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**Coordinated Government Decisionmaking on Spectrum Issues:  
It's Vital to Locating More Spectrum for 5G Use**

by

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**I. Introduction and Summary**

The Trump Administration, Congress, and the Federal Communications Commission all recognize that there is a strong public interest in promoting secure, private-sector-driven 5G networks. This agreement, which is bipartisan to boot, recognizes the enormous consumer welfare value to be realized if the U.S. achieves a global leadership role in developing and deploying 5G. Implementation of a national spectrum strategy that frees up additional frequency bands quickly is key to success in accomplishing that objective. Economic studies have demonstrated that more mid-band allocations, in particular, will spur investment, increase GDP, and add American jobs.

In recent years, however, intergovernmental coordination efforts essential to the sharing and reallocation of government-held spectrum have broken down. Moreover, executive branch agency disagreements have crept into areas that by statute fall within the exclusive authority of the FCC. These unfortunate consequences likely are due, at least in some large measure, to the ever-increasing scarcity and value of spectrum. Agencies and departments are more reluctant to surrender their spectrum holdings – and more eager to seize opportunities to add

to their portfolios. As a result, while the coordination process in its current form may have been sufficient to resolve disputes in the past, today it needs improvement to drive the prompt outcomes required to achieve 5G-related goals.

Thus, as the FCC continues its serious drive to deploy sufficient high-, mid-, and low-band spectrum for 5G, its efforts more often have been made more difficult by inconsistent positions taken by some federal executive branch agencies. The resulting lack of a consistently smooth coordination process not only interferes with the efficient and timely deployment of commercial spectrum, but it also hinders efforts to identify additional government spectrum that can be reallocated to, or shared with, commercial wireless users.

To date, several FCC decisions have reallocated approximately 465 MHz of mid-band spectrum (with some significant geographic carve outs for existing users) for carriers to deploy 5G services. But finding additional spectrum for 5G use has become increasingly difficult. New, primarily mid-band, spectrum for commercial use is most likely to be found in spectrum already allocated for federal government use. Government holds huge swaths of mid-band spectrum, perhaps as much as 60 percent.

By statute, the FCC has primary responsibility for licensing and regulating the commercial use of spectrum. The National Telecommunications and Information Administration (NTIA) serves a similar role with respect to spectrum held by various government departments and agencies. Ideally, the two agencies would work together in a collaborative, efficient fashion to identify and make available additional frequency bands for 5G. Particularly within the last two years, however, high-profile disagreements between the FCC, NTIA, and individual federal spectrum users have expanded beyond the interagency coordination process to other fora, including Congress and the court of public opinion. The resulting public nature of these disputes is highly unusual from a historical perspective.

One recent example concerns the use of the 24 GHz band. After the FCC had adopted a final order to reallocate that band for 5G and was only days away from conducting an auction of that band and others, the National Oceanic & Atmospheric Administration (NOAA), National Aeronautics & Space Agency (NASA), and the Department of Defense (DoD), with the help of the Department of Commerce (DoC), tried to stop the auction, claiming that mobile use of 24 GHz could interfere with weather radar systems in an adjacent band. These agencies took this highly unusual step even though the proposed reallocation had been vetted within the Administration and had become the subject of international harmonization efforts. The last-minute interposition of objections may have led to unsatisfactory harmonization of the band internationally.

Another recent and high-profile example involved Ligado Networks (Ligado), which had sought modifications to its existing satellite license to permit terrestrial use of the L-band for 5G services and equipment. The modification proposals had been pending for many years, largely because of substantial delays in the interagency coordination process mostly attributable to DoD and other federal agencies. These agencies claimed to be concerned that Ligado's terrestrial operations could interfere with Global Positioning System (GPS) devices operating in an adjacent band. The FCC decision to approve Ligado's applications, which included a thorough analysis of the engineering facts relating to the claimed interference

concern, concluded that Ligado's terrestrial operations were unlikely to produce harmful interference to GPS devices. Rather than defer to the FCC's statutorily granted decision-making authority, the Department of Defense then publicly sought to have Congress overturn the decision through legislation.

These disputes make the FCC's job of finding more 5G spectrum all the more difficult, and they add excessive delay to the process of reallocation and/or sharing of government-assigned spectrum. They also demonstrate that interagency coordination processes are not working as well as they once did – nor as well as the Administration, the FCC, Congress, and the public have a right to expect. A breakdown of the coordination process bodes ill for pending government spectrum user analyses concerning whether certain spectrum bands used by federal agencies can be reallocated and/or shared with the commercial sector for 5G use. At risk is the potential ability to cooperatively reallocate or share mid-band spectrum, such as the 3.1-3.55 GHz, 1675-1680 MHz, and other bands. The consequences would be potentially serious in undermining the Administration's and Congress' goal of encouraging U.S. global leadership in 5G.

Recognizing that government spectrum holders lack meaningful incentives necessary to encourage voluntary participation in all cases, the Administration and Congress should try to revitalize the interagency coordination process so that it once again is able to produce timely and definitive results. Federal spectrum users, NTIA, and the FCC must recommit to resolving coordination disputes through the intergovernmental process in a timely fashion. That commitment should include accepting outcomes consistent with national policy so long as they are based upon sound technical analysis.

The following steps would help restore and revitalize the coordination process:

- The President should appoint, and the Senate should confirm, a permanent NTIA head whose decisions are supported by the President and the Department of Commerce. In disputes between the FCC and government spectrum users, it is NTIA's responsibility not only to represent government interests, but also to help make sure that the process concludes promptly – and that its constituent agencies accept the results.
- Federal agencies should be directed by the Administration to respect that, at least as to commercial spectrum use, the FCC is the ultimate decisionmaker by statute.
- Congress, recognizing that it has become more difficult for the interagency coordination process to reach consensus in light of increasing spectrum demands, should shoulder more responsibility for setting policy that is consistently applied to all spectrum-related matters. Legislation should support overarching policies and not address particular situations in an ad hoc fashion.
- The Administration, Congress, and the FCC should base decisions on the use of spectrum on solid engineering studies evaluating whether spectrum users can be protected from harmful interference.
- Congress should enact meaningful incentives for government agencies to offer spectrum for reallocation and/or sharing with commercial 5G providers. A variety of worthy proposals have been put forward, including the establishment of a federal

agency spectrum inventory, assigning a market value to existing government spectrum allocations, and conducting incentive auctions like those used to reallocate over-the-air broadcasting spectrum.

In order to achieve the Administration's national priority of encouraging U.S. global leadership in 5G, agencies must work together to rapidly identify and reallocate spectrum, particularly mid-band spectrum. While it is almost certainly not possible to eliminate all future disputes between NTIA, on the one hand, and the FCC, on the other, changes to the intergovernmental cooperation process that produce sound and timely spectrum decisions would be a win for the American consumer and economy.

## **II. Government Recognizes U.S. Global Leadership in 5G Is Tied to Finding Additional Mid-Band Spectrum**

Because of the tangible economic and consumer welfare benefits of U.S. leadership in 5G, President Donald Trump recognizes the value of secure, private-sector-driven 5G networks.<sup>1</sup> The Administration, therefore, has made 5G deployment a national priority. In particular, in October 2018, President Trump issued a Presidential Memorandum<sup>2</sup> asking NTIA, in consultation with other government institutions and the FCC, to develop a long-term national spectrum strategy.

According to the Presidential Memorandum, that strategy should include legislative, regulatory, or other policy recommendations to "increase spectrum access for all users, including on a shared basis, through transparency of spectrum use and improved cooperation and collaboration between Federal and non-Federal spectrum stakeholders." Thus, the Administration appears to envision that the intergovernmental coordination process will resolve disagreements and free additional spectrum – including spectrum currently used by government. The FCC, for its part, pursuant to Chairman Ajit Pai's 5G Fast Plan, has been moving full steam ahead to allocate additional low-, mid-, and high-band spectrum to meet private sector needs to deploy 5G in a prompt time frame.<sup>3</sup>

In an age of routine political bickering, the search for mid-band spectrum for commercial 5G use is truly bipartisan. RAY BAUM'S Act of 2018<sup>4</sup> was enacted two years ago. Among other

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<sup>1</sup> Remarks by President Trump on United States 5G Deployment (Apr. 12, 2019), *available at* <https://www.whitehouse.gov/briefings-statements/remarks-president-trump-united-states-5g-deployment/>.

<sup>2</sup> Presidential Memorandum on Developing a Sustainable Spectrum Strategy for America's Future (issued Oct. 25, 2018), *available at* <https://www.whitehouse.gov/presidential-actions/presidential-memorandum-developing-sustainable-spectrum-strategy-americas-future/>.

<sup>3</sup> *See, e.g.*, Gregory J. Vogt, "Getting to 'Yes' on Allocating Mid-Band Spectrum," *Perspectives from FSF Scholars*, Vol. 14, No. 13 (May 15, 2019), *available at* <https://freestatefoundation.org/wp-content/uploads/2019/08/Getting-to-Yes-on-Allocating-Identified-5G-Mid-band-Spectrum-051519.pdf>.

<sup>4</sup> Repack Airwaves Yielding Better Access for Users of Modern Services Act (RAY BAUM'S Act of 2018), enacted as part of the Consolidated Appropriations Act, 2018, Rules Committee Print 115-66 (enacted Mar. 23, 2018).

things, RAY BAUM'S Act mandated that at least 255 MHz of mid-band spectrum be allocated for wireless mobile and fixed broadband use no later than December 31, 2022, in line with the Obama Administration's 2010 500 MHz allocation goal, and requires government to conduct a feasibility study for commercial/government sharing of spectrum between 3.1 and 3.5 GHz and between 3.7 and 4.2 GHz. This goal likely underestimates the amount of spectrum needed as consumer demand for wireless services surges, but nevertheless is a clear expression of Congress' intent to reallocate spectrum currently held by government to commercial use.

Additional mid-band spectrum is required if U.S.-based 5G providers are to ensure the United States maintains a leading role in the development of 5G.<sup>5</sup> A number of econometric studies have demonstrated the huge enhanced consumer welfare value associated with wireless services like 5G. For example, in February 2019 the Analysis Group estimated that with 400 MHz of mid-band spectrum 5G could spur \$274 billion in GDP growth, adding 1.3 million new jobs.<sup>6</sup>

U.S. leadership in 5G will produce enormous benefits not only to the world economy, but more specifically to U.S. companies and consumers. Some have argued that U.S. leadership in 4G drove a \$100 billion increase to the U.S. economy.<sup>7</sup> A major economic spur similarly is expected in the 5G arena as well.<sup>8</sup>

Concern has been raised that other countries have been more aggressive than the U.S. in allocating mid-band spectrum for 5G use.<sup>9</sup> Others argue that the U.S. has embraced a holistic approach to spectrum allocation and has been aggressive in allocating a mix of low-, mid-, and high-band spectrum for 5G use.<sup>10</sup> Regardless of who is right, there is little doubt that allocation of sufficient spectrum, particularly mid-band spectrum, for 5G is critical to achieve

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<sup>5</sup> David Absecassis, Chris Nickerson, Janette Stewart, Analysys Mason, "Global Race to 5G – Spectrum and Infrastructure Plans and Priorities" (Apr. 2018), *available at* <https://www.ctia.org/news/global-race-to-5g-spectrum-and-infrastructure-plans-and-priorities>.

<sup>6</sup> See David Sosa and Greg Rafert, Analysis Group, "The Economic Impacts of Reallocating Mid-Band Spectrum to 5G in the United States" 1, 4-5 (Feb. 2019), *available at* <https://api.ctia.org/wp-content/uploads/2019/02/The-Economic-Impacts-of-Reallocating-Mid-Band-Spectrum-to-5G-1.pdf>.

<sup>7</sup> Meredith Atwell Baker, "The Wireless Race the United States Must Win," Morning Consult (Apr. 17, 2018), *available at* <https://morningconsult.com/opinions/the-wireless-race-the-united-states-must-win/>.

<sup>8</sup> James Prieger, "An Economic Analysis of 5G Wireless Deployment: Impact on the U.S. and Local Economies," *Perspectives from FSF Scholars*, Vol. 15, No. 28 (Jun. 1, 2020), *available at* <https://freestatefoundation.org/wp-content/uploads/2020/06/An-Economic-Analysis-of-5G-Wireless-Deployment-060120.pdf>.

<sup>9</sup> Statement of Commissioner Jessica Rosenworcel Dissenting, *Expanding Flexible Use of 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Report & Order of Proposed Modification, FCC 20-22 (rel. Mar. 3, 2020) (C-Band R&O); CTIA, "5G Mid-Band Spectrum Band Global Update" (Mar. 23, 2020), *available at* <https://www.ctia.org/news/report-5g-mid-band-spectrum-global-update>.

<sup>10</sup> Statement of Chairman Ajit Pai, C-Band R&O.

global first-to-market advantages that can produce the enormous consumer welfare benefits noted above. That demands an interagency coordination process able to reach conclusions swiftly and with finality.

### **III. Spectrum Reallocation Decisions Are Increasingly More Difficult Because of Scarcity**

Spectrum is a finite resource. After the FCC decisions to reallocate spectrum in the 2.5 (116.5 MHz),<sup>11</sup> 3.5 (70 MHz),<sup>12</sup> and 3.7-4.2 (280 MHz)<sup>13</sup> GHz bands for 5G use, which together free approximately 465 MHz (with some significant geographic carve-outs for existing users of spectrum), finding additional spectrum for 5G has become increasingly difficult. Existing uses must either be moved to other spectrum or subjected to rules designed to allow for sharing. Sharing schemes can be complicated, requiring new procedures, such as automatic frequency coordination, to mitigate potential interference and enhance efficiency.

New commercial spectrum, primarily mid-band spectrum, is most likely to be found in spectrum already allocated to government. Government uses huge swaths of mid-band spectrum, perhaps as much as 60 percent. Studies of government operations often identify spectrum bands that have only limited geographic or time uses.<sup>14</sup> Government also has older equipment that is not as efficient as more modern technology, limiting the ability to reuse spectrum through technical antenna configurations such as wireless carriers widely use today.

To be fair, part of the reason that government does not become more efficient is rooted in the antiquated budget process that does not provide agencies with funding to update spectrum use and equipment with newer technology. The MOBILE NOW Act did provide some funding for research into the feasibility of relocating existing uses to other spectrum bands. But it is limited to 1 percent of the receipts achieved through auction of previously identified government spectrum, which is a relatively paltry sum.

In order to achieve 5G-related goals, spectrum currently used by government agencies and departments must be reallocated to, or shared with, commercial users. This need not harm current or future operations, because government spectrum often is unused, used in limited geographic areas or at discrete times, or used in a manner less efficient than current technology allows. But it will require those agencies and departments to surrender certain rights to spectrum. Legislation can initiate and define that process. Interagency coordination efforts that enjoy buy-in from all parties can be productive in achieving results. As described in the next section, however, that process is failing. Government spectrum holders

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<sup>11</sup> *Transforming the 2.5 GHz Band*, WT Docket No. 18-120, Report & Order, FCC 19-62 (rel. Jul. 11, 2019).

<sup>12</sup> *Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258, Report & Order, FCC 18-149, ¶ 3 (rel. Oct. 24, 2018).

<sup>13</sup> C-Band R&O.

<sup>14</sup> *See, e.g.*, Department of Commerce, "Quantitative Assessments of Spectrum Usage" (Nov. 2016) ("Quantitative Assessments"), available at <https://www.ntia.doc.gov/report/2016/quantitative-assessments-spectrum-usage>.

increasingly appear unwilling to compromise, instead dragging their feet and turning to Congress, the Administration, and the press to protect their assets.

#### **IV. Recent Spectrum Decisions Have Laid Bare a Breakdown in the Interagency Coordination Process**

Within the last two years, federal agencies have demonstrated an increased willingness to escalate their concerns about FCC licensing decisions beyond the interagency coordination process, even for spectrum allocated for private commercial use.

##### **A. 24 GHz**

On March 13, 2019, the day before the 24 GHz band auction was scheduled to begin, Reps. Bernice Johnson (D-TX) and Frank Lucas (R-OK) sent a letter to the FCC that expressed concern on behalf of NOAA, NASA, and DoD about potential interference to weather data collection in an adjacent band.<sup>15</sup> The Department of Navy raised similar concerns in a belated March 27, 2019 memorandum.<sup>16</sup> The FCC rightfully rejected these late-filed objections because it found no evidence of interference to the adjacent band in the rulemaking record compiled a year earlier.<sup>17</sup> As the agency entrusted by statute to resolve, based on the submitted records, such technical questions regarding commercially allocated spectrum, the courts have upheld the Commission's judgment unless it is "arbitrary or capricious."

In a closely related matter, the FCC developed a proposal for consideration at the World Radiocommunication Conference (WRC) 15 that would give co-primary status in the 24 GHz band worldwide to mobile services, except aeronautical mobile.<sup>18</sup> This proposal would have harmonized globally the FCC's licensing approach to the 24 GHz band. After it was published on February 28, 2019, Commerce Secretary Wilbur Ross and NASA Administrator Jim Bridenstine sent a letter to Chairman Pai requesting that the proposal be deleted from the FCC's public website, claiming that the issue had not been coordinated adequately with government users of the adjacent 23 GHz band.<sup>19</sup> Chairman Pai rejected that request on March 8, reasserting that the matter in fact had been fully coordinated with the

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<sup>15</sup> Letter from Chairwoman Eddie Bernice Johnson and Ranking Member Frank Lucas, Committee on Science, Space, and Technology, U.S. House of Representatives, to Chairman Ajit Pai, FCC (Mar. 13, 2019), *available at* <https://science.house.gov/imo/media/doc/Pai%20FCC%20Letter.pdf>.

<sup>16</sup> Capt. Marc Eckardt, OPNAV, Information Brief (Mar. 27, 2019), *available at* <https://www.wyden.senate.gov/imo/media/doc/Navy%2024Hz%205G%20Spectrum%20Impacts.pdf>. The memorandum did not include any data or studies.

<sup>17</sup> Letter from Chairman Ajit Pai, FCC, to Eddie Bernice Johnson, Chairwoman, Committee on Science, Space and Technology, U.S. House of Representatives (Apr. 29, 2019), *available at* <https://docs.fcc.gov/public/attachments/DOC-357582A1.pdf>.

<sup>18</sup> U.S. contributions sent to CITEL PCC.II (Nov. 13, 2018), *available at* <https://www.fcc.gov/us-contributions-sent-citel-pccii-0>.

<sup>19</sup> Letter described in P. Kirby, Wolters Kluwer, "FCC Rejects Request to Delay 24 GHz Band Auction" (Mar. 13, 2019), *available at* <https://lrus.wolterskluwer.com/news/tr-daily/fcc-rejects-request-to-delay-24-ghz-band-auction/75119/>.

Administration, and that reallocating 24 GHz spectrum to 5G use was the consensus decision reached.<sup>20</sup> Pai's open frustration with NASA and the Commerce Department was evident: he chided them for actively lobbying foreign delegations against the official WRC proposal, even though the State Department fully supported the proposed agenda item at the WRC.

The WRC eventually agreed to harmonize the 24 GHz band in accordance with the official U.S. position. But the Conference adopted power levels for the service that could seriously undermine the value of the 24 GHz band.<sup>21</sup> Did the ongoing dispute among different agencies of the federal government, and between the FCC and two agencies of the federal government, adversely impact the WRC result? We may never know the answer to that question, but it certainly could not have helped. As a result, the usefulness of the 24 GHz band for 5G is now subject to debate.

## **B. L-Band**

Ligado was granted an FCC satellite license. It later sought license modifications to provide terrestrial mobile services using its existing satellite spectrum. These L-Band frequencies are currently allocated to base stations in the 1526-1536 MHz portion of the Mobile Satellite Service (MSS) downlink band, user equipment in the 1627.5-1637.5 MHz band, and the 1646.5-1656.5 MHz portions of the MSS uplink band. Ligado's license modifications were designed to conform to agreements that Ligado had made with the largest commercial GPS manufacturers to reduce the potential for interference in adjacent bands used for GPS transmissions. The federal government performed tests to determine whether advanced GPS systems would receive harmful interference from the proposed adjacent L-Band terrestrial operations. Ligado made additional modifications to its technical operations proposal in response to government concerns. In April 2018, the Positioning, Navigation & Timing (PNT) Executive Committee determined that it had enough information as a result of the tests to make a decision on the question,<sup>22</sup> but the PNT Advisory Board, a federal advisory committee of private companies and individuals, still was not satisfied.

Eventually, NTIA sent the FCC a letter in December 2019 indicating that it was "unable to recommend" grant of Ligado's modification applications.<sup>23</sup> At that point it was up to the FCC to decide whether to grant or deny Ligado's modified applications. Nevertheless, after this

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<sup>20</sup> Debra Werner, SpaceNews, "FCC rejects call for last-minute meeting with NASA and Commerce Department" (Mar. 8, 2019), available at <https://spacenews.com/5g-trumps-weather-in-spectrum-debate/>.

<sup>21</sup> Paul Kirby, Wolters Kluwer, "WRC-19 Reaches Compromise on 24 GHz Band" (Nov. 21, 2019), available at <https://rus.wolterskluwer.com/news/tr-daily/wrc-19-reaches-compromise-on-24-ghz-band/99776/>.

<sup>22</sup> The PNT Executive Committee is a presidentially-mandated committee, jointly headed by the Departments of Transportation and Defense, and includes a number of agencies that rely on GPS systems and equipment operating in the adjacent band.

<sup>23</sup> Letter from Douglas W. Kinkoph, Deputy Assistant Secretary for Communications and Information (Acting), National Telecommunications and Information Administration, U.S. Dept. of Commerce, to Ajit Pai, Chairman, FCC, IB Docket No. 11-109, at 2 (filed Dec. 6, 2019).



letter, DoD and NTIA did not stand down. To the contrary, their opposition to Ligado's modified applications became more vocal and public.

In April 2020, the Commission adopted an Order and Authorization that granted Ligado's modified applications.<sup>24</sup> The unanimous decision will allow Ligado to deploy a low-power terrestrial nationwide network utilizing mid-band spectrum in the L Band for advanced wireless services, including 5G. The decision thoroughly analyzed the potential harmful interference issues that parties had raised in the proceeding. It rejected DoD's argument that Ligado's proposed operation might interfere with GPS devices, including advanced GPS systems used by DoD and other federal agencies. In the context of that analysis, the FCC rejected DoD's argument that potential harmful interference in the adjacent band should be evaluated on whether Ligado's operations raised, to any GPS receiver, the floor noise, i.e., created a "1db c/N<sub>0</sub> degradation with respect to any satellite within view."<sup>25</sup> The FCC concluded that the 1 db metric "does not assess and is not directly correlated with harmful interference."<sup>26</sup> And no studies were presented to the FCC to show Ligado's proposed operations would produce harmful interference to GPS receivers operating in the adjacent band.

Admittedly, this analysis is extremely technical. The key, however, is that the FCC has frequently indicated that it is required to protect spectrum users from "harmful interference" caused by others, including co-channel and adjacent channel spectrum users, and in this case it relied on engineering and operational facts to make its determination that such users in fact would be so protected, a conclusion which is reviewable in court pursuant to the statutory "arbitrary and capricious" test. Given the appellate precedent, it is unlikely the courts will reverse the FCC's expert judgment on engineering technical matters, absent the failure to address specific relevant arguments on evidence in the record.

Rather than defer to the FCC's statutory authority to make the final call, it is apparent that DoD approached members of Congress to aid it in challenging the FCC's decision. A Senate hearing was held in the Armed Services Committee,<sup>27</sup> but no FCC commissioner or Ligado official was called to testify at this arguably one-sided hearing.

Certainly, Congress has a legitimate oversight role with respect to FCC decisions, and it can pass legislation to reverse an FCC decision. Nevertheless, the dispute among Administration

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<sup>24</sup> *Ligado Amendment to License Modification Applications*, IB Docket No. 11-109, Order and Authorization, FCC 20-48 (rel. Apr. 22, 2020) ("Ligado Order").

<sup>25</sup> *Id.* at ¶ 38.

<sup>26</sup> *Id.* at ¶ 47.

<sup>27</sup> U.S. Senate Armed Services Committee Hearing, 116th Cong., Department of Defense Spectrum Policy and the Impact of the Federal Communication Commission's Ligado Decision on National Security (May 6, 2020), *archived video recording available at* <https://www.armed-services.senate.gov/hearings/20-05-06-department-of-defense-spectrum-policy-and-the-impact-of-the-federal-communications-commissions-ligado-decision-on-national-security>.

departments, and between DoD and the FCC, unreasonably lengthened the pendency of the Ligado applications and made the FCC's decisionmaking process more difficult.

### C. 3.1-3.55 GHz

Although the foregoing two examples involve private spectrum, they have potentially grave implications for the ability of interagency coordination to lead to the reallocation and/or sharing of government-held mid-band spectrum for commercial 5G use.

A recent NTIA Report<sup>28</sup> recognizes that the MOBILE NOW Act required NTIA by March 2020 to submit to Congress a report on the feasibility of sharing the 3.1 to 3.55 GHz band between federal spectrum users and commercial licensed and unlicensed users.<sup>29</sup> NTIA previously had made a "high level assessment" of the band and determined that the top 100 MHz (3.45 to 3.55 GHz), which currently is allocated to the DoD for military radar systems, exhibited the most promising opportunity for shared use.<sup>30</sup> NTIA required DoD to conduct on a priority basis feasibility studies for two bands, including the 3.1-3.55 GHz band, and was expected to schedule the due date for DoD's supplemental information in this band in January 2020.<sup>31</sup>

Since that time, very little has been said about the requested DoD supplemental information. NTIA did release a limited study of the use of the upper portion of the band in April,<sup>32</sup> but it is unclear whether this is all that will be forthcoming from either NTIA or DoD.

The reallocation of the 3.45 to 3.55 GHz band for private use would be consistent with approaches being considered for 5G by foreign countries. It also makes sense because, given that the 3.5 and 3.7-4.0 GHz bands already are allocated for flexible mobile use, it would create a roughly contiguous band in the 3 to 4 GHz range that could be used for 5G.

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<sup>28</sup> U.S. Department of Commerce, "Annual Report on the Status of Spectrum Repurposing" (Aug. 2019) ("NTIA Spectrum Repurposing Report"), *available at* [https://www.ntia.doc.gov/files/ntia/publications/spectrum\\_repurposing\\_report\\_august\\_2019.pdf](https://www.ntia.doc.gov/files/ntia/publications/spectrum_repurposing_report_august_2019.pdf).

<sup>29</sup> NTIA Spectrum Repurposing Report, at 20.

<sup>30</sup> National Telecommunications & Information Administration, Blog Posting, "NTIA Identifies 3450-3550 MHz for Study as a Potential Band for Wireless Broadband Use" (Feb. 26, 2018), *available at* <https://www.ntia.doc.gov/blog/2018/ntia-identifies-3450-3550-mhz-study-potential-band-wireless-broadband-use>.

<sup>31</sup> Diane Rinaldo, Acting Assistant Secretary of Commerce for Communications and Information, Department of Commerce (Aug. 1, 2019), *available at* [https://www.ntia.doc.gov/files/ntia/publications/guidance\\_to\\_agencies\\_on\\_current\\_spectrum\\_usage\\_final\\_08-01-2019.pdf](https://www.ntia.doc.gov/files/ntia/publications/guidance_to_agencies_on_current_spectrum_usage_final_08-01-2019.pdf).

<sup>32</sup> National Telecommunications & Information Administration, Report No. 20-548, 3.45-3.65 GHz Spectrum Occupancy from Long-Term Measurements in 2018 and 2019 at Four Coastal Sites (Apr. 2020), *available at* <https://www.its.bldrdoc.gov/publications/details.aspx?pub=3243>.

The required assessments are taking too long, particularly for the previously identified 3.45-3.55 GHz part of the band. More transparency concerning the status of this process should be provided so that private interests can make future deployment plans. But more to the point, this unexplained and lengthy delay may serve as additional evidence of the foot-dragging, perhaps based on federal agency self-interest in retaining spectrum it uses, observed in other spectrum decisions – foot-dragging that undermines both interagency coordination efforts and the achievement of overriding national policy concerns like success in the global race to 5G.

#### **D. Other Federal Spectrum Bands**

Additional spectrum bands used by the federal government have also been the subject of preliminary discussions for reallocation or sharing. The foregoing agency disputes regarding 5G spectrum reallocation decisions highlight how critical it is to U.S. 5G global leadership for the Administration and Congress to get the interagency coordination process back on track.

A year ago the FCC initiated a proceeding proposing to allow terrestrial broadband use of the 1675-1680 MHz band, subject to protection of current users.<sup>33</sup> The band currently is allocated to both federal and non-federal users of radiosonde and meteorological space-to-earth services. The federal government repeatedly has proposed to reallocate the spectrum for shared use with federal weather satellites. Some services are scheduled to be moved to other spectrum, but the timing of such a move is still uncertain. There continue to be non-federal weather-related earth station users that raise interference concerns, but these issues are slated to be addressed in the proceeding. The FCC's initiation of the rulemaking proceeding is positive, but its successful resolution will require that the Commission and NTIA are able to work together to resolve these issues in a timely manner.

Although the 1675-1680 band is a relatively small swath of spectrum, it is one more piece of the puzzle of locating usable blocks of mid-band spectrum for 5G. Indeed, in a statement issued regarding the Commission's notice, Commissioner Carr said this referencing adjacent L-band spectrum: "The 5 MHz before us is a small sliver of spectrum, to be sure. But if it's combined with adjacent and nearby channels, we could have a 40 MHz block that offers high-throughput at great distance. Those are excellent characteristics for next-gen mobile broadband."<sup>34</sup>

NTIA also has asked federal agencies, including DoD, to study and report on their use of the 7.125 to 8.4 MHz band.<sup>35</sup> Other frequencies have been identified for potential reallocation, as well.<sup>36</sup>

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<sup>33</sup> *Allocation of Service Rules for the 1675-1680 MHz Band*, WT Docket No. 19-116, Notice of Proposed Rulemaking, FCC 19-43 (rel. May 13, 2019).

<sup>34</sup> *Id.*, Statement of Commissioner Brendan Carr, at 1.

<sup>35</sup> Memorandum from Diane Rinaldo, Assistant Secretary of Commerce for Communications and Information (Acting) to Executive Branch Department and Agencies (Aug. 1, 2019), available at <https://www.ntia.doc.gov/press-release/2019/federal-agencies-asked-review-current-frequency-assignments>.

<sup>36</sup> Quantitative Assessments, at 7, Table 1-2.

These efforts to make additional mid-band spectrum available for 5G will hinge upon close coordination, and compromise, among federal spectrum users and the FCC.

## **V. The Federal Government Should Recommit to Meeting the President's 5G Leadership Goal**

The solutions to the current inability of the interagency coordination process to produce timely and final results are fairly straightforward. First, the federal government writ large must take steps to shore up the traditional coordination framework that has worked well in the past. Second, Congress should enact real incentives for government agencies to relinquish inefficiently used spectrum.

### **A. Better Coordinated Spectrum Decisions Will Aid the National Goal of Making Additional Mid-Band Spectrum Available for 5G**

The breakdown of the interagency coordination process became very public during a Senate Commerce Committee FCC Oversight hearing on June 12, 2019, when Chairman Pai indicated that one government agency has been undermining "at every turn" allocation of additional 5G spectrum due to its concerns about interference with government operations.<sup>37</sup> The Chairman specifically called out the DoC's interference with respect to the 24 GHz band. FCC Commissioner Michael O'Rielly agreed with the Chairman's assessment.

Perhaps one incident could be chalked up to bureaucratic miscommunication. But the frequent escalation of intergovernmental disputes beyond the intended coordination process reflects a systemic breakdown, one that highlights the strong objections government spectrum users have to relinquishing valuable assets. While rationally motivated, these impasses make it more difficult for the FCC to locate and assign in a timely fashion spectrum where needed to provide the advanced services that American consumers demand. And the Administration speaking with multiple voices leads to unsettled policymaking both domestically and internationally and delays vital decisions to locate additional 5G spectrum.

Traditionally, the Administration has coordinated spectrum use disputes among agencies through negotiations between NTIA and the FCC, which have served the nation well. Recent events make clear, however, that without strong NTIA leadership, backed up by the Department of Commerce and the President, such coordination efforts are not likely to be successful or reach sound results. Appointing, and securing Senate confirmation of, a permanent NTIA head would go a long way toward returning to normalcy. The President and the head of the Department of Commerce should then commit to achieving uniform Administration positions to present to the FCC and international spectrum organizations.

The Administration also should respect that, at least as to commercial spectrum use, the FCC is the decisionmaker by statute. The NTIA is free to raise concerns during the pendency of a

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<sup>37</sup> U.S. Senate Committee on Commerce, Science, & Transportation Hearing, Oversight of the Federal Communications Commission (Jun. 12, 2019), *archived video recording available at <https://www.commerce.senate.gov/2019/6/oversight-of-the-federal-communications-commission>*.

proceeding, but once a decision is made, the Administration should work to uniformly implement that decision.

Congress should provide structure and clarity to government spectrum sharing/reallocation by taking a more active role in policymaking to prevent agencies and departments from resorting to whatever tools available to protect their spectrum assets, as the examples above demonstrate. In addition, while Congress may pass laws that govern how the FCC exercises its decisionmaking authority, legislation always should be adopted that does not produce ad hoc results that are not consistent with past legislative efforts. Congress's major recent policy positions on 5G were represented by passage of the MOBILE NOW Act and the Spectrum Pipeline Act, both of which firmly signaled that additional spectrum (including spectrum currently used by government) must be found for commercial use, in particular 5G.

Finally, spectrum decisions must be based on facts, including solid engineering studies evaluating whether existing spectrum users can be relocated to different bands or, in sharing scenarios, protected from harmful interference.<sup>38</sup> Courts rightfully demand a careful weighing of facts.

#### **B. Government Must Alter Meaningfully the Way in Which It Evaluates Spectrum Usage and Value**

Despite the consistent bipartisan push to identify and reallocate for commercial use additional government spectrum, existing users are not moving with sufficient speed to achieve 5G policy objectives. I recognize that there are vital national security, public safety, and other government needs for spectrum that complicate these efforts. The fact remains, however, that government is an essential source for more mid-band spectrum: a 2012 White House report (PCAST Report) estimated that the federal government occupied about 60% of the spectrum in the range of 225 MHz and 3.7 GHz, which totals approximately 2,417 megahertz.<sup>39</sup> Much of this spectrum was allocated years ago during a far different technological era. And it is well known, in many instances, that the existing equipment government uses has been supplanted by more efficient technology and equipment.

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<sup>38</sup> See Randolph J. May and Seth L. Cooper, "FCC's Order Approving Ligado's Next-Gen Wireless Network: A Deliberative Process that Protects Against Signal Interference," *Perspectives from FSF Scholars*, Vol. 15, No. 25 (May 21, 2020), available at <https://freestatefoundation.org/wp-content/uploads/2020/05/FCCs-Order-Approving-Ligados-Next-Gen-Wireless-Network-052120.pdf>.

<sup>39</sup> Executive Office of the President, President's Council of Advisors on Science and Technology, "Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth," at 8 (Jul. 2012), available at [https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/pcast\\_spectrum\\_report\\_final\\_july\\_20\\_2012.pdf](https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/pcast_spectrum_report_final_july_20_2012.pdf).

As I have said in the past, it is time for a bold new approach to provide government with a market-oriented incentive to become more efficient and vacate occupied spectrum.<sup>40</sup>

There is a significant "opportunity cost" associated with government spectrum, which is defined as the loss of potential benefits when a suboptimal alternative is chosen over one that would generate higher consumer welfare. In May 2015, Coleman Bazelon and Giulia McHenry estimated the economic value of 645.5 MHz of licensed spectrum in the hands of government users was \$455 billion.<sup>41</sup> If this spectrum was auctioned off to commercial users, it would generate about \$1.7 trillion in 2015 dollars in economic activity.

The government therefore must become more rigorous in its management of spectrum resources. In January 2019, Free State Foundation scholars filed comments with NTIA on the future of government spectrum strategy, including 5G spectrum, that advocated adherence to the following principles:<sup>42</sup>

- *NTIA Should Issue an Annual Report Calculating the Market Value of Federal Government Spectrum*
- *The OMB Should Have a Role in Auditing Federal Spectrum Holdings*
- *The Spectrum Relocation Fund Should Become a Spectrum Incentive Fund*
- *Agencies Should Be Assessed Spectrum Fees*
- *Agencies Should Be Allowed to Use Spectrum Holdings to Offset Budget Appropriations*
- *The Transparency and Accountability of Government Spectrum Decisions Should Be Increased*

Finally, recent inquiries regarding whether government should be allowed access to commercial spectrum, termed "bidirectional sharing," should be viewed with extreme caution. It appears that some DoD proposals for "bidirectional sharing" in fact would impose exclusive government control over spectrum licensed for commercial operations. Such approaches fail to recognize the serious detriment to private investment that would be caused by unpredictable government operating environments that have been described as "chaotic."

It should also be recognized that DoD has been actively evaluating general 5G technology development in order to make sure that DoD can utilize commercial technology and devices

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<sup>40</sup> Gregory J. Vogt, "Avoiding a Train Wreck: Giving Government a Market Incentive to Vacate Spectrum," *Perspectives from FSF Scholars*, Vol. 9, No. 26 (Aug. 5, 2015), available at <https://freestatefoundation.org/wp-content/uploads/2019/06/Avoiding-a-Train-Wreck-Giving-Government-a-Market-Incentive-to-Vacate-Spectrum-080415.pdf>.

<sup>41</sup> Coleman Bazelon and Giulia McHenry, "Mobile Broadband Spectrum: A Vital Resource for the U.S. Economy," (May 11, 2015), available at <https://ecfsapi.fcc.gov/file/60001117200.pdf>.

<sup>42</sup> Comments of the Free State Foundation, NTIA, Developing a Sustainable Spectrum Strategy for America's Future, Docket No. 181130999-8999-01 (Jan. 28, 2019), available at [https://freestatefoundation.org/wp-content/uploads/2019/01/NTIA\\_Spectrum\\_Strategy\\_Comments\\_-\\_Final\\_012819.pdf](https://freestatefoundation.org/wp-content/uploads/2019/01/NTIA_Spectrum_Strategy_Comments_-_Final_012819.pdf).

for its own systems and purposes.<sup>43</sup> This means that all 5G technology would have to be secure enough to protect sensitive defense and national security communications. DoD has focused not only on use of 5G technology on its own spectrum, but also on the availability of commercial equipment that could be used in the federal spectrum and sharing of 5G spectrum with commercial providers.<sup>44</sup> Indeed, instituting "bidirectional sharing" appears to be one of the aims of that effort. Certainly, DoD has a legitimate national security interest in evaluating whether it can utilize 5G services and technology developed by the private sector. I submit, however, that this potentially places DoD at odds with the President's policy and FCC policy regarding a private-sector driven 5G ecosystem.

An effective incentive for government to relinquish spectrum and to become more efficient can help to resolve current spectrum disputes between agency spectrum users and the FCC.

## VI. Conclusion

Getting the federal government on the proverbial "same page" is essential to furthering the Trump Administration's national priority of achieving U.S. global leadership in 5G. Rapidly identifying and reallocating spectrum, particularly mid-band spectrum, that can be deployed in 5G networks should be viewed as a critical governmental activity. To accomplish this goal, and for the United States to adopt and implement sound engineering-based spectrum decisions without undue delay, it will be necessary to improve the inter-governmental coordination process.

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### Further Readings

Randolph J. May and Seth L. Cooper, "[FCC's Order Approving Ligado's Next-Gen Wireless Network: A Deliberative Process that Protects Against Signal Interference](#)," *Perspectives from FSF Scholars*, Vol. 15, No. 25 (May 21, 2020).

Randolph J. May and Gregory J. Vogt, "[NTIA Report Identifies Mid-Band Spectrum Repurposing Opportunities](#)," *Perspectives from FSF Scholars*, Vol. 14, No. 28 (Oct. 2, 2019).

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<sup>43</sup> DoD has issued a series of requests for prototype proposals that would allow it to operate in and share mid-band spectrum for 5G use. *See, e.g.*, "DOD Issues Fourth 5G Request for Prototype Proposal for Dynamic Spectrum Sharing Testbed, Enhancement & Applications,": available at <https://www.prnewswire.com/news-releases/dod-issues-fourth-5g-request-for-prototype-proposal-for-dynamic-spectrum-sharing-testbed-enhancement--applications-301033440.html>.

<sup>44</sup> *See, e.g.*, Defense Science Board, Final Report of the Defense Science Board Quick Task Force on Defense Application of Fifth Generation Network Technology (Jun. 24, 2019). The Defense Science Board is a private sector Advisory Committee of DoD.

Randolph J. May and Gregory J. Vogt, "[A Free Market Approach Should Be Used to Reallocate C-Band Spectrum](#)," *Perspectives from FSF Scholars*, Vol. 14, No. 17 (July 17, 2019).

Gregory J. Vogt, "[Getting to 'Yes' on Allocating Mid-band Spectrum](#)," *Perspectives from FSF Scholars*, Vol. 14, No. 13 (May 15, 2019).

Gregory J. Vogt, "[The Race for Global 5G Leadership: Where Are We Now?](#)" *Perspectives from FSF Scholars*, Vol. 14, No. 7 (Mar. 5, 2019).

Gregory J. Vogt, "[STREAMLINE 5G Processes to Match the Speed of Business](#)," *FSF Blog* (July 9, 2018).

Gregory J. Vogt, "[RAY BAUM Would be Proud](#)," *FSF Blog* (Mar. 23, 2018).

Gregory J. Vogt, "[Avoiding a Train Wreck: Giving Government a Market Incentive to Vacate Spectrum](#)," *Perspectives from FSF Scholars*, Vol. 9, No. 26 (Aug. 5, 2015).