Shared Spectrum Update

March 2023
Federated Wireless
at-a-glance

Founded in 2012
HQ in Arlington, VA
124 employees

Pioneer in shared spectrum

$210M invested to date

CBRS market share leader
450+ customers
Federated Wireless
transforming wireless

CBRS SAS
- 48% market share
- Cloud scale and redundancy
- Unsurpassed features & functionality
- Multi-region architecture
- 99.999% reliability
- 24x7x365 NOC

Private Wireless
- Private 4G/5G Wireless
- Cloud-native managed service
- Shared spectrum + wireless expertise
- Solution integration
- 24x7x365 NOC
- Enterprise SLAs
- Simplified pricing

6 GHz AFC
- Conditionally approved
- Wi-Fi 6E support
- OEM agnostic
- Cloud scale and redundancy
- 99.999% reliability
- 24x7x365 NOC
- Contractual SLAs

Professional Services
- Wireless design
- Spectrum assessment
- Network performance optimization
- Custom planning and support
- Online CPI Training

Autonomous UAS
- Spectrum management system for aviation
- Deterministic connectivity links for both crewed and uncrewed aviation applications
- Enabling beyond visual line of sight flights in controlled airspace

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DYNAMIC SPECTRUM MANAGEMENT SYSTEMS (DSMS)

Supporting multiple use cases and bands

Regulator update

Incumbent Database

Computation Engine

DSMS

Calculation Database

ENTERPRISE

RESIDENTIAL

FACTORY

CAMPUS

PARKS

STADIUM

5G Basestation

Wi-Fi Access Point

Users
CBRS Market Status

strong momentum

✓ More than 323k base stations deployed nationwide in 3 years
  • Wide variety of mobile broadband, fixed wireless & private use cases

✓ Record number of CBRS spectrum users
  • 228 winners of 20,625 PALs
  • >900 GAA operators
    • Enterprises, smart cities, education, healthcare, rural WISPs, etc.

✓ Vibrant competitive ecosystem
  • Nine authorized SAS Administrators
  • 187 commercial CBSD models
  • 496 authorized client devices
  • >4000 certified professional installers
Private Wireless for Enterprise
built for use cases at the edge

- **Government**: Modernize operations with private 5G connectivity
- **Education**: Bridge the digital divide with reliable, affordable wireless internet
- **Real Estate**: Differentiate with custom 5G-enabled IoT services
- **Agriculture**: Automate operations with reliable coverage for your entire property
- **Manufacturing**: Reliable connectivity with high mobility for your most challenging edge sites
- **Logistics**: Minimize disruption with private wireless connectivity
- **Retail**: Rapidly launch new experiences to any device or location, indoor or out
- **Healthcare**: Keep critical staff connected on all devices with private wireless
- **Smart Cities**: Reduce waste and improve lives with ubiquitous connectivity
- **Venues/Events**: Stand up private, portable wireless in days with a fraction of the hardware
Spectrum Sharing at 6 GHz
Automated Frequency Coordination (AFC)

Proprietary Cloud Architecture
- Unique cloud architecture that utilizes offline computations for maximum responsiveness at scale

Precise RF Environment Models
- Massive GeoData database combined with machine learning for refined propagation modeling

Precise Incumbent User Models
- Proprietary database of Incumbent microwave antenna Radiation Pattern Envelopes (RPEs) to optimize spectrum availability

Dashboards & Analytics
- Solutions to provide unique insights into spectrum utilization, improve manageability, and troubleshoot issues
U.S. shared spectrum near term opportunities

Low Band
Wide Area IoT

Mid Band
Mobile & Fixed Broadband Indoor & Enterprise

mmW Bands
High Bandwidth Applications

3.1-3.45 GHz
- DoD band
- PATHSS group exploring DSMS approaches

4.9 GHz
- Public safety incumbents
- FCC to select Band Manager for commercial leases

5 GHz
- 61 MHz terrestrial control UAS links
- Control-and-non-payload communications (CNP)

7 GHz
- 1275 MHz of federal spectrum
- Point-to-point links similar to 6 GHz
- WISPA petition for AFC to enable sharing

10 GHz
- 500 MHz of federal spectrum
- 1050 MHz of satellite+BAS spectrum
- Sharing being explored

12+13 GHz
- 600 MHz co-primary band
- AFC-like sharing for coordination

37 GHz