



# THE FREE STATE FOUNDATION

A Free Market Think Tank for Maryland.....Because Ideas Matter

## ***Perspectives from FSF Scholars*** ***June 21, 2019*** ***Vol. 14, No. 15***

### **A Tale of Two Administrations: Prying Valuable 5G Spectrum from Government Hands**

by

**Gregory J. Vogt \***

#### **I. Introduction and Summary**

Charles Dickens immortalized 18th century London and Paris when he penned *A Tale of Two Cities*. “It was the best of times, it was the worst of times . . . .” So it is not without some irony that President Donald Trump announced the “best of times” by declaring a secure, private-sector driven 5G network a national priority, while the “worst of times,” at least figuratively speaking, proceeds as some federal government spectrum users continue to constitute a hindrance in achieving the President’s announced goal.

This bipolar Dickensian spirit is doubly disconcerting because, even in these turbulent political times, there is a solid bipartisan bloc in favor of relinquishment or sharing of government spectrum for 5G use, along with general agreement by the president, Congress, and the Federal Communications Commission (FCC), the independent federal agency in charge of allocating commercial spectrum. It is urgent that federal spectrum users step up and do their part to promote U.S. leadership in the 5G race, including especially by repurposing mid-band spectrum.

This *Perspectives* is the second of two regarding the search for additional mid-band spectrum for 5G. The previous *Perspectives*, "[Getting to 'Yes' on Allocating Mid-band Spectrum](#)," addressed the FCC's progress in locating non-federal mid-band spectrum.

---

**The Free State Foundation**  
**P.O. Box 60680, Potomac, MD 20859**  
**[info@freestatefoundation.org](mailto:info@freestatefoundation.org)**  
**[www.freestatefoundation.org](http://www.freestatefoundation.org)**

President Trump has set, as a national priority, the creation of a secure, private-sector driven 5G network. He has also required the federal government to establish a national spectrum strategy that can aid in allocating sufficient spectrum to achieve this national priority. The National Telecommunications & Information Administration (NTIA) is in the process of sifting through comments it received on the issue and has requested that federal spectrum users report on their use of spectrum, both of which NTIA expects to use to develop that strategy.

The bipartisan RAY BAUM'S Act enacted into law last spring reflects Congress's commitment to push for additional commercial spectrum for 5G development and deployment. RAY BAUM'S Act substantially improved the previous Spectrum Pipeline Act.

The Obama Administration originally committed to locating 500 MHz of spectrum, including both non-federal and federal spectrum, for reallocation to wireless use. The Administration's 2012 PCAST Report watered down the effort by placing too much emphasis on sharing spectrum between commercial and government users. By the end of the Obama Administration, its 500 MHz goal was not attained, and efforts to locate additional government spectrum bogged down.

Although Secretary of Commerce Wilbur Ross testified to Congress during his Senate confirmation hearing about the importance of locating government spectrum for potential reallocation, to date there has been insufficient progress.

It is true that NTIA last year identified the 3.45 to 3.55 GHz band as a potential candidate for commercial mobile use. But little more has been said publicly since that announcement was made. From the *Quantitative Assessments* analysis, the 3.45 to 3.55 GHz band should be relatively simple to reallocate given very low government use in such band.

The Federal Communications Commission has also initiated a proceeding proposing to allow terrestrial broadband use of the 1675-1680 MHz band, subject to protection of current users. The band currently is allocated to both federal and non-federal users of radiosonde and meteorological space-to-earth services. The FCC's initiation of the rulemaking proceeding is a positive development. Now government users must step up their efforts to relocate from the band in accordance with current planning.

There have been some warning signs that not all federal government users are on board with the reallocation effort. The Department of Defense (DoD), very late in the game, raised concerns about its ability to use upper 37 GHz band frequencies for future, unspecified use, even after such spectrum was auctioned. Only through last minute negotiations between NTIA, on behalf of DoD, and the FCC were procedures enacted to limit DoD's claim to additional spectrum in the upper 37 GHz band.

In another situation, just as the FCC was set to auction 24 GHz spectrum, two closely related claims by the federal government potentially upset the effort. First, NASA and the Secretary of Commerce urged the FCC to delete a World Radio Conference (WRC) 15 agenda item that would have globally harmonized the 24 GHz band for mobile use, excluding aeronautical mobile. And then federal spectrum users of the adjacent 23 GHz band, together with House of Representatives allies, attempted to stop the 24 GHz auction on the eve of the auction. FCC Chairman Ajit Pai rightfully rejected such efforts and auctioned the spectrum because the

Commission had already fully explored the issues and found no evidence of potential interference a year earlier.

And, meanwhile, a federal interagency GPS working group has been slow-rolling Ligado's efforts to repurpose satellite spectrum for terrestrial mobile use that would be an important part of the national 5G effort. Because of a lack of transparency, the public is left to speculate what is going on.

These not-so-private disputes became very public during a Senate Commerce Committee FCC Oversight hearing on June 12, 2019, when Chairman Pai revealed that one agency had been undermining its 5G efforts "at every turn." The remark was apparently directed at the Department of Commerce. One incident could be chalked up to bureaucratic miscommunication. But the public airing of inter-governmental disputes is unusual in the history of spectrum coordination efforts. The White House should resolve this situation *post haste* in order to achieve the national goal of 5G world leadership, which would bring enormous consumer welfare benefits to Americans.

Notwithstanding the foregoing and despite the consistent bipartisan push to identify and reallocate for commercial use additional government spectrum that currently is inefficiently used, government spectrum users are moving too slowly in the 5G rollout effort. Government occupies some 60 percent of spectrum below 3.7 GHz, which imposes an enormous "opportunity cost" on the U.S. economy. As Free State Foundation scholars indicated in comments to NTIA regarding development of a national spectrum strategy, the federal government should reform its spectrum management practices, including the following principles:

- *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*
- *Allow Agencies to Use Spectrum Holdings to Offset Budget Appropriations*
- *Increase the Transparency and Accountability of Government Spectrum Decisions*

Whatever the incentives provided, less emphasis should be placed on sharing between non-federal and federal spectrum users. While in some circumstances sharing may be appropriate, inevitably, sharing reduces the available usable spectrum and the flexibility and reliability that commercial users need to deploy services that consumers want. Sharing increases commercial user costs, reduces efficient operations, and exposes networks to security vulnerabilities.

RAY BAUM'S Act required the FCC, in collaboration with NTIA, to issue a report on whether government should be allowed access to commercial spectrum, termed "bidirectional sharing." The vast majority of the comments in that docket indicate that government access to commercial spectrum can be addressed through existing mechanisms, such as contracts and leasing arrangements. One defense industry commenter, in contrast, argued that DoD needs to access spectrum that is deployed for commercial use to gain the benefit of economies of scale to obtain lower-priced equipment and commercial cybersecurity software. I think both the FCC and the NTIA must consider whether government actually needs access to additional commercial

spectrum on an exclusive basis, or whether limited emergency use based on contracts or leases would adequately meet government needs. If government believes that these existing arrangements are insufficient, it should publicly state the shortcomings of such arrangements so that the FCC and NTIA can determine whether a workable compromise can be derived without chilling new private investment.

If the U.S. is going to attain world leadership in 5G, government spectrum users must step up to make “the worst of times” more like the “best of times.”

## **II. Bipartisan Policy Makers Agree That Additional Mid-band Spectrum for 5G Is a Crucial National Policy**

### **A. The Trump Administration has strongly endorsed a secure, private-sector driven 5G network, together with the spectrum necessary to power it**

Because of the tangible economic and consumer welfare benefits of U.S. leadership in 5G, President Donald Trump [recognizes](#) the value of a secure, private-sector-driven 5G network. The Administration therefore has made development of a 5G network a national priority. In particular, in October 2018, the President issued a [memorandum](#) asking NTIA, in consultation with other government institutions and the FCC, to develop a long-term national spectrum strategy.

According to the President's memorandum, the 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.”

NTIA sought comment on developing the national spectrum strategy, including the application of incentives and enforcement mechanisms to promote efficient and effective spectrum use. In addition, NTIA [asked](#) federal agencies to file in April 2019 final reports with it regarding their use of spectrum. NTIA committed to making such reports publicly available, to the extent possible. These reports should be useful in evaluating whether additional government spectrum can be made available for commercial use.

The federal government recently published two reports that should help inform Office of Science and Technology Policy (OSTP) work on developing a national spectrum strategy. The [first report](#), compiled by the IDA Science and Technology Policy Institute, is a technical guide to emerging 5G wireless technology and the impact on spectrum demand. The [second report](#), led by the National Science and Technology Council's Wireless Spectrum Research and Development Interagency Working Group, evaluates the need for research and development of future mobile and broadband communications over the near- and long-terms. These forward-looking documents help focus federal government and private sector attention to future technological development of 5G technologies and future advancements.

NTIA Administrator David Redl was a strong proponent of reallocating additional spectrum for exclusive or shared commercial use to aid in the national 5G development. But with Administrator Redl's departure from NTIA in early May, and Acting Administrator Diane

Rinaldo's recusal from spectrum matters, there is concern that NTIA will not have the presidential clout that it needs to continue the government spectrum reallocation responsibilities. I fear that publication of the reports of government spectrum usage, as well as the establishment of a national spectrum strategy, may be victims of Administrator Redl's departure. There has been little indication about who might pick up the slack left in Administrator Redl's wake.

**B. Congress is committed to exploring reallocation of government spectrum for commercial use**

In an age of political bickering, the search for mid-band spectrum for commercial 5G use is truly bipartisan. The Repack Airwaves Yielding Better Access for Users of Modern Services Act (RAY BAUM'S Act of 2018), [H.R. 4986](#), was enacted last year. Among other 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.

RAY BAUM'S Act contained some welcome improvements over the [Bipartisan Budget Act of 2015](#), which included the Spectrum Pipeline Bill's required identification of 30 MHz of below-3 GHz spectrum for reallocation from government to commercial use, plus identification of a total of 100 MHz below 6 GHz. Although this effort moved in the right direction, the deadline for the 30 MHz spectrum auction to begin is 2024, well past the expected rollout of 5G. Mere identification of the remaining 100 MHz is just as late, scheduled in two tranches for 2022 and 2024.

**C. The Obama Administration's efforts to reallocate 500 MHz of spectrum for commercial wireless use ground to a halt in later years**

In 2010 the Obama Administration established the [policy goal](#) of allocating by 2020 500 MHz of spectrum for wireless broadband that was then allocated to other commercial and government uses. At the time the plan was released, it was believed to include only spectrum below 6 GHz. The government's 2012 [PCAST Report](#) changed the direction of that policy for current government spectrum allocations to rely almost exclusively on sharing between government and commercial interests.

Larry Strickling, then head of NTIA, after almost a year of promises, finally issued in November 2016 NTIA's final installment in its search for additional mobile broadband spectrum to fulfill the Obama Administration's 500 MHz goal of allocating sub-6 GHz spectrum for mobile broadband use. Even the [Quantitative Assessments of Spectrum Usage](#) describes the report as "an *intermediate* step in a process for identifying and prioritizing strategic *options* for *potential* repurposing of bands." There are some 245 MHz listed in the "under study" column, including 120 MHz of U-NII-2B & 4 band spectrum that the FCC has been considering exclusively for shared unlicensed use since 2012. But the agency has not yet evaluated potential interference studies associated with sharing these U-NII bands with government spectrum holders and other users. The identified 75 MHz of 5.9 GHz spectrum listed as "under study" is still subject to much debate, although the 5.9 GHz logjam may be breaking with FCC Chairman Pai's recent

announcement that he will in the near future urge the Commission to adopt an NPRM to consider reallocating at least part of the band for unlicensed use.

### **III. The Administration's Search for Government Spectrum for Reallocation or Sharing with Commercial Wireless Providers is Lagging**

Although Commerce Secretary Wilbur Ross emphasized during his confirmation hearing that government should do more to efficiently use spectrum and that it should be given incentives to relinquish spectrum when inefficiently used, there is very little concrete progress to show on this score. There is no doubt that the task of identifying additional government spectrum is not easy, but government must act more speedily with regard to making more spectrum available for 5G.

#### **A. 3.45-3.55 GHz**

It is true that NTIA last year [identified](#) the 3.45 to 3.55 GHz band, currently allocated to the DoD for military radar systems, as a potential candidate for commercial mobile use. But little has been said publicly about potential sharing in that band a year after that announcement was made. From the *Quantitative Assessments* analysis, the 3.45 to 3.55 GHz band should be relatively simple to reallocate given very low DoD use in such band.

The 3.45 to 3.55 GHz band is consistent with the spectrum that is being considered for 5G by foreign countries. That band would make sense because, with the 3.5 GHz band already allocated, and consideration for 3.7 to 4.2 GHz already underway, a roughly contiguous band in the 3 to 4 GHz range would be available for 5G use. More transparency concerning the status of such possible reallocation assessment should be provided so that private interests can plan for current deployment planning.

It is true that RAY BAUM'S Act required NTIA to report, no later than two years after enactment, to Congress on the feasibility of allowing commercial wireless entities to share the 3.1 to 3.55 GHz band. Given the evaluation the *Quantitative Assessments* already published, I wonder whether such an extended reporting period is actually warranted. The lack of transparency in making this evaluation contributes to the seemingly limited progress being made in identifying mid-band spectrum for commercial 5G use.

#### **B. 1675-1680 MHz**

At its May 9 public meeting, the FCC initiated a [proceeding](#) proposing to allow terrestrial broadband use of the 1675-1680 MHz band, subject to protection of current users. 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 a positive development, and now government users must step up their efforts to relocate from the band in accordance with current planning.

Although the 1675-1680 band is a relatively small swath of spectrum, it is an important piece of the quest for locating usable blocks of mid-band spectrum for 5G. Indeed, in a [statement](#) issued regarding the Commission's notice, Commissioner Brendan Carr, referencing adjacent L-band spectrum, said this: “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.”

**C. Evaluation of additional government bands under study should be completed promptly.**

The above-described potential reallocations are a rather meager showing given that even under the Obama Administration, NTIA identified over 1000 MHz of spectrum for possible future study and potential reallocation. Bands already identified for further study, the 1300-90 MHz and 1.78 MHz bands, do not have due dates for study completion until 2021. In the *Quantitative Assessments*, NTIA indicated that there is some possibility in the future that it could move radar receive stations currently located in the 1300-1350 MHz band to the 2700-2900 MHz band. The ability to move would entail a possible consolidation of functions among different government agencies to a newer generation system, or system of systems, being terms a Spectrum Efficient Nation Surveillance Radar (SENSR) capability. This could free up the lower 50 MHz band either totally or partially. Although NTIA concludes that there is no opportunity for sharing now in the 2900-3100 MHz band, such SENSR consolidation might also free up part of the 2900-3100 MHz band. Since the *Quantitative Assessments* is still quite vague on the possibility, and nothing further has been announced, it is difficult to conclude that good progress is being made to accomplish the stated goals.

**D. Warning signs of a federal government that is not totally committed to a private-sector driven 5G network.**

There are some red flags concerning federal executive spectrum coordination with the FCC. At the same time that the President is urging government support for 5G, including ample spectrum allocations, including mid-band spectrum, parts of the federal government appear to be dragging their feet.

For example, recently a last minute skirmish arose because DoD, which wanted to retain the ability to add new transmitting sites in the upper 37 GHz band, even after the band had been auctioned for private use. Although during the rulemaking NTIA had warned vaguely about future DoD needs in the 37 GHz band, it was not until a draft Fifth Report & Order in the *Spectrum Frontiers Proceeding* was published did DoD’s and potential commercial bidders’ concerns come to light. Eventually, the FCC did negotiate a resolution with NTIA, on behalf of DoD, which limited DoD access to upper 37 GHz band spectrum where additional sites could not be accommodated in the lower portion of the band. Such procedures were not clear until an eleventh hour [NTIA letter](#) to the FCC and modifications to coordination procedures adopted in the revised final [Fifth Report & Order](#). Because the ability of DoD to add a new protected site after the auction was completed and spectrum awarded would undermine the value of the spectrum, commercial interests rightfully were concerned about unpredictable potential government access to the auctioned spectrum. I am additionally concerned about the potential for

conflict regarding commercial use of the 37 GHz band because of the already difficult nature of sharing arrangements, which I outline below.

And in another situation, 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) [expressed](#) concern about the potential interference to earth science data use in an adjacent band by NOAA, NASA and DoD to predict weather patterns. The Department of Navy penned a belated March 27, 2019 [memorandum](#) that operations in the 24 GHz band would likely interfere with these adjacent band weather data transmissions. Chairman Pai rightfully [rejected](#) these late-filed objections because the FCC found no evidence of interference to the adjacent band in the rulemaking record compiled a year earlier.

In a closely related matter, the FCC earlier [published](#) a proposal for consideration at WRC 15, that would give co-primary status in the 24 GHz band worldwide for mobile services, except aeronautical mobile. This proposal would have harmonized globally the FCC's licensing of the 24 GHz band. After publication, on February 28, 2019, Secretary Ross and NASA Administrator Jim Bridenstine [sent](#) a letter to Chairman Pai requesting that the proposal be deleted from the FCC's public website because the issue was not adequately coordinated adequately with government users of the adjacent 23 GHz band. Chairman Pai [rejected](#) that request on March 8, reasserting that the matter was fully coordinated with the Administration and reallocating 24 GHz spectrum to 5G use was the consensus decision in the Administration. Pai's open frustration with NASA and the Commerce was evident, chiding 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.

Another proceeding, seemingly relegated to "slow motion," regards Ligado's proposal to modify its satellite license to allow it to provide a terrestrial mobile service. Ligado's license applications have been pending for nearly four years and still have not been decided. From all the evidence, it appears that over the past several years Ligado has worked diligently to resolve all claimed interference concerns, even though some objections purportedly are based on interference metrics that have never been accepted by the FCC. And if these interference metrics were accepted by the FCC, this would alter the way the agency traditionally has viewed "harmful interference," and it likely would impact, in a detrimental way, the utility of the application of the FCC's harmful interference standard in the other contexts. NTIA, for too long, apparently has been waiting for a recommendation from an inter-agency working group (including DoD and Department of Transportation) on GPS, but the group's recommendation is over a year past due. It's time for the FCC to move forward to act on Ligado's license applications, which it has the authority to do.

These not-so-private disputes became very public during a Senate Commerce Committee FCC Oversight hearing on June 12, 2019, when Chairman Pai [indicated](#) one government agency has been undermining "at every turn" allocation of additional 5G spectrum based on concerns about interference with government operations. The Chairman specifically called out that Department of Commerce, which he stated had interfered with coordinated spectrum policy issues concerning the 24 GHz band. FCC Commissioner Michael O'Rielly specifically agreed with the Chairman's assessment. Some Democrats at the hearing raised the same questions that NOAA

had been raising in regard to the 24 GHz band, but no FCC Commissioner agreed with those arguments.

One incident could be chalked up to bureaucratic miscommunication. But the public airing of inter-governmental disputes is unusual in the history of spectrum coordination efforts between the FCC and federal government spectrum users. There is no question, after Chairman Pai's June 2019 congressional testimony, that at least the Department of Commerce, if not other federal spectrum users, are not on the same page as the FCC when it comes to government spectrum reallocation efforts. And this raises the important question whether the Department of Commerce is on the same page as the President, who as recently as May reemphasized the national importance of a secure private-sector driven 5G deployment. The White House should resolve this situation *post haste* in order to achieve the national goal of 5G world leadership, which would bring enormous consumer welfare benefits to Americans.

#### **IV. 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 that currently is underutilized by government, spectrum users are moving too slowly in the 5G rollout effort. I recognize that there are vital nation security, public safety, and other government needs for spectrum. Notwithstanding, a 2012 White House [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. Much of this spectrum was allocated years ago during a different technological era. And it is well known, in many instances, that existing equipment government uses have been supplanted by more efficient technology and equipment. It is time that the federal government become part of the U.S. team to bring 5G services to reality.

The NTIA *Quantitative Assessments* is proof that government still lacks the incentive to get serious about the need for relinquishing spectrum and/or making efficiency gains in its use of spectrum. As I indicated [here](#), it is time for a bold new approach to provide government with a market-oriented incentive to become more efficient and vacate occupied spectrum.

There is a significant "opportunity cost" associated with government spectrum, which is defined as the loss of potential benefits when one alternative is chosen over another. When federal agencies ignore the opportunity cost of unused spectrum, it harms the U.S. economy in two ways. In May 2015, Coleman Bazelon and Guilia McHenry [estimated](#) the economic value of 645.5 MHz of licensed spectrum was \$455 billion. If this spectrum was auctioned off to commercial users, it would generate about \$1.7 trillion in 2015 dollars in economic activity.

The Government 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, to include one or more of the following principles:

- *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*
- *Allow Agencies to Use Spectrum Holdings to Offset Budget Appropriations*
- *Increase the Transparency and Accountability of Government Spectrum Decisions*

I further address some of these proposals below.

**A. Government must conduct an inventory and budget spectrum amounts.**

In May 2019, Senator Mike Lee (R-UT) reintroduced the “Government Spectrum Valuation Act of 2019,” [S.1626](#), which, if passed, would require NTIA, in consultation with OMB, to calculate on a periodic basis the market value of spectrum assigned to each federal agency. This calculation can be valuable and should accompany the report required by the RAY BAUM’S Act because it can provide valuable information to policymakers in fashioning effective incentives to relinquish spectrum for commercial use.

As indicated previously, NTIA [has asked](#) agencies to submit reports regarding spectrum usage that begins such a process. But the effort does not go far enough. Each year, NTIA, in consultation with OMB, should provide Congress and federal agencies with spectrum holdings an updated report of the federal government’s spectrum inventory, including the amount and market value held by each agency. The report also should list unused and underutilized frequencies held by federal agencies and provide legislative and regulatory recommendations to transfer these underutilized frequencies from federal users to commercial users. These annual updates will provide federal agencies with necessary information about how they should proceed with their spectrum holdings. They will also give Congress important information about legislative initiatives that could shift unused or underutilized spectrum from federal users to commercial users.

**B. Government agencies must be given a real incentive to relinquish underutilized spectrum.**

A real incentive must be provided for government to relinquish its hold on underutilized spectrum. Although current legislation reserves one percent of the proceeds from certain auctions for research and development associated with relocating government users, such amount is at best only a weak incentive.

One approach has been too little discussed until recently: creating a government incentive auction patterned on the now-advanced broadcaster incentive auction. FCC Commissioner Jessica Rosenworcel [recommended](#), among multiple options, that Congress authorize a government spectrum auction that along the lines of the first incentive auction in which over-the-air broadcasters volunteered to vacate their spectrum in exchange for part of the proceeds from an auction to repurpose that spectrum to mobile broadband use. If the broadcaster incentive auction is viable for repurposing spectrum to the best and highest use, then the same procedure could be used to vacate government spectrum.

**C. Other procedures should be devised to bolster these efforts.**

In a September 2015 [blog](#), Commissioner O’Rielly proposed the establishment of agency spectrum fees to discourage government agencies from hoarding spectrum that is not used and therefore not needed. NTIA should impose an appropriate fee on federal agencies based on the amount of spectrum each agency is holding. Then, the Office of Management & Budget should subtract the fee amount from each agency’s overall budget appropriation. Such an approach would make public the value of government used spectrum, allowing for more rational, market-based approaches to spectrum allocation.

#### **D. Government sharing is an unsatisfactory solution**

The biggest problem with the latest NTIA *Quantitative Assessments* is the degree to which it relies on potential sharing between commercial and government interests. Inevitably sharing reduces the available usable spectrum and the flexibility and reliability that commercial users need to deploy services that consumers want. A number of these sharing problems also can exist among commercial users. There are five serious problems with sharing.

First, sharing is inherently inefficient. Shared spectrum by definition reduces capacity available for broadband use. Some [are concerned](#) that government is utilizing inefficient, outdated technology. Although the PCAST report includes some efficiency improvement proposals, no concrete steps in this direction have yet been taken.

Second, sharing spectrum undermines investment incentives by increasing costs and potentially reducing reliability. Some [have noted](#) that sharing inevitably increases carrier costs through ongoing coordination and operational work-arounds, costs that ultimately must be borne by consumers. Ongoing coordination obligations inevitably reduce available capacity, and sometimes on infrequent and unpredictable occasions, and thus raise potential mobile broadband reliability concerns.

Third, sharing techniques are not sufficiently advanced to produce efficient results. Although modern dynamic sharing techniques, with more refinement, show some promise to aid in real time-sharing of spectrum, such as with white spaces microphone usage, such systems are designed for relatively fixed users and involve a significant amount of manual coordination, as some [have noted](#). Even today, the entities pushing dynamic sharing in the 3.5 GHz Citizens Band Radio Service, which is a more automated system associated with mobile users, admit that real-world operational experience is necessary prior to concluding that sharing is a long-term viable solution.

Fourth, sharing reduces potential auction revenues because the market will devalue spectrum saddled with significant limitation, as I detailed [here](#). The coordination requirements contained in both the AWS-3 auction and proposed 3.5 GHz allocation are particularly significant given current government exclusion zones and coordination obligations are likely to remain murky even at the time of an auction.

Fifth, ongoing sharing between sensitive national security and law enforcement systems and commercial operations pose continuing security concerns to government operations, a position taken in the Obama Administration’s [memo](#) promoting sharing. Senators Marsha Blackburn (R-TN) and Richard Blumenthal (D-CN) reiterated that concern when they recently [expressed](#) their

concern that Huawei had been participating in development of 3.5 GHz sharing systems, which is responsible for implementing workable sharing with DoD systems currently operating in that band.

**E. Government must become more transparent about its decisionmaking process.**

In the past, it is well known that the decision to repurpose government spectrum to private use is an extremely lengthy process. [Reports](#) show that it has taken an average 13 years from the time a decision is made to relinquish spectrum until spectrum is actually placed in the hands of a commercial user. Although part of the reason for such delays can be attributed to uncertain or protracted procedural processes, there are often long delays where government decisions appear to the public simply to be on a blank screen of government indecision. Numerous examples abound of such seemingly inexplicable government inaction.

Providing greater transparency into the process, i.e., the proposals being considered, the agencies involved, the timeframe for decision, the way to submit comments to aid in those decisions, would substantially improve these processes. Creating greater accountability through such improved transparency, and creating self imposed deadlines for action, would make these government spectrum users more accountable to the public and improve the expected time frame for taking action.

**V. Government Bidirectional Sharing Should be Limited to Emergencies or Other Special Circumstances.**

RAY BAUM'S Act required the FCC, in collaboration with NTIA, to issue a report by September 23, 2019, on whether government should be allowed access to commercial spectrum, termed "bidirectional sharing". In accordance with that statutory requirement, the FCC's Office of Engineering & Technology and the Wireless Telecommunications Bureau [issued](#) a public notice in Docket No.19-128 requesting comments regarding bidirectional spectrum sharing "across a range of short-, mid-, and long-range timeframes, including for intermittent purposes like emergency use."

The vast majority of the comments in that docket indicate that government access to commercial spectrum can be addressed through existing mechanisms, such as contracts and leasing arrangements. The commenting commercial spectrum users are willing to discuss bidirectional sharing arrangements, but urge caution to preserve spectrum value and operational integrity.

One defense industry commenter argued that DoD needs to access spectrum that is deployed for commercial use to gain the benefit of economies of scale to obtain lower-priced equipment and commercial cybersecurity software. These are laudable goals, however, the same argument supports DoD relinquishment of current spectrum to commercial use and then to gain access to the relinquished spectrum through commercial arrangements, a goal long sought by commercial carriers.

From vague government positions repeated in the press, it appears that some government spectrum users seek "bidirectional sharing" to control, on an exclusive basis, new commercial

spectrum, even spectrum already auctioned for private use, at some unspecified time and circumstance in the future. Exclusive government control, such as is found in a command and control environments like military operations, certainly is consistent with existing government operations. But the position does not recognize the serious detriment to private investment that would be caused by unpredictable government operating environments that one commenter described as “chaotic.”

I think that both the FCC and NTIA must consider whether government actually needs access to additional commercial spectrum on an exclusive basis, or whether limited emergency use based on contracts or leases would adequately meet government needs. If government believes that these existing arrangements are insufficient, it should publicly state the shortcomings of such arrangements so that the FCC and NTIA can determine whether a workable compromise can be derived without chilling new private investment.

## **VI. Conclusion**

President Trump, Congress, and the FCC all agree that more mid-band spectrum should be allocated to help enable a secure, private-sector driven 5G network. It is therefore perplexing that federal spectrum users have not proceeded in a more timely fashion to free up inefficiently used government spectrum for commercial wireless use. There are a number of bold new solutions that could address this issue, including a spectrum inventory and valuation, spectrum fees, incentive auctions, and transparency by government spectrum users. President Trump needs to ensure that executive agencies under his control cooperate in the execution of his policy to locate additional spectrum for 5G use. If the U.S. is going to attain world leadership in 5G, government spectrum users must step up to make “the worst of times” become another example of the “best of times.”

\* Gregory J. Vogt is a Visiting Fellow of the Free State Foundation, an independent, nonpartisan free market-oriented think tank located in Rockville, Maryland.

### **Further Reading**

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 (March 5, 2019).

Comments of Free State Foundation, Developing a Sustainable Spectrum strategy for America’s Future, National Telecommunications & Information Administration, Docket No. 181130999-8999-01 (filed January 28, 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* (March 23, 2018).

Gregory J. Vogt, “[Now Is the Time for MOBILE NOW](#),” *Perspectives from FSF Scholars*, Vol. 12, No. 15 (April 28, 2017).

Randolph J. May & Gregory J. Vogt, “[Focusing on Communications Infrastructure Development: Completing the Incomplete Obama Administration Spectrum Report Card](#),” *Perspectives from FSF Scholars*, Vol. 11, No. 44 (December 13, 2016).

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