlink traffic prioritization, immediate access with nationwide availability, and 5 MHz wide carriers.

Band 54 Overview

Band 54 frequencies are utilized in a TDD mode providing users with significant flexibility to apportion the bandwidth between Uplink and Downlink according to their applications' requirements. TDD mode is more efficient than legacy Frequency Division Duplex "FDD" where the ratio between uplink and downlink capacity is fixed and typically lower in the uplink than in the downlink due to link budget differences.



Governed by Part 27 "cellular" rules, Band 54 spectrum has authorized power of 2000 Watts EIRP for base stations and fixed devices, providing unparalleled flexibility and performance for fixed deployments. Within 30 CMAs (Cellular Market Areas), this authorized power limit is raised to 4000 Watts/MHz in non-rural and 8000 Watts/MHz in rural areas. Consistent with typical vehicular radios, the band has an authorized power limit of 4 Watts EIRP for mobile devices.

Key applications for UCII's supported by Band 54 spectrum include Mobile or Fixed Data Services (4G LTE & 5G NR), Field Area Network (FAN), Internet of Things (IoT) / Sensors, Broadband Internet Services, Demand Response (DR), Distributed Energy Resources (DER), Advanced Metering Infrastructure (AMI), Emergency Management & Service Restoration, Electric Vehicle (EV) and Charging Stations, Workforce Mobility, Direct Transfer Trip, Line Fault / Falling Conductor Protection, Supervisory Control and Data Acquisition (SCADA), Distribution Automation (DA), Video Monitoring, Volt VAR (Advanced Voltage Control), VoLTE / Push-to-Talk (PTT), and Smart Grid monitoring and control.

Usage of Band 54 frequencies afford UCII organizations with existing/planned Land Mobile Radio (LMR) operations on narrowband frequencies, such as those using interleaved 900 MHz Business/Industrial Land Transportation channels, the assurance that they can continue operating without interference from new broadband data operations.

Manufacturers including PowerTrunk and Ubiik are working to develop compatible products to utilize Band 54. Ligado and Select Spectrum are also in advanced discussions with major chip, module, base station and LTE core manufacturers to expand the range of options for constructing private 4G-LTE networks supporting UCII applications using Band 54 spectrum. Announcements describing this rapidly expanding Band 54 ecosystem are expected to continue throughout 2023.