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# **Spectrum Provisions in P.L. 119-21, the FY2025 Reconciliation Law**

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## Spectrum Provisions in P.L. 119-21, the FY2025 Reconciliation Law

The FY2025 reconciliation law (P.L. 119-21; commonly known as “the One Big Beautiful Bill Act”) was signed into law on July 4, 2025. The act was established pursuant to H.Con.Res. 14, a budget resolution, which set budgetary goals for certain House and Senate committees. The House Committee on Energy and Commerce and Senate Committee on Commerce, Science, and Transportation each developed proposals to meet budgetary targets, which included provisions to auction radio spectrum, and to use the proceeds to meet budgetary goals. The spectrum auctions are expected to generate over \$85 billion from FY2025 to FY2034, according to the Congressional Budget Office.

P.L. 119-21 directs the National Telecommunications and Information Administration (NTIA), an agency in the Department of Commerce (DOC) responsible for managing federal spectrum use, and the Federal Communications Commission (FCC), which is responsible for managing nonfederal spectrum use (i.e., commercial, state, and local spectrum use), to make 800 megahertz of spectrum available for commercial mobile services while also excluding certain bands from auction. Title IV, Section 40002, of the act contains the following provisions:

- The FCC’s general auction authority (which had expired on March 9, 2023) is reinstated through September 30, 2034, excluding the 3.1-3.45 gigahertz (GHz) and 7.4-8.4 GHz bands from auction.
- The FCC is required to grant licenses through competitive bidding (i.e., auctions) for 300 megahertz of spectrum, including not less than 100 megahertz in the 3.98-4.2 GHz band within two years of enactment.
- The Assistant Secretary of Commerce for Communications and Information (i.e., head of NTIA), with the FCC, is directed to identify 500 megahertz of spectrum in the 1.3-10.5 GHz range (excluding the 3.1-3.45 GHz and 7.4-8.4 GHz bands) for reallocation from federal use to (1) nonfederal use, (2) shared federal and nonfederal use, or (3) a combination thereof for full-power commercial licensed use. It directs the FCC to complete, within four years of enactment, one or more auctions for no less than 200 megahertz of this spectrum and, no later than eight years after enactment, one or more auctions for the remaining spectrum.
- DOC is provided \$50 million to assist the head of NTIA with analysis of three bands (2.7-2.9 GHz, 4.4-4.9 GHz, and 7.25-7.4 GHz) and to publish a biennial report on the value of federally held spectrum.

In the past, Congress has taken a similar approach when renewing the FCC’s spectrum auction authority. With past renewals, Congress often required the FCC and NTIA to make additional spectrum available for commercial use through auctions. In some cases, Congress has named specific bands for auction; in other cases, Congress directed the FCC and NTIA to identify and reallocate bands for auction. In P.L. 119-21, Congress does both and also excludes certain bands from auction.

With the growth in wireless communications, demand for spectrum is increasing. Making spectrum available for commercial use can spur innovation, improve services, yield economic gains, and bolster U.S. leadership in the global telecommunications market. However, much of the spectrum in the mid-band range (1-6 GHz)—where P.L. 119-21 is targeting spectrum for reallocation—is already in use. Identifying spectrum for reallocation is complex and often requires technical studies and time to determine the feasibility and costs and benefits of sharing or reallocating spectrum, including costs to reconfigure or relocate communication systems. The FCC and NTIA may face challenges in identifying and reallocating 800 megahertz of spectrum for full-power commercial licensed use in the spectrum range and timelines specified in the act, some of which were expedited in a December 19, 2025, presidential memorandum. A challenge for the FCC and NTIA is balancing spectrum needs of incumbent users, including federal agencies performing critical functions, and commercial users, which can spur economic growth.

Configuration of spectrum and terms of use can affect auction proceeds. As Congress is relying on proceeds from spectrum auctions to fund provisions in P.L. 119-21, it may seek to monitor (1) agencies’ progress in identifying spectrum for reallocation; (2) bands selected for reallocation; (3) the impact of reallocation on incumbent users, including federal agency users; (4) auction proceeds and timelines to ensure budgetary targets are met; and (5) costs of reallocations that can diminish auction proceeds. An area of debate may be balancing spectrum use between users (e.g., federal and nonfederal) and among technologies (e.g., mobile, satellite, Wi-Fi). Other areas of interest for Congress may be enhancing interagency coordination on domestic and international spectrum decisions, and supporting research and development of new spectrum-sharing approaches.

## Contents

Introduction .....	1
Spectrum Provisions in P.L. 119-21 .....	1
Issues for Congress.....	2
Reinstatement of FCC Auction Authority .....	2
Amendments to FCC Auction Authority.....	3
Differences in Directives to NTIA and the FCC .....	3
Directive to NTIA to Identify Spectrum for Reallocation .....	3
Directive to the FCC to Identify and Auction Spectrum for Reallocation .....	4
Bands Excluded from Auction .....	5
3.1-3.45 GHz (Lower 3 GHz Band).....	6
7.4-8.4 GHz Band .....	9
Bands Identified for Auction.....	10
Upper C-band (3.98-4.2 GHz) .....	10
Bands Identified for Future Study .....	15
2.7-2.9 GHz.....	15
4.4-4.9 GHz.....	16
7.125-7.4 GHz.....	18
Other Bands Under Consideration for Reallocation and Auction .....	19
1.3-1.35 GHz.....	19
1.78-1.85 GHz.....	21
3.55-3.7 GHz.....	23
5.925-7.125 GHz.....	24
Auction Proceeds .....	25
CBO Estimates of Auction Proceeds .....	26
Treatment of Proceeds .....	26
Timelines .....	27
Valuation Report.....	28
Presidential Powers on Spectrum.....	29
Concluding Observations .....	30

## Figures

Figure A-1. Radio Spectrum.....	33
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## Tables

Table 1. Spectrum Directives in P.L. 119-21 .....	5
Table B-1. Allocated Spectrum Suitable and Available for Mobile Service.....	35

## **Appendixes**

Appendix A. Background on Spectrum.....	32
Appendix B. Spectrum Previously Allocated to Commercial Licensed Use.....	35

## **Contacts**

Author Information.....	37
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## Introduction

The FY2025 reconciliation law (P.L. 119-21; commonly known as “the One Big Beautiful Bill Act”) was signed into law on July 4, 2025. The act included several spectrum provisions. Specifically, Title IV, Section 40002, reinstates the Federal Communications Commission’s (FCC’s) spectrum auction authority<sup>1</sup> and directs the reallocation and auction of 800 megahertz of spectrum for commercial wireless use to meet budgetary goals agreed to in the Concurrent Resolution on the Budget for Fiscal Year 2025 (H.Con.Res. 14).<sup>2</sup> The auctions specified in P.L. 119-21 are expected to generate over \$85 billion in offsetting receipts from FY2025 to FY2034, according to the Congressional Budget Office (CBO).<sup>3</sup>

This report discusses the spectrum provisions in the act, including bands targeted for reallocation and auction, bands excluded from reallocation and auction, and other bands and services, including federal spectrum use, that may be affected by such reallocations.

## Spectrum Provisions in P.L. 119-21

Section 40002 in Title IV of P.L. 119-21 contains the following provisions:

- The FCC’s general auction authority, which expired on March 9, 2023, is reinstated and extended through September 30, 2034, excluding the 3.1-3.45 GHz and the 7.4-8.4 GHz bands from auction.
- The FCC is required to grant licenses through competitive bidding (i.e., auctions) for 300 megahertz of spectrum including at least 100 megahertz in the 3.98-4.2 GHz band within two years of enactment.
- The Assistant Secretary of Commerce for Communications and Information—the head of the National Telecommunications and Information Administration (NTIA)—is directed to identify and reallocate 500 megahertz of federal spectrum for commercial licensed use; specifically, the act directs the following:
  - The head of NTIA, in consultation with the FCC, is directed to identify 500 megahertz of spectrum in the 1.3-10.5 GHz range (excluding the 3.1-3.45 GHz band and 7.4-8.4 GHz band) for reallocation from federal use to (1) nonfederal use, (2) shared federal and nonfederal use, or (3) a combination thereof for full-power commercial licensed use.<sup>4</sup> To identify bands for

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<sup>1</sup> Since 1993, the Federal Communications Commission (FCC) has had authority to auction licenses, granting entities rights to use specific radio frequencies for a set time so they may provide wireless services. See FCC, “About Auctions,” <https://www.fcc.gov/about-auctions>.

<sup>2</sup> In this context, “commercial wireless” refers mainly to commercial cellular service (e.g., 5G, 6G). The term “megahertz” refers to bandwidth or size of the band. The abbreviation “MHz” (megahertz) or “GHz” (gigahertz) is used to indicate a specific frequency or range of frequencies in the band. For example, the spectrum band containing frequencies in the 3450-3550 MHz range has a bandwidth of 100 megahertz. For an overview of spectrum, see **Appendix A**. For more information on H.Con.Res. 14, see CRS Report R48532, *H.Con.Res. 14: The Budget Resolution for FY2025*, by Drew C. Aherne and Megan S. Lynch.

<sup>3</sup> Congressional Budget Office (CBO), “Table 4. Estimated Budgetary Effects of Public Law 119-21, to Provide for Reconciliation Pursuant to Title II of H. Con. Res. 14, Relative to the Budget Enforcement Baseline for Consideration in the Senate, Title IV, Committee on Commerce, Science, and Transportation, As Enacted on July 4, 2025,” July 21, 2025, <https://www.cbo.gov/publication/61570>. (See “Title IV” tab in attached spreadsheet.)

<sup>4</sup> P.L. 119-21, Title IV, §40002(a)(4) defines “full-power commercial licensed use cases” as “flexible use wireless broadband services with base station power levels sufficient for high-power, high-density, and wide-area commercial (continued...)”

reallocation, NTIA is to conduct analysis—assess revenue potential, relocation or sharing costs, and feasibility of reallocation.

- The FCC, within two years of enactment, is required to complete one or more auctions for no less than 100 megahertz of spectrum in the 3.98-4.2 GHz range and, no later than eight years after enactment, one or more auctions for the remaining spectrum.
- The Department of Commerce (DOC) is provided \$50 million to assist NTIA with spectrum analysis of (1) 2.7-2.9 GHz, (2) 4.4-4.9 GHz, and (3) 7.25-7.4 GHz bands and to publish a biennial report on the value of federal spectrum.

The growth in wireless communications devices and use has led to increased demand for spectrum.<sup>5</sup> Much of the spectrum in the 1.3-10.5 GHz range is already allocated for certain uses (e.g., satellite, mobile, maritime, space research), including to federal agencies performing critical functions. Given incumbent use, and given that Congress has exempted two large bands from auction and several other bands for study, NTIA and the FCC may face challenges in identifying and reallocating 800 megahertz of spectrum for full-power commercial licensed use within the range and timelines mandated in P.L. 119-21.

## Issues for Congress

This section provides background on the spectrum provisions in P.L. 119-21 and selected issues that may arise during implementation that may be of interest to Congress.<sup>6</sup>

### Reinstatement of FCC Auction Authority

The FCC’s general auction authority (i.e., authority to auction any band) lapsed on March 9, 2023, for the first time in its 30-year history.<sup>7</sup> For nearly two years, the FCC could not auction spectrum. Entities could acquire spectrum on the secondary market (e.g., acquisitions, mergers), but the FCC could not make spectrum available through auction.<sup>8</sup> P.L. 119-21 reinstated the FCC’s general auction authority for nine years, through September 30, 2034.<sup>9</sup>

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mobile services, consistent with the service rules under [47 C.F.R. Part 27], or any successor regulations, for wireless broadband deployments throughout the covered band.” Full-power use enables sufficient radio propagation (e.g., coverage) and enhanced signal strength to deliver voice and data across a wider area. See Keith Mallinson, “Full-Power, Mid-Band Spectrum Licensing Is Vital to Accommodate Cellular Data Traffic Growth,” *RCR Wireless*, December 2, 2024, <https://www.rcrwireless.com/20241202/analyst-angle/full-power-mid-band-spectrum-licensing-is-vital-to-accommodate-cellular-data-traffic-growth-analyst-angle>.

<sup>5</sup> Aspen Group, *Implementing the National Spectrum Strategy*, 2024, pp. 6-10, 16-17, [https://www.aspendigital.org/wp-content/uploads/2024/10/Aspen-Digital\\_Implementing-the-National-Spectrum-Strategy\\_October-2024.pdf](https://www.aspendigital.org/wp-content/uploads/2024/10/Aspen-Digital_Implementing-the-National-Spectrum-Strategy_October-2024.pdf).

<sup>6</sup> Congress uses the term “commercial wireless services” and “mobile broadband use” interchangeably. There are many commercial wireless services such as mobile broadband (e.g., cellular networks and devices), Wi-Fi, satellite, air traffic control systems, broadcast television and radio. Mobile broadband is one type of commercial wireless use.

<sup>7</sup> CRS Report R47578, *The Federal Communications Commission’s Spectrum Auction Authority: History and Options for Reinstatement*, by Patricia Moloney Figliola and Jill C. Gallagher.

<sup>8</sup> For example, see U.S. Cellular Corporation, “UScellular Announces Sale of Spectrum Assets for \$1.0 Billion,” press release, October 18, 2024, <https://investors.uscellular.com/news/news-details/2024/UScellular-announces-sale-of-select-spectrum-assets-for-1.0-billion/default.aspx>.

<sup>9</sup> P.L. 119-21, Title IV, §40002(b)(1).

## Amendments to FCC Auction Authority

When the FCC’s auction authority expired on March 9, 2023, the FCC asserted that the auction authorities defined in Title 47, Section 309(j)(11), of the *U.S. Code* applied that statutory expiration date to both its *auction authority* and its authority to *grant licenses* after an auction.<sup>10</sup> At the time, the FCC had completed an auction of the 2.5 GHz band but had not awarded all licenses before its auction authority expired. Congress passed the 5G Spectrum Authority Licensing Enforcement Act (5G SALE Act; P.L. 118-27), authorizing the FCC to grant licenses won in the 2.5 GHz auction. The act did not apply to licensees facing the same scenario in the future. P.L. 119-21 amended Section 309(j)(11), striking language that applied the expiration date to both the FCC’s auction authority and its authority to grant licenses after an auction, which would enable the FCC to award licenses after an auction even if its auction authority has expired.

## Differences in Directives to NTIA and the FCC

P.L. 119-21 requires NTIA and the FCC to make 800 megahertz of spectrum available for commercial wireless use over nine years. The directives to NTIA and the FCC in P.L. 119-21 to identify and reallocate spectrum are slightly different, as discussed below and shown in **Table 1**.

### Directive to NTIA to Identify Spectrum for Reallocation

Section 40002(c) of P.L. 119-21 requires NTIA, in consultation with the FCC, to identify 500 megahertz of federal spectrum in the range of 1.3-10.5 GHz for reallocation from federal to (1) nonfederal use, (2) shared federal and nonfederal use, or (3) a combination thereof for full-power commercial licensed use. Congress did not name specific bands for reallocation but directed NTIA to select federal bands for reallocation and auction.

The range specified in the act (1.3-10.5 GHz) includes mid-band spectrum (1-6 GHz) and segments above the mid-band (sometimes called the Upper mid-band).<sup>11</sup> The mid-band (1-6 GHz) is considered the “sweet spot” for commercial mobile services (e.g., cellular communications), as frequencies in the mid-band range can travel long distances, carry voice and data, and offer wide coverage, capacity, and speed. Because of its favorable propagation characteristics, mid-band spectrum is preferred and heavily used by federal and nonfederal users for a variety of services; thus, finding unused spectrum in the mid-band segment can be challenging.<sup>12</sup>

The Upper mid-band frequencies (7.125-24 GHz) are under study in the United States and internationally for next generation wireless communications (e.g., 6G). Globally, the band of frequencies in the 7.125-8.4 GHz range (sometimes called the “7/8 GHz band”) is emerging as a

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<sup>10</sup> U.S. Congress, House Committee on Energy and Commerce, Subcommittee on Communications and Technology, *Oversight of the Federal Communications Commission*, 118<sup>th</sup> Cong., 1<sup>st</sup> sess., May 21, 2023, <https://energycommerce.house.gov/events/communications-and-technology-subcommittee-hearing-oversight-of-the-federal-communications-commission>. (See statements of FCC Chairwoman Jessica Rosenworcel on video at 1:56:34.)

<sup>11</sup> Names and ranges of spectrum bands can vary. Generally, low-band are frequencies below 1 GHz, mid-band are frequencies between 1 and 6 GHz, and high-band are frequencies above 6 GHz. High-band use has been focused on millimeter wave frequencies, frequencies from 24 to 300 GHz. Some researchers are calling the bands above the mid-band segment “Upper mid-band.” See Gary Xu et al., “Upper Mid-Band Spectrum for 6G: Opportunities and Key Enablers,” *Samsung Research*, August 12, 2024, <https://research.samsung.com/blog/Upper-Mid-Band-Spectrum-for-6G-Opportunities-and-Key-Enablers>. See also **Appendix A**.

<sup>12</sup> FCC Technical Advisory Council (TAC), Advanced Spectrum Sharing Working Group, *A Preliminary View of Spectrum Bands in the 7.125-24 GHz Range; and a Summary of Spectrum Sharing Frameworks*, August 17, 2023, p. 3, <https://www.fcc.gov/sites/default/files/SpectrumSharingReportforTAC%20%28updated%29.pdf>. (The council states, “Given the current federal and non-federal allocations in the United States, it is impossible to find a large amount of spectrum below 7.125 GHz that is not already utilized.”)

potential global band for 6G mobile services.<sup>13</sup> In the United States, NTIA’s 2023 National Spectrum Strategy (NSS)—a plan that identified over 2,700 megahertz of spectrum for study and potential reallocation—targeted the 7/8 GHz band for study for commercial use.<sup>14</sup>

While P.L. 119-21 creates a wide range of spectrum from which NTIA could identify 500 megahertz of spectrum for commercial use (1.3-10.5 GHz), this segment is heavily used by federal and nonfederal entities, and several segments in this range have already been reallocated from federal to commercial mobile use.<sup>15</sup> In addition, bands identified in the NSS and globally for future study and potential reallocation to commercial use—the 3.3-3.4 GHz and 7.4-8.4 GHz bands<sup>16</sup>—have been excluded from reallocation in P.L. 119-21 because of congressional concerns about mission-critical U.S. government systems operating in those bands.<sup>17</sup>

## Directive to the FCC to Identify and Auction Spectrum for Reallocation

Section 40002(b)(2) of P.L. 119-21 directs the FCC to identify 300 megahertz of spectrum for reallocation:

- P.L. 119-21 requires that at least 100 megahertz of this spectrum be within the range of 3.98-4.2 GHz (also called the Upper C-band) and that the FCC complete an auction of the Upper C-band within two years of enactment.
- P.L. 119-21 does not prescribe a range for the remaining (up to 200 megahertz) spectrum; it requires the FCC to identify spectrum for reallocation, hold spectrum auctions, and grant licenses before its general auction authority expires (2034).

The FCC is planning an auction of the Upper C-band by July 2027 and is considering the quantity of spectrum to auction in the C-band (from 100 to 180 megahertz).<sup>18</sup> For the remainder of the spectrum, the range is not specified; thus, the FCC could identify low-band (below 1 GHz), mid-band (1-6 GHz), or high-band (above 6 GHz) spectrum.<sup>19</sup> Typically, the FCC seeks to reallocate spectrum to align with international allocations for new services.<sup>20</sup> However, some of the bands identified for 5G and 6G services (3.3-3.4 GHz and 7.4-8.4 GHz) have been excluded from reallocation in P.L. 119-21, which limits the FCC’s options.

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<sup>13</sup> Viet Nguyen, 5G Americas, “Unlocking the Power of the 7-8 GHz Spectrum: A ‘Golden Band’ of 6G Innovation - 5G Americas,” October 7, 2024, <https://www.5gamericas.org/unlocking-the-power-of-the-7-8-ghz-spectrum-a-golden-band-of-6g-innovation/>.

<sup>14</sup> National Telecommunications and Information Administration (NTIA), *National Spectrum Strategy*, November 2023, p. 6, [https://www.ntia.gov/sites/default/files/publications/national\\_spectrum\\_strategy\\_final.pdf](https://www.ntia.gov/sites/default/files/publications/national_spectrum_strategy_final.pdf).

<sup>15</sup> See **Appendix B** for a list of bands allocated for commercial wireless use by the FCC.

<sup>16</sup> NTIA, *National Spectrum Strategy*, November 2023, pp. 15-16.

<sup>17</sup> For example, see Sen. Mike Rounds, “Protection of Spectrum by Congress Also Protects Trump’s Iron Dome from Shortsighted 5G Policy” (op-ed), *Defense Scoop*, February 26, 2025, <https://defensescoop.com/2025/02/26/spectrum-5g-policy-congress-trump-dod-iron-dome-senator-mike-rounds/>; and U.S. Congress, Senate Committee on Commerce, Science, and Transportation, *America Offline? How Spectrum Auction Delays Give China the Edge and Cost Us Jobs*, hearing, 119<sup>th</sup> Cong., 1<sup>st</sup> sess., February 19, 2025. (See opening statement from Sen. Maria Cantwell and statements from Sens. Deb Fischer and Jacky Rosen.)

<sup>18</sup> FCC, *In the Matter of Upper C-Band (3.98-4.2 GHz)*, notice of proposed rulemaking (NPRM), FCC 25-78, November 20, 2025, <https://docs.fcc.gov/public/attachments/FCC-25-78A1.pdf>.

<sup>19</sup> See **Appendix A** for spectrum background, which includes descriptions of band designations and characteristics.

<sup>20</sup> FCC, “Best Practices for National Spectrum Management,” <https://www.fcc.gov/general/best-practices-national-spectrum-management>.

**Table I. Spectrum Directives in P.L. 119-21**  
Comparing NTIA and FCC Spectrum Directives

	Directives to NTIA	Directives to the FCC
Quantity of spectrum for reallocation	500 megahertz	300 megahertz
Spectrum range	1.3-10.5 GHz	At least 100 megahertz must be within 3.98-4.2 GHz (Upper C-band).
Directives to the FCC	n/a	Identify and auction 300 megahertz. Of the 300 megahertz, the FCC is directed to auction at least 100 megahertz in the Upper C-band (3.98-4.2 GHz) within two years of the statute's enactment (by July 2027).  The FCC is to auction and grant licenses for remaining spectrum it was tasked with identifying (for a total of 300 megahertz) before the FCC's auction authority expires (September 2034).
Directives to NTIA and the FCC	Identify 500 megahertz in the 1.3-10.5 GHz range. Of the 500 megahertz, NTIA is to identify at least 200 megahertz in the 1.3-10.5 GHz range within two years of the statute's enactment (by July 2027).  NTIA is to identify remaining spectrum (for a total of 500 megahertz) in the 1.3-10.5 GHz range no later than four years from the statute's enactment (by July 2029).	The FCC is to complete an auction within four years of the statute's enactment (by July 2029) of the 200 megahertz in the 1.3-10.5 GHz range that NTIA was directed to identify.  The FCC is to complete an auction of the remaining spectrum (for a total of 500 megahertz) identified by NTIA within eight years of the statute's enactment (by July 2033).
Bands excluded from auction	3.1-3.45 GHz 7.4-8.4 GHz	3.1-3.45 GHz 7.4-8.4 GHz
Bands for future study	2.7-2.9 GHz 4.4-4.9 GHz 7.25-7.4 GHz	n/a
Report	NTIA to receive \$50 million for spectrum studies and for a biennial report on federal spectrum valuation.	n/a

**Source:** P.L. 119-21, Title IV, Section 40002.

**Notes:** NTIA = National Telecommunications and Information Administration; FCC = Federal Communications Commission; n/a = not applicable. The term "megahertz" refers to bandwidth or size of the band. The abbreviation "MHz" (megahertz) or "GHz" (gigahertz) is used to indicate a specific frequency or range of frequencies in a band.

## Bands Excluded from Auction

P.L. 119-21 states that the FCC's auction authority does not apply to two bands: the 3.1-3.45 GHz and 7.4-8.4 GHz bands. In effect, this clause excludes these two bands from auction. Some Members expressed concerns that reallocation of these two bands would affect U.S. government functions, including radar and defense satellite systems operated by the Department of Defense

(DOD),<sup>21</sup> radar and air traffic control systems operated by the Federal Aviation Administration (FAA), defense satellite systems operated by various federal agencies, and others.<sup>22</sup> Additional information on the bands is provided below.

### **3.1-3.45 GHz (Lower 3 GHz Band)**

The 3.1-3.45 GHz band (also called the Lower 3 GHz band) is heavily used by DOD for military radar and other defense systems.<sup>23</sup> The exclusion of the Lower 3 GHz band from auction preserves the band for federal agency use, which many Members support.<sup>24</sup> For several years, commercial mobile service providers have pressed the U.S. government to reallocate all or a portion of the Lower 3 GHz band from federal to commercial licensed use.<sup>25</sup> They argue that the band is valuable mid-band spectrum, conducive to mobile communications.<sup>26</sup> They assert that a portion of the band (i.e., 3.3-3.4 GHz) has already been identified globally for mobile 5G use; that in some countries, the band accommodates both military and 5G services; and that the United States should align with global allocations and reallocate a segment of the band for 5G use.<sup>27</sup>

DOD officials assert that sharing the band may be possible but vacating the band would disrupt DOD radar systems and operations essential to national security, would take decades to complete, and would cost billions of dollars.<sup>28</sup> Some Members of Congress have urged protection of DOD radar systems in the Lower 3 GHz band.<sup>29</sup> Using funding from Section 90008 of the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58, Division I), DOD undertook a study to determine the feasibility of making frequencies in the 3.1-3.45 GHz band available for shared federal and nonfederal use. The Emerging Mid-Band Radar Spectrum Sharing (EMBRSS) Feasibility Study was completed in September 2023. It found that sharing in the Lower 3 GHz band is not feasible unless certain regulatory, technological, and resourcing conditions are met.<sup>30</sup> Specifically, it

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<sup>21</sup> The Department of Defense (DOD) is “using a secondary Department of War designation” under Executive Order 14347 of September 5, 2025, “Restoring the United States Department of War,” 90 *Federal Register* 43893, September 10, 2025, <https://www.federalregister.gov/documents/2025/09/10/2025-17508/restoring-the-united-states-department-of-war>.

<sup>22</sup> FCC TAC, Advanced Spectrum Sharing Working Group, *A Preliminary View of Spectrum Bands in the 7.125-24 GHz Range; and a Summary of Spectrum Sharing Frameworks*, August 17, 2023, p. 3, <https://www.fcc.gov/sites/default/files/SpectrumSharingReportforTAC%20%28updated%29.pdf>.

<sup>23</sup> NTIA, “3100-3300 MHz,” in *Federal Government Spectrum Use Reports 225 MHz-7.125 GHz*, December 2015, [https://www.ntia.gov/files/ntia/publications/compendium/3100.00-3300.00\\_01DEC15.pdf](https://www.ntia.gov/files/ntia/publications/compendium/3100.00-3300.00_01DEC15.pdf).

<sup>24</sup> Kelly Hill, “House Committee Takes Lower 3 GHz, 6 GHz Off the Auction Table in Reconciliation Markup,” *RCR Wireless*, May 12, 2025, <https://www.rcrwireless.com/20250512/spectrum/house-committee-takes-lower-3-ghz-6-ghz-off-the-auction-table-in-reconciliation-mark-up>.

<sup>25</sup> Doug Brake, “Action Required on Commercial Spectrum to Avoid Isolating the United States,” CTIA (blog), February 15, 2024, <https://www.ctia.org/news/action-required-on-commercial-spectrum-to-avoid-isolating-the-united-states>.

<sup>26</sup> For more information on spectrum traits and characteristics, see **Appendix A**.

<sup>27</sup> CTIA, *Successful Military Radar and 5G Coexistence in the Lower 3 GHz Band: Evidence from Around the World*, 2023, <https://api.ctia.org/wp-content/uploads/2023/08/Lower-3-GHz-Report.pdf>.

<sup>28</sup> C. Todd Lopez, “Spectrum Sharing Is Way Ahead to Maintain Economic Dominance, Defense Official Says,” *U.S. Department of Defense News*, September 21, 2022, <https://www.defense.gov/News/News-Stories/Article/Article/3165774/spectrum-sharing-is-way-ahead-to-maintain-economic-dominance-defense-official-s/>.

<sup>29</sup> Alexander Bolton, “Trump Hails Deal Between Senators on Government-Owned Spectrum,” *The Hill*, June 6, 2025, <https://thehill.com/homenews/senate/5337195-trump-spectrum-auction-deal/>. (Discussing deal with Sens. Mike Rounds and Deb Fischer to protect Lower 3 GHz band from reallocation and auction in P.L. 119-21.)

<sup>30</sup> DOD, *Emerging Mid-Band Radar Spectrum Sharing (EMBRSS) Feasibility Assessment Report* (unclassified), September 2023, pp. ii-iii, <https://dodcio.defense.gov/Portals/0/Documents/Library/DoD-EMBRSS-FeasabilityAssessmentRedacted.pdf>.

identified a need for a more advanced spectrum-sharing system—similar to that used in the 3.55-3.7 GHz band (also called Citizens Broadband Radio Service, or CBRS).<sup>31</sup>

The EMBRSS report found that the sharing approach used in the CBRS band (see **text box**) presents a potential model for sharing in the Lower 3 GHz band. However, it also noted that the current spectrum-sharing technologies and coordination framework would need to be improved and evolved into a large-scale, dynamic spectrum sharing (DSS) mechanism operated within and by DOD, to allow for near-real-time spectrum monitoring and interference mitigation; it would also require extensive testing.

### Citizens Broadband Radio Service (CBRS) Sharing Model

In the CBRS band, the Federal Communications Commission (FCC) created a three-tiered prioritization model with U.S. government users (Navy) as a Tier I operator, with priority access and protections from interference. Mobile service providers, as Tier II operators, hold licenses to use spectrum in certain geographic areas, agree not to interfere with Tier I use, and are protected from interference from Tier III users. Tier III users, limited to low-power uses, have general authorized access, which gives them open access to spectrum with conditions that prevent interference with Tier I and Tier II users. Access is coordinated by a spectrum access system (SAS) managed by third-party vendors. The SAS may incorporate information from an Environmental Sensing Capability, a sensor network that detects transmissions from Department of Defense radar systems and transmits that information to the SAS to coordinate spectrum access and use. The model is seen as an innovative approach to spectrum sharing, has spurred new deployments and devices,<sup>32</sup> and has generated over \$4.5 billion in auction proceeds from Tier II licensees.<sup>33</sup> However, the model is not favored by some commercial mobile service providers because it may place some limitations on their operations.<sup>34</sup>

The 2023 NSS called for a national testbed to test and develop an advanced DSS system.<sup>35</sup> In December 2024, DOD’s Office of the Chief Information Officer (OCIO) solicited proposals for the Advanced Dynamic Spectrum Sharing Demonstration. In April 2025, media reports indicated that the DOD was evaluating spectrum-sharing proposals and expected to hold demonstrations in November 2025.<sup>36</sup> In October 2025, media sources reported that the DOD OCIO, partnering with the National Spectrum Consortium, awarded contracts to five industry and academia teams to conduct large-scale demonstrations of new spectrum-sharing capabilities and that experiments were scheduled to begin in November 2025.<sup>37</sup>

The NSS Implementation Plan, released by NTIA on March 12, 2024, provides a timeline for studies of five bands, including further studies of the Lower 3 GHz band, after the DSS

<sup>31</sup> FCC, “3.5 GHz Band Overview,” <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/35-ghz-band/35-ghz-band-overview>.

<sup>32</sup> Douglas M. Boulware and Anthony W. Romaniello, *An Analysis of Aggregate CBRS SAS Data from April 2021 to July 2024*, NTIA Report 25-575, November 2024, <https://www.ntia.gov/sites/default/files/reports/an-analysis-of-aggregate-cbrs-sas-data-from-april-2021-to-july-2024.pdf>.

<sup>33</sup> FCC, “Auction 105: 3.5 GHz Band,” <https://www.fcc.gov/auction/105>.

<sup>34</sup> CTIA, *CBRS: An Unproven Spectrum Sharing Framework*, November 2022, <https://www.ctia.org/news/cbrs-an-unproven-spectrum-sharing-framework>.

<sup>35</sup> NTIA, *National Spectrum Strategy*, November 2023, pp. 15-16, <https://www.ntia.gov/report/2023/national-spectrum-strategy-pdf>. The National Spectrum Strategy provides a strategic plan, goals, and a high-level roadmap for managing U.S. spectrum access and making spectrum available for new users. It identifies several bands for study, including the 3.1-3.45 GHz and 7.125-8.4 GHz bands for mobile service and three bands for other uses (e.g., satellite, drone).

<sup>36</sup> Mikayla Easley, “DOD Preparing for First Large-Scale Demonstration of Spectrum-Sharing Tech in 2025,” *Defense Scoop*, April 23, 2025, <https://defensescoop.com/2025/04/23/dod-large-scale-demonstration-spectrum-sharing-tech-2025-rondeau/>.

<sup>37</sup> Mikayla Easley, “Pentagon CIO Greenlights 5 Large-Scale Spectrum Sharing Tech Demonstrations,” *Defense Scoop*, October 2, 2025, <https://defensescoop.com/2025/10/02/defense-department-electromagnetic-spectrum-sharing-asc-demonstrations/>. This report will be updated as more information on the projects becomes available.

demonstration is complete. The studies are to examine (1) coexistence (sharing) and moving systems out of the band or to alternate locations (relocating systems); (2) compressing the frequency usage within the band to free up segments of the band for commercial use; (3) enabling additional access below 3.1 GHz; and (4) any other mechanisms and possibilities with the potential to allow for expanded or more efficient uses of the spectrum. The studies and final report on the Lower 3 GHz band are set to be completed in October 2026, after the DSS demonstration is complete.<sup>38</sup>

Some Members have raised concerns about risks associated with reallocating all or a portion of the Lower 3 GHz band for commercial use, noting that it could jeopardize existing and future military systems and capabilities and cost billions of dollars.<sup>39</sup> Some Members supported protection for the Lower 3 GHz band until the planned studies of interference and testing of DSS mechanisms were complete and conclusive.<sup>40</sup> Other Members have raised issues with the cost of relocating federal radar systems from the Lower 3 GHz band,<sup>41</sup> which could exceed or diminish spectrum proceeds. By law, auction proceeds must cover 110% of federal relocation or sharing costs, and the FCC cannot conclude—and must cancel—the auction if the auction proceeds are less than 110%.<sup>42</sup>

P.L. 119-21 excludes the Lower 3 GHz band from reallocation and auction for the duration of the auction authority (through September 30, 2034). This provides the U.S. government time to assess optimal use in the band and potential for spectrum sharing; it also preserves DOD use and protects U.S. government radar systems, which many Members support.<sup>43</sup> However, the protection timeframe in P.L. 119-21 (nine years) may run counter to the timeline and goals in the NSS Implementation Plan to allow for expanded or more efficient uses of the Lower 3 GHz band.

Further, as the U.S. government assesses sharing potential in the Lower 3 GHz band, a portion of the band (3.3-3.4 GHz) has been recognized and harmonized globally for 5G use by the International Telecommunications Union (ITU), an agency of the United Nations, established to promote global communications.<sup>44</sup> Countries in Europe, the Middle East, Africa, the Americas, and Asia (including China) are using portions of the band for commercial mobile services, developing new equipment for use in the band that can be marketed and sold globally, and

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<sup>38</sup> NTIA, *National Spectrum Strategy Implementation Plan*, March 2024, pp. A-6, A-7, <https://www.ntia.gov/sites/default/files/publications/national-spectrum-strategy-implementation-plan.pdf>.

<sup>39</sup> U.S. Congress, Senate Committee on Commerce, Science, and Transportation, “Hegseth Dereliction in Defending DoD Spectrum from Land Grab Threatens National Security, Cantwell Warns,” press release, May 6, 2025, <https://www.commerce.senate.gov/2025/5/hegseth-dereliction-in-defending-dod-spectrum-from-land-grab-threatens-national-security-cantwell-warns>; Sen. Mike Rounds, “Protection of Spectrum by Congress Also Protects Trump’s Iron Dome from Shortsighted 5G Policy” (op-ed), *Defense Scoop*, February 26, 2025, <https://defensescoop.com/2025/02/26/spectrum-5g-policy-congress-trump-dod-iron-dome-senator-mike-rounds/>.

<sup>40</sup> U.S. Congress, Senate Committee on Commerce, Science, and Transportation, *America Offline? How Spectrum Auction Delays Give China the Edge and Cost Us Jobs*, hearing, 119<sup>th</sup> Cong., 1<sup>st</sup> sess., February 19, 2025. (For example, see opening statement from Sen. Maria Cantwell and statements from Sens. Deb Fischer and Jacky Rosen.)

<sup>41</sup> U.S. Congress, Senate Committee on Commerce, Science, and Transportation, *America Offline? How Spectrum Auction Delays Give China the Edge and Cost Us Jobs*, hearing, 119<sup>th</sup> Cong., 1<sup>st</sup> sess., February 19, 2025. (See statements from Sen. Deb Fischer on risks and costs of relocating federal agency users.)

<sup>42</sup> 47 U.S.C. §309(j)(16).

<sup>43</sup> Kelly Hill, “House Committee Takes Lower 3 GHz, 6 GHz Off the Auction Table in Reconciliation Markup,” *RCR Wireless*, May 12, 2025, <https://www.rcrwireless.com/20250512/spectrum/house-committee-takes-lower-3-ghz-6-ghz-off-the-auction-table-in-reconciliation-mark-up>.

<sup>44</sup> International Telecommunications Union (ITU), “World Radiocommunication Conference 2023 (WRC-23): Final Acts,” August 19, 2024, p. 447, <https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-ACT-WRC.16-2024&media=electronic>.

potentially realizing economic gains by opening the band to new uses.<sup>45</sup> Wireless industry groups have urged Congress to consider designating a portion of the band (e.g., 3.3-3.45 GHz) for commercial use, in alignment with global allocations made at the World Radiocommunication Conference (WRC) in 2023 (i.e., WRC-23).<sup>46</sup> Some DOD officials have warned that such decisions could threaten U.S. national defense. For instance, a May 2025 Department of the Navy blog asserts that “in international forums, adversaries are advocating for the repurposing of this spectrum to impact critical DOD capabilities, claiming it can be shared, while they continue to use it for defense purposes.”<sup>47</sup> In the months before P.L. 119-21 was enacted, DOD proposed alternative bands for reallocation in lieu of the Lower 3 GHz band.<sup>48</sup>

As studies on the Lower 3 GHz band are under way and new findings emerge, industry and agencies working together may discover new approaches for sharing the band. In such cases, Congress could revisit the Lower 3 GHz band in future legislation.

### **7.4-8.4 GHz Band**

The band of frequencies in the 7.4-8.4 GHz range is heavily used by federal agencies, including

- the FAA, for microwave communications links used to connect remote long-range aeronautical radionavigation radars to air traffic control centers;
- the U.S. Space Force, for the Defense Satellite Communications System that supports U.S. military communications globally;
- the U.S. Space Force, for its Wideband Global SATCOM Satellite, which is the backbone of the U.S. military’s satellite communications, providing worldwide, flexible, high-capacity communications for U.S. agencies, including DOD, and North Atlantic Treaty Organization (NATO) partners;<sup>49</sup>
- the National Aeronautics and Space Administration (NASA) and National Oceanic and Atmospheric Administration (NOAA), for passive sensing of the Earth from space on the Geostationary Operational Environmental Satellite system; and
- NASA, for its Deep Space Network.

Both the FCC and NTIA were examining segments of the 7/8 GHz band for future use prior to enactment of P.L. 119-21. In 2023, the FCC Technological Advisory Council prepared an initial

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<sup>45</sup> Alan Weissberger, “WRC-23 Concludes with Decisions on Low-Band/Mid-Band Spectrum and 6G (?),” *IEEE ComSoc*, December 16, 2023, <https://techblog.comsoc.org/2023/12/16/wrc-23-concludes-with-decisions-on-low-band-mid-band-spectrum-and-6g/>. See Global System for Mobile Communications Association (GSMA), “Lower 3.4 GHz in the U.S.: Expanding Spectrum for Industry, Jobs, and Growth,” July 2023, p. 2, <https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2023/07/Lower-3.5-GHz-in-US.pdf>; and GSMA, “China Issues 5G Spectrum Licenses for Indoor Coverage,” February 18, 2020, <https://www.gsma.com/solutions-and-impact/technologies/networks/5g/china-issues-5g-spectrum-licences-for-indoor-coverage/>.

<sup>46</sup> Kelly Hill, “CTIA Report Suggests Segmenting Spectrum Below 3.3 GHz,” *RCR Wireless*, August 16, 2023, <https://www.rcrwireless.com/20230816/featured/ctia-report-suggests-segmenting-spectrum-below-3-3-ghz>.

<sup>47</sup> Arthur DeLeon, “Spectrum: Myth vs. Reality,” *Department of the Navy Chief Information Officer* (blog), May 29, 2025, <https://www.doncio.navy.mil/ContentView.aspx?id=19288>.

<sup>48</sup> See “DOD Spectrum Proposal,” March 25, 2025, which can be accessed via Jimm Phillips and Howard Buskirk, “DOD Floats Vacating 420 MHz of Spectrum for Auction but Retaining Lower 3 GHz Band,” *Communications Daily*, April 7, 2025, [https://communicationsdaily.com/search/view?search\\_id=42437](https://communicationsdaily.com/search/view?search_id=42437) (link requires paid subscription).

<sup>49</sup> U.S. Space Force, “Wideband Global SATCOM Satellite,” February 2023, <https://www.spaceforce.mil/about-us/fact-sheets/article/2197740/wideband-global-satcom-satellite/>.

assessment of use and recommendations for sharing in the 7.125-24 GHz range.<sup>50</sup> In the NSS, NTIA identified five bands for study, including frequencies in the range of 7.125-8.4 GHz.<sup>51</sup> In its NSS Implementation Plan, NTIA reported that it would set technical parameters for study of the 7.125-8.4 GHz band. Agencies with equities in the band would co-lead the study using funds provided through the Spectrum Relocation Fund (SRF).<sup>52</sup> The study is to examine the potential for (1) shared use; (2) reconfigured use of the band (e.g., compressing federal operations into a smaller segment of the band, freeing spectrum for commercial use); and (3) any other mechanisms to enable expanded use in the band.<sup>53</sup> The final report is expected in October 2026.

As with the Lower 3 GHz band, P.L. 119-21 excludes the 7.4-8.4 GHz band from auction for the duration of the auction authority (through September 30, 2034). This provides the U.S. government time to assess optimal use in the band and potential for spectrum sharing, and it preserves federal use in the band. However, the timeframe in P.L. 119-21 (nine years) may run counter to the timeline and goals in the NSS Implementation Plan, which aim to allow for expanded or more efficient uses in the band.

## **Bands Identified for Auction**

P.L. 119-21 names one specific band for auction: the Upper C-band (3.98-4.2 GHz). It directs the FCC to reallocate and auction at least 100 megahertz in the Upper C-band within two years of enactment (by July 2027). Auction of the Lower C-band (3.7-3.98 GHz) in 2021 generated over \$81 billion, spurring interest in future auctions in the band. However, reallocation and auction of the Lower C-band for commercial mobile services raised concerns among aviation stakeholders related to potential interference from high-power mobile (5G) services to aircraft altimeters operating in the 4.2-4.4 GHz band, which led to FAA directives restricting some aircraft landings at certain airports, requirements to replace or retrofit filters on aircraft altimeters, and delays in 5G deployment.<sup>54</sup> Proposals to auction the Upper C-band have raised similar concerns among aviation stakeholders and in Congress.

### **Upper C-band (3.98-4.2 GHz)<sup>55</sup>**

In February 2025, the FCC issued a notice of inquiry (NOI) seeking comment on opening the Upper C-band segment (3.98-4.2 GHz) for new wireless services (e.g., terrestrial or satellite

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<sup>50</sup> FCC TAC, Advanced Spectrum Sharing Working Group, *A Preliminary View of Spectrum Bands in the 7.125-24 GHz Range; and a Summary of Spectrum Sharing Frameworks*, August 17, 2023, pp. 5-7, <https://www.fcc.gov/sites/default/files/SpectrumSharingReportforTAC%20%28updated%29.pdf>.

<sup>51</sup> NTIA, *National Spectrum Strategy*, November 2023, p. 6.

<sup>52</sup> The Spectrum Relocation Fund (SRF) was established in 2004 to reimburse federal agencies for costs of relocating systems from one band to another when a band was repurposed for commercial use; the SRF was expanded in 2015 to allow agencies to use funds for research and development and analyses to help identify repurposing opportunities. For more information, see 47 U.S.C. §928 and NTIA, *Annex O: Procedures and Guidance Related to the Spectrum Relocation Fund and Transition Activities in Support of Relocation or Sharing by Federal Government Stations*, January 2021, [https://www.ntia.gov/files/ntia/publications/o\\_21\\_1.pdf](https://www.ntia.gov/files/ntia/publications/o_21_1.pdf).

<sup>53</sup> NTIA, *National Spectrum Strategy Implementation Plan*, March 2024, pp. A-9, A-10, <https://www.ntia.gov/sites/default/files/publications/national-spectrum-strategy-implementation-plan.pdf>.

<sup>54</sup> See CRS In Focus IF12028, *Aviation Concerns Regarding the Rollout of 5G Wireless Telecommunications Networks*, by Bart Elias. See also Peter Elkind, “Inside the Government Fiasco That Nearly Closed the U.S. Air System,” *ProPublica*, March 26, 2022, <https://www.propublica.org/article/fcc-faa-5g-planes-trump-biden>; and Federal Aviation Administration (FAA), “Requirements for Interference-Tolerant Radio Altimeter Systems,” NPRM, FAA-2025-5666, 91 *Federal Register* 463, January 7, 2026.

<sup>55</sup> In the United States, the FCC calls the frequencies in the 3.7-4.2 GHz range the “C-band.” Prior to 2020, the C-band (continued...)

services).<sup>56</sup> The FCC sought comment on several issues, including (1) the amount of spectrum that may be suitable for reallocation, (2) allowable uses for the Upper C-band segment, (3) treatment of incumbent services, and (4) avoiding interference with altimeters operating in the 4.2-4.4 GHz band.<sup>57</sup>

P.L. 119-21 requires the FCC to auction at least 100 megahertz of spectrum in the Upper C-band (3.98-4.2 GHz) within two years of enactment (by July 2027).<sup>58</sup>

In November 2025, the FCC released a notice of proposed rulemaking (NPRM) seeking input on the Upper C-band (3.98-4.2 GHz band).<sup>59</sup> Pursuant to P.L. 119-21, the FCC is seeking to make at least 100 megahertz (3.98-4.08 GHz), and potentially up to 180 megahertz (3.98-4.16 GHz), available for commercial terrestrial high-powered 5G use.<sup>60</sup> The FCC proposed a 20-megahertz guard band between the 5G and satellite services operating in the Upper C-band to protect incumbent satellite operations from potential harmful interference from 5G operations.<sup>61</sup>

Concerns about interference from 5G deployments operating in the Lower C-band to aircraft radio altimeters operating in the 4.2-4.4 GHz segment delayed and affected the activation of 5G services after the FCC auctioned the Lower C-band in 2021.<sup>62</sup> The FAA and aviation stakeholders asserted that high-power 5G deployments in the Lower C-band could cause harmful interference to aircraft radio altimeters, which could degrade altimeter performance and result in misleading data.<sup>63</sup> The FAA recommended short-term mitigation measures, such as assessing and approving altimeters that do not experience interference from 5G deployments, retrofitting existing radio altimeters with filters, and restricting certain operations (e.g., low-visibility landings) at select airports.<sup>64</sup> In addition, the FAA recommended longer-term solutions, such as developing standards

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was used primarily by satellite service providers for downlink (space-to-earth) delivery of television and radio programming and other services, including public safety communications. In March 2018, Congress, in the Making Opportunities for Broadband Investment and Limiting Excessive and Needless Obstacles to Wireless Act (MOBILE NOW Act; P.L. 115-141, Title VI, §605(b)), directed the FCC to evaluate the feasibility of allowing commercial wireless use (e.g., 5G) in the C-band. In March 2020, the FCC adopted final rules for the C-band. The FCC relocated the incumbent satellite operators to the Upper 200-megahertz segment of this 500-megahertz band (4.0-4.2 GHz), freeing up the Lower C-band (3.7-3.98 GHz) to auction for 5G use. The FCC preserved a segment between the Lower and Upper C-band (3.98-4.0 GHz) to serve as a guard band, to prevent mobile services in the Lower C-band from interfering with satellite services in the Upper C-band. For additional information on the C-band, see FCC, “In the Matter of the Upper C-Band (3.98-4.2 GHz),” 90 *Federal Register* 56076, December 5, 2025. (See “Background” section.)

<sup>56</sup> FCC, *In the Matter of Upper C-Band (3.98-4.2 GHz)*, notice of inquiry, February 27, 2025, <https://docs.fcc.gov/public/attachments/FCC-25-13A1.pdf>.

<sup>57</sup> Altimeters are devices on aircraft that measure the aircraft’s height above terrain and other obstacles using low-power signals to detect reflections from the ground. Pilots use these data for navigating low-visibility approaches and for terrain awareness and warning, wind shear alerts, and traffic collision avoidance.

<sup>58</sup> P.L. 119-21 specifies that the FCC must complete an auction of at least 100 megahertz but does not specify a particular use.

<sup>59</sup> FCC, *In the Matter of Upper C-Band (3.98-4.2 GHz)*, NPRM, FCC 25-78, November 20, 2025, <https://docs.fcc.gov/public/attachments/FCC-25-78A1.pdf>. See also FCC, “In the Matter of the Upper C-Band,” 90 *Federal Register* 56076, December 5, 2025.

<sup>60</sup> FCC, “In the Matter of the Upper C-Band,” 90 *Federal Register* 56076, December 5, 2025.

<sup>61</sup> FCC, “In the Matter of the Upper C-Band,” 90 *Federal Register* 56078, December 5, 2025.

<sup>62</sup> FAA, “5G and Aviation,” <https://www.faa.gov/5g> (see “5G Timeline”); and FAA, “Requirements for Interference-Tolerant Radio Altimeter Systems,” NPRM, FAA-2025-5666, 91 *Federal Register* 459, January 7, 2026 (see “Background”).

<sup>63</sup> FAA, “Requirements for Interference-Tolerant Radio Altimeter Systems,” NPRM, FAA-2025-5666, 91 *Federal Register* 459, January 7, 2026 (see “Statement of the Problem”).

<sup>64</sup> FAA, “Requirements for Interference-Tolerant Radio Altimeter Systems,” NPRM, FAA-2025-5666, 91 *Federal Register* 459, January 7, 2026.

for new altimeters that were less susceptible to interference from 5G signals.<sup>65</sup> The FAA also requested some constraints for mobile service providers. Providers voluntarily agreed to delay 5G deployments and then to limit and coordinate power levels around select airports to allay concerns about interference from 5G stations to radio altimeters; that agreement ends January 1, 2028.<sup>66</sup> The FAA aims to complete new altimeter standards by 2027 and make more resilient altimeters available for integration into aircraft starting in 2028. This could allow providers to operate at the power levels and under the technical parameters granted in the Lower C-band licenses they won at auction and to inform the FCC on parameters of the Upper C-band operations.<sup>67</sup>

On January 7, 2026, the FAA issued an NPRM proposing new regulations that would require all radio altimeters to meet specific performance requirements so they can withstand interference from wireless signals in neighboring spectrum bands and still provide accurate altitude readings. The regulations would require certain aircraft to comply with the requirements by the date that the FCC authorizes wireless service providers to begin service in the Upper C-band;<sup>68</sup> all others would be required to comply within two years.<sup>69</sup> The standard is scheduled for publication in early 2027, but the FAA has requested that it be published by June 2026, if possible.<sup>70</sup> The FAA proposed to have the retrofit deadline coincide with the FCC date initiating new 5G service in the Upper C-band, which it expects to be sometime between 2029 and 2032.<sup>71</sup>

There are several issues that may be of interest to Congress, including the amount of spectrum auctioned, potential interference with altimeters, timing of 5G deployments, and relocation costs.

### *Amount of Spectrum Auctioned*

Congress may be interested in the terms set for the Upper C-band auction—including the amount of spectrum the FCC chooses to auction—as the terms may affect spectrum auction proceeds. Auctions of mid-band spectrum (which includes the C-band) have generated the highest levels of proceeds.<sup>72</sup> Within this range, the Lower C-band auction yielded the highest proceeds to date (\$81

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<sup>65</sup> FAA, “Radar Altimeter and Compatibility with 5G,” July 2021, p. 20, <https://verticalavi.org/wp-content/uploads/2021/08/FAA-Presentation-RA-5G-Industry-Forum-July-2021.pdf>.

<sup>66</sup> Letter from Henry G. Hultquist, Vice President-Federal Regulatory, AT&T Services, Inc., et al. to Marlene H. Dortch, FCC Secretary, March 31, 2023, <https://www.fcc.gov/ecfs/document/1033142661477/1>.

<sup>67</sup> FCC, “In the Matter of the Upper C-Band (3.98-4.2 GHz),” 90 *Federal Register* 56094, December 5, 2025.

<sup>68</sup> In its NPRM, the FAA notes that “these regulations would require all aircraft equipped with radio altimeters operating under Part 121 [generally large, U.S.-based airlines, regional air carriers, and all cargo operators] and those aircraft with radio altimeters operating under part 129 [foreign air carriers] with 30 or more passenger seats or a payload capacity of more than 7,500 pounds to comply with the minimum performance requirements by the date the Federal Communications Commission authorizes wireless services in the Upper C-band. All other aircraft equipped with radio altimeters would be required to comply with the same minimum performance requirements two years later.” FAA, “Requirements for Interference-Tolerant Radio Altimeter Systems,” NPRM, FAA-2025-5666, 91 *Federal Register* 459, January 7, 2026.

<sup>69</sup> FAA, “Requirements for Interference-Tolerant Radio Altimeter Systems,” NPRM, FAA-2025-5666, 91 *Federal Register* 459, January 7, 2026.

<sup>70</sup> FAA, “Requirements for Interference-Tolerant Radio Altimeter Systems,” NPRM, FAA-2025-5666, 91 *Federal Register* 464, January 7, 2026.

<sup>71</sup> FAA, “Requirements for Interference-Tolerant Radio Altimeter Systems,” NPRM, FAA-2025-5666, 91 *Federal Register* 467, January 7, 2026.

<sup>72</sup> In 2015, the AWS-3 auction generated nearly \$42 billion; FCC, “Auction 97,” <https://www.fcc.gov/auction/97>. In 2021, the C-band auction (3.7-3.98 GHz) generated \$81 billion; FCC, “Auction 107,” <https://www.fcc.gov/auction/107>.

billion). Experts have found that creating large, contiguous bands and allowing full-power use were among the factors that drove spectrum price and proceeds in the Lower C-band.<sup>73</sup>

Per P.L. 119-21, the FCC identified 100 megahertz within the band (3.98-4.08 GHz) and is considering auctioning up to 180 megahertz (3.98-4.16 GHz). Auctioning 180 megahertz in the Upper C-band would provide more spectrum for commercial mobile use, could increase auction proceeds and spur economic gains, and would bring the FCC closer to its mandate in P.L. 119-21 to auction 300 megahertz of spectrum for commercial wireless use. However, auctioning 180 megahertz of the Upper C-band could affect incumbent users, including satellite service providers that were recently (2023) relocated from the Lower C-band to the Upper C-band.<sup>74</sup> 5G providers paid over \$9.7 billion in relocation costs and additional payments to accelerate the clearing of the Lower C-band; some satellite firms say they spent billions on new launches intended to operate in the Upper C-band, which could now be affected by new high-power 5G services in that band.<sup>75</sup> Broadcasters that rely on program distribution by satellite have urged the FCC to consider spectrum needs of all service providers, potential relocation costs, and impact on broadcast services, including in Alaska, Hawaii, and other regions.<sup>76</sup>

### *Potential Interference with Altimeters*

In its January 2026 NPRM, the FAA raises issues with deployment of high-power 5G services in the Upper C-band (3.98-4.2 GHz), noting that the Upper C-band is even closer to the radio altimeter band (4.2-4.4 GHz) than the Lower C-band and “poses a risk of increased interference with [radio altimeters] and critical aviation systems dependent on the [radio altimeter] for accurate altitude data.”<sup>77</sup>

The FAA described its efforts to assess and mitigate interference from 5G deployments in the Lower C-band to radio altimeters operating in the 4.2-4.4 GHz band. The FAA determines whether a radio altimeter is interference tolerant based on terms established in voluntary agreements it holds with wireless providers—these terms reduce emissions at certain 5G sites and are set to expire on January 2028.<sup>78</sup> The FAA notes that its current directives and agreements do not provide a long-term resolution that would ensure safety in the presence of Lower C-band wireless services operating at full power, nor do they contemplate wireless services in the Upper C-band.<sup>79</sup> Some Members have raised concerns about impacts of 5G services on critical aviation

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<sup>73</sup> Roger Entner, “Lessons from Spectrum Auctions: Entner,” *Fierce Network*, February 11, 2021, <https://www.fierce-network.com/regulatory/lessons-from-spectrum-auctions-entner>.

<sup>74</sup> Randy J. Stine, “The C-Band Is Back in the Crosshairs,” *Radio World*, September 5, 2025, <https://www.radioworld.com/news-and-business/business-and-law/the-c-band-is-back-in-the-crosshairs>.

<sup>75</sup> Randy J. Stine, “The C-Band Is Back in the Crosshairs,” *Radio World*, September 5, 2025, <https://www.radioworld.com/news-and-business/business-and-law/the-c-band-is-back-in-the-crosshairs>.

<sup>76</sup> Letter from Alison Martin, Vice President, Innovation and Strategy, National Association of Broadcasters, to Marlene H. Dortch, FCC Secretary, November 12, 2025, <https://www.fcc.gov/ecfs/document/1112349125995/1?ref=broadbandbreakfast.com>.

<sup>77</sup> FAA, “Requirements for Interference-Tolerant Radio Altimeter Systems,” NPRM, FAA-2025-5666, 91 *Federal Register* 464, January 7, 2026.

<sup>78</sup> FAA, “Requirements for Interference-Tolerant Radio Altimeter Systems,” NPRM, FAA-2025-5666, 91 *Federal Register* 464, January 7, 2026. *Emissions* refer to the electromagnetic energy from a device; interference can occur when electronic devices, which can intentionally and unintentionally emit electromagnetic energy, disrupt radio signals from or to another device.

<sup>79</sup> FAA, “Requirements for Interference-Tolerant Radio Altimeter Systems,” NPRM, FAA-2025-5666, 91 *Federal Register* 464, January 7, 2026.

systems and have urged careful consideration and coordination on rules and technical parameters that could affect aviation systems and safety.<sup>80</sup>

Congress has directed the FAA Administrator, in consultation with NTIA, to conduct research on the use and management of spectrum in the civil aviation domain. P.L. 118-63, Section 1026, requires that the agency report on several things, including (1) how reallocation or repurposing of spectrum adjacent to spectrum allocated for communication, navigation, and surveillance may affect civil aviation; (2) the effectiveness of measures to protect and mitigate against spectrum interference in bands used in civil aviation operations for public safety; and (3) identification of emerging civil aviation systems and their anticipated spectrum requirements. This report is to be completed and submitted to Congress by May 2026. While this report could offer insight into current issues and future needs, it may not be released in time to affect decisions and technical parameters for the Upper C-band, given the mandate to complete the auction by July 2027.

### *Timing of 5G Deployments*

An area of interest for Congress may be the timing set by the FCC for terrestrial 5G deployments in the Upper C-band. In its November 2025 NPRM, the FCC discussed the urgency of the proceeding, given the mandate in P.L. 119-21 to complete the auction within two years of the statute's enactment (by July 2027). Despite this deadline, no mandatory date has been set for activation of 5G services. The FAA requires that certain aircraft be equipped with new altimeters by the date the FCC sets for deployment; however, that date is currently unknown, standards for such altimeters are still under development, and equipment is not yet available. In its January 2026 NPRM, the FAA reports that the standard to define the maximum tolerable radio frequency interference levels is scheduled for publication in early 2027 and that it has asked for the standard to be released in 2026.<sup>81</sup> Aviation and wireless industry stakeholders report that while there are areas of consensus among wireless and aviation stakeholders, other issues remain under discussion, including appropriate out-of-band emission limits to avoid interference between the wireless and aviation services.<sup>82</sup>

The FAA Reauthorization Act of 2024 (P.L. 118-63, §318, enacted May 16, 2024) required the DOT Office of Inspector General (OIG) to audit the FAA's coordination with NTIA to communicate the views of aviation stakeholders regarding spectrum reallocations and auctions; DOT OIG has initiated the audit, which is due two years from the statute's enactment (by May 2026).<sup>83</sup> The audit could lead to findings and recommendations that could enhance interagency coordination on spectrum decisions but may not be completed in time to affect Upper C-band decisions, given the July 2027 auction date.

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<sup>80</sup> U.S. Congress, House Committee on Transportation and Infrastructure, Subcommittee on Aviation, *Finding the Right Frequency: 5G Deployment and Aviation Safety*, 117<sup>th</sup> Cong., 2<sup>nd</sup> sess., February 3, 2022 (e.g., see statements from House Transportation Committee Chairman Peter DeFazio). See also letter from Sen. Maria Cantwell, Ranking Member, Senate Committee on Commerce, Science, and Transportation, to Sean Duffy, Secretary, Department of Transportation (DOT), May 12, 2025, <https://www.commerce.senate.gov/services/files/17240991-C943-48C7-A51B-7B836736A5A1>.

<sup>81</sup> FAA, "Requirements for Interference-Tolerant Radio Altimeter Systems," NPRM, FAA-2025-5666, 91 *Federal Register* 461, January 7, 2026.

<sup>82</sup> Letter from Dorothy B. Reimold, Vice President, Aerospace Industries Association (AIA) et al. to Marlene H. Dortch, October 2, 2025, <https://api.ctia.org/wp-content/uploads/2025/10/251002-Joint-Association-Upper-C-Band-Ex-Parte-Filing.pdf>.

<sup>83</sup> Memorandum from Nelda Smith, Assistant Inspector General for Aviation Audits, DOT, to Director, Audit and Evaluation, August 1, 2025, <https://www.oig.dot.gov/sites/default/files/library-items/Audit%20Announcement%20-%20FAA%27s%20Communication%20of%20Spectrum%20Concerns.pdf>.

Congress could consider options to encourage or mandate coordination between the FCC and the FAA and their stakeholders, given congressional concerns over previous coordination efforts. Congress could also consider options to ensure that activation dates for 5G deployments align with installment of new altimeters to safeguard air safety and facilitate 5G deployments.

### ***Relocation Costs***

Aviation stakeholders have raised issues of costs to retrofit the existing aircraft fleet with new interference-tolerant radio altimeters, which the FAA has estimated would cost \$4.5 billion.<sup>84</sup> While the FCC has a framework for facilitating and incentivizing the clearing of spectrum for emerging technologies (e.g., providing relocation costs or payments to clear bands quickly), its framework has not previously been used to address adjacent band equities.<sup>85</sup> In its November 2025 NPRM, the FCC sought comment on ways radio altimeter retrofits could be incentivized or accelerated. Options for Congress could include directing the FCC to consider or adopt rules related to relocation costs and/or acceleration payments for systems affected by spectrum reallocations in an adjacent band, including altimeters, or restricting the FCC from doing so to avoid increasing spectrum and relocation costs for service providers seeking to launch new and emerging technologies.

## **Bands Identified for Future Study**

P.L. 119-21 identified three bands for future study: 2.7-2.9 GHz, 4.4-4.9 GHz, and 7.125-7.4 GHz bands. The bands align closely to bands identified by the ITU for future study: 4.4-4.8 GHz and 7.125-8.4 GHz bands.<sup>86</sup> At the WRC in 2027 (WRC-27), participants will be expected to consider studies on sharing in these bands and to develop technical conditions for mobile use in each of the bands, while also taking into account incumbent and adjacent systems and services.

Although P.L. 119-21 did not set specific timelines for study, a December 19, 2025, presidential memorandum directed agencies to immediately commence studies of the bands named in P.L. 119-21 and set timelines and tasks for agencies to carry out these directives.<sup>87</sup> This section discusses the three bands identified for study in P.L. 119-21 and the directives in the recent presidential memorandum.

### **2.7-2.9 GHz**

P.L. 119-21 directs NTIA to conduct a spectrum analysis of the 2.7-2.9 GHz band. Both nationally and internationally, the 2.7-2.9 GHz band—valuable mid-band spectrum—has been considered for mobile use.<sup>88</sup> In the United States, the band is used by the FAA and DOD for hundreds of high-power radar systems operating across the United States for air traffic control

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<sup>84</sup> FAA, “Requirements for Interference-Tolerant Radio Altimeter Systems,” NPRM, FAA-2025-5666, 91 *Federal Register* 479, January 7, 2026.

<sup>85</sup> FCC, *In the Matter of Upper C-Band (3.98-4.2 GHz)*, NPRM, FCC 25-78, November 20, 2025, pp. 46-47, <https://docs.fcc.gov/public/attachments/FCC-25-78A1.pdf>.

<sup>86</sup> ITU, “ITU Preparatory Studies for WRC-27,” <https://www.itu.int/en/ITU-R/study-groups/rcpm/Pages/wrc-27-studies.aspx> (see Agenda Item 1.7).

<sup>87</sup> White House, “Winning the 6G Race,” presidential memorandum, December 19, 2025, <https://www.whitehouse.gov/presidential-actions/2025/12/national-security-presidential-memorandum-nspm-8-0bda/>.

<sup>88</sup> GSMA, “The Suitability of an IMT Identification in the 2.7-2.9 GHz Band at WRC-15,” January 2015, <https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2015/02/2.7-2.9-Information-Paper.pdf>.

systems and weather monitoring.<sup>89</sup> The National Weather Service (NWS), the FAA, and DOD operate a network of Next Generation Weather Radar (NEXRAD) systems in this band, which, according to NTIA, are operating nearly 100% of the time, limiting opportunities for time sharing in the band.<sup>90</sup> These federal systems avoid interference with each other through design of radar receivers, deliberate frequency selection, and NTIA regulations.

Use of the 2.7-2.9 GHz band is under consideration by industry and government stakeholders. The band sits above the 2.5 GHz band (2.496-2.690 GHz) that was reallocated for mobile 5G use and auctioned in 2022. Opening the 2.7-2.9 GHz band for mobile use could provide a broader contiguous band of mid-band spectrum to help providers meet future demands for spectrum and services that are projected by industry.<sup>91</sup> The 2.7-2.9 GHz band sits below the Lower 3 GHz band (3.1-3.45 GHz)—a band used predominantly by DOD.<sup>92</sup> The band could also be used to create a broader federal segment, to accommodate federal systems relocated from other bands. A 2017 spectrum report commissioned by CTIA, a trade association representing the U.S. wireless communications industry, states that the 2.7-3.1 GHz band may be a possible band to relocate federal surveillance systems currently operating in the 1.3-1.35 GHz band, which could free up to 50 megahertz of spectrum for mobile broadband services.<sup>93</sup>

P.L. 119-21 provided \$50 million to DOC to enable the head of NTIA to conduct timely analysis of several bands, including the 2.7-2.9 GHz band. The December 2025 presidential memorandum expedited this study.<sup>94</sup> The memorandum directed NTIA to immediately commence studies of the 2.69-2.9 GHz band to determine whether portions of those bands can feasibly be reallocated for full-power commercial licensed use. Congress may seek to monitor NTIA's progress on this analysis to understand potential and optimal use in the band and to determine whether NTIA has the resources it needs to carry out these directives and congressional priorities in P.L. 119-21, which include identification of spectrum for auctions.

#### **4.4-4.9 GHz**

P.L. 119-21 directs NTIA to conduct an analysis on the 4.4-4.9 GHz band. The band is currently under study globally to determine feasibility of mobile services in the band.<sup>95</sup> WRC-27 participants will be invited to consider a global identification of the 4.4-4.8 GHz band for advanced 5G and 6G services in ITU Region 1 and 3; Region 2 (the Americas) was not included in this provision.<sup>96</sup> A U.S. advisory body to the FCC issued preliminary views on Agenda Item

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<sup>89</sup> NTIA, "Quantitative Assessments of Spectrum Usage," November 2016, p. 61, [https://www.ntia.gov/files/ntia/publications/ntia\\_quant\\_assessment\\_report-no\\_appendices.pdf](https://www.ntia.gov/files/ntia/publications/ntia_quant_assessment_report-no_appendices.pdf).

<sup>90</sup> *Time sharing* refers to mechanisms that allow different users access to the same frequency band at different times. Instead of assigning bands to single users, it allows multiple users access to the band, on a coordinated basis.

<sup>91</sup> GSMA, "6G Mobile Networks Will Need Up to Three Times Today's Spectrum to Meet Surging Data Demands, New GSMA Report Shows," November 20, 2025, <https://www.gsma.com/newsroom/press-release/6g-mobile-networks-will-need-up-to-three-times-todays-spectrum-to-meet-surging-data-demands-new-gsma-report-shows/>.

<sup>92</sup> For background, see CRS In Focus IF12350, *Repurposing 3.1-3.55 GHz Spectrum: Issues for Congress*, by Jill C. Gallagher.

<sup>93</sup> Coleman Bazelon, "The Next Wave of Spectrum Reallocation: The Value of Additional Mid-Band Spectrum Reallocations," Brattle Group, November 14, 2017, p. 4, <https://docs.house.gov/meetings/IF/IF16/20171116/106636/HHRG-115-IF16-20171116-SD005-U5.pdf>.

<sup>94</sup> White House, "Winning the 6G Race," presidential memorandum, December 19, 2025, <https://www.whitehouse.gov/presidential-actions/2025/12/national-security-presidential-memorandum-nspm-8-0bda/>.

<sup>95</sup> ITU, "U.S. Contributions Sent to CITELEC PCC.II (for WRC-27)," <https://www.fcc.gov/us-contributions-sent-citelec-pccii-wrc-27-0> (see Agenda Item 1.7).

<sup>96</sup> Region 1 covers Africa, Europe, Russia, and other territories. Region 2 covers the Americas, Greenland, and some (continued...)

1.7, supporting sharing and compatibility studies in the band to determine whether the band could be designated globally for mobile (e.g., 6G) use, with the view that incumbent systems and services operating in and adjacent to the band are protected.<sup>97</sup>

According to NTIA, the 4.4-4.9 GHz band is used by many federal agencies, including NASA and the Departments of Defense, Energy, Homeland Security, Justice, and the Interior. It supports military use and training, specifically fixed line of sight (LOS) systems, drone vehicle control and telemetry, and mobile communications for law enforcement, drug interdiction, and nuclear emergency response activities.<sup>98</sup> A 2016 NTIA report projected that use in the band would increase due to expanded unmanned aerial systems (UAS), or drone, operations.<sup>99</sup> Since then, drone registrations, as well as market growth and government spending related to drones,<sup>100</sup> has increased in the United States, which could drive demand for spectrum.

Experts testifying before the Senate Committee on Commerce, Science, and Transportation in a February 2025 hearing stated that allies and adversaries are building and using advanced drone capabilities (e.g., sensors on drones, videos on drones) and jamming technologies that rely on spectrum. Some reports indicate that the United States is falling behind in the manufacturing and testing of drones.<sup>101</sup> Experts assert that the U.S. military requires access to spectrum across multiple bands for development, training, and operations of new technologies, including drones; they advocate for shared use of spectrum to open multiple bands for drone use.<sup>102</sup>

Some Members have raised questions about the impact of proposed reallocations on federal capabilities. Senator Cantwell, in a May 6, 2025, letter to Secretary of Defense Pete Hegseth,<sup>103</sup> discussed “the urgency to accelerate American investments in [drone] technologies and the need to rapidly deploy this technology to compete with China’s military transformation to UAS,” and expressed concern about auctioning the band for commercial use; she asked Secretary Hegseth whether DOD could afford to lose access to the 4.4 GHz band.<sup>104</sup>

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Pacific Islands. Region 3 covers parts of Asia (Iran, China, India, and other nations), Australia, and Oceania. See FCC ITU Regions Map available at <https://www.itu.int/en/ITU-R/information/Pages/emergency-bands.aspx>.

<sup>97</sup> ITU, “U.S. Contributions Sent to CITEP PCC.II (for WRC-27),” <https://www.fcc.gov/us-contributions-sent-citel-pccii-wrc-27-0> (see Agenda Item 1.7).

<sup>98</sup> NTIA, *Federal Spectrum Compendium*, “4400-4500 MHz,” December 2015, [https://www.ntia.gov/files/ntia/publications/compendium/4400.00-4500.00\\_01DEC15.pdf](https://www.ntia.gov/files/ntia/publications/compendium/4400.00-4500.00_01DEC15.pdf).

<sup>99</sup> NTIA, “Quantitative Assessments of Spectrum Usage,” November 2016, p. 61, [https://www.ntia.gov/files/ntia/publications/ntia\\_quant\\_assessment\\_report-no\\_appendices.pdf](https://www.ntia.gov/files/ntia/publications/ntia_quant_assessment_report-no_appendices.pdf).

<sup>100</sup> FAA, *Compendium to FAA Aerospace Forecast FY 2025-2045 Emerging Aviation Entrants: Unmanned Aircraft System and Advanced Air Mobility*, 2025, pp. 5-6 (registration data), [https://www.faa.gov/data\\_research/aviation/aerospace\\_forecasts/2025-uas-and-aam-full-document.pdf](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-uas-and-aam-full-document.pdf); and National Law Review, “U.S. Government’s Spending on Defense Contracts for Drones Leading to a Projected \$47 Billion Market by 2032 (Market News Update),” press release, October 16, 2025, <https://natlawreview.com/press-releases/us-governments-spending-defense-contracts-drones-leading-projected-47>.

<sup>101</sup> William Lawson, “The United States Is Falling Behind in Drone Technology,” *National Interest*, July 22, 2025, <https://nationalinterest.org/blog/buzz/the-united-states-is-falling-behind-in-drone-technology-wl>.

<sup>102</sup> Testimony of Bryan Clark, Senior Fellow, Hudson Institute, in U.S. Congress, Senate Committee on Commerce, Science, and Transportation, *America Offline? How Spectrum Auction Delays Give China the Edge and Cost Us Jobs*, hearing, 119<sup>th</sup> Cong., 1<sup>st</sup> sess., February 19, 2025, <https://www.commerce.senate.gov/services/files/E3003F22-F4CE-439E-8B51-B7F11B6D0432>.

<sup>103</sup> Letter from Sen. Maria Cantwell to Pete Hegseth, Secretary of Defense, May 6, 2025, <https://www.commerce.senate.gov/services/files/2B29105E-75BF-4D7B-B6B2-7AEC58053698>. The Secretary of Defense is using “Secretary of War” as a “secondary title” under Executive Order 14347 of September 5, 2025.

<sup>104</sup> U.S. Congress, Senate Committee on Commerce, Science, & Transportation, “Hegseth Dereliction in Defending DoD Spectrum from Land Grab Threatens National Security, Cantwell Warns,” press release, May 6, 2025, (continued...)

The December 2025 presidential memorandum directed the head of NTIA to immediately commence studies of the 4.4-4.94 GHz band to determine whether portions of that band could feasibly be reallocated for full-power commercial licensed use. Congress may be interested in NTIA's progress on this analysis and whether NTIA has the resources needed to carry out the directives in P.L. 119-21 and in the December 2025 presidential memorandum in the mandated timelines.

## **7.125-7.4 GHz**

P.L. 119-21 calls for future study of the 7.125-7.4 GHz band and preservation of the 7.4-8.4 GHz band. Internationally, the broader 7/8 GHz band (7.125-8.4 GHz) is emerging as a potential global band for 6G mobile services.<sup>105</sup> The ITU has called for studies of several bands, including the broader 7.125-8.4 GHz band, for consideration at WRC-27. In the United States, NTIA has identified five bands for in-depth study in its NSS, including frequencies in the range of 7.125-8.4 GHz.<sup>106</sup> NTIA is to lead the studies (e.g., set technical parameters and assumptions); agencies with equities in the band would co-lead the studies, using funds provided from the SRF. In its NSS Implementation Plan, NTIA provided a timeline for the 7.125-8.4 GHz band study. This study is to examine the potential for (1) shared use, (2) reconfigured use of the band (e.g., compressing federal operations into a smaller segment of the band), and (3) any other mechanisms to enable expanded use in the band.<sup>107</sup> The final report is expected in October 2026.

Some industry stakeholders, including some network equipment manufacturers, advocate for the 7.125-7.4 GHz and 7.4-8.4 GHz bands to be combined to enable a large, contiguous band of spectrum for future 6G mobile use.<sup>108</sup> Others argue that the 7.125-7.4 GHz band could be paired with the adjacent 6 GHz band—a band that was recently allocated for unlicensed use, which supports Wi-Fi and millions of connected devices—to expand Wi-Fi and other unlicensed uses.<sup>109</sup>

There are a variety of mission-critical federal operations in the 7.125-7.4 GHz band, which presents challenges to repurposing it.<sup>110</sup> In addition, there are federal operations in adjacent bands that rely exclusively on specific frequencies to collect atmospheric and oceanic data, which NTIA and agencies protect from interference. NTIA urges agencies to consider passive readings when contemplating future plans for the band.<sup>111</sup>

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<https://www.commerce.senate.gov/2025/5/hegseth-dereliction-in-defending-dod-spectrum-from-land-grab-threatens-national-security-cantwell-warns>.

<sup>105</sup> Viet Nguyen, 5G Americas, “Unlocking the Power of the 7-8 GHz Spectrum: A ‘Golden Band’ of 6G Innovation - 5G Americas,” October 7, 2024, <https://www.5gamericas.org/unlocking-the-power-of-the-7-8-ghz-spectrum-a-golden-band-of-6g-innovation/>.

<sup>106</sup> NTIA, *National Spectrum Strategy*, November 2023, p. 6.

<sup>107</sup> NTIA, *National Spectrum Strategy Implementation Plan*, March 2024, pp. A-9, A-10.

<sup>108</sup> Eliane Semaan et al., “6G Spectrum—Enabling the Future Mobile Life Beyond 2030,” Ericsson, May 2024, p. 19, <https://www.ericsson.com/49ac9c/assets/local/reports-papers/white-papers/2024/6g-spectrum.pdf>.

<sup>109</sup> Generally, unlicensed use pertains to radio frequencies (typically a band of frequencies) that are open to all users and all technologies provided the devices meet certain technical rules established by the FCC, primarily to enable access to spectrum and avoid interference between users. Technologies such as Wi-Fi and Bluetooth use unlicensed spectrum; connected devices (e.g., smart home devices) may also rely on unlicensed spectrum to operate.

<sup>110</sup> FCC TAC, Advanced Spectrum Sharing Working Group, *A Preliminary View of Spectrum Bands in the 7.125-24 GHz Range; and a Summary of Spectrum Sharing Frameworks*, August 17, 2023, pp. 5-7. See also NTIA, *National Spectrum Strategy*, November 2023, p. 6.

<sup>111</sup> NTIA, “5925-7125 MHz,” in *Federal Spectrum Compendium*, August 9, 2017, p. 2, [https://www.ntia.gov/files/ntia/publications/compendium/5925.00-7125.0\\_mhz\\_aug\\_9\\_2017\\_final.pdf](https://www.ntia.gov/files/ntia/publications/compendium/5925.00-7125.0_mhz_aug_9_2017_final.pdf) (noting “in the band 7025-7250 MHz, passive microwave sensor measurements are carried out. Administrations should bear in mind the needs of the Earth (continued...)”).

The December 2025 presidential memorandum directs the head of NTIA and White House staff, including the Assistant to the President for Economic Policy and the Assistant to the President for Science and Technology, to immediately commence studies in consultation with federal incumbent users with operations in the 7.125-7.4 GHz range to determine how to relocate their affected systems to other frequencies, including 7.4-8.4 GHz. The memorandum directs the head of NTIA, no later than December 2026, to submit to the President, through the Assistant to the President for Economic Policy, the Assistant to the President for Science and Technology, and the Assistant to the President for National Security Affairs, results of the studies of the 7.125-7.4 GHz band, including estimated transition costs and timelines. The memorandum requires that the results demonstrate how such relocation of systems “will not materially impair the national security missions or electric grid operations that occur in the 7.125-7.4 GHz band, as identified by the Secretary of War and the Director of National Intelligence.”<sup>112</sup>

The specific directives and increased involvement of the White House may prioritize and focus NTIA efforts on the 7.125-7.4 GHz band and position the United States to lead in developing this band for 6G. On the other hand, technical analysis of spectrum bands is complex and requires interagency coordination, careful planning, thorough testing across multiple agencies, and time. The expedited timelines and increased involvement of the White House and DOD may add complexity and time to this analysis. Congress may be interested in NTIA capabilities to expedite these spectrum studies, identify and reallocate 500 megahertz of spectrum as directed in P.L. 119-21, prepare for WRC-27, implement the NSS, and complete the spectrum valuation report. A question may be whether NTIA and federal agencies have the resources needed to immediately undertake and complete these studies by the statutory deadlines in P.L. 119-21.

## **Other Bands Under Consideration for Reallocation and Auction**

To meet requirements in P.L. 119-21, the FCC and NTIA may consider other bands for reallocation and auction. Some bands have been named in previous legislation. Other bands have been under study by agencies or industry for potential for reallocation. Some bands have been identified in the NSS. Others are under consideration globally for future mobile use. Below is a selection of bands under consideration by other entities, which the FCC and NTIA may consider as they strive to meet reallocation mandates in P.L. 119-21.

### **1.3-1.35 GHz**

In a March 2025 proposal, DOD suggested that it could vacate its systems from the 1.3-1.35 GHz band to provide 50 megahertz of spectrum for mobile services.<sup>113</sup> Congress had been considering reallocation and auction of the Lower 3 GHz band; DOD offered alternative proposals, which included reallocation and auction of several other bands, including the 1.3-1.35 GHz band.

The band has been under study for several years, pursuant to the Spectrum Pipeline Act of 2015 (P.L. 114-74, Title X), which directed the Secretary of Commerce to identify, by January 1, 2022,

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exploration-satellite (passive) and space research (passive) services in their future planning of the bands 6425-7025 MHz and 7025-7250 MHz.”)

<sup>112</sup> White House, “Winning the 6G Race,” presidential memorandum, December 19, 2025, <https://www.whitehouse.gov/presidential-actions/2025/12/national-security-presidential-memorandum-nspm-8-0bda/>. The Secretary of Defense is using a secondary “Secretary of War” designation under Executive Order 14347 of September 5, 2025.

<sup>113</sup> See “DOD Spectrum Proposal,” March 25, 2025, which can be accessed via Jimm Phillips and Howard Buskirk, “DOD Floats Vacating 420 MHz of Spectrum for Auction but Retaining Lower 3 GHz Band,” *Communications Daily*, April 7, 2025, [https://communicationsdaily.com/search/view?search\\_id=42437](https://communicationsdaily.com/search/view?search_id=42437) (link requires paid subscription).

30 megahertz of spectrum below 3 GHz for reallocation from federal to (1) nonfederal use, (2) shared federal and nonfederal use, or (3) a combination thereof.<sup>114</sup> The act directs the President to clear the band (i.e., withdraw or modify the federal frequency assignments) no later than January 1, 2022, and for the FCC to begin, by July 1, 2024, an auction of the 30 megahertz below 3 GHz.<sup>115</sup>

Several bands were targeted for study by NTIA and federal agencies, including the 1.3-1.35 GHz band. The band is used by the FAA, DOD, and the Department of Homeland Security for long-range radar systems for air surveillance to conduct air traffic control, border surveillance, early warning missile detection, and more.<sup>116</sup> In 2017, the agencies jointly proposed studies to determine the feasibility of developing a joint national aircraft, weather, and homeland security surveillance system, potentially vacating these long-range air surveillance systems from the 1.3-1.35 GHz band.<sup>117</sup>

The agencies received funding from the SRF to study the feasibility of reallocating or sharing spectrum in 1.3-1.35 GHz band and to recover costs associated with sharing or relocating systems.<sup>118</sup> Separately, DOD received funding from the SRF to assess the potential for sharing with commercial users, as some of their systems were expected to remain in the band.<sup>119</sup> Per NTIA, the studies were expected to be completed by 2021, in time for a repurposing decision by January 2022 and an auction by July 2024.<sup>120</sup> However, in its 2023 *Annual Report on the Status of Spectrum Repurposing and Other Initiatives*, NTIA stated that, after such studies, agencies had significant concerns about the impact of repurposing the band on radar systems operating in the 1.3-1.35 GHz band.<sup>121</sup> NTIA noted that it would continue to work with federal stakeholders to identify 30 megahertz for commercial use, as mandated in P.L. 114-74.

Globally, the band is used for the same purpose—long-range radar systems to monitor commercial aircraft. In 2019, the 1.3-1.35 GHz band was proposed for future studies to determine whether it could accommodate mobile use.<sup>122</sup> In 2023, several entities, including the International Civil Aviation Organization—a specialized agency of the United Nations that promotes safety, regularity, and efficiency in global air transit—opposed future studies in the band. It stated that

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<sup>114</sup> P.L. 114-74, Title X. (The act excludes the 1,675-1,695 MHz band from auction.)

<sup>115</sup> P.L. 114-74, Title X, §1007. The act extended the FCC’s auction authority for this 30-megahertz segment through September 30, 2025. For more information, see CRS Report R47258, *FCC Spectrum Auction Authority: Background and Proposals for Extension*, by Jill C. Gallagher and Patricia Moloney Figliola.

<sup>116</sup> NTIA, *Annual Report on the Status of Spectrum Repurposing and Other Initiatives*, March 2023, p. 14, [https://www.ntia.gov/sites/default/files/publications/annual\\_spectrum\\_repurposing\\_initiatives\\_report\\_final.pdf](https://www.ntia.gov/sites/default/files/publications/annual_spectrum_repurposing_initiatives_report_final.pdf).

<sup>117</sup> DOT Office of Inspector General, *FAA Has Taken Steps to Advance the SENSr Program, but Opportunities and Risks Remain*, April 23, 2019, p. 4, <https://www.oig.dot.gov/sites/default/files/FAA%20SENSr%20Program%20Final%20Report%5E04-23-19.pdf>; and NTIA, *Second Annual Report on the Status of Spectrum Repurposing*, December 2020, p. 14, [https://www.ntia.gov/files/ntia/publications/second\\_annual\\_ntia\\_spectrum\\_repurposing\\_report.pdf](https://www.ntia.gov/files/ntia/publications/second_annual_ntia_spectrum_repurposing_report.pdf).

<sup>118</sup> NTIA, *Annual Report on the Status of Spectrum Repurposing*, August 2019, p. 13, [https://www.ntia.gov/files/ntia/publications/second\\_annual\\_ntia\\_spectrum\\_repurposing\\_report.pdf](https://www.ntia.gov/files/ntia/publications/second_annual_ntia_spectrum_repurposing_report.pdf). The SRF is codified at 47 U.S.C. §928.

<sup>119</sup> NTIA, *Annual Report on the Status of Spectrum Repurposing and Other Initiatives*, March 2023, p. 21.

<sup>120</sup> NTIA, *Annual Report on the Status of Spectrum Repurposing*, August 2019, pp. 13-14.

<sup>121</sup> NTIA, *Annual Report on the Status of Spectrum Repurposing and Other Initiatives*, March 2023, p. 21.

<sup>122</sup> Resolution 250 of WRC-19 called for global studies of 1.3-1.35 GHz. See ITU, “ITU-R Preliminary Studies for WRC-27 (Agenda Item 2.9),” <https://www.itu.int/en/ITU-R/study-groups/rcpm/Pages/wrc-27-preliminary-studies.aspx>.

past studies have not shown the potential for compatibility of mobile services in the band, nor are alternative radio frequencies available to support these radar systems.<sup>123</sup>

In March 2025, as Congress contemplated the reallocation and auction of the Lower 3 GHz band, DOD proposed vacating its radar systems from the 1.3-1.35 GHz band.<sup>124</sup> Vacating the band could make up to 50 megahertz of spectrum available for commercial use; however, some have raised concerns about the impact mobile services may have on other systems and agencies operating in the band. In a May 12, 2025, letter to Secretary of Transportation Sean Duffy, Senator Maria Cantwell, Ranking Member of the Senate Committee on Commerce, Science, and Transportation, noted that DOD had proposed spectrum for mobile use where FAA radars operate. She also asked about the impact of such reallocation on FAA systems and safety, and whether DOD had coordinated with the FAA on this proposal.<sup>125</sup>

If the 1.3-1.35 GHz band is identified for reallocation and auction, Congress may seek information on potential impacts to federal systems operating in the band and adjacent bands.<sup>126</sup>

### 1.78-1.85 GHz

In May 2025, DOD suggested that it could vacate its systems from the 1.78-1.85 GHz band. This could make 50 megahertz of spectrum available for mobile services; however, there are other agencies operating in the band—some of which were relocated from the 1.755-1.780 GHz band prior to its auction in 2015.

Prior to 2015, the broader band—1.755-1.850 GHz—was used by more than 20 federal agencies, including DOD, the National Park Service, the U.S. Geological Survey, Bonneville Power Administration, and NASA, for a variety of uses.<sup>127</sup> Starting in 2010, the band was identified for

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<sup>123</sup> International Civil Aviation Organization (ICAO), “Updated ICAO Position for the ITU WRC-23,” July 19, 2023, <https://www.icao.int/sites/default/files/FSMP/SL.2023.60.english.pdf>. (ICAO urged its members to participate in their nations spectrum discussions and delegations to international meetings to ensure their positions reflect aviation needs, including on the 1.3-1.35 band, where proposals to use the band for mobile services could cause harmful interference to incumbent radar systems.) European Conference of Postal and Telecommunications Administration (CEPT), “CEPT Electronic Communications Committee, Status of CEPT Preparation for WRC-23,” September 22, 2023, p. 74, <https://www.itu.int/en/ITU-R/conferences/wrc/2023/Documents/2023-09-22%20Status%20of%20CEPT%20preparation%20for%20WRC-23%20%2822%20September%202023%29rev%201.pdf>. (CEPT coordinates spectrum use in Europe and did not support study of the 1.3-1.35 GHz band in 2023.)

<sup>124</sup> See “DOD Spectrum Proposal,” March 25, 2025, which can be accessed via Jimm Phillips and Howard Buskirk, “DOD Floats Vacating 420 MHz of Spectrum for Auction but Retaining Lower 3 GHz Band,” *Communications Daily*, April 7, 2025, [https://communicationsdaily.com/search/view?search\\_id=42437](https://communicationsdaily.com/search/view?search_id=42437) (link requires paid subscription).

<sup>125</sup> Letter from Sen. Maria Cantwell to Sean Duffy, Secretary of Transportation, May 12, 2025, <https://www.commerce.senate.gov/services/files/17240991-C943-48C7-A51B-7B836736A5A1>.

<sup>126</sup> NTIA, *Annual Report on the Status of Spectrum Repurposing and Other Initiatives*, March 2023, [https://www.ntia.gov/sites/default/files/publications/annual\\_spectrum\\_repurposing\\_initiatives\\_report\\_final.pdf](https://www.ntia.gov/sites/default/files/publications/annual_spectrum_repurposing_initiatives_report_final.pdf). In this report, NTIA notes concerns about reallocation of the band from the National Science Foundation and the impact of mobile services on radio astronomy services operating in the band and on passive remote sensing (reading of natural radio signals for earth observations) in the nearby 1,400-1,427 MHz band.

<sup>127</sup> NTIA, *Commercial Spectrum Enhancement Act: Annual Progress Report for 2023*, September 2024, p. 13, <https://www.ntia.gov/sites/default/files/2024-10/2023-csea-report.pdf>; and 5G Americas, *Mid-Band Spectrum Update*, March 2023, p. 6, <https://www.5gamericas.org/wp-content/uploads/2023/03/Mid-Band-Spectrum-Update-2023-Id.pdf>. (Uses include fixed point-to-point microwave, military tactical radio, air combat training systems, precision-guided munitions, law enforcement mobile video surveillance, telemetry training for federal space systems, air-to-ground telemetry, unmanned aerial systems, and more.)

potential reallocation to mobile use by the FCC and NTIA.<sup>128</sup> In 2015, the Lower segment (1.755-1.780 GHz) was reallocated for advanced wireless services (e.g., mobile services) and auctioned.<sup>129</sup> Certain federal systems were to remain in the band with the spectrum shared between federal and nonfederal users; other systems were relocated to other bands or reconfigured to operate only in the upper segment of the band (1.780-1.850 GHz).<sup>130</sup> The total sharing and relocation costs, which were covered by the auction, were over \$4.5 billion,<sup>131</sup> and the transition took about 10 years to complete.<sup>132</sup>

In 2017, a report prepared for CTIA—the wireless industry association—discussed potential reallocation of the 1.78-1.85 GHz band for shared commercial and federal use, with coordination zones to protect federal operations from any interference from 5G operations.<sup>133</sup> Most recently, DOD proposed vacating its systems from several spectrum bands, including 1.78-1.85 GHz, to make 50 megahertz available for commercial wireless use.<sup>134</sup>

Reallocating and auctioning the band could fulfill spectrum mandates in P.L. 119-21, and proceeds could help to meet budgetary goals. However, some Members of Congress have raised concerns about reallocating the 1.78-1.85 GHz band for commercial use. In particular, Senator Cantwell, in a May 6, 2025, letter to Secretary of Defense Pete Hegseth, expressed concern regarding DOD’s proposal to reallocate and auction certain bands where other agencies also have systems operating in the band. Senator Cantwell stated the need to “understand the full consequences” to all agencies before spectrum is reallocated and auctioned.<sup>135</sup> In addition, in a May 12, 2025, letter to Secretary of Transportation Sean Duffy, Senator Cantwell asked whether DOT had evaluated the potential interference to aviation telemetry and whether DOT was consulted before DOD identified the 1.78-1.85 GHz band for reallocation.<sup>136</sup> If the band is selected for reallocation, Congress may seek to assess the costs, benefits, and timelines for reallocation and any impacts reallocation may have on federal systems operating in the band.

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<sup>128</sup> FCC, *Connecting America: The National Broadband Plan*, March 17, 2010, pp. 86-87, 96-97, <https://transition.fcc.gov/national-broadband-plan/national-broadband-plan.pdf>; and NTIA, *Plan and Timetable to Make Available 500 Megahertz of Spectrum for Wireless Broadband*, October 2010, p. 7, [https://www.ntia.gov/files/ntia/publications/tenyearplan\\_11152010.pdf](https://www.ntia.gov/files/ntia/publications/tenyearplan_11152010.pdf).

<sup>129</sup> FCC, “Auction 97: Advanced Wireless Services (AWS-3),” <https://www.fcc.gov/auction/97>.

<sup>130</sup> NTIA, “1755-1850 MHz,” December 1, 2015, [https://www.ntia.gov/files/ntia/publications/compendium/1755.00-1850.00\\_01DEC15.pdf](https://www.ntia.gov/files/ntia/publications/compendium/1755.00-1850.00_01DEC15.pdf). For affected agencies, see FCC, “The Federal Communications Commission and the National Telecommunications and Information Administration: Coordination Procedures in the 1695-1710 MHz and 1755-1780 MHz Bands (GN-Docket No. 13-185),” public notice, July 18, 2014, pp. 3-4, <https://docs.fcc.gov/public/attachments/DA-14-1023A1.pdf>.

<sup>131</sup> FCC, “Auction of Advanced Wireless Services (AWS-3) Licenses Scheduled for November 13, 2014,” public notice, July 23, 2014, p. 16 (paras. 39-41), <https://docs.fcc.gov/public/attachments/DA-14-1018A1.pdf>. Sharing and relocation costs were funded through AWS-3 spectrum auction proceeds, which yielded over \$42 billion.

<sup>132</sup> NTIA, *Commercial Spectrum Enhancement Act: Annual Progress Report for 2023*, September 2024, p. 13.

<sup>133</sup> Coleman Bazelon, “The Next Wave of Spectrum Reallocation: The Value of Additional Mid-Band Spectrum Reallocations,” Brattle Group (prepared for CTIA), November 14, 2017, p. 5, <https://docs.house.gov/meetings/IF/IF16/20171116/106636/HHRG-115-IF16-20171116-SD005-U5.pdf>.

<sup>134</sup> See “DOD Spectrum Proposal,” March 25, 2025, which can be accessed via Jimm Phillips and Howard Buskirk, “DOD Floats Vacating 420 MHz of Spectrum for Auction but Retaining Lower 3 GHz Band,” *Communications Daily*, April 7, 2025, [https://communicationsdaily.com/search/view?search\\_id=42437](https://communicationsdaily.com/search/view?search_id=42437) (link requires paid subscription).

<sup>135</sup> Letter from Sen. Maria Cantwell to Pete Hegseth, Secretary of Defense, May 6, 2025, <https://www.commerce.senate.gov/services/files/2B29105E-75BF-4D7B-B6B2-7AEC58053698>.

<sup>136</sup> Letter from Sen. Maria Cantwell to Sean Duffy, Secretary of Transportation, May 12, 2025, <https://www.commerce.senate.gov/services/files/17240991-C943-48C7-A51B-7B836736A5A1>.

### 3.55-3.7 GHz

The 3.55-3.7 GHz band (CBRS) is allocated for shared federal and nonfederal use. For this band, the FCC created a three-tiered access and authorization framework to allow federal users priority access and protection from interference, while also allowing some licensed and unlicensed commercial use, coordinated through a third-party-managed spectrum access system (SAS). Licenses were auctioned in August 2020, yielding about \$4.5 billion. Views on usage of this band vary. CTIA asserted in 2023 that the band is underutilized.<sup>137</sup> In November 2024, NTIA reported on increased usage and deployment in the band, including in rural areas.<sup>138</sup>

In May 2025, as Congress considered various bands for reallocation as part of the reconciliation process, DOD was reportedly contemplating a spectrum plan that supported a proposal initiated by AT&T that would move low-power CBRS (Tier III) users to the Lower 3 GHz band to share with DOD systems.<sup>139</sup> The intent would be to reauction the 3.55-3.7 GHz band for exclusive, high-power 5G mobile use. Mobile network operators support the proposal,<sup>140</sup> CBRS users who have invested in the band oppose the plan.<sup>141</sup>

Federated Wireless, a SAS provider, asserted in an August 2025 filing to the FCC that the CBRS federal/nonfederal sharing model has been a success. With over 400,000 deployed CBRS devices, more than 1,200 different network operators, more than 1,000 certified device types, over 2 million consumer devices operating in the band, and no reports of interference to incumbent users, CBRS has exceeded goals for sharing in the band, according to the company.<sup>142</sup> WISPA, an organization that advocates for internet service providers, stated that it relies on CBRS to provide broadband service to thousands of end users, many in rural regions. It argued that changes in use (allowing for increased power levels and expanding Tier II areas) or forcing relocation would require operators either to use existing equipment in a smaller service area (reducing customers) or to invest in higher-power equipment (costing them money).<sup>143</sup> WISPA argued that changing the rules “would strand investment, chill innovation, and impose costs” and affect rural areas.<sup>144</sup> While the CBRS band was not excluded from reallocation and auction in P.L. 119-21, there is some interest in Congress in preserving the band for its existing use. In September 2025, 10 Republican Senators wrote FCC Chairman Brendan Carr urging the Commission to preserve

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<sup>137</sup> CTIA, “CTIA Comments on NTIA CBRS Data Report,” May 31, 2023, <https://www.ctia.org/positions/documents/ctia-comments-on-ntia-cbrs-data-report>.

<sup>138</sup> NTIA, “NTIA Submits Comments on ITS CBRS Usage Report,” November 18, 2024, <https://www.ntia.gov/fcc-filing/2024/ntia-submits-comments-its-cbrs-usage-report>.

<sup>139</sup> Low-power systems enable many users to share the same spectrum, offering specialized services in localized areas at lower power levels to avoid interference among users. Rhonda Johnson, “Ten Years Later: A New Vision for the 3 GHz Band,” *AT&T Connects* (blog), October 9, 2024, <https://www.attconnects.com/ten-years-later-a-new-vision-for-the-3-ghz-band/>; and Mike Dano, “DoD Reportedly Enlists in AT&T’s Plan to Blow Up CBRS,” *Light Reading*, May 1, 2025, <https://www.lightreading.com/5g/dod-reportedly-enlists-in-at-t-s-plan-to-blow-up-cbrs-band>.

<sup>140</sup> Letter from Thomas C. Power, Senior Vice President and General Counsel, CTIA, to Charles Cooper, Acting Director, Institute for Telecommunication Sciences, NTIA, May 31, 2023, <https://its.ntia.gov/media/yz2dhhjd/ctia-comments-on-ntia-tr-23-567.pdf>.

<sup>141</sup> Monica Allevan, “DoD’s Latest Spectrum Proposal Is Not Good for CBRS,” *Fierce Wireless*, May 1, 2025, <https://www.fierce-network.com/wireless/dods-latest-spectrum-proposal-not-looking-good-cbrs>.

<sup>142</sup> Letter from Kurt Schaubach, Chief Technology Officer, Federated Wireless, to Marlene H. Dortch, Secretary, FCC, June 9, 2025, <https://www.fcc.gov/ecfs/document/10609032926080/1>.

<sup>143</sup> Letter from David Zumwalt, President & CEO, WISPA, to Marlene H. Dortch, Secretary, FCC, July 25, 2025, <https://www.fcc.gov/ecfs/document/10725886504287/1>.

<sup>144</sup> Letter from David Zumwalt, President & CEO, WISPA, to Marlene H. Dortch, Secretary, FCC, July 14, 2025, <https://www.fcc.gov/ecfs/document/10714036520689/1>.

existing operations in the CBRS band, to protect rural broadband services and Wi-Fi access, and to support small business investments in the band, competition, and innovation.<sup>145</sup>

In an alternative proposal, DOD suggested that it could vacate its (Navy) radars from the CBRS band to make 100 megahertz of spectrum available for commercial wireless use via auction.<sup>146</sup> This proposal raised concerns among some policymakers. In a May 6, 2025, letter to Secretary of Defense Pete Hegseth, Senator Cantwell raised concerns about recent DOD spectrum proposals and asked the Secretary whether relocating Navy systems from the CBRS band could disrupt DOD detection and response capabilities.<sup>147</sup> While relocating Navy radars from the CBRS band could free spectrum for commercial wireless use, it could also affect DOD systems and capabilities and incumbent users operating in the Lower 3 GHz band, and could present significant costs.

The CBRS band falls within the 1.3-10.5 GHz range targeted for relocation and auction in P.L. 119-21. Options proposed for the band affect users differently. A challenge for the spectrum management agencies is that there are competing pressures. There are mandated spectrum targets and timelines in the act, a limited amount of spectrum available in the range specified, and pressures from Congress to leave the CBRS band intact, due to U.S. security and economic interests.<sup>148</sup> As demand for spectrum increases, Congress may seek to review spectrum holdings, assess spectrum demand, and examine leading and innovative sharing models that promote more efficient spectrum use.

### **5.925-7.125 GHz**

The 6 GHz band (5.925-7.125 GHz) has some licensed users (e.g., utilities, commercial and private entities, public safety agencies) who use the frequencies mainly to transmit data between wireless networks and wireline networks where fiber installation may be challenging. Some broadcasting entities use the band to transmit programming from remote locations and special events, and others use the band to provide satellite services.

In 2020, the FCC adopted rules to also permit unlicensed use in the band. The FCC allows low-power access points to enable Wi-Fi connections, as well as standard-power access points that could enable wireless service providers, in coordination with other users, to extend their network coverage and capacity.<sup>149</sup> The band—1,200 megahertz of spectrum—enabled expansive use of connected devices, meaning that entities could access and use the band without a license (for free), provided that their equipment complies with Wi-Fi 6E standards and FCC terms and conditions designed to avoid interference among users. The band is used heavily for Wi-Fi services and connected devices; an ecosystem of devices that can operate in the band is emerging (e.g., laptops, smartphones, surveillance cameras).

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<sup>145</sup> Letter from Sen. Steve Daines et al. to Brendan Carr, FCC Chairman, September 10, 2025, [https://spectrumfuture.com/wp-content/uploads/2025/09/FILE\\_1767.pdf](https://spectrumfuture.com/wp-content/uploads/2025/09/FILE_1767.pdf).

<sup>146</sup> See “DOD Spectrum Proposal,” March 25, 2025, which can be accessed via Jimm Phillips and Howard Buskirk, “DOD Floats Vacating 420 MHz of Spectrum for Auction but Retaining Lower 3 GHz Band,” *Communications Daily*, April 7, 2025, [https://communicationsdaily.com/search/view?search\\_id=42437](https://communicationsdaily.com/search/view?search_id=42437) (link requires paid subscription).

<sup>147</sup> Letter from Sen. Maria Cantwell to Pete Hegseth, Secretary of Defense, May 6, 2025, <https://www.commerce.senate.gov/services/files/2B29105E-75BF-4D7B-B6B2-7AEC58053698>.

<sup>148</sup> Monica Allevan, “DoD’s Latest Spectrum Proposal Is Not Good for CBRS,” *Fierce Wireless*, May 1, 2025, <https://www.fierce-network.com/wireless/dods-latest-spectrum-proposal-not-looking-good-cbrs>.

<sup>149</sup> FCC, “Unlicensed Use of the 6 GHz Band,” 85 *Federal Register* 31390, May 26, 2020.

Some wireless service providers have petitioned the FCC for changes to allow for higher-power use in the 6 GHz band or to allow for licensed use of the band to accommodate 5G services.<sup>150</sup> They argue that demand for wireless services is increasing; portions of both bands were designated globally for 5G use; “dozens of nations,” including China, have made licensed spectrum in these bands available; and the failure to allocate these bands for mobile use hinders development of equipment by U.S. manufacturers—equipment that could be marketed globally, benefitting U.S. companies and the economy.<sup>151</sup>

Wi-Fi stakeholders (e.g., cable companies, manufacturers, and Big Tech, such as Apple, Facebook, and Google) have opposed these requests to allow for licensed use and have pressed for more spectrum for Wi-Fi.<sup>152</sup> They argue that unlicensed use in the 6 GHz band has spurred innovation and economic growth, and point to a recent study commissioned by a Wi-Fi industry organization finding that allocation of the 6 GHz band generated an estimated \$870 billion in economic value by 2024; that value is projected to increase to \$1.2 trillion by 2027.<sup>153</sup>

Some versions of H.R. 1, the bill that became P.L. 119-21, would have excluded the 6 GHz band from reallocation and auction.<sup>154</sup> Options for Congress include reallocating all or a portion of the 6 GHz band for commercial licensed use to align with international allocations; leaving the 6 GHz band as it is, protecting unlicensed use; or expanding unlicensed use by allocating the adjacent 7.125-7.4 GHz band for unlicensed use.

## **Auction Proceeds**

Estimating proceeds from spectrum auctions is challenging. Potential auction proceeds are driven by the terms of the auction (e.g., the bands auctioned, the amount of spectrum auctioned, restrictions on use, licensing terms, and private sector demand). Proceeds are also driven by costs, including relocation costs, and provisions to allocate proceeds to specific programs or purposes. Below is a discussion of projected auction proceeds under P.L. 119-21.

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<sup>150</sup> Verizon, *Verizon Petition for Reconsideration Before the Federal Communications Commission in the Matter of Unlicensed Use of the 6 GHz Band (ET Docket No. 18-295) and Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz (GN Docket No. 17-183)*, June 25, 2020, pp. 1-2, <https://www.fcc.gov/ecfs/document/106252747102489/1>.

<sup>151</sup> Verizon, *Comments of Verizon Before the U.S. Department of Commerce National Telecommunications and Information Administration in the Matter of Development of National Spectrum Strategy (Docket No. NTIA-2023-0003)*, April 17, 2023, pp. 17-18, <https://www.ntia.doc.gov/sites/default/files/publications/verizon.pdf>; and AT&T, *Comments of AT&T Services, Inc. on a National Spectrum Strategy*, n.d., pp. 14-15, [https://www.ntia.gov/sites/default/files/publications/at\\_t\\_0.pdf](https://www.ntia.gov/sites/default/files/publications/at_t_0.pdf).

<sup>152</sup> Adrian Potoroaca, “Apple, Google and Others Want the FCC to Approve Unlicensed Use of 6 GHz Wi-Fi Band,” *TechSpot*, July 29, 2019, <https://www.techspot.com/news/81184-apple-google-others-want-fcc-approve-unlicensed-use.html>; and Verizon, *Comments of Verizon Before the U.S. Department of Commerce National Telecommunications and Information Administration in the Matter of Development of National Spectrum Strategy (Docket No. NTIA-2023-0003)*, April 17, 2023, pp. 17-18, <https://www.ntia.doc.gov/sites/default/files/publications/verizon.pdf>.

<sup>153</sup> Raul Katz et al., *Assessing the Economic Value of Wi-Fi in the United States*, Telecom Advisory Services, LLC, September 2024, pp. 7-8, <https://wififorward.org/wp-content/uploads/2024/09/Assessing-the-Economic-Value-of-Wi-Fi.pdf>. (The report cites value in such things as profits from production of Wi-Fi equipment, Wi-Fi services sold for a fee, and savings to consumers for using Wi-Fi.)

<sup>154</sup> For more information, see CRS Report R48559, *Proposed Spectrum Provisions in the House Reconciliation Bill (H.R. 1)*, by Jill C. Gallagher.

## CBO Estimates of Auction Proceeds

CBO estimated that the auctions prescribed in P.L. 119-21 would generate \$85 billion in offsetting receipts from FY2025 to FY2034.<sup>155</sup> Estimates of auction proceeds are driven by several factors: the bands auctioned, the terms of use, and funds needed to cover federal relocation or sharing costs, among other things. CBO explains that it has in some cases overestimated receipts from spectrum auctions and in other cases underestimated receipts due to uncertainties surrounding auctions, such as fluctuations in market conditions, changes in technologies that could drive demand and interest in auctions, and the financial and strategic interests of individual wireless companies.<sup>156</sup> Other factors can affect projections of spectrum receipts: uncertainties around the quantity of spectrum that will be available for auction, exact bands to be auctioned, costs to relocate incumbent users, and decisions on auction design<sup>157</sup> that are often made by the FCC after the legislation has passed and CBO has completed its estimate.

In P.L. 119-21, Congress has addressed some of these uncertainties. It restored the FCC's auction authority for the long term, identified specific bands for auction (mainly in the mid-band and Upper mid-band ranges) and specific quantities of spectrum, mandated full-power commercial licensed use, and set timelines for auctions. The act requires NTIA, in its analysis of spectrum bands, to identify the best approach to maximize net proceeds. Congress may defer to the FCC and NTIA to coordinate on spectrum identification. Congress could also exercise its oversight authorities (1) to monitor progress on spectrum identification and reallocation, auction design, and implementation and (2) to ensure auction design maximizes proceeds, that auctions are on schedule, and that actual receipts meet budgetary goals established in P.L. 119-21.

## Treatment of Proceeds

By law, proceeds from spectrum auctions are to be used to cover FCC costs of conducting the auction<sup>158</sup> and federal agency relocation and sharing costs associated with the auction(s);<sup>159</sup> remaining funds are to be deposited into the General Fund of the U.S. Treasury and are to be used to reduce the deficit,<sup>160</sup> unless otherwise specified by Congress. By law, auction proceeds are to cover 110% of federal relocation or sharing costs; the FCC cannot conclude, and must cancel, the auction if the auction proceeds are less than 110% of the federal relocation or sharing costs.<sup>161</sup>

In previous spectrum legislation, Congress has designated a portion of the proceeds for public interest programs, such as public safety communication systems to improve interoperability among agencies and improvements to local 911 centers, and for spectrum research, such as advanced spectrum-sharing technologies and approaches (e.g., see P.L. 112-96, Title VI). Recent

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<sup>155</sup> CBO, "Table 4. Estimated Budgetary Effects of Public Law 119-21, to Provide for Reconciliation Pursuant to Title II of H. Con. Res. 14, Relative to the Budget Enforcement Baseline for Consideration in the Senate, Title IV, Committee on Commerce, Science, and Transportation, As Enacted on July 4, 2025," July 21, 2025, <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.cbo.gov%2Fsystem%2Ffiles%2F2025-07%2F61569-pl119-21-2025Recon-BEB.xlsx&wdOrigin=BROWSELINK>.

<sup>156</sup> Doug Elendorf, "The Accuracy of CBO's Budget Projection," CBO (blog), March 25, 2013, <https://www.cbo.gov/publication/44017>.

<sup>157</sup> Roger Entner, "Lessons from Spectrum Auctions: Entner," *Fierce Network*, February 11, 2021, <https://www.fierce-network.com/regulatory/lessons-from-spectrum-auctions-entner>. (Experts assert that auction design—granting exclusive use in larger license areas, offering unencumbered spectrum [already cleared, or without incumbents], and enabling access to contiguous bands have, in the past, driven spectrum price and proceeds.)

<sup>158</sup> 47 U.S.C. §309(j)(8)(B).

<sup>159</sup> 47 U.S.C. §309(j)(3)(F).

<sup>160</sup> 47 U.S.C. §309(j)(8).

<sup>161</sup> 47 U.S.C. §309(j)(16).

spectrum bills reflected the same approach—allocating proceeds to spectrum-sharing research, next generation 911 improvements, and broadband deployment programs, for example.<sup>162</sup> P.L. 119-21 does not include funding for public interest programs. While some Members proposed amendments that would have directed some spectrum auction proceeds to public safety, cybersecurity, and broadband affordability, the measures were defeated.<sup>163</sup>

Spectrum auctions have generated over \$233 billion in receipts for the U.S. government since they began in 1994.<sup>164</sup> Some Members seek to dedicate the revenues from the sale of this public resource entirely to deficit reduction, while others argue that auction proceeds provide a means to upgrade public safety systems, invest in spectrum research, or fund other public interest programs. In P.L. 119-21, proceeds are dedicated entirely to deficit reduction.

## Timelines

Another issue for Congress is whether the FCC can complete the auctions and activities in the timelines given in the act and expedited in the December 2025 presidential memorandum.

Specifically, within two years of enactment (by July 2027), the FCC is to complete an auction of at least 100 megahertz in the Upper C-band (3.98-4.2 GHz). The FCC has started the process, issuing an NOI in February 2025 and an NPRM in November 2025. In comparison, the auction on the Lower C-band (3.7-3.98 GHz) occurred about three years after it was directed by law.<sup>165</sup> However, the development of altimeter standards in the 4.2-4.4 GHz band, which may affect the terms of spectrum use in the Upper C-band, are ongoing and could affect the auction timeline.

Per P.L. 119-21, NTIA is to identify the remaining spectrum within four years of enactment (by July 2029), and the FCC is to auction that spectrum within eight years of enactment (by July 2033). The December 2025 presidential memorandum expedited these activities, requiring that the head of NTIA immediately begin the process of identifying the 7.125-7.4 GHz band for reallocation for full-power commercial licensed use. The presidential memorandum directs the head of NTIA, in consultation with the White House—specifically, the Assistant to the President for Economic Policy and the Assistant to the President for Science and Technology—to immediately commence studies of the 7.125-7.4 GHz band. Further, NTIA, in consultation with federal incumbents operating in the 7.125-7.4 GHz band, is to determine how to relocate federal systems to other frequencies, including 7.4-8.4 GHz. That study is to be submitted to the President, through the Assistant to the President for Economic Policy, the Assistant to the President for Science and Technology, and the Assistant to the President for National Security Affairs, within 12 months of the presidential memorandum (by December 19, 2026). The study is to also demonstrate how such relocation of systems “will not materially impair the national security missions or electric grid operations that occur in the 7.125-7.4 GHz band, as identified by the Secretary of War and the Director of National Intelligence.”<sup>166</sup> While the NSS Implementation Plan set October 2026 as the deadline for the final report, additional considerations in the

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<sup>162</sup> For example, see H.R. 7624 in the 117<sup>th</sup> Congress and H.R. 3565 in the 118<sup>th</sup> Congress.

<sup>163</sup> Jericho Casper, “House Commerce Advances \$88 Billion Spectrum Auction Plan, Turning Back Amendments,” *Broadband Breakfast*, May 14, 2025, <https://broadbandbreakfast.com/house-commerce-advances-88-billion-spectrum-auction-plan-turning-back-amendments/>.

<sup>164</sup> FCC, “Chairwoman Rosenworcel Statement on the Expiration of FCC Spectrum Auction Authority,” press release, March 10, 2023, <https://docs.fcc.gov/public/attachments/DOC-391576A1.pdf>.

<sup>165</sup> MOBILE NOW Act, P.L. 115-141, Division P, Title VI, §§601 et seq. The MOBILE NOW Act became law on March 23, 2018.

<sup>166</sup> White House, “Winning the 6G Race,” presidential memorandum, December 19, 2025, <https://www.whitehouse.gov/presidential-actions/2025/12/national-security-presidential-memorandum-nspm-8-0bda/>.

presidential memorandum (e.g., consulting with the White House; designating the band for full-power commercial licensed use; assessing impairment to the grid) may affect the study's timeline. As a comparison, per the NSS Implementation Plan, the study of the 3.1-3.45 GHz band took several years. Further, as the 7/8 GHz band is on the agenda for WRC-27, and it is in the interest of the United States to align its spectrum use with global use, outcomes of WRC-27 may also affect 7/8 GHz band use.

Congress may choose to conduct oversight on the activities and timelines prescribed in the act to ensure that spectrum is brought to market and budget goals are met.

## Valuation Report

P.L. 119-21, Title IV, Section 40002(f), provides DOC with \$50 million for the head of NTIA to conduct analysis of three new bands and to publish a biennial report on the value of federal spectrum. Experts have identified challenges in valuing federal spectrum. For example, measuring allocation and actual use is difficult, especially as some use is in a classified setting. There is a lack of market pricing (i.e., no comparatives). National security and public safety considerations complicate economic models; there is no economic value or comparable market value for national security functions. Gauging opportunity costs is difficult, given for example, that all bands do not provide the same characteristics or behave in the same way; some, such as those used in passive sensors for weather data, are unique—there may be a lack of substitutability.<sup>167</sup> Thus, moving users from one band to another is not always possible, nor are the bands always comparable.

Some Members of the 119<sup>th</sup> Congress have proposed legislation with additional instruction for NTIA. For example, S. 792 would direct NTIA, working with the FCC and the Office of Management and Budget, to estimate the value federal spectrum bands would have if the bands were reallocated for licensed or unlicensed commercial wireless use with the highest potential value. It also directs NTIA to use “dynamic scoring,” which accounts for macroeconomic impacts (e.g., secondary impacts) of the reallocation. S. 794 would require the head of NTIA to audit federal spectrum allocation and use and to identify spectrum not being used. Some economists assert that a better system of audits—for both federal and commercial use—would help to identify opportunities for reallocating or sharing spectrum.<sup>168</sup> The challenge of valuation is that spectrum use is continually changing, and new technologies are constantly emerging, creating new demands on spectrum even as incumbent users may be upgrading or relocating systems. For this reason, some Members have advocated for long-term strategic planning and have proposed legislation for inventorying by the FCC and NTIA to facilitate effective spectrum management decisions.<sup>169</sup>

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<sup>167</sup> Sarah Oh Lam and Scott Wallsten, “Federal Spectrum Management Valuation, Management, and Reform: Key Takeaways,” *Technology Policy Institute*, March 6, 2025, <https://techpolicyinstitute.org/publications/broadband/spectrum-and-wireless/federal-spectrum-valuation-management-and-reform-panel-discussion/>; and ITU, *Exploring the Value and Economic Valuation of Spectrum*, April 2012, [https://www.itu.int/dms\\_pub/itu-d/opb/pref/D-PREF-BB.RPT3-2012-PDF-E.pdf](https://www.itu.int/dms_pub/itu-d/opb/pref/D-PREF-BB.RPT3-2012-PDF-E.pdf).

<sup>168</sup> U.S. Congress, Senate Committee on Commerce, Science, and Transportation, *America Offline? How Spectrum Auction Delays Give China the Edge and Cost Us Jobs*, hearing, 119<sup>th</sup> Cong., 1<sup>st</sup> sess., February 19, 2025 (see statements from Dr. Hazlett regarding the need for audit of spectrum use).

<sup>169</sup> For example, see S. 2869.

## Presidential Powers on Spectrum

P.L. 119-21 stipulates that the President shall modify and withdraw any frequency proposed for reallocation under the act no later than 60 days before the commencement of an auction if the President determines that such modification or withdrawal is necessary to protect U.S. national security. While the President has authority to amend, modify, or revoke frequency assignments, these authorities have generally been delegated to the Secretary of Commerce, not including the authority to make final disposition of appeals from frequency assignments.<sup>170</sup>

Given recent spectrum disputes,<sup>171</sup> NTIA, as the spectrum management agency representing federal agency and national spectrum interests in discussions with the FCC, has clarified coordination processes with the FCC in a memorandum of understanding. The agencies are to meet regularly on spectrum, communicate on spectrum actions, and identify as early as possible in the decisionmaking process technical issues that have a likelihood of generating disputes and are to act to assess such issues. If such disputes cannot be resolved by senior spectrum staff, they may be referred to the head of NTIA and to the FCC Chair for consideration.<sup>172</sup>

In some cases, Congress has adopted alternative processes for spectrum dispute resolution in legislation. For example, in the IJA (P.L. 117-58), Congress directed the Secretary of Commerce to identify spectrum, in coordination with the Secretary of Defense and the Director of the Office of Science and Technology Policy, and provided that the Secretary of Commerce may identify frequencies only if the Secretary of Defense determined that sharing those frequencies with nonfederal users would not impact primary military uses in the band.

In the development of the National Defense Authorization Act (NDAA) for Fiscal Year 2026, a similar debate ensued.<sup>173</sup> A version of the NDAA for FY2026 (S. 2296) passed by the Senate in October 2025 would have restricted modifications to the Lower 3 GHz and the 7/8 GHz bands until the DSS model defined in the EMBRSS report is fully operational, unless the Secretary of Defense and the Chairman of the Joint Chiefs of Staff together certify to Congress that the modification would not result in a loss of capability for the armed forces.<sup>174</sup> The House version (H.R. 3838), passed on September 10, 2025, did not include those provisions. Wireless industry associations and several advocacy organizations opposed the Senate provision, arguing that it would undermine the directives in P.L. 119-21, give DOD “veto power” in spectrum decisions, and override presidential authorities.<sup>175</sup> The White House also opposed this provision, stating that

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<sup>170</sup> 47 U.S.C. §902(b)(2)(A).

<sup>171</sup> See CRS In Focus IF12046, *National Spectrum Policy: Interference Issues in the 5G Context*, by Ling Zhu.

<sup>172</sup> NTIA, “Memorandum of Understanding Between the Federal Communications Commission and the National Telecommunications and Information Administration,” August 1, 2022, p. 4, [https://www.ntia.gov/sites/default/files/publications/ntia-fcc-spectrum\\_mou-8.2022.pdf](https://www.ntia.gov/sites/default/files/publications/ntia-fcc-spectrum_mou-8.2022.pdf).

<sup>173</sup> Jimm Phillips, “Cruz, Pro-DOD Senators Tussle Over NDAA Language to Halt Military Spectrum Reallocation,” *Communications Daily*, October 8, 2025, [https://communicationsdaily.com/article/2025/10/08/cruz-prodod-senators-tussle-over-ndaa-language-to-halt-military-spectrum-reallocation-2510070037?BC=bc\\_69987e3d7c809](https://communicationsdaily.com/article/2025/10/08/cruz-prodod-senators-tussle-over-ndaa-language-to-halt-military-spectrum-reallocation-2510070037?BC=bc_69987e3d7c809).

<sup>174</sup> S. 2296, Division A, Title XV, Subtitle D, §1564.

<sup>175</sup> Letter from Ajit Pai, President and CEO of CTIA, to Sen. John Thune, Sen. Chuck Schumer, Rep. Mike Johnson, and Rep. Hakeem Jeffries, November 13, 2025, <https://api.ctia.org/wp-content/uploads/2025/11/CTIA-Letter-to-Leadership-11-13-25-1.pdf>; Deborah Collier, “DOD Must Not Be Allowed to Veto Spectrum Availability,” *Citizens Against Government Waste*, October 16, 2025, <https://www.cagw.org/dod-must-not-be-allowed-to-veto-spectrum-availability/>; and Free State Foundation (@FSFthinktank), “I agree w/@dcolliercagw @GovWaste on this. And there is an additional reason @SenatorFischer’s amendment should be stricken. It would preclude the president from exercising ultimate control of the Executive Branch. This violates #separationofpowers,” X post, October 16, 2025.

it would hinder the President’s executive authority.<sup>176</sup> The final NDAA for FY2026 (P.L. 119-60), enacted December 18, 2025, did not include the provision.

In the NSS Implementation Plan, the executive branch specified a dispute resolution process. For the Lower 3 GHz and the 7/8 GHz bands, the plan states, “Outstanding issues arising from the study implementation, results, or recommendations (if any) will be subject to resolution as set forth in the President’s February 4, 2021, Memorandum on Renewing the National Security Council System. Furthermore, the Office of the Joint Chiefs of Staff may, if it so chooses, provide a written National Security Risk Assessment to the President through the Secretary of Defense before any decision is made to repurpose this band.”<sup>177</sup> The 2021 presidential memorandum specifies that the National Security Council shall be the “principal forum for consideration of national security policy issues requiring Presidential determination,” and establishes interagency committees to consider issues affecting national security and to advise the President.<sup>178</sup>

On December 19, 2025, directly after signing the NDAA for FY2026, President Trump issued a presidential memorandum, “Winning the 6G Race,” which accelerates studies of several bands, focusing particularly on reallocation of federal systems in the 7.125-7.4 GHz band, and provides for extensive involvement of White House officials in spectrum relocation studies and decisionmaking. While coordination with the White House could add complexity and time to spectrum decisionmaking, some experts assert that involvement from the White House on spectrum issues could focus and enhance interagency coordination on critical spectrum issues and support U.S. leadership on global spectrum policy.<sup>179</sup>

## Concluding Observations

In P.L. 119-21, Congress established a spectrum pipeline—it identified quantities of spectrum for reallocation, specific bands for reallocation, and bands for future study. Freeing spectrum for commercial use can spur innovation, improve services, yield economic gains, and bolster U.S. leadership in the global telecommunications market. Given increasing wireless technology use, rising demand for spectrum from multiple emerging technologies (e.g., mobile, satellite, Wi-Fi), and current spectrum use by federal and nonfederal users, spectrum reallocation is expected to be challenging and time consuming. Considering mandates in P.L. 119-21 and in the December 2025 presidential memorandum, the FCC and NTIA may face challenges in identifying and reallocating 800 megahertz of spectrum for full-power commercial licensed use in the spectrum range and timelines specified in the act.

As Congress is relying on proceeds from spectrum auctions to fund provisions in P.L. 119-21, it may seek to monitor (1) agencies’ progress in identifying spectrum for reallocation; (2) bands selected for reallocation; (3) the impact of reallocation on incumbent users, including federal

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<sup>176</sup> White House, “Statement of Administration Policy: S. 2296 – National Defense Authorization Act for Fiscal Year 2026,” September 9, 2025, p. 7, <https://www.whitehouse.gov/wp-content/uploads/2025/09/SAP-S2296-Senate-NDAA-9.9.25.pdf>.

<sup>177</sup> NTIA, *National Spectrum Strategy Implementation Plan*, March 2024, pp. A-6, A-9, <https://www.ntia.gov/sites/default/files/publications/national-spectrum-strategy-implementation-plan.pdf>.

<sup>178</sup> White House, “Memorandum on Renewing the National Security Council System,” presidential memorandum, February 4, 2021, <https://www.presidency.ucsb.edu/documents/memorandum-renewing-the-national-security-council-system>.

<sup>179</sup> U.S. Congress, Senate Committee on Commerce, Science, and Transportation, *America Offline? How Spectrum Auction Delays Give China the Edge and Cost Us Jobs*, hearing, 119<sup>th</sup> Cong., 1<sup>st</sup> sess., February 19, 2025 (e.g., see statements supporting involvement of the White House in spectrum decisions from Matt Pearl, Director, Strategic Technologies Program, Center for Strategic & International Studies).

agency users performing critical functions; and (4) auction proceeds and timelines to ensure budgetary targets are met. Options for Congress include pursuing additional auctions of other bands under study or reallocation of bands identified globally for specific technologies (e.g., satellite). Areas of debate may include balancing spectrum needs among federal and nonfederal users and among various technologies (e.g., mobile, satellite, Wi-Fi, and other emerging technologies).

## Appendix A. Background on Spectrum

*Spectrum* refers to the range of radio waves that enable wireless communications. These waves can travel through space at the speed of light. They can be generated naturally, from the Sun, for example, or artificially using technologies such as transmitters found in smartphones, AM/FM transmitters, and radar systems. Radio waves have different wavelengths, frequency rates (i.e., oscillation rates), and energy levels. The frequency is measured in *hertz* (Hz), or cycles per second. For a wave with a frequency rate of

- 1 kilohertz (kHz), 1,000 waves pass through a given point in the interval of one second;
- 1 megahertz (MHz), 1 million waves pass through a given point in the interval of one second; and
- 1 gigahertz (GHz), 1 billion waves pass through a given point in the interval of one second.

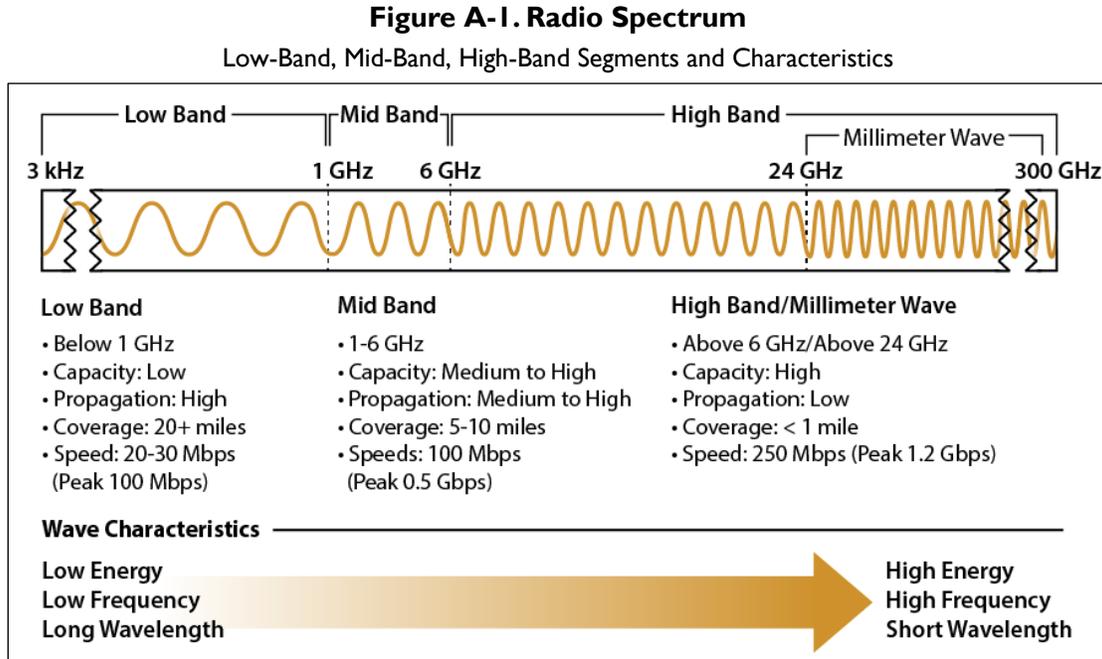
Frequency and wavelength have an inverse relationship. High energy, high frequency waves have shorter wavelengths; low energy, low frequency waves have longer wavelengths. Each wave (known by its frequency, such as 99.5 MHz or 7.125 GHz) has different characteristics, which cause them to behave differently from one another. Lower frequency waves can bend around obstacles, allowing them to travel longer distances than higher frequency waves; these waves are useful for carrying communications across wide areas. Higher frequency waves can carry more data (i.e., more bits per second) than lower frequency waves but are more easily absorbed in the environment, which limits their range.<sup>180</sup>

Wireless telecommunication providers deploy transmitters to generate radio waves that can carry communications from one location to another wirelessly. Providers rely on different bands (or sets of radio frequencies) to provide service.

- **Low-band spectrum**—radio waves with frequencies below 1 GHz. These low-frequency radio waves have long wavelengths, can travel long distances (50 to 100 miles from a cell site) and around obstacles with less attenuation (i.e., signal loss), enabling reliable, wide area coverage; however, low-band spectrum typically has less capacity to carry data and lower transmission speeds.
- **Mid-band spectrum**—radio waves with frequencies in the 1-6 GHz range. These radio waves can travel moderate distances (e.g., a few miles to 25 miles), offering broad coverage, ability to penetrate obstacles, and capacity to carry more data than low-band frequencies, and at higher speeds. These characteristics make mid-band spectrum optimal for mobile communications and valuable to providers.
- **High-band spectrum**—radio waves with frequencies above 6 GHz. These high-frequency radio waves have shorter wavelengths and limited range (less than a mile) and limited ability to penetrate obstacles (e.g., walls, trees); however, these high-frequency waves have the greatest capacity to carry data at high speeds and with less latency (i.e., lag time).

<sup>180</sup> In telecommunications, voice and data communications are converted into digital data—a series of 0s and 1s (called binary digits). Binary digits (*bits*) are the most basic unit of data in computing and digital communications. Radio frequency waves can be altered (or modulated) to represent and transmit the binary data. Each cycle of a wave can be modulated to represent a single bit of data (0 or 1). With more cycles per second, more bits per second can be transmitted, effectively increasing the data rate. Thus, higher frequency waves can transmit more data.

**Figure A-1** depicts the radio spectrum—the range of radio waves that enables various wireless communications (e.g., mobile use, including cellular; AM/FM radio; satellite television; Wi-Fi; military radio communications on the ground, in the air, and at sea; military radar and detection for national security; air traffic control systems; and research).



**Source:** CRS.

**Notes:** This graphic shows the radio spectrum, that is, those frequencies from 3 kilohertz (kHz) to 300 gigahertz (GHz), and their characteristics. It shows low-band (below 1 GHz), mid-band (1-6 GHz), and high-band (above 6 GHz), and their characteristics. Kiloherztz is a measure of a wave oscillation rate equivalent to 1,000 waves passing through a one-second interval; gigahertz is a radio wave with an oscillation rate equivalent to 1 billion wave crests passing through a one-second interval. Megabits per second (Mbps) refers to the speed of data transfer over a network. At 20-30 Mbps, users can typically stream videos, download large files, and support multiple connected devices in the home, for example. A speed of 100 Mbps could support more people streaming and browsing simultaneously, high-definition streaming, online gaming, video conferencing, and file downloads. Speeds above 250 Mbps and into gigahertz speeds can support multiple users streaming high-definition video, simultaneous online gaming, ultrafast downloads, reliable video calls.

Different technologies rely on different radio frequency bands to transmit voice and data. Transmitters are built to transmit on certain frequencies or across a range of frequencies. The selection of frequencies is not random. Service providers and manufacturers pair technologies with certain frequencies to develop new uses. Service providers must obtain permission from government regulators to transmit on those frequencies. Regulators ensure that the assignment of frequencies for a new user or use does not interfere with others operating in the same band in the same area. Equipment is typically built to operate within a range of frequencies; changing an entity’s frequency assignments may affect its ability to transmit and receive communications or may change aspects of its transmissions (e.g., coverage and capacity).

As new technologies emerge and require access to spectrum to operate, regulators will need to examine incumbent use, opportunities for sharing frequencies in the band, potential for interference, costs and benefits of reallocating spectrum (e.g., changing use of the band) and relocating incumbent users, and other methods to maximize spectrum use. In some cases, regulators will need to press for improvements to technologies to improve spectrum efficiency.

While spectrum is an unlimited resource, preferences for certain bands can lead to congestion or interference in those bands, which can limit access. With technological advancement, some technologies have been engineered to be more spectrally efficient, which can free spectrum for new uses. Since most of the radio spectrum is in use, finding spectrum for new uses is challenging. Regulators may open bands for sharing, designate a segment of a band for a new use, or relocate incumbent users to make spectrum available for new uses.

## **Spectrum Management in the United States**

Spectrum—the radio waves that enable wireless communications—is a public resource. In the United States, spectrum access and use are managed by two agencies: the National Telecommunications and Information Administration (NTIA), an agency in the Department of Commerce that manages federal use, and the Federal Communications Commission (FCC), which manages nonfederal (e.g., commercial) spectrum use. Together, the agencies coordinate to manage spectrum use in the United States.

NTIA can assign specific frequencies to federal agencies. The FCC may assign frequencies to nonfederal entities (e.g., state and local police, satellite operators) through an administrative process or, when two or more mutually exclusive applicants seek an initial spectrum license (i.e., request to use the same frequencies), must grant the license through competitive bidding (i.e., auction).<sup>181</sup> Auctions enable entities to bid on licenses, which grant them rights to use specific frequencies in certain geographic areas.

After auctions, the FCC awards licenses to the highest bidders. The FCC may place conditions on licenses, such as requirements to operate within specified technical parameters prescribed by the FCC to avoid interference with other users, and obligations to offer wireless services in a set timeframe.

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<sup>181</sup> 47 U.S.C. §309(j).

## Appendix B. Spectrum Previously Allocated to Commercial Licensed Use

Over the last 25 years, the U.S. government has allocated spectrum to support commercial wireless use—for both licensed and unlicensed use. In its 2023 *Annual Report on the Status of Spectrum Repurposing and Other Initiatives*, NTIA said that over 15,214 megahertz of spectrum have been made available for commercial wireless use, including

- 250 megahertz of low-band spectrum, consisting of 210 megahertz for licensed use and 40 megahertz for unlicensed use;
- 3,014 megahertz of mid-band spectrum, consisting of 1,150.5 megahertz for licensed use and 1,863.5 megahertz for unlicensed use; and
- 11,950 megahertz of high-band spectrum, consisting of 4,950 megahertz for licensed use and 7,000 megahertz for unlicensed use.

Per the National Telecommunications and Information Administration (NTIA), an additional 7,235 megahertz is under study as of March 2023; most of that (6,750 megahertz) is high-band spectrum, as it is relatively unencumbered and offers some characteristics (e.g., high data capacity) that are useful to commercial wireless service providers.<sup>182</sup>

The FCC identifies the following bands allocated for licensed mobile service (**Table B-1**).<sup>183</sup>

**Table B-1. Allocated Spectrum Suitable and Available for Mobile Service**

Band <sup>a</sup>	Frequencies <sup>b</sup>	Suitable and Available Spectrum <sup>a</sup>
Low-Band (Below 1 GHz) Spectrum		
600 MHz	614-698 MHz*	70 megahertz
700 MHz	698-806 MHz	70 megahertz
Cellular	824-849 MHz 869-894 MHz	50 megahertz
SMR	800/900 MHz	14 megahertz
<b>Total</b>		<b>204 megahertz</b>
Mid-Band (1-6 GHz) Spectrum		
AWS-3	1695-1710 MHz 1755-1780 MHz* 2155-2180 MHz*	65 megahertz
PCS	1850-1990 MHz	120 megahertz
PCS G Block	1910-1915 MHz 1990-1995 MHz	10 megahertz

<sup>182</sup> NTIA, *Annual Report on the Status of Spectrum Repurposing and Other Initiatives*, March 2023, p. 14, [https://www.ntia.gov/sites/default/files/publications/annual\\_spectrum\\_repurposing\\_initiatives\\_report\\_final.pdf](https://www.ntia.gov/sites/default/files/publications/annual_spectrum_repurposing_initiatives_report_final.pdf).

<sup>183</sup> **Table 1** shows the bands that the FCC has identified as “suitable and available” for mobile service. The FCC reviews transactions (e.g., mergers, acquisitions of spectrum licenses) to assess whether the transaction would result in one company holding a concentration of licenses. Transactions that meet or exceed the screen amounts trigger a more intensive review of transactions. For more information, see FCC, “Policies Regarding Mobile Spectrum Holdings,” <https://www.fcc.gov/wireless/bureau-divisions/competition-infrastructure-policy-division/policies-regarding-mobile>.

PCS H Block	1915-1920 MHz* 1995-2000 MHz*	10 megahertz
AWS-1	1710-1755 MHz 2110-2155 MHz	90 megahertz
AWS-4	2000-2020 MHz* 2180-2200 MHz*	40 megahertz
WCS	2305-2320 MHz* 2345-2360 MHz*	20 megahertz
BRS	2496-2690 MHz	67.5 megahertz
EBS	2496-2690 MHz	117.5 megahertz
3.45 GHz	3.45-3.55 GHz*	100 megahertz
CBRS	3.55-3.65 GHz*	0 megahertz <sup>d</sup>
C-Band	3.7-3.98 GHz*	280 megahertz
<b>Total</b>		920 megahertz
<b>High-Band or Millimeter Wave (24 GHz+) Spectrum</b>		
24 GHz	24.25-24.45 GHz 24.75-25.25 GHz	700 megahertz
28 GHz	27.500-27.925 GHz 27.925-28.350 GHz	850 megahertz
37 GHz	37.6-38.6 GHz	1,000 megahertz
39 GHz	38.6-40.0 GHz	1,400 megahertz
47 GHz	47.2-48.2 GHz	1,000 megahertz
<b>Total</b>		4,950 megahertz

**Source:** CRS, based on Federal Communications Commission (FCC) notices: FCC, *In the Matter of Policies Regarding Mobile Spectrum Holdings*, May 15, 2014, pp. 36-58, <https://docs.fcc.gov/public/attachments/FCC-14-63A1.pdf>; FCC, *In the Matter of T-Mobile License, LLC*, February 27, 2024, pp. 14, 16 (fn. 128), <https://docs.fcc.gov/public/attachments/DA-24-171A1.pdf>.

**Notes:** SMR = Specialized Mobile Radio; AWS = Advanced Wireless Services; PCS = Personal Communication Services; WCS = Wireless Communication Service; BRS = Broadband Radio Service; EBS = Educational Broadband Service; CBRS = Citizens Broadband Radio Service. Amounts marked with an asterisk indicate bands identified in the National Telecommunications and Information Administration’s (NTIA’s) *Plan and Timetable to Make Available 500 Megahertz of Spectrum for Wireless Broadband*, October 2010, [https://www.ntia.doc.gov/files/ntia/publications/tenyearplan\\_11152010.pdf](https://www.ntia.doc.gov/files/ntia/publications/tenyearplan_11152010.pdf).

- a. Bands have been named by different entities over time, including the International Telecommunications Union (ITU), an agency of the United Nations that facilitates global communications; the FCC; the Institute of Electrical and Electronics Engineers (IEEE), a professional organization and standards-making body; U.S. and foreign military agencies; and the North Atlantic Treaty Organization (NATO). Industry analysts report that bands were often named by the engineers or scientists who pioneered their use. Some bands were named for a reason (e.g., C-band was a “compromise” band, providing medium-range coverage where only long- and short-range satellite coverage existed); the origin of other band names is unknown. Band names used in this table are those used by the FCC. For more information, see “Why Are Frequency Band Designations So Confusing?,” *Military + Aerospace Electronics*, February 19, 2019, <https://www.militaryaerospace.com/directory/blog/14059687/why-are-frequency-band-designations-so-confusing>.
- b. These are frequencies deemed suitable and available for mobile service. The abbreviation “MHz” (megahertz) or “GHz” (gigahertz) is used to indicate a specific frequency or range of frequencies in the band.

- c. This shows the bandwidth or size of the band. The term “megahertz” is spelled out when it refers to bandwidth. In some cases, the FCC provides an exact number for the total suitable and available spectrum; sometimes it rounds the number upward. Thus, total amounts listed in this table are approximate.
- d. The CBRS band has three tiers of users. Tier I is federal users, who have primary access; Tier II is commercial mobile service providers with Priority Access Licenses, who can use the band but must yield to Tier I users; and Tier III is general authorized access users, who can use the band as long as they do not interfere with Tier I and Tier II users. The FCC counts the band as mobile spectrum, but due to its shared nature, the FCC does not attribute a specific bandwidth.

A substantial amount of spectrum has been allocated for commercial licensed use, which commercial mobile service providers monetize by providing services to customers (e.g., individuals, businesses, government) or by leasing it to other users, such as mobile virtual network operators (e.g., Red Pocket Mobile), other wireless service providers, or, potentially, satellite service providers.

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