



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Telecommunications and**  
**Information Administration**  
Washington, D.C. 20230

JUN 4 2014

The Honorable John D. Rockefeller IV  
Chairman  
Committee on Commerce, Science, and Transportation  
United States Senate  
Washington, DC 20510

RE: Notification Pursuant to 47 U.S.C. § 923(j)(2) Regarding the 1695-1710 MHz and  
1755-1780 MHz Spectrum Bands

Dear Mr. Chairman:

In accordance with Section 113(j)(2) of the National Telecommunications and Information Administration (NTIA) Organization Act, as amended, NTIA hereby provides notification of its determination that relocation of certain federal entities from the 1695-1710 MHz and 1755-1780 MHz spectrum bands is not feasible because of technical or cost constraints.<sup>1</sup> In evaluating these bands for possible reallocation for exclusive non-federal use or shared use, NTIA initially gave priority to options involving reallocation for exclusive non-federal use, but determined that technical or cost constraints (or both) required it to select options involving shared use.<sup>2</sup> This notification provides details on the specific technical or cost constraints on which NTIA based these determinations.

#### 1695-1710 MHz Band

Federal government entities operate meteorological satellite systems in the 1695-1710 MHz band. In preparing the October 2010 *Fast Track Report*,<sup>3</sup> NTIA, in consultation with the Office of Management and Budget (OMB) and the other federal agencies on the Policy and Plans Steering Group (PPSG),<sup>4</sup> evaluated the federal systems operating in the 1695-1710 MHz band

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<sup>1</sup> 47 U.S.C. § 923(j)(2).

<sup>2</sup> *Id.* § 923(j)(1), which provides as follows:

In evaluating a band of frequencies for possible reallocation for exclusive non-Federal use or shared use, the NTIA shall give priority to options involving reallocation of the band for exclusive non-Federal use and shall choose options involving shared use only when it determines, in consultation with the Director of the Office of Management and Budget, that relocation of a Federal entity from the band is not feasible because of technical or cost constraints.

<sup>3</sup> See NTIA, *An Assessment of the Near-Term Viability of Accommodating Wireless Broadband Systems in the 1675-1710 MHz, 1755-1780 MHz, 3500-3650 MHz, and 4200-4220 MHz, 4380-4400 MHz Bands* (Oct. 2010) (*Fast Track Report*); see also U.S. Dept. of Commerce, *Identification of 15 Megahertz of Spectrum Between 1675 and 1710 MHz for Reallocation from Federal Use to Non-Federal Use Pursuant to Section 6401(a) of the Middle Class Tax Relief and Job Creation Act of 2012* (Feb. 2013).

<sup>4</sup> See White House, *Memorandum for the Heads of Executive Departments and Agencies: Unleashing the Wireless Broadband Revolution* at § 1(c) (rel. June 28, 2010), published at 75 Fed. Reg. 38387 (July 1, 2010).

and determined that relocation of these systems would not be technically feasible or cost effective based on operational needs and life cycles of the satellites in orbit. The meteorological satellites and associated earth station facilities deployed by the federal agencies will continue to operate in this band for many years and it is not possible to change the frequencies on which they operate. Foreign countries also operate satellites in this band in accordance with the worldwide allocation for the meteorological-satellite service (space-to-Earth) and the United States Government and other entities download their data. As long as the satellites continue to operate, key satellite receivers must be protected to receive and disseminate this critical data, which is used daily for weather prediction. These predictions are broadcast throughout the United States over television and radio and provide information critical to protect life and property.

Prior to enactment of the above-referenced statutory provision, NTIA proposed that the Federal Communications Commission (FCC) reallocate the 1695-1710 MHz band to accommodate new commercial broadband wireless services on a shared basis, subject to certain contingencies and assumptions. NTIA recommended that the FCC implement geographic exclusion zones to protect federal operations from harmful interference from new wireless broadband operations. Industry commenters subsequently urged further evaluation that could potentially reduce the impact of such exclusion zones to make the band more attractive and useful for wireless broadband operations.<sup>5</sup> In that regard, NTIA tasked a working group of its Commerce Spectrum Management Advisory Committee (CSMAC) to evaluate improved modeling of commercial wireless networks and possible reduction of the exclusion zones. The CSMAC working group studied the potential interference from new commercial systems into meteorological-satellite earth station receivers and, based on its studies, recommended establishment of more flexible protection zones around earth stations within which a commercial system could operate after successful coordination.<sup>6</sup> As a result, the potential impact on the population within such zones would be substantially reduced.<sup>7</sup>

The CSMAC working group also recommended that NTIA consider the feasibility of moving earth stations away from the most heavily populated areas or using remote receive locations to maximize commercial use of the band.<sup>8</sup> Federal users on the working group noted that there were significant technical and cost challenges to relocating receive locations or using remote receiver locations. Some of those challenges included ensuring that: a receive site is located in a suitable area to capture necessary data; the location is in a rural enough area to minimize the size of or need for protection zones in high population areas; reliable power is available and adequate/redundant backhaul facilities can be established to ensure highly-reliable reception of data; any delay in receiving raw satellite data introduced by a remote receiver is

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<sup>5</sup> See NTIA, *Third Interim Progress Report on the Ten-Year Plan and Timetable* at 7 (Nov. 29, 2012).

<sup>6</sup> See CSMAC, *Final Report, Working Group 1—1695-1710 MHz Meteorological-Satellite*, Rev. 1 (July 23, 2013).

<sup>7</sup> While the exclusion zones proposed in the *Fast Track Report* would have potentially impacted approximately 13 percent of the United States population, the CSMAC working group's proposed coordination areas would impact only 10 percent of the population (or less based on successful coordination). The proposed coordination zones in the top 100 cities in the country would potentially impact eight percent of the population in those markets. See *id.* at App. 1.1-1.

<sup>8</sup> See *id.* at 7.

minimal and does not negatively impact the government mission; and any suitable site is able to meet applicable environmental statutory and regulatory requirements.

The CSMAC working group did not analyze the costs associated with such options and challenges related to relocating receivers. Nor did NTIA or the affected federal agencies conduct any cost analysis in connection with the feasibility of relocating all federal meteorological satellite operations from the 1695-1710 MHz band.

On March 31, 2014, the FCC amended its rules by allocating the 1695-1710 MHz band to fixed and mobile except aeronautical mobile services on a primary basis for non-federal use for Advanced Wireless Services (AWS).<sup>9</sup> While the FCC retained the primary federal meteorological satellite (space-to-Earth) allocation in the 1695-1710 MHz band, this allocation is limited to the 27 protection zones within which one or more federal earth stations will continue to be protected from harmful interference.

### 1755-1780 MHz Band

A variety of federal systems operate in the 1755-1780 MHz band such as aeronautical telemetry and unmanned aircraft systems, fixed point-to-point microwave links, software defined radios, and video surveillance systems. While initial reallocation feasibility assessments addressed the entire 95 megahertz of spectrum in the 1755-1850 MHz band,<sup>10</sup> the challenges and impact to the federal agencies and the wireless industry's primary interest in the lower 25 megahertz led the Department of Defense (DoD) to present to NTIA an alternative proposal.<sup>11</sup> DoD proposed to relocate or modify certain systems to operate in the upper 1780-1850 MHz band, the 2025-2110 MHz band, and several other federal bands. NTIA endorsed this approach as it would significantly enhance the wireless industry's ability to successfully deploy commercial systems in the 1755-1780 MHz band, reduce the impact of such deployment on federal systems, and reduce estimated transition periods and costs.

Accordingly, NTIA, in consultation with OMB, DoD, and the other federal agencies on the PPSG, determined that most of the federal operations in the 1755-1850 MHz band can relocate to other bands or use alternative technologies, except for four types of military systems that will continue to operate in the band on a shared basis with new commercial wireless

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<sup>9</sup> See FCC, Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands, *Report and Order*, GN Docket No. 13-185, FCC 14-31 at ¶¶ 198-200 (Mar. 31, 2014) (*AWS-3 Report and Order*).

<sup>10</sup> See NTIA, *An Assessment of the Viability of Accommodating Wireless Broadband in the 1755-1850 MHz Band* at 32 (Mar. 2012) (*1755-1850 MHz Report*).

<sup>11</sup> See Letter from Teresa M. Takai, Chief Information Officer, DoD, to Lawrence E. Strickling, Assistant Secretary for Communications and Information, NTIA, U.S. Dept. of Commerce (July 17, 2013) (*attached to* Letter from Karl B. Nebbia, Associate Administrator, Office of Spectrum Management, NTIA, to Julius P. Knapp, Chief, Office of Engineering and Technology, FCC (July 22, 2013)); *see also* Letter from Steve Sharkey, T-Mobile U.S., Inc., to Marlene H. Dortch, Secretary, FCC, WT Docket Nos. 10-123 and 07-195 (June 24, 2013) (Attachment: *Industry Roadmap to Assessing the 1755-1850 MHz Band*).



services. Relocation of these four systems is not technically feasible or cost effective based on the following constraints.<sup>12</sup>

**Satellite Control (Command Uplinks)** – DoD satellites provide communications, navigation, surveillance, missile early warning, weather monitoring, and research and development support. Tracking, telemetry, and command uplinks provide the sole means of sending commands for mission-related functions, positioning, and orbit maintenance of satellites. These uplinks are particularly critical for launch, early orbit, and correcting anomalous operations. Relocation was not considered technically feasible in a reasonable time because of the very long lead-time for satellite space station development and launch. To be cost effective, DoD would need to operate in this band through the lifetime of the satellites currently in orbit (possibly into the 2050s) until their retirement.

DoD estimated the cost to relocate satellite control uplinks from the entire 1755-1850 MHz band to be \$2.35 billion, and said it would cost \$292 million to reduce the size of exclusion zones to the most practical extent possible in the 1755-1780 MHz band within five years through tactics, techniques, procedures, and technical modifications that would not impact operations. Based on recommendations by the CSMAC, NTIA and the FCC determined that commercial operations can co-exist with satellite control systems in the 1761-1780 MHz sub-band through use of protection zones at 25 locations.<sup>13</sup>

**Air Combat Training System (ACTS)** – ACTS provides, via ground-based and airborne components, real-time monitoring of air combat training including gun-scoring; no-drop bombing; evasion and intercept tactics, techniques, and procedures; and electronic warfare. These operations occur at DoD test and training ranges and other flight areas near Reserve and Air National Guard locations, including some civilian airports.

Due to the requirement to ensure highly reliable links, the number of frequency pairs needed to support existing ranges, and frequency separation requirements, it is not technically feasible for DoD to completely relocate this system out of the 1755-1780 MHz band. DoD estimated that it would cost about \$4.5 billion to relocate ACTS out of the 1755-1850 MHz band. DoD also determined that relocating systems out of the 1755-1780 MHz portion of the band within five-years – as a step to complete relocation out of the entire 1755-1850 MHz band – would be impractical. Therefore, DoD did not provide a preliminary estimate of the costs to relocate ACTS out of the 1755-1780 MHz portion of the band.<sup>14</sup> ACTS stations will

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<sup>12</sup> An additional consideration for relocating military systems out of the 1755-1780 MHz band was that alternative bands of frequencies with comparable technical characteristics must be available to restore essential military capability that will be lost. See National Defense Authorization Act for Fiscal Year 2000, Pub. Law No. 106-65, § 1062(a), 113 Stat. 768 (Oct. 5, 1999). NTIA also considered operational constraints and the need to maintain mission-critical operations.

<sup>13</sup> See *AWS-3 Report and Order* at Appendix A, Final Rules, § 2.106, Footnote US91(b)(3). Non-federal base stations must accept harmful interference caused by the operation of federal earth stations at these locations.

<sup>14</sup> See *1755-1850 MHz Report* at 29. DoD was not directed to and did not determine cost estimates for solutions it considered to be unfeasible or assess costs and operational impacts for remaining in the upper 70 megahertz for an indefinite period.

continue to operate on two frequencies within the two geographic zones (in Montana and Wyoming) specified in the FCC's rules.<sup>15</sup>

**Joint Tactical Radio System (JTRS)** – JTRS represents a family of multi-band/multi-mode software defined radios designed to provide communications across a wide frequency range. JTRS operates with new advanced waveforms that enhance performance capabilities in both military and civilian frequency bands. DoD determined that it can accommodate new wireless broadband systems in the 1755-1850 MHz band within five years, but would require exclusion zones at several geographic locations. Therefore, DoD did not provide estimated relocation costs for JTRS as part of its 2010 feasibility study. A CSMAC working group explored ways to reduce the size of proposed exclusion or protection zones, and it recommended a sharing approach and coordination procedures to permit commercial deployment within the JTRS protection zones.<sup>16</sup>

To accommodate new commercial operations in the 1755-1780 MHz band, NTIA determined that most of DoD's JTRS locations will operate within the 1780-1850 MHz band and other frequency ranges within the available JTRS tuning range and pursuant to current regulatory allocations. However, DoD will continue to operate JTRS at six high-priority and critical training locations (in North Carolina, California, New Mexico, Texas, Arizona, and Louisiana) in the entire 1755-1850 MHz band in support of tactical training activities and mission functions.<sup>17</sup> It is not technically viable to compress the JTRS operations into the 1780-1850 MHz band at these six sites since it would pose significant operational impacts at these locations.<sup>18</sup> The entire 1755-1850 MHz band is required so as not to degrade military operations and training functions.

**Electronic Warfare (EW) Operations** – DoD employs EW systems to ensure friendly forces can use spectrum while denying that use to enemies. To ensure the continued protection of military operations, forces must be equipped with cutting edge EW equipment and be thoroughly trained in the most current employment tactics, techniques, and procedures. Many EW systems need to operate in commercial wireless bands as those bands are often used by the enemy.

EW is critical in DoD's Counter-Improvised Explosive Device and Command, Control, and Communications exploitation capabilities. The future threat is driven by the great number of commercial wireless systems being employed in nontraditional ways against United States forces. DoD must retain the ability to develop, test, and train on EW systems that counter existing and emerging threat systems that operate within the 1755-1780 MHz band. As such, costs to relocate EW out of this band were not considered. Therefore, NTIA determined that

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<sup>15</sup> See *AWS-3 Report and Order* at Appendix A, Final Rules, § 2.106, Footnote US91(b)(2).

<sup>16</sup> See *CSMAC Working Group 4: 1755-1850 MHz Point-to-Point Microwave, Tactical Radio Relay (TRR), Joint Tactical Radio System/Software Defined Radio (JTRS/SDR) Final Report* at 15-18 (July 24, 2013).

<sup>17</sup> See *AWS-3 Report and Order* at Appendix A, Final Rules, § 2.106, Footnote US91(b)(1).

<sup>18</sup> See DoD, *Spectrum Reallocation Feasibility Study, 1755-1850 MHz Band* at § 6.10.2.1.2 (Sept. 8, 2011).

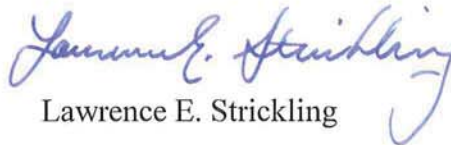
DoD should continue to conduct EW research, training, and other functions, but only on a non-interference basis to commercial operations.<sup>19</sup>

### Conclusion

NTIA is pleased to present this timely notification as the FCC recently announced that the two reallocated spectrum bands addressed herein will be subject to a competitive bidding process that is scheduled to commence on November 13, 2014.<sup>20</sup> On May 13, 2014, NTIA, on behalf of eligible federal agencies, notified the FCC of the initial estimated relocation and sharing costs and the estimated timelines for these two bands.<sup>21</sup> The total estimated relocation and sharing costs for the 1695-1710 MHz band are approximately \$527.1 million. The total estimated relocation or sharing costs for the 1755-1780 MHz band are approximately \$4.576 billion.

NTIA is committed to ensuring that commercial wireless broadband services are widely available while also maintaining critical federal operations and systems where necessary. Should you have any questions, please feel free to contact me or Mr. James V. Wasilewski, Director of Congressional Affairs, at (202) 482-2476.

Sincerely,



Lawrence E. Strickling

Identical letters sent to:

The Honorable John Thune, Ranking Member, Committee on Commerce, Science and Transportation, United States Senate

The Honorable Fred Upton, Chairman, Committee on Energy and Commerce, House of Representatives

The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce House of Representatives

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<sup>19</sup> See *AWS-3 Report and Order* at Appendix A, Final Rules, § 2.106, Footnote US91(c). EW systems in this band are not afforded protection from harmful interference from commercial users, are prohibited from causing harmful interference to other users, and cannot constrain implementation of non-federal AWS operations. This use is restricted to research, development, test, evaluation, training, and large force exercise operations.

<sup>20</sup> See FCC, Auction of Advanced Wireless Services Licenses Scheduled for November 13, 2014, Comment Sought on Competitive Bidding Procedures for Auction 97, *Public Notice*, AU Docket No. 14-78, DA-14-669 (May 19, 2014).

<sup>21</sup> See Letter from Lawrence E. Strickling, Assistant Secretary for Communications and Information, U.S. Dept. of Commerce, NTIA, to Tom Wheeler, Chairman, FCC (May 13, 2014).