



October 5, 2015

TO: Members, Subcommittee on Communications and Technology

FROM: Committee Majority Staff

RE: Hearing entitled “Improving Federal Spectrum Systems”

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## **I. INTRODUCTION**

On Wednesday, October 7, 2015, at 10:15 a.m. in 2322 Rayburn House Office Building, the Subcommittee on Communications and Technology will hold a hearing entitled “Improving Federal Spectrum Systems.”

## **II. WITNESSES**

- Phillip Berenbroick, Counsel, Government Affairs, Public Knowledge;
- Jeffrey H. Reed, Willis G. Worcester Professor in ECE, Virginia Polytechnic Institute and State University; and,
- Dennis A. Roberson, Vice Provost, Research Professor in Computer Science, Illinois Institute of Technology.

## **III. BACKGROUND**

As smartphones, tablets, and other wireless-enabled devices have proliferated, data usage has increased dramatically, and consumer demand for wireless connectivity has grown at an astounding rate, with one report predicting that wireless subscribers worldwide data use will grow 400 percent by 2019.<sup>1</sup> With higher data throughput rates and increased consumer expectations for network performance, the stress on networks necessitates more spectrum to handle the demand. As a result, there has been more than \$260 billion in wireless carrier capital investment over the last ten years, much of which has been directed towards the acquisition of spectrum licenses.<sup>2</sup>

In response to this ever-growing demand, policy-makers have devoted a great deal of focus towards creating a steady supply of commercially usable spectrum. In 2010, the National

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<sup>1</sup> ABI Research, Average Monthly Mobile Data Consumed to Reach 2,289 Megabytes by 2019, Says ABI Research, January 2015; [http://www.businesswire.com/news/home/20150128005900/en/Average-Monthly-Mobile-Data-Consumed-Reach-2289#.VN0p\\_PnF98E](http://www.businesswire.com/news/home/20150128005900/en/Average-Monthly-Mobile-Data-Consumed-Reach-2289#.VN0p_PnF98E) - See more at: <http://www.ctia.org/resource-library/facts-and-infographics/archive/monthly-data-usage#sthash.dHQzZsYR.dpuf>

<sup>2</sup> Background on CTIA’s Wireless Industry Survey, June 2014, [http://www.ctia.org/docs/defaultsource/Facts-Stats/ctia\\_survey\\_ye\\_2013\\_graphics-final.pdf?sfvrsn-2](http://www.ctia.org/docs/defaultsource/Facts-Stats/ctia_survey_ye_2013_graphics-final.pdf?sfvrsn-2).

Broadband Plan called for the Federal Communications Commission (FCC) to make 500 MHz of new spectrum available for broadband use within ten years, with 300 MHz between 225 MHz and 3.7 GHz made available within five years.<sup>3</sup> In June 2010, a Presidential Memorandum ordered National Telecommunications and Information Administration (NTIA) to collaborate with the FCC to identify 500 MHz of spectrum, both Federal and commercial, that could be repurposed to mobile and fixed broadband by 2020, either through sharing or exclusive use.<sup>4</sup> Pursuant to the Memorandum, NTIA, in conjunction with the Policy and Plans Steering Group, issued a Plan and Timetable that identified more than 2,000 MHz of spectrum for evaluation.<sup>5</sup> To date, the FCC and NTIA have made available 245 MHz to be either reallocated for exclusive use or repurposed for sharing.<sup>6</sup>

To meet these goals, Congress, the FCC, and NTIA have worked together to begin the process of identifying, clearing, and reallocating bands of spectrum for commercial use. In 2012, the Committee made a significant advance in meeting carriers and consumers' demand for spectrum through the Middle Class Tax Relief and Job Creation Act of 2012.<sup>7</sup> The Middle Class Tax Relief Act allowed the FCC to auction off spectrum in the 600 MHz band currently used by broadcasters. This auction is expected to commence in March 2016.<sup>8</sup> In addition, the Middle Class Tax Relief Act required the FCC to free up additional spectrum for commercial use, resulting in the auction of 75 MHz of spectrum in the H-Block in 2014<sup>9</sup> and the AWS-3 band earlier this year.<sup>10</sup>

The Middle Class Tax Relief Act also instructed the FCC and NTIA to investigate the potential for increased unlicensed use of the spectrum in the 5 GHz band.<sup>11</sup> As demand for wireless grows, this band can potentially house expanded Wi-Fi use and other unlicensed data services. In March 2014, the FCC adopted an order that modified rules governing the use of unlicensed devices in the 5 GHz band, removing restrictions and improving the usability of the spectrum.<sup>12</sup> Because of the incumbent users in some parts of the 5 GHz band, including Intelligent Transportation Systems and Federal radar systems, the Middle Class Tax Relief Act

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<sup>3</sup> *Connecting America: The National Broadband Plan*, Federal Communications Commission (2010).

<sup>4</sup> [https://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast\\_spectrum\\_report\\_final\\_july\\_20\\_2012.pdf](https://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_spectrum_report_final_july_20_2012.pdf).

<sup>5</sup> NTIA, *Plan and Timetable to Make Available 500 Megahertz of Spectrum for Wireless Broadband* (Oct. 2010), available at [http://www.ntia.doc.gov/files/ntia/publications/tenyearplan\\_11152010.pdf](http://www.ntia.doc.gov/files/ntia/publications/tenyearplan_11152010.pdf).

<sup>6</sup> See "Nearly Halfway to Meeting Spectrum Target," Paige Atkins, (July 2015),

<http://www.ntia.doc.gov/blog/2015/nearly-halfway-meeting-spectrum-target> (identifies the following spectrum as reallocated or made available for sharing: 2305-2320 and 2345-2360 MHz; 1915-1920 and 1995-2000 MHz; 2000-2020 and 2180-2200 MHz; 1695-1710, 1755-1780 and 2155-2180 MHz; and 3550-3650 MHz.).

<sup>7</sup> Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, Sec. 6403 (2012) ("Middle Class Tax Relief Act").

<sup>8</sup> [https://apps.fcc.gov/edocs\\_public/attachmatch/FCC-15-78A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-78A1.pdf).

<sup>9</sup> *Auction of H Block Licenses in the 1915-1920 MHz and 1995-2000 MHz Bands Closes*, AU Docket No. 13-178, Public Notice, 28 FCC Rcd. 13019 (2014).

<sup>10</sup> *Auction of Advanced Wireless Services (AWS-3) Licenses Closes*, AU Docket No. 14-78, Public Notice, 29 FCC Rcd. 8386 (2015).

<sup>11</sup> See Middle Class Tax Relief Act, Sec. 6406.

<sup>12</sup> In the Matter of Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, ET Docket No. 13-49, First Report and Order (2014).

also instructed the FCC and NTIA to examine whether and how to facilitate co-existence among the systems, without harmful interference.<sup>13</sup>

The FCC adopted rules in April 2015 that made an additional 100 MHz available for shared use in the 3.5 GHz band, combining it with 50 MHz of existing commercial use and calling it the Citizens Broadband Radio Service.<sup>14</sup> The band is shared with Department of Defense radar systems through a framework called the Spectrum Access System, which acts as a highly automated frequency coordinator.<sup>15</sup>

While work continues on some portions of the above spectrum, particularly evaluation of the 5 GHz band, the FCC and NTIA have made available a total 245 MHz either to be reallocated for exclusive use or repurposed for sharing, just shy of halfway to the goal for the ten year period and short of the National Broadband Plan's five year target.<sup>16</sup> Additionally, only 75 MHz of the 245 total is truly repurposed spectrum – the remaining spectrum was “made available” through rule changes that enabled users to deploy mobile broadband service.<sup>17</sup>

#### IV. DISCUSSION

Though there has been progress made in achieving the goals set forth by the National Broadband Plan, additional spectrum is still needed to satisfy the spectrum clearing targets. Federally-held spectrum has been considered as an opportunity for consolidating systems and repurposing cleared bands for commercial use as the Federal government is the largest single user of spectrum.

The two primary approaches for making spectrum currently used by Federal agencies available for non-Federal use are reallocation – relocating current government users to new spectrum – and sharing – allowing commercial users and government users to use the same band of spectrum through rules that minimize the potential for interference.

Congress has long expressed its preference for reallocation,<sup>18</sup> as the resulting licenses are better suited to commercial use and typically result in higher auction proceeds for the Treasury. In the past, Federal users have relinquished spectrum and relocated to other bands to make more

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<sup>13</sup> See Middle Class Tax Relief Act, Sec. 6406.

<sup>14</sup> <https://www.fcc.gov/document/citizens-broadband-radio-service-ro>

<sup>15</sup> Id.

<sup>16</sup> See “Nearly Halfway to Meeting Spectrum Target,” Paige Atkins, (July 2015), <http://www.ntia.doc.gov/blog/2015/nearly-halfway-meeting-spectrum-target> (identifies the following spectrum as reallocated or made available for sharing: 2305-2320 and 2345-2360 MHz; 1915-1920 and 1995-2000 MHz; 2000-2020 and 2180-2200 MHz; 1695-1710, 1755-1780 and 2155-2180 MHz; and 3550-3650 MHz.).

<sup>17</sup> See Id., (2305-2320 and 2345-2360 MHz was auctioned in 1997 but included because of 2012 FCC rule changes making the spectrum usable for mobile broadband service; 2000-2020 and 2180-2200 MHz was also considered to be made available because of an FCC rule change allowing terrestrial use for mobile broadband service; and 3550-3650 MHz was made available for shared use due to an FCC rule change).

<sup>18</sup> See Middle Class Tax Relief Act, Sec. 6701(a). “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...that relocation of a Federal entity from the band is not feasible because of technical or cost constraints.”

spectrum available for auction to the private sector, and in return have been compensated for the relocation. To facilitate clearing, the Commercial Spectrum Enhancement Act of 2004 (CSEA) authorizes the FCC to hold auctions of spectrum used by Federal agencies.<sup>19</sup> If the proceeds of the auction cover the cost of relocating the Federal agencies by 110 percent, the winning bidders receive licenses for the spectrum and the Federal agencies receive funding to relocate.<sup>20</sup> In order to facilitate the clearing process, the CSEA also created the Spectrum Relocation Fund (SRF), from which agencies recover their clearing costs. In 2012, the Middle Class Tax Relief Act amended the CSEA to permit Federal entities to receive reimbursement additional expenditures, including planning for auction participation, use of alternative technologies, replacement of equipment, and research and analysis of potential spectrum sharing solutions.<sup>21</sup>

The most recent example of the successful CSEA approach to auctioning and clearing Federal spectrum came pursuant to the provisions of the Middle Class Tax Relief Act of 2012. In 2014, the FCC began the process of clearing and reallocating the spectrum used by Federal agencies in 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz.<sup>22</sup> Coordination among the Department of Defense, FCC, and NTIA, facilitated by the Committee, freed up the 65 MHz of spectrum. The spectrum was auctioned in the AWS-3 auction in late 2014 and generated more than \$44 billion.<sup>23</sup> The success of the AWS-3 auction has prompted further conversations among policymakers, industry, and Federal users about ways to utilize this model as a blueprint for clearing additional spectrum.

## V. LEGISLATION

The discussion draft to be considered at the hearing, the Spectrum Pipeline Act of 2015, directs the FCC to produce a series of reports for the Commerce committees of the House and Senate. The reports, which are designed to mimic the FCC's existing processes in preparation for an auction, will include draft service and auction rules for an auction, relocation plans for incumbent Federal users in the specified frequencies, and specific timelines for the proposed auctions. In addition, the reports will discuss the balance between licensed and unlicensed spectrum. The discussion draft is intended to provide for an ongoing discussion of appropriate frequencies for action and a statutory framework for thoughtful deliberation between the agencies, the Federal Communications Commission, and the Congress.

Additionally, the Subcommittee will consider H.R. 1641, the Federal Spectrum Incentive Act of 2015, sponsored by Representatives Brett Guthrie (R-KY) and Doris Matsui (D-CA). This bill amends the CSEA to allow Federal entities to participate in an incentive auction whereby agencies are compensated through auction proceeds for relinquishment of spectrum authorizations to be auctioned for commercial use. Current law only allows for entities to be reimbursed for the costs of sharing with non-Federal users or relocating. Funds from the

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<sup>19</sup> Commercial Spectrum Enhancement Act of 2004, Pub. L. No. 108-494, (2004) ("CSEA").

<sup>20</sup> *Id.*

<sup>21</sup> See Middle Class Tax Relief Act, Sections 6701-6702.

<sup>22</sup> *Auction of Advanced Wireless Services (AWS-3) Licenses Closes*, AU Docket No. 14-78, Public Notice, 29 FCC Rcd. 8386 (2015).

<sup>23</sup> *Id.*

proceeds would be placed into a fund at the Office of Management and Budget, to be used by participating agencies to offset the costs of relocation and sharing or the budgetary impact of sequestration.

## **VI. STAFF CONTACTS**

If you have any questions regarding this hearing, please contact David Redl or Kelsey Guyselman of the Committee staff at (202) 225-2927.