

## OVERVIEW

WifiForward appreciates the opportunity to comment on NTIA's [aggregate analysis of Citizens Broadband Radio Service \(CBRS\) Spectrum Access System \(SAS\) data](#). NTIA's report reinforces the success of CBRS in the 3.5 GHz band and the value of its spectrum-sharing framework for future bands.

WifiForward is a broad coalition of companies, organizations and public institutions supporting a comprehensive approach to spectrum policy including unlicensed, shared licensed and exclusive licensed spectrum. Specifically, WifiForward supports:

- creating new shared-licensed bands to promote innovation and competition,
- freeing up new spectrum for unlicensed and shared-licensed use at a variety of frequencies including low, medium and high-frequency bands, and
- adopting innovative and pro-competition unlicensed and shared-licensed rules that encourage growth and deployment.

Advances in technology have enabled dynamic, future-forward applications that facilitate wider use of our nation's airwaves by many users at once. The CBRS band's three-tiered coexistence rules, for example, allow government users and different types of commercial users to share spectrum, and NTIA's report contains important data showing the success and growth of that band in just a short time. CBRS is a success and NTIA and the FCC should use CBRS as a model for future spectrum licensing in a wide range of spectrum bands.

## BENEFITS

### CBRS promotes competition.

Most commercially licensed low-band and mid-band frequencies rely on an exclusively licensed approach with rules that set high power levels and large geographic license areas that benefit a handful of large mobile phone carriers—but act as a barrier to entry for all others. This means that the dominant nationwide carriers can control spectrum auctions, denying spectrum needed to support innovation and competition.

The dominant carriers who benefit the most from exclusive licensing oppose the CBRS band because its spectrum-sharing model does not exclusively favor them. The CBRS model levels the playing field for small providers and new entrants to participate—creating competition for the dominant carriers. The CBRS auction had far more qualified bidders than the previous five exclusive licensing auctions—a clear sign that a shared model is vastly more accessible to a wider swath of participants. NTIA's report shows that this approach is working: over 70% of all active CBSDs are serving rural areas, and states and territories across the nation are seeing new deployments. This model does not exclude large incumbents—it just makes it possible for other businesses to compete and to use spectrum for their own purposes.

## CBRS promotes innovation.

Thanks to innovative spectrum sharing technology, CBRS allows incumbent users, including federal government users, to coexist on the same spectrum band with new users—avoiding the delay and expense of dislocating existing users to accommodate new ones. This means new use cases and technologies can get into consumers’ hands without the need for a decade-long clear-and-auction process. This makes low power sharing particularly attractive in spectrum bands like 3.1-3.45 GHz as it would allow for robust commercial use to coexist with critical DoD operations. The FCC has approved more than 165 CBRS device (CBSD) models, and NTIA’s report shows that the number of active CBSDs has increased quarterly by an average of over 22,000 devices. This innovation is hitting the market at rapid speed thanks to the coexistence enabled by CBRS. NTIA and the FCC should use this model to encourage innovation in other spectrum bands.

### USE CASES

The CBRS band’s sharing regime allows operators requiring greater certainty to acquire priority access licenses (PALs), while also allowing more opportunistic use by general authorized access (GAA) users. Both types of use are available with much lower barriers to entry than in exclusive licensed spectrum, and NTIA’s data shows the growth of CBSDs with PAL grants, GAA grants, and both. We are already seeing important and highly varied deployments in the CBRS band using PALs and GAA, resulting in increased access and connectivity in education, health care, agriculture, manufacturing, public safety and the military:

- The Fort Worth Independent School System created a private LTE network to support students using CBRS under General Authorized Access (GAA). Several schools across the U.S. have implemented similar technology over CBRS.
- Amazon Web Services (AWS) offers private 5G services over CBRS.
- Dow has used CBRS to fully digitize its manufacturing processes, increasing safety outcomes at its factories.
- The Department of Veterans Affairs (VA) has created private 5G networks at four different facilities using CBRS to allow for better data transfers and collaboration among hospitals, improving veterans’ health care experience.
- Trilogy’s Rural Cloud Initiative has enabled farmers to connect wide swaths of land over CBRS and implement precision agriculture on their farms.

These are just some of several different applications for CBRS. More use cases across the U.S. can be found in the appendix.

### CONCLUSION

As outlined in NTIA’s recent report, the CBRS model proves that opening additional spectrum for shared use is an efficient way to deliver access to underserved and unserved populations while maintaining incumbent access to those bands, including for important government uses. With shared spectrum licensed in smaller areas, more companies have access to the spectrum in the areas they need, allowing more competition and more flexibility for businesses seeking to build their own localized deployments for things like private LTE and 5G. The spectrum we need now and in coming years will not be vacant of existing uses, and calling for every new band to be

cleared out for high-power exclusive use is not a viable solution. We need to promote and implement sharing technologies to make the most of spectrum resources for all Americans.

## **APPENDIX**

- CBRS Across the U.S.
- About Shared Spectrum
- The CBRS Success Story

# CBRS Across the U.S.

In January 2020, the FCC authorized full commercial deployment in the 3.5 GHz Citizens Broadband Radio Service (CBRS) band — creating a sharing model that powers innovation.

## What is CBRS?

- The Citizens Broadband Radio Service (CBRS) is the 150 MHz between 3.55 - 3.7 GHz.
- It employs a 3-tier spectrum sharing regime between government and private sector users:
  - Tier 1: Incumbent Access - used by the Navy and satellites
  - Tier 2: Priority Access License (PAL) - private users in education, healthcare, manufacturing and more
  - Tier 3: General Authorized Access (GAA) - unlicensed access without interference protections
- Cloud-based Spectrum Access Systems (SAS) coordinate sharing.

## CBRS Successes

- Over 228,000 CBSDs (CBRS devices) have been deployed as of May 2022.
- The FCC has approved more than 165 CBSD models.
- Deployments, as some are shown on the map, include military bases, school districts, factories, malls and more.



# About Shared Spectrum

## Shared licensing is a key part of a balanced spectrum policy.



The goal of U.S. spectrum policy is to ensure commercial and government users have access to bands they need to provide Americans with the most advanced wireless technologies, maintain U.S. technological leadership and support economic growth. The way we accomplish that goal is through a balanced spectrum policy using the FCC's three main ways of assigning spectrum:

- Exclusive Licensing** A single company buys a license in a location by auction and has sole use of a frequency range, typically over very large geographic areas and with very high power levels.
- Shared Licensing** Multiple companies buy licenses by auction and share bands with each other or government users, using smaller areas and lower power limits to promote efficient sharing.
- Unlicensed Use** Anyone can use a band without a license requirement, if they follow strict technical rules, protect incumbent licensees and accept interference from other users.

## Why we need shared licenses

The U.S. is a global leader in wireless technologies because of our commitment to this balanced spectrum policy using all three of these models. We all know that exclusive licensed bands gave us cell phones. And unlicensed bands made Wi-Fi possible. But the newest tool, shared licensed, is less well known.

The FCC completed licensing for the first of these just two years ago, the CBRS band, in response to the reality that opening new bands is getting harder and harder.



# Why shared spectrum models are important:

**More bands** Today, every new band has incumbent government or commercial users, but the explosion of wireless means we have to use every band more efficiently and intensively.

**Less displacement, cost and delay** Exclusive licensing works best with no incumbents, but there are none of these bands left. Spectrum policy must change as available bands change. If we use exclusive licensing in every new band, this will unnecessarily displace incumbents and cause huge delays and costs—and in some bands it is impossible.

**More competition** Shared licenses also address the pressing problem of spectrum concentration: today just three companies control the overwhelming majority of licensed mobile spectrum. Overuse of exclusive licensing will make a bad situation worse. But shared licenses allow a far wider array of auction winners—the CBRS band had more auction participation than any exclusive licensed band in recent history.



## How does shared spectrum work?

The shared licensed approach, such as that in the CBRS band, was built to tackle this problem. It opens bands with challenging incumbency environments that otherwise would remain unavailable by:

- 1 Allowing incumbents to remain in the band
- 2 Using databases or sensing technology to identify and protect these incumbents
- 3 Driving efficient and intensive use of the band by new commercial services using smaller license areas, power levels designed to promote sharing and new technologies to grant licensees channels when and where they need them



# The CBRS Success Story

The Citizens Broadband Radio Service (CBRS) is the **150 MHz band of spectrum between 3.55 - 3.7 GHz.**

It employs a 3-tier spectrum sharing regime between government and private sector users in a shared license approach.



## This has significant benefits:

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### COMPETITION:

CBRS allows for different devices to coexist in the same band. This promotes competition and enables new entrants, increasing the number of entities using the spectrum.

Most commercially available low-band and mid-band spectrum rely on an exclusively licensed approach that sets high power levels and large geographic license areas that support the deployment models of the largest carriers. This means that larger nationwide carriers dominate spectrum auctions, making it harder for new players to join and foster more competition.

The CBRS model, on the other hand, advances the FCC's commitment to a balanced spectrum policy rather than further concentrating the nation's licensed bands in the small group of nationwide mobile phone carriers who have dominated those resources for decades.

Both exclusively licensed and shared licensed bands need to be made available to accommodate new and existing players.

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### INNOVATIVE USE CASES:

Shared licensed bands balance new uses with important incumbent uses.

In order for the industry to continue to grow, there needs to be room for innovation. This can only occur if spectrum is made available to develop those new uses.

Shared licensed bands, unlike exclusively licensed bands, bypass the tedious process of relocating existing users to accommodate new ones. That means that the spectrum can be put to work quickly for new uses.

# CBRS Successes

We are already seeing highly successful and highly varied deployments in the CBRS band, resulting in increased broadband access and connectivity in education, health care, agriculture, manufacturing, public safety and the military.



## PUBLIC SAFETY

Cox Communications announced a collaboration with the City of Las Vegas to install connected devices on a CBRS network in a downtown park for public safety purposes.



## EDUCATION

In Virginia, the Arlington Public Schools 1-2-3 Connect Me initiative uses the CBRS band to establish a private network solely for students to connect to the school system's network from home without requiring the county to build additional fiber. With this initiative, 99.2% of all students participated successfully and 95.4% of all student devices are active on the network on a daily basis.



## HEALTH CARE

Memorial Health System Clinic in Springfield, Illinois uses the CBRS band to connect outdoor hotspots to indoor networks, enabling nurses to test and triage patients outside the hospital. Hospitals also use the CBRS band for asset tracking, critical communications and patient monitoring.



## MANUFACTURING

A Foxconn factory in Wisconsin uses the CBRS band to connect industrial equipment, including mobile equipment, to a private network in a 100,000 square-foot facility.



## AUTOMOBILE

US Ignite is planning a dedicated LTE network, using CBRS, for Internet of Things (IoT) research at Fort Carson in Colorado. It will support the upload of vehicle data and video traffic from route-monitoring cameras and, longer term, will support broader IoT research.