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**A Free Market Approach Should Be Used to Reallocate C-Band Spectrum**

by

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**I. Introduction and Summary**

There is widespread agreement within the Trump Administration, Congress, and the Federal Communications Commission (FCC) regarding the importance to the United States of maintaining its leadership in next-generation wireless communications. This agreement specifically includes the importance of the U.S. maintaining leadership, as the FCC put it in its July 2018 *C-Band NPRM*, of "fifth-generation (5G) wireless, Internet of Things (IoT), and other advanced spectrum-based services."<sup>1</sup> And there is a consensus, that having already made significant strides under the leadership of FCC Chairman Ajit Pai and his colleagues in allocating low- and high-band spectrum, further efforts are necessary to allocate additional mid-band spectrum for 5G use.

That's why the FCC's proceeding examining the 3.7 - 4.2 GHz spectrum band, commonly referred to the C-Band, is, rightly, of such intense interest. The FCC has sought public comment, among other procedural options, on the use of some form of innovative market-based mechanism, employing voluntary, secondary market negotiated transactions, as a means of clearing some or all of the 3.7 - 4.2 GHz band for terrestrial mobile broadband use. The purpose of this *Perspectives* is to support the adoption of some form of free market-oriented approach that allows incumbent Fixed Satellite Service (FSS) operators to clear part or all of the C-Band

spectrum using negotiated secondary market transactions that would, in effect, result in the flexible use of the spectrum by terrestrial mobile service providers in exchange for compensation.<sup>2</sup>

Most importantly, we believe that, at the end of the day, the trade-offs involved in such a free market-oriented approach will enhance overall consumer welfare and reduce overall societal costs by maximizing the efficient use of this valuable mid-band spectrum. It most likely will put the spectrum to use more speedily than could be accomplished by employment of traditional spectrum allocation approaches. We recognize such a market-based approach involves various non-trivial issues that must be addressed before the Commission reaches final determinations. But by maximizing overall consumer welfare and reducing overall societal costs, it comports with the public interest. Consistent with compliance with applicable legal requirements, from a policy perspective, this should be the Commission's objective.<sup>3</sup>

The FCC's market-based procedural option was crafted from comments in the record. The C-Band Alliance (CBA or Alliance) eventually championed a market-based option. CBA is made up of the four largest FSS licensees that operate approximately 90 percent of the authorized satellites in the C-Band. The CBA proposes to conduct some form of private auction transaction, subject to Commission oversight, that, in exchange for compensation by new mobile licensees, would relocate existing FSS users to only a portion of the existing 500 MHz band. Filters to existing earth stations would be provided to reduce interference potential.

There is no question that adding more mid-band spectrum to existing allocations, such as has already been accomplished in the 3.5 and 2.5 GHz bands, is critical to achieving U.S. leadership in 5G. The economic benefits to U.S. consumers are enormous. CBA estimates that, under its proposal, spectrum could be moved to terrestrial 5G use in 18 to 36 months, faster than by an incentive auction conducted by the FCC. The Analysis Group estimated that 400 MHz of mid-band spectrum 5G could spur \$274 billion in GDP growth, adding 1.3 million new jobs.<sup>4</sup> The Brattle Group has estimated that for every year of delay in reallocating a portion of the C-Band could create total social costs of \$10 to \$20 billion per year.<sup>5</sup> And NERA estimates that rapidly reallocating C-Band spectrum to 5G could add approximately \$540 billion of annual tax revenues.<sup>6</sup>

As stated above, we acknowledge there are a number of important issues that must be resolved, such as the amount of spectrum in the C-Band to be reallocated, the legal basis for the market-based approach, and whether a portion of the sale proceeds should be contributed to the federal government. Nevertheless, a market-based approach entails important public policy benefits, including substantial consumer welfare gains from earlier rather than later deployment of next-generation 5G services. The innovative nature of the free market approach is particularly justified in the C-Band given that each of the current FSS licensees is legally entitled to use the full 500 MHz of spectrum. Absent incentives for the incumbent operators to reach a voluntary agreement, the likelihood of "holdouts" is significantly increased. And earth station owners rely on C-Band transmissions to provide video and other services to their subscribers, and those services contribute billions of dollars to the U.S. economy. Booming demand for mobile broadband use clearly justifies actions that promote the most efficient use of spectrum, while adopting reasonable measures necessary to fairly accommodate legitimate affected interests.

The Commission has long looked to various types of voluntary secondary market transactions as a means of accomplishing more efficient use of the spectrum without the need for any heavy Commission involvement in the market process.<sup>7</sup> To assure that the various interests affected are treated in a manner that, ultimately, comports with the public interest, in this instance, there is no doubt that meaningful Commission oversight of the process will be required. Nevertheless, if the process is successful, it may provide a model – even if not an exact one – for carrying out similar market-based transactions in other bands that lead to similar public interest benefits in maximizing efficient use of the spectrum resource.

## **II. The Market-Based Approach to Reallocating C-Band Spectrum**

C-Band spectrum currently is allocated to FSS on a co-primary basis with fixed service. The rules provide that licenses in the C-Band are non-exclusive and entitle the licensee to operate throughout the 500 MHz band.<sup>8</sup> Four FSS licensees, Intelsat, SES, Telesat, and Eutelsat, operate approximately 90 percent of the authorized satellites in the band and serve nearly 120 million American households that receive programming content over the C-Band.<sup>9</sup> The 3.7 - 4.2 MHz band is reserved for downlink transmissions paired with 5.9 - 6.4 GHz uplink portion, collectively referred to as the C-Band. Only spectrum from the downlink portion of the C-Band would be reallocated.

The *C-Band NPRM*<sup>10</sup> proposes as one option a market-based approach to clear some or all of the 500 MHz that comprises the 3.7 - 4.2 MHz C-Band and make the cleared spectrum available for flexible mobile use, including 5G. Existing FSS operators would use secondary market transactions to repurpose the spectrum in exchange for compensation. The FCC's proposal would rely on a Transition Facilitator, a private cooperative entity created by FSS operators "to coordinate negotiations, clearing, and repacking the band."<sup>11</sup> The Transition Facilitator would deal with what is known as the "holdout problem," i.e., satellite operators unwilling voluntarily to relinquish spectrum. FSS operators would be required to notify incumbent earth station operators who receive signals in the C-Band to take steps to change their earth station facilities to reduce potential interference from new mobile licensees in the band. FCC Commissioner Michael O'Rielly frequently has advocated for a market-based approach for the C-Band precisely because of the benefit of quicker reallocation of the spectrum.<sup>12</sup>

The C-Band Alliance, formed by the four major FSS licensees, has urged the FCC to adopt the market-based approach in reallocating a portion the band.<sup>13</sup> The CBA proposes clearing 200 MHz of the C-Band, including a 20 MHz guard band, by repacking existing users to a smaller portion of the C-Band and making it available for terrestrial mobile use, including 5G services. It proposes to utilize a transition facilitator to effectuate the transition. Alliance members would launch eight new satellites to ensure that the same FSS capacity was available both before and after the repacking. At the same time, the CBA committed to protect earth station operators in their receipt of primarily video service transmission in the band.

The CBA would use secondary market transactions by establishing some form of private auction procedures conducted by the CBA and overseen by the FCC. Once the private auction is complete, winning mobile users would file FCC license applications. The mobile licenses would

include conditions agreed upon by the mobile operators as the winning bidders. Compensation distributed to CBA members would cover repacking costs and ensure uninterrupted service.

Since filing its original proposal, CBA has provided a number of additional details concerning its proposal.<sup>14</sup> As contemplated by the *C-Band NPRM*, a final order in the docket would establish the rules of the road to govern such a market-based approach.

### **III. Speedier Reallocation of C-Band Spectrum Produces Significant Consumer Benefits**

There is little question that a delay in reallocating a portion of the C-Band will risk incurrence of societal costs because the record consensus appears to conclude that the current band licensing structure is not the highest and best use for the C-Band. Therefore, the spectrum repurposing goal for the C-Band is consistent with the FCC's long-held policy to allow spectrum to be put to its highest and best use.

First and foremost, additional mid-band spectrum is required in order to permit U.S.-based 5G providers to ensure the United States maintains a leading role in the development of 5G.<sup>15</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 400 MHz of mid-band spectrum 5G could spur \$274 billion in GDP growth, adding 1.3 million new jobs.<sup>16</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>17</sup> A major economic spur similarly is expected in the 5G arena as well.

More specifically, with respect to the C-Band, the Brattle Group estimated that for every year of delay in reallocating a portion of the band, the value of the spectrum subject to the delay decreases from 7 to 11 percent per year. This decrease in value for every year of delay in reallocating spectrum would impose total social costs of \$10 to \$20 billion.<sup>18</sup> In addition, NERA estimates that rapidly reallocating C-Band spectrum to 5G could add approximately \$540 billion of annual tax revenues.<sup>19</sup>

The major alternative procedural proposal to reallocate spectrum in the C-Band is an FCC-run incentive auction, such as the one repurposing over-the-air television broadcasting spectrum to flexible mobile use. That auction is taking over six years to complete from the time the FCC decision<sup>20</sup> establishing the auction was released to the date the entire transition process is expected to take place.<sup>21</sup> This is some three years longer than the suggested timetable for the free market approach. Of course, because the TV incentive auction was the first, another incentive auction might not take quite as long to formulate and complete because some of the initial issues have already been addressed and tested.

But a C-Band auction would be complicated because, among other things, transponder capacity and signal strengths are not consistent within the same band, legal issues regarding compensation to existing users and government proceeds would continue, and the difficulty of dealing with

holdouts would persist. And replacing lost capacity will require new satellite launches, which can be more complicated and time-consuming than changing out tower-based transmitters. The anticipated three additional years to complete a government-run auction means a significant delay in the 5G deployment race, one that will entail significant societal costs as indicated previously. On July 7, Chairman Pai indicated that FCC staff believe that an incentive auction in the 2.5 GHz band would have added several years to the process.<sup>22</sup>

While we understand that the projections regarding completion of the repurposing are necessarily estimates – and we don't purport to vouch for their precision – we do think it is likely that a process employing market-based voluntary exchange along the lines proposed by CBA can be completed more quickly than can the Commission's traditional auction process. And although economic estimates of future value are reasonably debatable, the general thrust of the economic benefits realized by early reallocation of C-Band spectrum for 5G service cannot be seriously challenged.

#### **IV. Private Market-Based Transactions Can Be Expected to Achieve Maximum Value for both Current and New Licensees**

The traditional methodology for reallocating spectrum – identify a spectrum band, evaluate existing uses, conduct a rulemaking to reallocate spectrum, conduct an auction, and then manage the transition to new uses – takes a lot of time. Historically, the government has been agonizingly slow assigning spectrum to a licensee or other authorized user, taking an average of roughly 13 years from identification to reassignment. A July 2015 study commissioned by CTIA demonstrates this stark fact.<sup>23</sup> Even scheduling an FCC-run auction has been slow for other spectrum, with the 3.5 GHz auction to be held at some unspecified time in 2020. It is just a fact that government-run processes historically are considerably drawn out, which is a downside to an FCC incentive auction procedure.

When they are permitted, voluntary, private market-based transactions achieve the highest and best use for spectrum, as opposed to government fiat. Private transactions can reduce overall costs, particularly regulatory and litigation costs, and they can achieve results more swiftly than government decisionmaking. Prompt preservation of existing C-Band content delivery licensees and customers in a smaller amount of existing spectrum, while adding significant new mid-band spectrum for 5G use, is a win-win situation, the value of which is hard to underestimate.

The time estimated by CBA to reallocate spectrum from the Commission's final decision to issuance of new user licenses is lowered to 18 to 36 months. This relatively efficient time-to-market is important with regard to the race for world leadership in 5G. This is all the more so for the coveted C-Band spectrum, which, due to its propagation characteristics, is needed for wide 5G deployment, at least in initial stages. The C-Band is also adjacent to other 5G bands that have already been allocated, such as the Citizens Band Radio Service band at 3.5 GHz and the 2.5 GHz band. And it is consistent with international allocations for 5G use.

The traditional spectrum reallocation methodology becomes even more complicated in the C-Band given its unique licensing scheme where each FSS licensee has the right to transmit over the entire 500 MHz band for the duration of their license terms. Compounding this problem are

the thousands of receive-only earth stations (the exact number is not known) owned by independent entities that rely on such transmissions for the delivery of their primarily video and audio content that must be accommodated in the repacking process in the C-Band. All of these operating entities have legal rights to the use of the spectrum, and the government would face serious legal challenges to modify those rights on an involuntary basis. While the FCC can take steps to modify licensee rights, compliance with the statutory method for such modifications is often a lengthy process, and, upon completion, there may be court appeals.

Even setting aside such legal rights, the business expectations of the operating entities should not be lightly compromised in the process of changing spectrum usage. Because the operating entities will continue to use a portion of the C-Band, interference concerns must be carefully addressed to ensure continued operations on the repacked portion of the band. The FCC, of course, recognizes the importance of such business expectations and is careful to protect incumbent users when transitioning to new licensing schemes.

Given these difficulties, a market-based proposal along the lines of the CBA proposal, which incorporates voluntary exchange and compensation in a market context, should go a long way towards eliminating potential legal challenges, as well as eliminating additional detailed time-consuming processes at the Commission that otherwise would be required in managing the transition to terrestrial mobile use. As long as the private auction and repacking procedures are reasonably transparent and fair to all existing and potential new licensees, with an appropriate degree of Commission oversight, achieving prompt reallocation and repacking is likely to produce overall consumer welfare benefits and reduced costs consistent with the public interest.

## **V. Conclusion**

We are encouraged that FCC Chairman Ajit Pai has announced publicly that he expects to ask the Commission to vote on a final C-Band rulemaking order in the fall of 2019. Time is of the essence if the United States wishes to maintain its wireless leadership as the world transitions to 5G. Locating and reallocating low-, mid-, and high-band spectrum is a critical step to maintain that leadership. In sum, in light of the trade-offs and complexities involved, from a public policy perspective, a market-based proposal along the lines of the CBA proposal, relying substantially on a process of secondary market voluntary exchange, is attractive because of the likely overall increase in consumer welfare benefits.

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### **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).

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).

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<sup>1</sup> *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Order & Notice of Proposed Rulemaking, GN Docket No. 18-122, FCC 18-91, 2 (rel. Jul. 13, 2018) (*C-Band NPRM*).

<sup>2</sup> We may well address other issues, of course, in future papers.

<sup>3</sup> We note that the CBA has said that it will make a significant voluntary contribution to the Treasury if the FCC approves its auction proposal. As taxpayers, we surely might welcome such a contribution. But our support for a market-based approach along the lines of the CBA proposal is based on an assessment of the overall consumer welfare gains and reduction in societal costs relating to the proposal, not on representations regarding a contribution to the Treasury.

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

<sup>5</sup> Joint Comments of Intel Corporation, Intelsat, License, LLC, & SES Americom, Inc., Appendix A, C. Bazelon, The Brattle Group, *Maximizing the Value of the C-Band*, GN Docket No. 18-122, 27 & note 72 (Oct. 29, 2018) (*Brattle Group White Paper*).

<sup>6</sup> Reply Comments of The C-Band Alliance, GN Docket No. 18-122, Reply Declaration of Jeffrey A. Eisenach, NERA Economic Consulting, ¶ 30 (Dec. 7, 2018) (*NERA White Paper*).

<sup>7</sup> See, e.g., *Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands*, Report and Order and Order of Proposed Modification, 27 FCC Rcd 16102, ¶¶ 244-53 (2012) (AWS-4). The FCC more recently sought comment on whether its secondary market transaction rules needed updating to promote readier availability of more spectrum. *Partitioning, Disaggregation, and Leasing Spectrum*, Notice of Proposed Rulemaking, WT Docket No. 19-38, FCC 19-22 (rel. Mar. 15, 2019).

<sup>8</sup> There are a relatively small and declining number of fixed service licensees in the C-Band, which do not present the same challenges as allowing terrestrial mobile use adjacent to satellite downlink transmissions.

<sup>9</sup> Comments of the C-Band Alliance, GN Docket No. 18-122, 2 (dated Jul. 3, 2019).

<sup>10</sup> *C-Band NPRM*.

<sup>11</sup> *Id.*, ¶ 70.

<sup>12</sup> See, e.g., *C-Band NPRM*, Statement of Commissioner Michael O’Rielly.

<sup>13</sup> Comments of the C-Band Alliance, GN Docket No. 18-122 (dated Oct. 29, 2018).

<sup>14</sup> See, e.g., Letter from Jennifer D. Hindin, Counsel for C-Band Alliance, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (Mar. 4, 2019) (technical statement on protection of earth stations); Letter from Jennifer D. Hindin, Counsel, C-Band Alliance, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (dated Apr. 9, 2019) (transition implementation process); Letter from Bill Tolpegin, CEO, C-Band Alliance, to Marlene H. Dortch, Secretary, FCC, Docket No. 18-122 (dated Jun. 12, 2019) (private auction design).

<sup>15</sup> D. Absecassis, C. Nickerson, J. 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>16</sup> See Analysis Group White Paper, at 1, 4-5.

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<sup>17</sup> M. 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>18</sup> Brattle Group White Paper, at 27 & note 72.

<sup>19</sup> NERA White Paper, ¶ 30.

<sup>20</sup> *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report & Order, Docket No. 12-268, 29 FCC Rcd. 6567 (2014).

<sup>21</sup> Public Notice, Incentive Auction Closing and Channel Reassignment, 32 FCC Rcd. 2786 (2017) (July 2020 is the expected completion timeframe for the final phase of repacking).

<sup>22</sup> Chairman Ajit Pai, Press Conference (Jul. 10, 2019), available at <https://www.fcc.gov/news-events/events/2019/07/july-2019-open-commission-meeting>.

<sup>23</sup> T. Sawanobori, R. Roche, CTIA, *From Proposal to Deployment: The History of Spectrum Allocation Timelines* (Mar. 2015), available at <https://ecfsapi.fcc.gov/file/60001121340.pdf>.