

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Expanding Flexible Use of the 3.7 to 4.2 GHz Band)	GN Docket No. 18-122
)	
Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz)	GN Docket No. 17-183 (Inquiry Terminated as to 3.7-4.2 GHz)
)	
Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission's Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3.7-4.2 GHz Band)	RM-11791
)	
Fixed Wireless Communications Coalition, Inc., Request for Modified Coordination Procedures in Band Shared Between the Fixed Service and the Fixed Satellite Service)	RM-11778
)	

REPLY COMMENTS OF THE C-BAND ALLIANCE

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ATTACHMENTS:

- (1) TECHNICAL ANNEX
- (2) REPLY DECLARATION OF JEFFREY A. EISENACH, PH.D.

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REPLY COMMENTS OF THE C-BAND ALLIANCE

I. INTRODUCTION AND SUMMARY

The C-Band Alliance is extraordinarily pleased with the level of support shown for the Market-Based Approach in the opening round of comments.¹ The Market-Based Approach is favored by commenters spanning a diverse array of industries and interests, including the commercial aviation industry, C-band satellite operators, Internet service providers, broadcasters, nonpartisan think tanks, content distributors, video programmers and programming networks, data and telecommunications equipment providers, satellite transmission companies, industry associations, wireless carriers, and non-profit associations. Numerous commenters agree that the Market-Based Approach represents the fastest way to open some of the 3.7-4.2 GHz band (“C-

¹ *Expanding Flexible Use of the 3.7 to 4.2 GHz Band et al.*, Order and Notice of Proposed Rulemaking, GN Docket No. 18-122 *et al.*, FCC 18-91, ¶ 2 (2018) (“*NPRM*”). Unless otherwise noted, all comments were filed in Docket 18-122 in response to the *NPRM*.

band Downlink”) for terrestrial mobile services while protecting the quality, reliability, and certainty of existing C-band Downlink service upon which customers rely. The record confirms that achieving the optimal use of C-band Downlink spectrum is complex and best accomplished by market forces. The C-Band Alliance’s Market-Based Approach will allow the market to lead the way to America’s 5G future.

By contrast, alternative approaches, such as the one proffered by T-Mobile, would add years of delay to 5G deployment with lasting, negative societal effects. More fundamentally, the Communications Act does not provide authority for the Commission to conduct the T-Mobile auction proposal because it would be neither voluntary nor among competing bidders. **The C-Band Alliance exists for the sole purpose of carrying out the Market-Based Approach – it will not exist to effectuate the T-Mobile gambit.** The Commission cannot force FSS operators to participate in an incentive auction and cede their existing, investment-backed expectations in their spectrum.

In these reply comments, the C-Band Alliance again urges the Commission to adopt the Market-Based Approach and addresses key issues raised in the opening round of comments.²

Specifically:

- ***The record confirms that the Market-Based Approach will allow market forces to balance competing interests in the C-band Downlink and produce a winning outcome for all interested parties.*** Using mid-band spectrum will allow the U.S. to achieve and maintain 5G leadership. Expediently clearing mid-band spectrum will bolster America’s economic competitiveness. Additional spectrum for 5G will help meet growing demand.

² Included with these reply comments is a technical annex in which the C-Band Alliance proposes that the Commission adopt certain technical rules regarding, *inter alia*, FSS earth station interference protection, power limits for mobile and portable stations, and out-of-band emissions for 5G licensees.

- ***The Market-Based Approach is the only means of making C-band Downlink spectrum available for 5G deployment soon enough for the U.S. to win the race to 5G.*** The Market-Based Approach will clear up to 200 MHz of spectrum for licensed terrestrial use (including a guard band to protect adjacent services) in just 18-36 months after a final Commission order.
- ***The Market-Based Approach is the best mechanism for ensuring that incumbent users are protected.*** C-Band Alliance members have provided, or are in the process of providing, to their customers a post-transition configuration plan demonstrating the continued quality and reliability of C-band Downlink services (along with full-band, full-arc protection) that they will enjoy. In addition, the C-Band Alliance will (1) invest in new satellites to add capacity in the upper portion of the C-band Downlink to ensure Fixed Satellite Service (“FSS”) users continue to enjoy 99.999% reliability; (2) pay the reconfiguration and relocation costs for affected FSS users; and (3) ensure the interests of earth station operators are represented by the Transition Facilitator.
- ***The Market-Based Approach closes the digital divide by facilitating access to C-band Downlink spectrum, including in rural areas.*** The Market-Based Approach allows small, regional, and rural carriers—including point-to-multipoint (“P2MP”) operators—to enter into Secondary Market Agreements (“SMAs”) to acquire mid-band spectrum.
- ***The 200 MHz proposal is the result of months of hard work and analysis with respect to contracted satellite usage requirements and technical mitigation tools.*** In particular, the C-Band Alliance proposal reflects recent live, over-the-air testing using a 5G signal simulator and optimized band-pass filter prototypes as well as one-on-one conversations with large earth station users. A significant portion of the increase of clearable spectrum came from a reduction in the size of the guard band, which resulted from detailed technical analysis and testing by the C-Band Alliance.
- ***Clearing a portion of the C-band Downlink for terrestrial 5G is an arduous, complex, and costly task that the C-Band Alliance, acting as Transition Facilitator, is best positioned to undertake.*** Commenters confirm that members of the C-Band Alliance have intimate knowledge of the business needs and operational requirements of their customers and the FSS earth station operators, which is essential for quickly and efficiently clearing and repacking a portion of the C-band Downlink.
- ***The Market-Based Approach fulfills the Commission’s statutory obligation to protect the public interest.*** The FCC will exercise regulatory authority by amending the Table of Frequency Allocations to authorize terrestrial mobile service in the C-band Downlink; reviewing license applications from entities entering into SMAs; and adopting a licensing framework and technical rules.

- ***The benefits of the Market-Based Approach greatly outweigh any perceived concerns about a “windfall” to incumbents.*** Any returns realized by members of the C-Band Alliance will represent a return on the entrepreneurship of the FSS operators in coming forward with and implementing a value-creating secondary market transaction, precisely as envisioned under the Commission’s secondary markets policy. Additionally, any economic benefit to entities entering into SMAs is incidental to the goal of winning the race to 5G. Further, the accelerated 5G deployment and other public interest benefits stemming from the Market-Based Approach outweigh any benefit from a public auction process:

- C-Band Alliance members have made significant investments in the C-band Downlink;
- the Market-Based Approach creates a financial incentive for the C-Band Alliance to undertake the costly, complicated, and difficult voluntary clearing process and ensures its success;
- economic studies confirm that the accelerated pace of the Market-Based Approach will create billions of dollars in public interest benefits compared to other alternatives; and
- alternative proposed auction schemes could provide some revenue to the Treasury but only at the expense of a prolonged administrative process that would likely result in years of delay.

- ***The Market-Based Approach will not result in mutually exclusive applications and therefore will not trigger any obligation to employ an auction under Section 309(j).*** SMAs negotiated by the C-Band Alliance will qualify only one applicant for each license and are fully consistent with the Commission’s obligation to use negotiation, engineering solutions, and threshold qualifications to avoid mutual exclusivity.

- ***T-Mobile and Comcast seek to delay C-band 5G deployment for anticompetitive reasons.*** Both entities support regulatory action that would delay increased 5G deployment and stifle competitive forces affecting their businesses.

- ***The Market-Based Approach adequately protects non-U.S. C-band satellite operators.*** The Transition Facilitator will be open to all C-band satellite operators that have coverage of all or a portion of the continental United States (“CONUS”) pursuant to Commission-issued licenses or grants of market access. Even if they elect not to join, they will be reimbursed for CONUS earth station reconfiguration and relocation costs, to the extent they or their customers have any.

- ***Under the Market-Based Approach, wireless Internet service providers (“WISPs”) and other P2MP service providers will have the opportunity to enter into SMAs to obtain C-band Downlink spectrum.*** Commenters overwhelmingly oppose allocating P2MP operations in the C-band Downlink in frequencies that will remain for FSS use. The C-Band Alliance has clearly expressed its intent “to ensure that smaller regional carriers will have an opportunity to acquire this spectrum.”

II. THE MARKET-BASED APPROACH IS FAST AND EQUITABLE – IT FULFILLS PUBLIC POLICY OBJECTIVES AND THE STATED NEEDS OF THE MAJORITY OF COMMENTERS

The record confirms that the Market-Based Approach carefully balances the competing interests in the C-band Downlink and produces a “win-win” outcome for all interested parties.³

The U.S. can win the race to 5G. Consumers will benefit from the expeditious deployment of terrestrial mobile services. Incumbent users will be protected and made whole. The

Commission will need to take only minimal regulatory action. And all interested parties will

have the opportunity to enter into negotiations with the Transition Facilitator for SMAs,

including entities dedicated to bringing broadband services to rural America.

³ Comments of Aviation Spectrum Resources, Inc. at 4 (“ASRI Comments”); Comments of CB2.0 Communications Inc. at 5 (“CB2.0 Comments”); Comments of the C-Band Alliance, at 3-4 (“C-Band Alliance Comments”); Comments of Cisco Systems, Inc. at 1, 3 (“Cisco Comments”); Comments of Cumulus Media Inc. and Westwood One, LLC at 15 (“Cumulus Comments”); Comments of Digital Networks, LLC at 3-4 (“Digital Comments”); Comments of Eutelsat S.A. at 3 (“Eutelsat Comments”); Comments of Extreme Reach, Inc. at 4-5 (“Extreme Reach Comments”); Comments of Inmarsat at 3 (“Inmarsat Comments”); Comments of International Technology and Innovation Foundation at 4 (“ITIF Comments”); Joint Comments of Intel Corporation, Intelsat License LLC, and SES Americom, Inc. at 4 (“Joint Comments”); Comments of Linkup Communications Corporation at 5 (“Linkup Comments”); Comments of Luken Communications, LLC at 4 (“Luken Comments”); Comments of Motorola Solutions, Inc. at 2 (“MSI Comments”); Comments of National Public Radio at 3 (“NPR Comments”); Comments of Olympusat, Inc. at 3 (“Olympusat Comments”); Comments of PSSI Global Services, Inc. at 10-11 (“PSSI Comments”); Comments of QVC, Inc. and HSN, Inc. at 5 (“QVC Comments”); Comments of the Telecommunications Industry Association at 4 (“TIA Comments”); Comments of Verizon at 4-5 (“Verizon Comments”); Comments of the World Teleport Association at 3 (“World Teleport Comments”). *See also* Doug Brake, *Keeping Up with Spectrum Policy: Mid-band Opportunities*, ITIF, at 5 (Nov. 2018), <http://www2.itif.org/2018-spectrum-policy-mid-band.pdf> (“ITIF Report”).

A. Facilitating accelerated 5G deployment with the Market-Based Approach produces broad public interest benefits.

Numerous commenters agree that bringing mid-band spectrum to market quickly will achieve U.S. policy goals and provide broad public interest benefits. First, allocating mid-band spectrum for terrestrial 5G use is critical if the U.S. hopes to achieve and maintain 5G leadership.⁴ As Commissioner Rosenworcel recently noted, “while other countries are racing ahead with 5G efforts, ‘we’re headed to study hall.’”⁵ Indeed, some countries have already reallocated mid-band spectrum for terrestrial 5G services.⁶ Given “the intense global interest in making mid-band spectrum available for 5G,” the Commission must “employ all tools at its disposal to ensure continued U.S. leadership in the race to 5G.”⁷

Second, expeditiously clearing mid-band spectrum is vital to America’s economic competitiveness. AT&T correctly notes that the stakes in the race to 5G are high – \$275 billion in new investment, \$500 billion in economic growth, and 3 million in new jobs.⁸ Countries that adopt 5G first are expected to enjoy disproportionate gains in macroeconomic impact compared to those that lag behind.⁹ Cisco agrees and reminds the FCC that being the first country in the

⁴ See, e.g., C-Band Alliance Comments at 9-10; Comments of AT&T Services, Inc. at 1-2 (“AT&T Comments”); Comments of CTIA at 5 (“CTIA Comments”); ITIF Comments at 2-3; Comments of Qualcomm, Inc. at 1-2 (“Qualcomm Comments”); Verizon Comments at 1-2.

⁵ Monty Tayloe et al., Commissioners Divided on Space Debris Authority Questions, *Communications Daily* (Nov. 16, 2018). See also CTIA Comments at 5-6.

⁶ CTIA Comments at 5-6. See also Comments of Federated Wireless, Inc. at 4 (“Federated Wireless Comments”).

⁷ Federated Wireless Comments at 4.

⁸ AT&T Comments at 5 (citing David Abecassis et al., *Global Race to 5G – Spectrum and Infrastructure Plans and Priorities*, *Analysys Mason*, at 2 (Apr. 2018)).

⁹ C-Band Alliance Comments at 10; see also CTIA Comments at 3 (“[A]cross the globe, mid-band spectrum in the 3 GHz to 5 GHz band range is viewed as a key component to unlocking the economic and societal benefits of 5G connectivity. In the United States, the [C-band Downlink]

world to deploy 4G technology “allowed the US to be the locus of significant technology development at the network and device level, new intellectual property, and in addition spawned the now-enormous applications economy.”¹⁰

Third, additional spectrum for 5G is needed to meet growing demand. According to Ericsson, expectations for long-term mobile data traffic dwarf the capacity of existing spectrum holdings.¹¹ The Brattle Group agrees, estimating that mobile data traffic will grow exponentially from 2017 to 2023.¹²

Importantly, many commenters believe that the Market-Based Approach will best achieve the Commission’s strategy to Facilitate America’s Superiority in 5G Technology (“5G FAST Plan”).¹³ The Market-Based Approach will clear up to 200 MHz of spectrum for licensed terrestrial use (inclusive of a guard band to protect adjacent services) *in just 18-36 months* after a final Commission order. Alternative approaches “could easily be expected to add years of delay” – as long as 18 years, according to one commenter¹⁴ – with lasting, negative societal

offers a sizable swath of spectrum that presents the U.S. with the opportunity to allocate spectrum in this range, which can enable global economies of scale, global 5G roaming, and other scale benefits.”).

¹⁰ Cisco Comments at 3.

¹¹ Comments of Ericsson at 4 (“Ericsson Comments”) (“U.S. wireless operators have concluded that ‘expectations for long-term mobile data traffic outweigh the capacity that can be provided with existing spectrum holdings.’”).

¹² Coleman Bazelon, *Maximizing the Value of the C-Band: Comments on the FCC’s NPRM to Transition C-Band Spectrum to Terrestrial Uses*, Brattle Group, at 4 (Joint Comments, Appendix A) (“Brattle Paper”).

¹³ See footnote 3, *supra*.

¹⁴ See Federated Wireless Comments at 4.

effects.¹⁵ The Brattle Group’s estimates suggest that just one year of delay could reduce the total social value of repurposing the C-band Downlink by between 7% and 11%.¹⁶

Indeed, numerous commenters explicitly support the Market-Based Approach. For example, Verizon stated that the Market-Based Approach has “significant benefits” and “offers a meaningful basis to swiftly transition a significant swath of spectrum while addressing the various stakeholders’ key interests.”¹⁷ The World Teleport Association called the Market-Based Approach “the only practical solution for introducing terrestrial mobile operations in the C-band.”¹⁸ In addition, the Market-Based Approach has earned the support of the Information Technology & Innovation Foundation (“ITIF”), an independent think tank “whose mission is to formulate, evaluate, and promote policy solutions that accelerate innovation and boost productivity to spur growth, opportunity, and progress.”¹⁹ ITIF recently published a report in which it evaluated each of the proposals set forth in the *NPRM*.²⁰ ITIF concluded that the Market-Based Approach “has merit and would be the fastest possible mechanism to identify the amount of spectrum that could be transitioned to 5G services – and have the right incentives to protect the important existing C-band services.”²¹ According to ITIF, “A market-based approach empowers the relevant stakeholders with the flexibility to best balance the complex, competing interests in the band. . . . A voluntary, market-based mechanism provides the incentive to

¹⁵ Brattle Paper at 27.

¹⁶ *Id.*

¹⁷ Verizon Comments at 4-5.

¹⁸ World Teleport Comments at 3.

¹⁹ ITIF, *About ITIF: A Champion for Innovation*, <https://itif.org/about>.

²⁰ ITIF Report.

²¹ *Id.* at 5.

expeditiously free up valuable 5G spectrum to those actors best positioned to gather accurate information on existing operations and most interested in protecting existing customers.”²²

In its paper, the Brattle Group states that all of the proposed alternatives to the Market-Based Approach “would require the FCC to make many top-down, difficult, and controversial determinations which are also likely to lead to inefficient results and long delays.”²³ The FCC simply faces “larger information gaps” than the C-Band Alliance regarding current usage of the band.²⁴ Any attempt at closing this divide would require an FSS freeze that would harm utilization of the C-band Downlink and potentially disrupt critical services and key communications channels for numerous organizations.

B. The Market-Based Approach ensures the continued reliable operations of video distribution and other applications supported by Fixed Satellite Service.

Many commenters emphasize the value of existing C-band satellite services.²⁵ They thus affirm that a great benefit of the Market-Based Approach is that it will clear spectrum for

²² *Id.* at 6.

²³ Brattle Paper at 28.

²⁴ *Id.*

²⁵ *See, e.g.*, Comments of Altice USA, Inc. at 2 (“Altice Comments”); AT&T Comments at 10-11; ASRI Comments at 2-3; Comments of The Boeing Company at 2-3 (“Boeing Comments”); C-Band Alliance Comments at 12; Comments of C-SPAN Networks at 4 (“C-SPAN Comments”); Comments of Comcast Corporation and NBCUniversal Media, LLC at 3-6 (“Comcast Comments”); Cumulus Comments at 11; Digital Comments at 2; Comments of Eternal Word Television Network, Inc. at 3 (“EWTN Comments”); Eutelsat Comments at 1; Comments of Global Eagle Entertainment at 1 (“Global Eagle Comments”); Comments of ITC Global, Inc. at 1-2 (“ITC Global Comments”); Linkup Comments at 1-2; Comments of Block Communications, Inc., Gray Television, Inc. and Meredith Corporation at 3 (“Local Broadcasters Comments”); Luken Comments at 2-3; Comments of the National Association of Broadcasters at 4 (“NAB Comments”); Comments of NCTA — The Internet & Television Association at 3-5 (“NCTA Comments”); Olympusat Comments at 2; QVC Comments at 4; Comments of the Satellite Industry Association at 8 (“SIA Comments”); Comments of Speedcast Communications, Inc. at 2-3 (“Speedcast Comments”).

licensed terrestrial use *without impairing incumbent use*. Indeed, the Market-Based Approach is founded on “protect[ing] C-band services in the United States and the rest of the world” and “continuing to provide the quality, reliability and certainty that [incumbents] need to successfully operate and grow their businesses.”²⁶

The record demonstrates that the C-band Downlink is well-utilized and critically important. As of November 6, 2018, more than 17,000 C-band earth stations were registered with the Commission.²⁷ Video content distributors heavily use the C-band Downlink because it has the “capacity and capability to deliver high-quality, high-resolution video.”²⁸ Indeed, programmers state that it “forms the backbone of the infrastructure content companies use to supply consumers across the country with premium television programming”²⁹ and facilitates the delivery of “more than 450,000 hours of news, music, and cultural programming to 1,278 public

²⁶ *Ex Parte* Letter of the C-Band Alliance, GN Docket Nos. 17-183 and 18-122 (October 17, 2018) (the “C-Band Alliance Ex Parte”).

²⁷ This number was derived by regularly monitoring new applications filed in the IBFS database following the announcement of the freeze on new earth stations and adding those totals to the more than 4,000 earth stations that had been registered or licensed before the freeze was put in place. *See also* C-Band Alliance Comments at Earth Station Annex (listing known earth stations not registered with the Commission) (“Earth Station Annex”). The C-Band Alliance is reviewing the list provided in the Earth Station Annex to ensure it accurately reflects the known earth stations not registered as of the close of the filing window on October 31, 2018. An updated list will be submitted to the record.

²⁸ Comcast Comments at 3. *See also* SIA Comments at 3 (“By far the largest users of C-band FSS are content providers that require the ability to reliably transmit programming to every corner of the United States. . . . Cable operators, content companies, and radio and television broadcasters all rely on 3.7-4.2 GHz C-band spectrum for video and audio content distribution. Much of the programming that Americans enjoy on television and on the radio, at one point or another, transits the 3.7-4.2 GHz band.”); Altice Comments at 2 (explaining that, as one of the largest video service providers in the United States, Altice USA relies on close to 150 earth stations to distribute video programming to its 4.9M residential and business customers.).

²⁹ Digital Comments at 2. *See also* Olympusat Comments at 2; QVC Comments at 4.

radio stations throughout the United States.”³⁰ The C-band Downlink is also critical to communications for the government, maritime, and energy sectors,³¹ and plays a small but significant role in aviation and weather data distribution.³² In addition, the C-band Downlink provides nationwide distribution for the Emergency Alert System, enables critical links to remote and underserved areas, and ensures the availability of essential communications systems during natural disasters when terrestrial services fail.³³

The record also affirms that alternative spectrum bands and technologies are not adequate substitutes.³⁴ Fiber service is not available everywhere and is often cost prohibitive.³⁵ Similarly, the Ku-band is an unworkable substitute because it is “notorious for being subject to severe rain fade conditions.”³⁶ Particularly for smaller content providers, the C-band Downlink enables “a

³⁰ NPR Comments at 3. *See also* Eutelsat Comments at 1 (The C-band Downlink is “by far the most cost effective and efficient means to distribute large amounts of video programming and other data-intensive services over large geographic areas, while ensuring a very high level of availability and reliability.”).

³¹ ITC Global Comments at 1-2.

³² ASRI Comments at 2-3.

³³ SIA Comments at 6.

³⁴ *See, e.g.*, NAB Comments at 5; NCTA Comments at 14-18; Comments of the Society of Broadcast Engineers, Inc. at 4 (“SBE Comments”); Comments of the Content Companies at 3 (shifting C-band Downlink video delivery to alternative spectrum or technologies would present incredibly complex operational challenges) (“Content Companies Comments”).

³⁵ C-Span Comments at 4; QVC Comments at 4 (“The reliability, quality, cost efficiency, and ubiquitous coverage offered by C-band is currently unmatched by fiber technologies or other satellite spectrum. . . . [F]iber simply is not available or is prohibitively costly to deploy [in rural and remote areas.]”); SIA Comments at 13-14 (“[F]iber deployment is not ubiquitous and is particularly limited in lesser populated areas. . . . Even where fiber is available, redundancy may be required to satisfy the high reliability expectations of content providers. Fiber systems are vulnerable to cable cuts, and such damage is particularly likely following a natural disaster.”).

³⁶ C-SPAN Comments at 4. *See also* Comments of Charter Communications, Inc. at 3-4 (“Charter Comments”) (“[T]he currently proposed alternatives to the use of the 3.7-4.2 GHz Band are less reliable and cost effective. Use of alternative satellite spectrum, such as the Ku-band, is not as desirable, as this spectrum is much more susceptible to rain fade, potentially

robust and reliable distribution network” as well as backhaul capability at a fixed cost.³⁷ Simply put, the “C-band offers reliability, quality, and cost efficiency that cannot be matched by other technologies or in other satellite spectrum.”³⁸

The Market-Based Approach is the best mechanism for ensuring that incumbent users are protected. The C-Band Alliance has already provided assurances to its content customers that they can continue to count on the quality and reliability of the C-band Downlink services,³⁹ and additional details are provided in Section IV, below. In addition, occasional use (on demand) services, which are an essential source of news, sports and special events programming for broadcasters and content producers,⁴⁰ will be protected. The Market-Based Approach also ensures that current C-band Downlink users continue to receive full-band, full-arc protection, an essential feature to maintain reliability that commenters strongly supported.⁴¹

resulting in a poor customer experience. And fiber delivery is vastly more expensive than Charter’s established earth stations, due to the need for multiple paths of redundancy, and the greatly increased expenses for installation and maintenance.”); Global Eagle Comments at 6 (“Global Eagle simply cannot transition its existing services to fiber[,]” and “relocating existing C-band operations to either the Ku- and Ka-band could compromise the performance of Global Eagle’s network”); Comcast Comments at 3-6; Cumulus Comments at 4-5; Luken Comments at 3; Speedcast Comments at 3-4; Comments of Gary E. Timm, at 5.

³⁷ EWTN Comments at 3.

³⁸ Digital Comments at 2. *See also* Linkup Comments at 2 (“C-band is the only cost effective and reliable transmission for content delivery that is sufficient for the 99.99% reliability that broadcasters require to serve their communities”); Local Broadcasters Comments at 3 (“no other method of delivering programming has the same reliability and national reach as [the C-band Downlink]”).

³⁹ *See* C-Band Alliance Ex Parte.

⁴⁰ Comments of North American Broadcasters Association at 4 (“NABA Comments”). *See also* PSSI Comments at 5-9 (providing examples of the various types of programming dependent upon the C-band Downlink, including college football and NASCAR).

⁴¹ *See, e.g.*, AT&T Comments at 12-13 (“earth stations authorized to operate in the [post-transition] satellite portion of the C-band should be permitted to obtain ‘full band, full arc’ coordination. . . . [S]uch flexibility will be all the more important with reduced C-band

C. The Market-Based Approach permits closing the digital divide by facilitating access to C-band Downlink spectrum, including in rural areas.

The C-Band Alliance and its members appreciate the necessity of high-speed broadband for participation in modern American life. Closing the digital divide in rural and remote communities will ensure that every American can enjoy the myriad economic and social benefits of universal access to advanced telecommunications services.

The C-Band Alliance, the Commission, and many commenters agree that the C-band Downlink is well suited for bringing terrestrial 5G to rural and remote communities because of its unique combination of favorable propagation characteristics and high data throughput.⁴² The Market-Based Approach allows small, regional, and rural wireless carriers and local exchange carriers – including P2MP operators – an opportunity to enter into SMAs to acquire this spectrum. The C-Band Alliance is committed to insuring that smaller regional and rural carriers (i.e., non-Tier 1) have access to valuable mid-band spectrum for 5G services. To facilitate that goal, the C-Band Alliance plans to create a block of spectrum solely for the use of smaller regional and rural carriers. The C-Band Alliance is already actively engaged in conversations with the aforementioned carriers to more fully understand their concerns.

capacity.”); Boeing Comments at 7 (the FCC should “preserve full-band and full-arc protection for C-band satellite earth stations in order to ensure that they can continue to make the most intensive use of the band.”); Comcast Comments at 32 (“The ability to quickly shift frequencies, azimuths, and/or elevation angles is one of the key factors that makes the C-Band as reliable as it is and that allows it to function correctly from both business and operational perspectives.”); Content Companies Comments at 9-10; Cumulus Comments at 12; Comments of GCI Communications Corp. at 12-13 (“GCI Comments”); NPR Comments at 2, 7-8; NCTA Comments at 24-28; NABA Comments at 4; PSSI Comments at 14; SIA Comments at 30; Speedcast Comments at 8; World Teleport Comments at 3.

⁴² *NPRM* ¶ 4; Comments of Competitive Carriers Association at 3 (“CCA Comments”); Comments of United States Cellular Corporation at 3 (“USCC Comments”); Comments of the Broadband Access Coalition at 2-3 (“BAC Comments”).

III. MARKET FORCES WILL PRODUCE THE RIGHT BALANCE OF SPECTRUM CLEARED FOR TERRESTRIAL 5G AND SPECTRUM PRESERVED FOR SATELLITE SERVICE

The record is divided on the amount of spectrum that should be made available for terrestrial 5G. One side, representing primarily terrestrial mobile operators and equipment manufacturers, claims the C-Band Alliance’s recent proposal to clear up to 200 MHz for terrestrial 5G use (inclusive of a guard band to protect adjacent services) is too little to support robust terrestrial 5G operations for multiple carriers.⁴³ The other, representing primarily the broadcast and cable industry, expresses concern that clearing 200 MHz is too much, given the vital video and audio content distribution services that are currently dependent on C-band Downlink spectrum.⁴⁴ Notably, none of the commenters, other than the C-Band Alliance, provides sufficient technical and operational details to support their desired outcome.

The initial proposal put forth by Intelsat Corp. (“Intelsat”), SES Americom, Inc. (“SES Americom”), and Intel Corp. to clear 100 MHz for terrestrial 5G use and another 50 MHz for a

⁴³ See, e.g., Verizon Comments at 9 (urging the Commission to require an Initial Minimum Spectrum Benchmark greater than the C-Band Alliance’s recent proposal of 200 MHz); AT&T Comments at 6 (stating that 80-100 MHz *per operator* would be needed for optimal 5G performance); Comments of T-Mobile USA, Inc. at 5-7 (“T-Mobile Comments”) (recommending that the Commission auction all 500 MHz and set a floor of 300 MHz in most areas); Comments of United States Cellular Corporation at 4 (“USCC Comments”) (agreeing with T-Mobile that all 500 MHz should be made available for auction); Ericsson Comments at 3 (stating that hundreds of megahertz of the C-band Downlink should be repurposed for mobile broadband service); Comments of Nokia at 8-10 (“Nokia Comments”) (suggesting that the C-Band Alliance could increase the initial band clearing beyond 200 MHz and that ideally over time the entire 500 MHz would be reallocated for terrestrial 5G use).

⁴⁴ See, e.g., Content Companies Comments at 5 (stating that no more than 100 MHz should be cleared); PSSI Comments at 10 (stating that no more than 100 MHz should be set aside for terrestrial mobile use); NAB Comments at 11 (stating that clearing 100 MHz already represents a massive reallocation of spectrum); Comments of the American Cable Association, at 16 (suggesting that the Commission start by repurposing 50 MHz in a limited geographic area for testing purposes); Speedcast Comments at 6-7 (stating that the Commission should allocate at most a small portion of the band for new terrestrial mobile services).

guard band in the 18-36 months following a final Commission order reflected initial technical and operational efforts to determine how much spectrum could be cleared for terrestrial 5G without impairing incumbent C-band customer interests.⁴⁵ Based on the information available at the time, 100 MHz plus a 50 MHz guard band was a reasonable clearing target. After the initial proposal, Intelsat and SES Americom further assessed contractual commitments, customer growth requirements, advanced filter technologies and additional input from new C-Band Alliance members Eutelsat and Telesat to determine the maximum amount of spectrum that could be cleared in 18-36 months.

Thus, when the C-Band Alliance recently announced that it intended to increase the amount of cleared spectrum to 200 MHz (*i.e.*, 180 MHz for terrestrial 5G use plus a 20 MHz guard band), it was the result of months of hard work to further refine its analyses with respect to both contracted capacity commitments and technical mitigation tools, including in-depth discussions with mobile equipment manufacturers. More specifically, the C-Band Alliance recently finished live, over-the-air testing at a member facility in Georgia using a 5G signal simulator and optimized band-pass filter prototypes that it commissioned.⁴⁶ The results of those tests provided the foundation for the technical specifications listed in the Technical Annex submitted in the C-Band Alliance Comments.⁴⁷ The C-Band Alliance members have also engaged in conversations with customers, as well as with cable operator and broadcast trade

⁴⁵ See *Ex Parte* Letter of Intelsat Corp., SES Americom, Inc., and Intel Corp., GN Docket Nos. 17-183 and 18-122, at 1 (Apr. 20, 2018).

⁴⁶ As the C-Band Alliance noted in its comments, its members have tested the ability of filter prototypes to reject high-powered terrestrial 5G transmissions adjacent to the remaining satellite band in order not to saturate sensitive satellite earth station low-noise block converters. C-Band Alliance Comments at 20. See also *id.* at Technical Annex.

⁴⁷ See *id.* at Technical Annex, Section III.

associations, about its plans to ensure continuity of operations throughout the transition. Most recently, Intelsat and SES Americom provided their customers with a detailed post-transition network configuration plan demonstrating continuity of service. In addition to gaining valuable customer feedback about demand evolution, ultra-HD impact and other requirements such as dual illumination and re-seeding head-ends, this process resulted in the C-Band Alliance Customer Commitment that was recently filed with the Commission.⁴⁸ Finally, as a result of a Request for Proposal process, the C-Band Alliance gained further clarity regarding the ability to launch several new satellite assets to support the transition in the relevant timeframe.

Importantly, a significant portion of the increase in available spectrum for terrestrial 5G use came from a reduction in the size of the guard band from 50 MHz to 20 MHz. Testing revealed that only a 20 MHz guard band is required to protect FSS operations from adjacent high-powered terrestrial 5G transmissions when used in conjunction with a purpose-designed filter to be fitted on earth stations.⁴⁹ Given the importance of ensuring the continued “five nines” availability expected by customers using the C-band Downlink, the C-Band Alliance’s decision to reduce the size of the guard band came only after detailed technical coexistence studies and testing were successfully concluded. A similar analysis supporting a 20 MHz guard band was filed by Nokia, the only other commenter that provided any sort of detailed technical coexistence studies between FSS and terrestrial 5G operations.⁵⁰

In sum, the decision to increase the maximum amount of spectrum cleared to 200 MHz was the outgrowth of substantial efforts – including significant technical and capacity

⁴⁸ *See* C-Band Alliance Ex Parte.

⁴⁹ The original proposal included a 50 MHz guard band.

⁵⁰ Nokia Comments at 3.

management analysis – by the C-Band Alliance and its members to free more spectrum for terrestrial 5G use. Claims that the increase to 200 MHz was an “11th hour” or arbitrary decision to placate demands of wireless industry⁵¹ or the Commission⁵² or indicative of current underutilization of the C-band⁵³ are simply wrong and are made by parties that have provided no technical analysis in support of their claims.

IV. THE TRANSITION FACILITATOR IS BEST POSITIONED TO CLEAR SPECTRUM AND PROTECT CUSTOMERS WHILE THE COMMISSION PROVIDES OVERSIGHT THROUGH LICENSING TERRESTRIAL MOBILE SERVICES

A. The Transition Facilitator will clear spectrum for flexible use while protecting ongoing FSS operations.

Clearing a portion of the C-band Downlink for terrestrial 5G and other flexible uses is an arduous, complex, and costly task that the C-Band Alliance, acting as Transition Facilitator, is best positioned to undertake.⁵⁴ The C-Band Alliance has explained that the Transition Facilitator would be open to all C-band satellite operators that are capable of providing service to all or a portion of CONUS pursuant to Commission-issued licenses or grants of market access.⁵⁵

As PSSI Global Services acknowledges, the satellite operator members of the Transition Facilitator have intimate knowledge of the business needs and operations of FSS earth station

⁵¹ See NAB Comments at 10.

⁵² See *NPRM*, Statement of Commissioner Michael O’Rielly (stating that “far more than the 100 megahertz initially proposed by the resident satellite providers” needs to be repurposed).

⁵³ See Comments of Microsoft Corporation at 5 (stating that the C-Band Alliance’s recent willingness to clear 200 MHz is indicative of the “gross underutilization” of the spectrum).

⁵⁴ See, e.g., World Teleport Comments at 3.

⁵⁵ C-Band Alliance Comments at 35-36. A party’s interest in the Transition Facilitator would be based on an equitable metric that reflects the CONUS C-band operations of each member.

operators and content provider-customers.⁵⁶ The fact that more than 17,000 earth stations have now registered with the Commission highlights the magnitude of the informational advantage that the C-Band Alliance possesses, its ability to organize earth station owners to make such filings,⁵⁷ and the scope of the task at hand. Understanding the business needs and operations of thousands of registrants is essential due to the unprecedented logistics of filter installation and possible repointing of antennas that will be necessary to quickly and efficiently clear and repack a portion of the C-band Downlink. Any entity, including the Commission, attempting to do so with no hands-on experience faces an impossible, and possibly commercially disastrous, task.⁵⁸ In contrast, as the World Teleport Association points out, the C-Band Alliance understands the needs of earth station operators and has direct knowledge of their operations.⁵⁹ Therefore, the C-Band Alliance, as Transition Facilitator, will be able to begin clearing spectrum years faster and accomplish the entire clearing and repacking process more efficiently than the Commission or any other entity.⁶⁰

To ensure FSS earth station operators continue to provide the 99.999% reliability that consumers rely upon today, members of the C-Band Alliance will invest in new satellites (all of which will be American-made) to add capacity in the upper portion of the C-band Downlink.

⁵⁶ See PSSI Comments at 12.

⁵⁷ An as-of-yet unquantified, but undoubtedly substantial, number of these earth stations are associated with customers of the members of the C-Band Alliance.

⁵⁸ See also ITIF Report at 6 (“As the FCC has acknowledged, it lacks comprehensive information on existing earth station operations, with potentially thousands of earth stations still unregistered.”).

⁵⁹ World Teleport Comments at 3.

⁶⁰ In addition, satellite operators have the agility and nimbleness necessary to clear spectrum quickly. Unlike with a command and control approach, satellite operators, acting through the Transition Facilitator, have the ability to course correct or adjust quickly in response to market developments.

More specifically, as part of the Market-Based Approach, members of the C-Band Alliance will launch enough new satellites so as to have a similar amount of capacity to deliver audio, video, and data content nationwide in 300 MHz that they currently have in 500 MHz. The proceeds obtained from the SMAs is the financial incentive that motivates this enormous investment in new satellites. No other plan in this proceeding includes satellite investments to give a future 300 MHz the same carrying capacity as today's 500 MHz. In addition, the C-Band Alliance, as the Transition Facilitator, will pay the reconfiguration and relocation costs for all affected FSS earth station incumbents.⁶¹ Such costs include, but are not limited to, hardware and hardware installation, equipment rentals, dual illumination of uplinks, and labor.⁶²

The C-Band Alliance agrees with the numerous commenters in this proceeding urging the FCC to protect certain, identified earth stations receiving satellite signals in the C-band Downlink.⁶³ To best achieve this, the C-Band Alliance recommends that the FCC define a date after which earth stations in the C-band Downlink will no longer be considered "incumbent" users of the band eligible for interference protection at the earth station from licensed terrestrial flexible use operations. The C-Band Alliance suggests that an appropriate date would be 30 days after publication of a Report and Order in this proceeding in the Federal Register. To further ensure inclusion of all eligible incumbent users, the FCC should again, temporarily for a period of 30-days following publication of the Report and Order in the Federal Register, lift the freeze

⁶¹ C-Band Alliance Comments at 22-23.

⁶² C-Band Alliance Ex Parte.

⁶³ *See, e.g.*, Inmarsat Comments at 3; National Public Radio Comments at 2; Charter Comments at 3; GCI Comments at 16.

on receive-only registrations and license applications for operations in the C-band Downlink for earth stations that were in operation as of April 18, 2018.⁶⁴

This additional filing window would enable earth station operators to register any existing antennas that were not registered by the prior filing window deadline and thus afford those antennas protection from interference at the earth station from licensed terrestrial flexible use operations.⁶⁵ After this additional filing window closes, the FCC should permit new earth station sites to be registered or licensed for purpose of interference protection at the earth station from licensed terrestrial flexible use operations only by waiver if the earth station registrant or applicant provides evidence that all relevant terrestrial flexible use operators agree to protect the earth station's operations from interference at the earth station. This coordinated protection process among terrestrial flexible use operators and FSS earth station operators would serve the public interest by allowing affected spectrum users to jointly determine the most efficient use of spectrum. For example, coordination would likely be achieved for relocated or new earth stations that further the purpose of facilitating more intensive flexible use of C-band spectrum.

B. The C-Band Alliance is uniquely qualified to serve as Transition Facilitator.

Concerns about the C-Band Alliance's role as Transition Facilitator are unfounded.⁶⁶

Given the hundreds of millions of dollars of existing commercial contracts for CONUS C-band

⁶⁴ See *Temporary Freeze on Applications for New or Modified Fixed Satellite Service Earth Stations and Fixed Microwave Stations in the 3.7-4.2 GHz Band; 90-Day Window to File Applications for Earth Stations Currently Operating in 3.7-4.2 GHz Band*, Public Notice, DA 18-398 (Apr. 19, 2018).

⁶⁵ See Earth Station Annex (listing known earth stations not registered with the Commission).

⁶⁶ Ironically, Google has suggested that the C-Band Alliance should not act as the Transition Facilitator because it may do too good a job of protecting incumbent earth station operations to the possible detriment of 5G interests. Comments of Google LLC at 12 (“Google Comments”) (“An incumbent-determined transition . . . might yield a ‘patchwork quilt of spectrum’”

services, the C-Band Alliance has every incentive to ensure that the service quality and reliability is maintained at contractually specified levels throughout any transition. First, the C-Band Alliance appreciates the critical import of C-band Downlink spectrum for content delivery and governmental, maritime, aeronautical, and emergency communications (among others). Second, the C-Band Alliance agrees with Cisco that “[s]atellite operators have every reason to ensure that the transition will leave their customers whole. Not only are these customers an important source of revenue, but satellite operators who leave their customers dissatisfied face the risk of private litigation.”⁶⁷ Finally, satellite operators have a genuine desire to “do right” by their customers, some of which they’ve served for decades.⁶⁸ The C-Band Alliance will ensure the interests of earth station operators are represented as it thoroughly understands the critical importance of the C-band Downlink to incumbent users and the American public.⁶⁹ And, under the Market-Based Approach, the C-Band Alliance has no incentive to significantly reduce the value of lower C-band Downlink spectrum for terrestrial mobile services.

Indeed, the C-Band Alliance is already working to ensure the success of the Market-Based Approach for all stakeholders. For example, the C-Band Alliance is currently engaged in comprehensive outreach efforts across the communications industry to share information and

unsuitable for wireless mobile broadband use because incumbents have “little if any concern for the long-term development of 5G services in the United States.”).

⁶⁷ Cisco Comments at 3-4.

⁶⁸ For these reasons, allowing individual earth station owners to join the Transition Facilitator is unnecessary. More than 17,000 earth stations have registered with the Commission. Choosing some subset of those to participate in the Transition Facilitator directly would undoubtedly involve protracted debates over eligibility criteria and the rules governing the internal workings of the Transition Facilitator. Such delay is not only costly in terms of U.S. policy objectives, but also completely unnecessary because of the aligned interests of the C-Band Alliance and its customers.

⁶⁹ See C-Band Alliance Comments at 11-16.

gauge interest in acquiring market-based rights to use mid-band spectrum. Moreover, safeguards are in place to prevent the exchange of competitively sensitive information between “buyers and sellers,” thus preventing improper exchanges of information.⁷⁰ The C-Band Alliance is also willing and able to negotiate the commercial and technical terms of SMAs that could be executed even before this rulemaking is complete—subject, of course, to consummation after receipt of all governmental regulatory approvals and compliance with any rules and procedures adopted by the Commission in this proceeding.

C. FCC oversight of the reallocation of the C-band Downlink is achieved by the agency’s terrestrial licensing process.

The Market-Based Approach and the role of the Transition Facilitator in clearing spectrum and protecting existing users is not an abdication of FCC control as some commenters have suggested.⁷¹ Rather, it is an innovative mechanism designed to streamline a complicated undertaking for the American people – delivering cleared spectrum in as short a time as possible.⁷² Implementing an approach that avoids regulatory micromanagement, which can lead to unnecessary delays, increased costs, and lost opportunities, is very much in the public interest.

As the Brattle Paper explained:

By deferring to the Transition Facilitator to develop the efficient solution to repurposing C-Band frequencies, the FCC is allowing the entity with the best specific knowledge find the right changes to the band. And by allowing the Transition Facilitator to make these decisions with the FCC’s ability to review, the FCC is supporting a far quicker process than a traditional FCC reallocation or any other of the alternative proposals discussed in the NPRM.⁷³

⁷⁰ See Google Comments at 13-14; Comments of Dynamic Spectrum Alliance at 18 (“DSA Comments”).

⁷¹ Comcast Comments at 23-24.

⁷² See *id.* at 29.

⁷³ Brattle Paper at 40.

The Market-Based Approach requires only minimal regulatory action by the Commission, which can be taken promptly under existing authority. For example, amending the Table of Frequency Allocations to authorize terrestrial mobile service in the C-band Downlink would be an exercise, not an impairment, of the FCC’s spectrum authority. Consistent with Section 310 of the Communications Act, the Commission will also review license applications from entities entering into SMAs with the Transition Facilitator and issue terrestrial mobile licenses. As part of this review, the agency will assess whether a license applicant possesses the requisite “citizenship, character, financial, technical, and other qualifications.”⁷⁴ Moreover, the Commission will also adopt a licensing framework and technical rules applicable to C-band Downlink spectrum cleared for terrestrial operations.⁷⁵ Thus, the Commission will in no way be abdicating its responsibility to determine how the public interest will best be served.

Importantly, the Market-Based Approach does not call upon the Commission to pick winners and losers in the pursuit of repurposing C-band Downlink spectrum. Rather, it enables the Commission to open the C-band Downlink to terrestrial mobile and other potential uses by employing market forces to determine the optimal use of the band.

V. UNDER THE MARKET-BASED APPROACH, THE TRANSITION FACILITATOR WILL EFFECTUATE THE U.S. PUBLIC POLICY GOAL OF WINNING THE RACE TO 5G

Satellite operators formed the C-Band Alliance to advance the United States’ goal of winning the race to 5G. Due to global harmonization of the lower portion of the band, and strong wireless demand for mid-band spectrum, Congress and the executive branch have made

⁷⁴ C-Band Alliance Comments at 35; *see also* 47 U.S.C. §§ 308, 310.

⁷⁵ With that authority, the FCC can, if appropriate, determine whether public policy requires a market carve out for small, regional carriers and/or exclude specific geographic areas – like Alaska and Hawaii – from licensing. *See* AT&T Comments at 4 n.6.

clear that reallocating a portion of mid-band spectrum is a U.S. priority.⁷⁶ The C-Band Alliance developed the only proposal that effectively manages existing licensing overlap and extensive beneficial use in the band while making mid-band spectrum available for terrestrial 5G quickly and economically.⁷⁷

A. Any economic gain enjoyed by entities entering into the SMAs under the Market-Based Approach is incidental to winning the race to 5G.

The Market-Based Approach provides a commercial path and economic incentive to undertake the difficult task of clearing part of the band. This incentive – which reflects market demand – drives the incumbent FSS operators to make the commercial or business and operational sacrifices necessary to clear spectrum they would otherwise use.⁷⁸ The Market-Based Approach was designed to provide an economic incentive to incumbents to take the difficult and costly steps to clearing a portion of the C-band Downlink; that said, any economic benefit to entities entering into SMAs is incidental to the goal of winning the race to 5G.⁷⁹ As discussed below, claims of windfall are undercut by the large investments made by FSS operators and the availability of other spectrum suitable for terrestrial 5G. Further, the

⁷⁶ See, e.g., Letter from Sen. John Thune (R-SD) to Ajit Pai, Chairman, FCC at 1 (June 21, 2017) (urging the Commission to explore possible new allocations in the mid-band frequencies, including the 3.7 GHz and 6 GHz bands); Letter from Sen. Jerry Moran (R-KS) and Sen. Tom Udall (D-NM) to Ajit Pai, Chairman, FCC at 2 (Nov. 13, 2018) (supporting the FCC’s rigorous examination of new and innovative uses of the C-band spectrum).

⁷⁷ See also ITIF Report at 6.

⁷⁸ See *id.* at 3 (“Policy should also encourage private actors to internalize both the costs and benefits of what they choose to do with the rights to their spectrum. That is to say, we should generally encourage participants to make the decisions as to how a particular band is best used, and be incentivized to gather the information needed to make the best decision.”).

⁷⁹ See, e.g., DSA Comments at 17; Comcast Comments at iii, 26; Google Comments at 11. Compare Reply Declaration of Jeffrey A. Eisenach, Ph.D. at 2-5, attached hereto (concerns about a “windfall” to FSS operators “are unfounded both as a matter of economics and as a matter of fact”) (“Eisenach Declaration”).

accelerated 5G deployment and other public interest benefits that stem from the Market-Based Approach outweigh any potential benefit that might arise from a long-delayed public auction process.

C-Band Alliance members have made significant investments in the C-band Downlink, having built a substantial U.S.-centric network infrastructure, sales force, customer base, and related U.S. revenues based on a replacement expectancy.⁸⁰ It would be unreasonable to expect incumbents to willingly – much less quickly – surrender or transfer spectrum that they are actively using to deliver contracted services to their customers.⁸¹ Indeed, as public companies, the FSS operators have a fiduciary obligation to seek compensation for any relinquished spectrum assets. Recognizing the importance of making this spectrum available for 5G expeditiously,⁸² the Market-Based Approach creates a financial incentive for C-Band Alliance members to undertake the costly, complicated, and difficult voluntary clearing process and ensure its success.⁸³ This incentive responds to market demand and legitimately reflects the socially productive public value of putting spectrum to a higher and better use. Indeed, any economic benefit that C-Band Alliance members realize “will be a direct reflection of the

⁸⁰ See, e.g., Joint Comments at 5; C-Band Alliance Comments at 9; Eisenach Declaration at 18. Moreover, Intelsat and SES Americom have paid for spectrum. In 2001, Intelsat paid \$1.0 billion for certain U.S. satellites of Loral, and in 2006, Intelsat paid \$3.2 billion when it bought PanAmSat; similarly, SES paid \$5 billion in 2001 when it bought GE Americom.

⁸¹ See, e.g., Joint Comments at 5; C-Band Alliance Proposal Fact Sheet: October 22 Update, C-Band Alliance, <https://c-bandalliance.com/wp-content/uploads/2018/10/20181022-200-MHz-FactSheet-Clean-and-Final.pdf> (last accessed November 30, 2018). In addition, to expropriate the incumbents’ licenses without providing full compensation would “effectively signal to other licensees, now and in the future, that any investments they make in reliance on an expectation of license renewal would be equally at risk.” Eisenach Declaration at 14.

⁸² See, e.g., C-Band Alliance Comments at 9; CTIA Comments at 7-8; ITIF Comments at 2; Ericsson Comments at 4-9; Cisco Comments at 3-4.

⁸³ See also Section VIII, *infra*.

economic value created by their entrepreneurial efforts to move scarce spectrum to a higher valued use.”⁸⁴ For the C-band Downlink, this means helping to close the digital divide by facilitating 5G coverage throughout suburban and rural America, which are unlikely to be covered by terrestrial millimeter wave (“mmW”) 5G.⁸⁵

The Public Interest Spectrum Coalition (“PISC”) erroneously suggests that the Market-Based Approach “will make spectrum available to potential bidders based *only* on maximizing the incumbent licensees’ profit rather than the broader public interest.”⁸⁶ The PISC fails to realize that, where highest and best uses are involved, market forces align the Transition Facilitator and the public interests.⁸⁷ FSS operators have little motivation to resist offers from those envisioning better, more efficient use balanced against their need to continue serving their customers well.⁸⁸

⁸⁴ Eisenach Declaration at 5.

⁸⁵ *See, e.g.*, ITIF Comments at 3 (“[A]chieving wide coverage [with mmW technology] would be prohibitively expensive for some areas. Mid-band frequencies . . . offer[] significant coverage and real capacity compared to relatively limited low-band spectrum. . . . [Clearing and repurposing this spectrum] for flexible mobile services as quickly as possible would be another important step in setting the stage for successful early 5G deployment in the United States.”); C-Band Alliance Comments at 7-8. *Cf.* Eutelsat Comments at 14.

⁸⁶ Comments of the Public Interest Spectrum Coalition at 31 (“PISC Comments”) (emphasis added).

⁸⁷ *See* Eisenach Declaration at 14 (“the CBA proposal represents the culmination of decades of spectrum reform efforts, which have finally succeeded in aligning the economic interests of spectrum licensees with the public interest in the dynamic reallocation of spectrum”).

⁸⁸ *See* ITIF Comments at 2 (“Secondary market transactions would quickly incentivize those participants with the best information to decide how much spectrum can be transitioned and at what cost.”). *See also* Cisco Comments at 3-4 (noting that existing customers are an important source of revenues and that dissatisfied customers represent a risk of private litigation).

Any hypothetical incentive for the Transition Facilitator to “demand higher prices than a truly competitive market would support,”⁸⁹ will be adequately countered by the availability of other spectrum suitable for terrestrial use.⁹⁰ As the Eisenach Declaration states, “the FSS licensees do not have a monopoly on mid-band spectrum.”⁹¹ Indeed, “the potential supply of C-Band spectrum is simply not significant enough to create a meaningful amount of market power.”⁹² This is true because “the relevant market here is not C-Band spectrum, but rather licensed spectrum that has some substitutability for C-Band spectrum. Consequently, the market may be as wide as all licensed spectrum usable for 5G services, and probably contains all existing licensed spectrum. . . .”⁹³

Concerns over the potential economic benefits that FSS operators may enjoy by entering into SMAs under the Market-Based Approach ring particularly hollow when raised by parties who have themselves enjoyed substantial payouts because of secondary market spectrum transactions. Comcast, for example, owned 63.6% of SpectrumCo LLC, which – after failing to develop the spectrum – transferred a significant number of advanced wireless service licenses to Verizon Wireless in a complex, multi-billion-dollar deal in 2012. In approving this and other associated transactions, the Commission emphasized that these deals would “result in an

⁸⁹ See T-Mobile Comments at 13.

⁹⁰ C-Band Alliance Comments at 35-37.

⁹¹ Eisenach Declaration at 17. See also *id.* at 17-18 (stating “[m]ore than 700 MHz of mid-band spectrum is already in private hands, and the Commission is in the process of making substantial additional mid-band spectrum available. . . . CBA’s bargaining power is also constrained by the fact that potential buyers have other alternatives, including repurposing existing spectrum holdings, and by the uncertainties inherent in delay.”).

⁹² Brattle Paper at 36.

⁹³ *Id.*

expeditious transfer of valuable spectrum into the hands of multiple national service providers that will put it to use in providing the latest generation mobile broadband services.”⁹⁴

On numerous other occasions, the Commission has recognized the tremendous value of bringing spectrum to market on an expedited basis, even when doing so may yield an incidental economic benefit to a particular party. For example, in 2016, the Commission granted 5G mobile use rights to certain active fixed service licensees in the 28 GHz band even though it recognized that its decision could be seen to benefit these incumbents.⁹⁵ As the Commission explained then, the benefits of expediting and coordinating next generation service outweighed any disadvantage of the grant.⁹⁶ Similarly, in granting transfers of control of mmW spectrum licenses, the Commission found that the deployment of 5G and next-generation services on an accelerated basis weighed in favor of approving the transactions despite the substantial benefits reaped by the transferees.⁹⁷ Other parties in this proceeding have similarly recognized the

⁹⁴ See *Applications of Cellco Partnership*, Memorandum Opinion and Order and Declaratory Ruling, 27 FCC Rcd. 10698, 10700, ¶ 6 (2012).

⁹⁵ See *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd. 8014, 8031, ¶¶ 41-42 (2016).

⁹⁶ See *id.*

⁹⁷ See, e.g., *Application of Verizon Communications Inc. and Straight Path Communications, Inc.: For Consent to Transfer Control of Local Multipoint Distribution Service, 39 GHz, Common Carrier Point-to-Point Microwave, and 3650-3700 MHz Service Licenses*, Memorandum Opinion and Order, 33 FCC Rcd. 188, 193-94, 196-97, ¶¶ 16, 24 (2018) (“Straight Path MO&OR”) (approving Verizon’s purchase of various spectrum licenses held by Straight Path and rejecting arguments that consenting to the transaction would reward speculators and deprive the FCC of the opportunity to generate revenue for the Treasury); *Application of AT&T Mobility Spectrum LLC and FiberTower Corporation For Consent to Transfer Control of 39 GHz Licenses*, Memorandum Opinion and Order, 33 FCC Rcd. 1251, 1259, ¶ 22 (2018) (consenting to the transfer of control of 39 GHz licenses held by FiberTower to AT&T because it would most likely accelerate 5G development and deployment).

overriding value of making mid-band spectrum available for 5G as soon as possible.⁹⁸ In this context, the Market-Based Approach “is a direct outgrowth of the incentives created by the FCC’s secondary market policies and precedents.”⁹⁹

B. Economic studies favor the Market-Based Approach and recognize that accelerated 5G deployment and other public benefits are paramount.

Economic studies filed in the record demonstrate that the Market-Based Approach is the superior mechanism for accomplishing the Commission’s goals in this proceeding because, by providing powerful incentives for market participants to maximize the value of scarce resources, it promises to free up a significant portion of the C-band Downlink for terrestrial mobile use voluntarily, expeditiously, and efficiently while fully protecting incumbent satellite services.¹⁰⁰ The Market-Based Approach will further benefit taxpayers, both as consumers of 5G and as a result of the economic growth generated by rapid and efficient C-band repurposing,¹⁰¹ which will require satellite manufacturing and filter manufacturing and installation.

The alternative proposed auction schemes could also provide some revenue to the Department of the Treasury (“Treasury”) but only at the expense of complexity, uncertainty, and delay. As ITIF correctly observed in a recently-published report, “Auctions should be relied on as a tool to discover the most socially beneficial uses. Auctions identify the firms that are most confident they can derive value from the spectrum. Proceeds flowing to the treasury is an added

⁹⁸ See Joint Comments at 2; CTIA Comments at 7-8; ITIF Comments at 2; Ericsson Comments at 4-9; Cisco Comments at 3-4.

⁹⁹ Eisenach Declaration at 3-4. See also *id.* at 9-14.

¹⁰⁰ See *infra* notes 86-88. ITIF Report at 5.

¹⁰¹ Eisenach Declaration at 15-17. See Straight Path MO&OR at ¶ 30 (“[W]e find that the transaction is unlikely to result in any significant public interest harms [and] the record provides general support for the Applicants’ assertions that the transaction likely will result in certain public interest benefits.”).

benefit (with some political significance), but it should not drive spectrum allocation decisions.”¹⁰² Indeed, Congress built this calculus into the Communications Act.¹⁰³ On balance, the public benefits stemming from the Market-Based Approach’s adoption outweigh any concerns over the theoretical loss of Treasury revenues.¹⁰⁴

Despite suggestions to the contrary,¹⁰⁵ taxpayers will benefit from the rapid and efficient repurposing of C-band spectrum and the economic growth that it will generate.¹⁰⁶ As Dr. Eisenach’s Declaration explains, it is “extremely likely that the consumer welfare gains from rapid allocation of C-Band spectrum to mobile broadband carriers made possible by the [Market-Based Approach] will far exceed any government revenues that might be generated by a more administrative process.”¹⁰⁷ In addition, the Treasury will accrue substantial additional revenues, both directly and indirectly, from the economic growth generated by rapid and efficient C-band repurposing.¹⁰⁸

¹⁰² ITIF Report at 6. *See also* ITIF Comments at 4 (“The fact that [auction] proceeds flow to the treasury is an added benefit . . . but it should not drive spectrum allocation.”).

¹⁰³ *See* 47 U.S.C. § 309(j)(7)(A)-(B).

¹⁰⁴ Eisenach Declaration at 15-17. *See* Straight Path MO&OR at ¶ 30.

¹⁰⁵ *See, e.g.*, T-Mobile Comments at 2.

¹⁰⁶ Eisenach Declaration at 15.

¹⁰⁷ *Id.* at 15. The annual increase in consumer welfare surplus associated with the release of CMRS spectrum in the U.S. is approximately equal to the total amount paid by the purchasers but the social welfare benefit of auction revenues that accrue to the Treasury is approximately 33 cents per dollar of Federal revenue. *See id.* at 15-16. Accordingly, taxpayers are better off adopting a market-oriented approach over an administrative approach that returns all revenues to the Treasury if the market-oriented approach is just four months faster. *See id.* at 16

¹⁰⁸ *Id.* at 15-17. One recent study estimates that next generation wireless networks will add \$2.7 trillion to U.S. GDP by 2030 – roughly equivalent to increasing annual GDP growth by 0.7 percentage points. *Id.* at 16 (citing Michael Mandel, *Long-Term U.S. Productivity Growth and Mobile Broadband: The Road Ahead*, Progressive Policy Institute, at 1-2 (Mar. 2016), http://www.progressivepolicy.org/wp-content/uploads/2016/03/2016.03-Mandel_Long-term-US-Productivity-Growth-and-Mobile-Broadband_The-Road-Ahead.pdf). Assuming an average

Indeed, the Brattle Group estimates that the accelerated pace of the Market-Based Approach will create billions of dollars in total public benefit compared to other alternatives in the *NPRM* and solve market and regulatory failures that no alternative government-run frameworks adequately address.¹⁰⁹ Likewise, in a paper attached to the Verizon Comments, Professor Daniel Vincent highlights that the Market-Based Approach requires relatively little government intervention and may be expected to conclude much more quickly.¹¹⁰ As Verizon correctly observed, “swift action here is critical to U.S. prospects in the race to 5G, and the market-based mechanism offers the best prospects for action next year.”¹¹¹

In contrast, economic studies filed in this proceeding show that there is a significant risk that any of the proposed FCC-led auction schemes will result in delays, technical issues, litigation, and regulatory overhead that could offset any social benefit gained from Treasury proceeds.¹¹² Dr. Vincent and R Street Institute, for example, found that an overlay auction requires coordination among FSS operators and earth station licensees and is likely to result in

overall Federal tax rate of about 20 percent of GDP, this growth translates into incremental tax revenues of approximately \$540 billion. *Id.* at 16. Because it would accelerate the realization of those revenues, the Market-Based Approach “is very likely to increase rather than decrease net Federal tax receipts compared with slower, more bureaucratic alternatives.” *Id.*

¹⁰⁹ See Brattle Paper at 29, 31; Eisenach Declaration at 6-8.

¹¹⁰ Daniel R. Vincent, *Assessment of Proposed C-Band Mechanisms* (Oct. 22, 2018) (Verizon Comments, Attachment) (“Vincent Paper”).

¹¹¹ Verizon Comments at 6. The R Street Institute also generally supports the Market-Based Approach and encourages the Commission to “continue its track record of allowing markets, rather than government manipulation, to determine which business models succeed or fail.” Comments of R Street Institute at 13 (“R Street Comments”). See Joe Kane, *The FCC’s 3.7-4.2 GHz Spectrum Band Proceeding: Key Facts and Analysis*, R Street Institute (Sept. 2018) (R Street Comments, Appendix A) (“R Street Study”).

¹¹² See Eisenach Declaration at 7 (“proposals to deprive FSS operators of the full return on their spectrum rights through a forced sale or minimum clearing mandate would inevitably replace market incentives with administrative process, precipitating all of the delays and inefficiencies secondary markets are designed to avoid”).

holdouts.¹¹³ A capacity auction also suffers from the holdout problem¹¹⁴ and, as noted in the Vincent Paper and Verizon’s comments, creates a “threshold problem” where no licensee has the incentive to be the first to offer capacity.¹¹⁵ Proponents of an incentive auction ignore the fact that, given the non-exclusive licenses held by the members of the C-Band Alliance, “each of the potential suppliers of C-band spectrum owns rights to *all* of the spectrum . . . making it difficult to see how the reverse portion of the auction could work.”¹¹⁶ This approach would also introduce ambiguities and delays, and holdout incentives would persist.¹¹⁷ Given the fundamental deficiencies of proposed alternatives, the public benefits that will stem from the Market-Based Approach’s adoption outweigh any concerns over the possible loss of Treasury revenues.

Moreover, all the proposed alternatives require stripping away license rights from FSS operators that implemented those rights through substantial investment. The Fifth Amendment prohibits the taking of “private property . . . for public use, without just compensation.”¹¹⁸ At least one federal court has recognized that spectrum licensees have a property interest in the spectrum they are licensed to use, limited by the terms and conditions of the license.¹¹⁹ The

¹¹³ See Verizon Comments at 8 (citing Vincent Paper at 9); Eutelsat Comments at 12; R Street Study at 6. See also Brattle Paper at 29-30.

¹¹⁴ See Brattle Paper at 32-33.

¹¹⁵ See Vincent Paper at 9 (cited in Verizon Comments at 8). See also Eutelsat Comments at 12.

¹¹⁶ Verizon Comments at 7.

¹¹⁷ See Brattle Paper at 31; R Street Study at 5 (“Imposing the FCC as a middleman may delay the process more than a situation in which profit-driven parties deal with each other directly.”).

¹¹⁸ U.S. Const. amend. V.

¹¹⁹ See *Alpine PCS, Inc. v. United States*, 128 Fed. Cl. 303, 309 (2016), *aff’d on other grounds*, 878 F.3d 1086 (Fed. Cir. 2018), *cert. denied*, 139 S. Ct. 78 (2018); see also *In re Atlantic Bus. and Cmty. Dev. Corp.* 994 F.2d at 1074 (“Also indicative of a limited property interest are the procedural safeguards against arbitrary revocation of FCC licenses.”) (citing 47 U.S.C. § 312).

recognition of a constitutionally protected property interest makes eminent sense here in light of FSS operators' reasonable investment-backed expectations. FSS operators invested billions of dollars in building and launching satellites to provide C-band service with the understanding that, if they built their satellites within five years and perfected their license rights, they could continue to use their orbital location and spectrum for fifteen years. They also reasonably relied on the FCC's assurance that they would be permitted to replace these satellites pursuant to the FCC's written replacement expectancy policy.¹²⁰ The proposed alternatives to the Market-Based Approach would deprive satellite operators of a constitutionally protected property interest without just compensation.

VI. THE FCC LACKS AUTHORITY UNDER THE COMMUNICATIONS ACT TO CONDUCT AN AUCTION AS PROPOSED BY T-MOBILE

The Communications Act authorizes the Commission to use an incentive auction to encourage licensees to relinquish their holdings (1) *voluntarily* provided that (2) *at least two bidders* compete to relinquish spectrum usage rights.¹²¹ T-Mobile has proposed an approach in this proceeding that fails both prongs.¹²²

¹²⁰ See *Columbia Communications Corporation Authorization to Launch and Operate a Geostationary C-band Replacement Satellite in the Fixed-Satellite Service at 37.5° W.L.*, Memorandum Opinion and Order, 16 FCC Rcd 20176, ¶ 7 (2001) (“[G]iven the huge costs of building and operating satellite space stations, there should be some assurance that operators will be able to continue to serve their customers. The Commission has therefore stated that, when the orbit location remains available for a U.S. satellite with the technical characteristics of the proposed replacement satellite, it will generally authorize the replacement satellite at the same location.”) (citing *Assignment of Orbital Locations to Space Stations in Domestic Fixed-Satellite Service*, Memorandum Opinion and Order, 3 FCC Rcd 6972, n.31 (1988) and *GE American Communications, Inc.*, Order and Authorization, 10 FCC Rcd 13775, ¶ 6 (Int’l Bur. 1995)).

¹²¹ 47 U.S.C. §§ 309(j)(8)(G), 316. See also *In re Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Fourth Report and Order, GN Dkt. No. 14-177, FCC CIRC1812-01, ¶ 9 (circ. Dec. 12, 2018); *NPRM* at ¶ 103 (“Incentive auctions are a voluntary, market-based means of repurposing spectrum by encouraging licensees to compete to voluntarily relinquish spectrum

First, it is not voluntary. It would force satellite operators involuntarily to form a consortium to relinquish their spectrum rights. The C-Band Alliance would not serve this purpose because the C-Band Alliance exists now only because the Market-Based Approach creates incentives for it to exist. Specifically, the Market-Based Approach (unlike T-Mobile’s approach) creates economic incentives for the C-Band Alliance to repurpose spectrum and enables the C-Band Alliance to optimize resource, cost, and timeline decisions while protecting existing customers. If the Commission adopts T-Mobile’s proposal, the *raison d’être* for the C-Band Alliance would be lost and the C-Band Alliance would disband. Thus, any consortium formed under T-Mobile’s approach would be at the behest – nay, command – of the FCC. For that reason, T-Mobile’s approach is anything but a “market” plan. And the FCC would have to compel not just the members of the C-Band Alliance to join, but also other operators that have U.S. market access but no U.S. customers, U.S. revenue, and/or CONUS coverage. The Communications Act does not authorize the FCC to march satellite operators at regulatory gun point towards “consortium.” Even if it did, each one of the satellite operators is a potential holdout, a problem T-Mobile’s approach does not, and cannot, solve.¹²³

Second, under T-Mobile’s approach there is just one bidder – the forced march consortium. The Commission anticipates this problem in the *NPRM*:

We note that in the case of the Commission’s incentive auction authority, there is a legal aspect to the problem of FSS satellite operators’ incentives to reduce the amount of spectrum for repurposing discussed above. Specifically, the

usage rights in exchange for a share of the proceeds from an auction of new licenses to use the repurposed spectrum.”).

¹²² See generally T-Mobile Comments.

¹²³ Again, because the C-Band Alliance would cease to exist under T-Mobile’s approach, T-Mobile’s attempted reliance on the C-Band Alliance to solve the holdout problem is fundamentally, and fatally, flawed.

Commission’s legal authority to use that mechanism depends on having “at least two competing licensees participate in the reverse auction.”¹²⁴

Whatever legal smoke and mirrors T-Mobile anticipates employing to make the plain language of the Communications Act disappear is not evident from its proposal or subsequent filings.¹²⁵ Regardless, the better choice, clearly, is to reject T-Mobile’s proposal entirely.

T-Mobile’s government-forced auction also contemplates clearing different amounts of spectrum between urban and rural areas.¹²⁶ This geographic-based spectrum-clearing proposal is flawed for two reasons. First, it would exacerbate the digital divide by providing more mid-band spectrum in urban areas compared to rural. Second, it fundamentally misunderstands the technical capabilities of C-band satellites, which typically employ broad beams to transmit over the same frequencies to very large geographic regions designed to conform to the entirety of the CONUS. The satellite simply cannot cease using frequencies in urban areas while still using those same frequencies in rural areas. As a result, the only way to provide more cleared spectrum in one geographic area versus another would be to undertake the complex and impractical process of relocating all urban earth stations to a rural area and fiberizing their content back to the urban location. This suggestion ignores the reality of the dense C-band Downlink use in urban areas and ignores the operational reality that downlink antenna owners are not staffed to manage a thousand-node fiber network. Clearing major urban areas would require the relocation and fiberizing of thousands of antennas and would significantly impair the ability of

¹²⁴ *NPRM* at ¶ 105.

¹²⁵ While “decisions of the Commission and the U.S. Court of Appeals” may support a “broad reading of the operative provisions of the Communications Act,” *see Ex Parte* Letter of T-Mobile, GN Docket No. 18-122 (filed Nov. 15, 2018), it is unlikely they support a reading completely contrary to the plain language of the statute.

¹²⁶ *See* T-Mobile Comments at 5.

transportable antenna operators from using the C-band Downlink to beam must-watch events from downtown venues such as sports arenas.

VII. THE MARKET-BASED APPROACH IS CONSISTENT WITH THE COMMISSION’S AUTHORITY UNDER SECTION 309(J) OF THE COMMUNICATIONS ACT

The Market-Based Approach will not result in mutually exclusive applications and therefore will not trigger any obligation to employ an auction under Section 309(j)(1).¹²⁷ SMAs negotiated by the C-Band Alliance will qualify only one applicant for each license. These private negotiations contemplated under the Market-Based Approach are fully consistent with the Commission’s obligation to continue to use negotiation, engineering solutions, threshold qualifications, service regulations, and other means to avoid mutual exclusivity when it is in the public interest to do so.¹²⁸

The PISC complains that the use of private negotiations under the Market-Based Approach would create an “exception [that] swallows the rule” and effectively supplant Section 309(j)(1)’s mandate to use competitive bidding.¹²⁹ Likewise, the PISC argues that “incentive auction authority under Section 309(j) that Congress bestowed on the Commission in the 2012 Spectrum Act is the *legitimate* ‘market-based approach’ that can and should be designed to work for” the C-band Downlink.¹³⁰ The PISC’s arguments ignore the fact that the Commission can rely on a variety of specific tools – as well as “other means” – to satisfy its statutory obligations

¹²⁷ See 47 U.S.C. § 309(j)(1).

¹²⁸ See 47 U.S.C. § 309(j)(6)(E).

¹²⁹ PISC Comments at 25.

¹³⁰ *Id.* at 26.

where it advances the public interest.¹³¹ Passage of the Spectrum Act of 2012 in no way modified the Commission’s obligation under Section 309(j)(6)(E) to avoid mutual exclusivity through other means where it is in the public interest to do so.¹³² Indeed, the Commission continues to rely on various regulatory tools to avoid mutual exclusivity in the public interest, such as its longstanding use of industry-led frequency coordination and engineering solutions for licensing private mobile radio and other services.¹³³ Likewise, the Commission allowed the use of engineering solutions and settlements to avoid mutual exclusivity among low power TV and TV translator stations in the recently concluded Broadcast Incentive Auction.¹³⁴

Clearing the C-band Downlink is an exceptionally complex endeavor, which the Commission’s traditional spectrum reallocation tools are ill-suited to address at all, much less in an expedited manner. Indeed, the *NPRM* enumerates the numerous difficulties in reallocating

¹³¹ See, e.g., *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report and Order, 29 FCC Rcd. 6567, 6836-37, ¶ 661 (2014) (“Under our existing rules, mutually exclusive applications (i.e., those that cannot be granted without causing interference to each other) generally are resolved through an auction. In this case, the public interest would be served by allowing LPTV and TV translator stations with mutually exclusive displacement applications to explore engineering solutions or agree on a settlement to resolve the mutual exclusivity.”).

¹³² Cf. Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, §§ 6402 *et seq.* (codified at 47 U.S.C. § 309(j)(8)(G)). Congress has previously explained that the Commission’s auction authority was not to be construed as minimizing its obligation to avoid mutually exclusive license applications when it is in the public interest to do so. Expanding the Commission’s auction authority in the Balanced Budget Act of 1997, the accompanying Conference Report emphasized that the Commission “must still ensure that its determinations regarding mutual exclusivity are consistent with the Commission’s obligations under section 309(j)(6)(E)” and should not “overlook[] engineering solutions, negotiations, or other tools that avoid mutual exclusivity.” H.R. Rep. No. 105-217, at 572 (1997) (Conf. Rep.).

¹³³ See *Creation of Interstitial 12.5 Kiloherertz Channels in the 800 MHz Band Between 809-817/854-862 MHz*, Report and Order and Order, WP Docket No. 15-32 *et al.*, FCC 18-143, ¶¶ 2-3 (2018) (announcing that the Commission would continue to rely on private frequency coordination for the assignment of newly available 800 MHz band channels).

¹³⁴ *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report and Order, 29 FCC Rcd. 6567, 6836-37, ¶ 661 (2014).

the band for terrestrial use.¹³⁵ For example, the *NPRM* points out the obvious holdout problems that arise under an incentive auction model due to the equal, nonexclusive rights that the FSS operators have in the C-band Downlink.¹³⁶ Therefore, the C-Band Alliance believes it is in the public interest to avoid the problems and adopt the Market-Based Approach.

The PISC also argues that since adoption of Section 309(j), congressional intent has demonstrated a preference for use of an incentive auction to clear and repurpose a band expeditiously.¹³⁷ The PISC points to the FCC's initial 700 MHz auction approach (based in part on a proposal by the Spectrum Clearing Alliance¹³⁸) and subsequent congressional passage of the Auction Reform Act of 2002¹³⁹ as further evidence that an incentive auction is appropriate here.¹⁴⁰ As described above, however, Congress has taken no action to limit the Commission's authority to avoid mutual exclusivity under Section 309(j)(6)(E). Moreover, the PISC's attempted comparisons between the FCC's earliest broadcast incentive auction efforts and the Market-Based Approach for the C-band Downlink are inapposite, and demonstrate the problems associated with jerry-rigging a government-run incentive auction to fit an inappropriate situation.

The 700 MHz proposal by the Spectrum Clearing Alliance would have provided auction proceeds to broadcasters for their accelerated clearing of spectrum in the 700 MHz band, although the broadcasters were already under a mandate to transition from the band. Lacking specific incentive auction authority at the time, the FCC constructed a 700 MHz auction

¹³⁵ *NPRM* at ¶ 59.

¹³⁶ *Id.*

¹³⁷ PISC Comments at 27.

¹³⁸ Petition for Clarification and Reconsideration of the Spectrum Clearing Alliance, WT Docket No. 99-168 *et al.*, at 2 (filed Mar. 16, 2001).

¹³⁹ Auction Reform Act of 2002, Pub. L. No. 107-195.

¹⁴⁰ PISC Comments at 29-30.

framework based on the Spectrum Clearing Alliance proposal using mandatory mechanisms in an effort to incentivize early transitions, but the structural, political, and potential legal issues involved prompted congressional action. Congress later passed incentive auction legislation tailored to the broadcaster situation in the Spectrum Act of 2012, specifically endorsing the concept of relinquishing spectrum and keeping current revenue streams by allowing broadcasters to channel share following the Broadcast Incentive Auction.¹⁴¹

In contrast, the C-Band Alliance is volunteering to surrender use of up to 200 megahertz of the C-band Downlink, despite not being under any obligation or congressional mandate to do so, and will undertake extremely complex and expensive commitments to clear the spectrum quickly. The Market-Based Approach enables the Commission to use available licensing tools to further its public interest goals, balancing the urgent need for expedited access to mid-band spectrum for 5G terrestrial use with the ongoing spectrum needs of current FSS operators and their customers. There is no need to spend years trying to design an incentive auction to fit an untenable situation when the best solution is already in hand.

The lynchpin of an incentive auction is the voluntary participation of incumbent licensees in a reverse auction to cede spectrum rights. Without the C-Band Alliance members' participation in the process, there can be no incentive auction to clear the C-band Downlink.

Moreover, because each FSS operator has access to the entire band, the lack of even one FSS

¹⁴¹ Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, § 6403(a)(2) (codified at 47 U.S.C. § 1452). The PISC Comments incorrectly state that the entirety of nearly \$20 billion in revenue generated “were sent to the Treasury rather than into private pockets.” PISC Comments at 30. Approximately \$10 billion was directed towards broadcasters, and \$7 billion was directed to the public (of which some will now be used for extra broadcaster reimbursement costs). *See Broadcast Incentive Auction and Post-Auction Transition*, FCC, available at <https://www.fcc.gov/about-fcc/fcc-initiatives/incentive-auctions> (last updated May 9, 2017).

operator to participate cannot be overcome by finding available substitutes. This substitution problem is why the C-Band Alliance is necessary and why a government-run incentive auction for the C-band Downlink would fail. Reverse auctions rely on substitute products to create competition. In the Broadcast Incentive Auction, participating television broadcasters competed against each other for compensation to relinquish their mutually exclusive spectrum rights. Because no such mutually exclusive rights exist in the C-band Downlink, the substitute products required for a successful reverse auction do not exist.

In addition, the availability of unlicensed, government-held spectrum – the so-called “TV white spaces” – both in the 700 MHz auction and the broadcast spectrum auction further distinguishes those auctions from the C-band Downlink situation. In the 700 MHz auction, the DTV transition created sufficient inventory for the auction without requiring any broadcaster to go off the air. In the Broadcast Incentive Auction, significant amounts of unassigned spectrum in the 600 MHz band allowed clearing in many markets without any stations having to be paid to relinquish spectrum rights in a reverse auction. No such “white spaces” exist in the heavily-utilized and fully-licensed C-band Downlink. Full participation of all FSS operators would be required to clear even one megahertz of spectrum.

Finally, the PISC acknowledges that the 700 MHz “auction was delayed several years.”¹⁴² Contrary to the Commission’s stated objective of winning the race to 5G, it appears that the PISC is entirely comfortable with a decade-long auction proceeding. The FCC should not sacrifice important public interest goals in a lengthy effort to design an incentive auction that will be fraught with legal, practical, and other impediments.

¹⁴² PISC Comments at 30.

In light of the foregoing, the Market-Based Approach is entirely consistent with the Commission’s authority under Section 309(j) and no previous congressional statements or actions provide any indication to the contrary.

VIII. USING THE ADMINISTRATIVE PROCESS AS COVER TO DELAY 5G DEPLOYMENT STIFLES COMPETITION AND CONTRAVENES THE PUBLIC INTEREST

The record establishes that the Market-Based Approach will allow 5G deployment much faster than government-run mechanisms, thus benefitting consumer welfare, competition, and the public interest. By contrast, slowing the U.S. in the race to 5G will benefit only specific competitors who enjoy, or hope to enjoy, a market advantage. For example, T-Mobile, which has staked its merger with Sprint on being the first mover for a nationwide 5G network, and Comcast, which has substantial market power in the in-home broadband market, support regulatory procedural action that would delay increased 5G deployment and stifle their competition.

A. T-Mobile seeks to delay C-band 5G deployment for anticompetitive reasons.

Being first to market with a nationwide 5G network is the key driver for T-Mobile’s proposed merger with Sprint. Sprint’s 2.5 GHz spectrum is its “crown jewel.”¹⁴³ By controlling 76% of the nation’s 2.5 GHz spectrum, with an average of 160-194 MHz in the top 100 markets, Sprint’s holdings make it “the only carrier that doesn’t have to compromise what 5G can deliver,” according to Sprint Executive Chairman Marcelo Claure.¹⁴⁴ The Public Interest

¹⁴³ Bryan Gurley and Scott Moritz, *Inside the Plan to Pull Sprint Out of Its Death Spiral*, Bloomberg Businessweek (Jan. 26, 2016), available at <https://www.bloomberg.com/features/2016-how-to-fix-sprint/>.

¹⁴⁴ Fred Campbell, *Spectrum Complicates T-Mobile / Sprint Merger Regulatory Approval*, Forbes (May 9, 2018), available at

Statement (“Statement”) submitted in support of the T-Mobile/Sprint merger confirms that this spectrum serves as the lynchpin of the proposed acquisition. The combined company, New T-Mobile, would “implement a pure 5G network in the 2.5 GHz band as rapidly as possible.”¹⁴⁵ Importantly, the Statement adds that “with broader 5G coverage, New T-Mobile will be able to provide services that Verizon and AT&T cannot currently match.”¹⁴⁶

The Statement also argues that competition will make New T-Mobile’s first-mover advantage short-lived. “In the face of [New T-Mobile’s 5G deployment], Verizon and AT&T will need to respond with improved and accelerated 5G network investment and deployment to the betterment of all consumers and the country.”¹⁴⁷ Moreover, “consumer welfare will be enhanced further by Verizon’s and AT&T’s inevitable competitive response.”¹⁴⁸ In sum, “the rapid and widespread deployment of 5G networks in a market structure that spurs rivals to invest in a huge increase in capacity and, correspondingly, to drop tremendously the price of data per gigabyte” represents “a goal critical to enhancing consumer welfare in this country.”¹⁴⁹ By “accelerat[ing] significant industry-wide investment,” New T-Mobile will “propel the United States across the finish line first in the race to 5G.”¹⁵⁰

<https://www.forbes.com/sites/fredcampbell/2018/05/09/spectrum-complicates-t-mobile-sprint-merger-regulatory-approval/#44bc53254641>.

¹⁴⁵ Public Interest Statement of T-Mobile US, Inc. & Sprint Corp., WT Docket No. 18-197, at 37 (June 18, 2018) (“Public Interest Statement”).

¹⁴⁶ *Id.* at 101.

¹⁴⁷ *Id.* at i.

¹⁴⁸ *Id.* at 102.

¹⁴⁹ *Id.* at i.

¹⁵⁰ *Id.* at 50-51.

The C-Band Alliance wholeheartedly agrees that widespread 5G deployment, increased competition, and lower prices will benefit consumers. Here, in this proceeding, however, T-Mobile seeks to delay C-band spectrum – a critical input for rivals’ “inevitable competitive response” – from reaching the market. T-Mobile’s convoluted proposal would produce years of regulatory and legal challenges to delay the availability of C-band spectrum for wireless use by its competitors.¹⁵¹ Tellingly, only one commenter explicitly supported T-Mobile’s self-serving proposal.¹⁵²

T-Mobile can’t have it both ways; either it welcomes competition to benefit consumer welfare, or it seeks to block rivals’ access to mid-band spectrum to the detriment of the United States in the race to 5G. Regardless, in this proceeding, the public interest clearly favors the efficiency of the Market-Based Approach over T-Mobile’s proposal.

B. Comcast seeks to delay C-band 5G deployment for anticompetitive reasons.

Comcast’s argument that the Market-Based Approach does not put “America First” is disingenuous.¹⁵³ Winning the race to 5G is, by definition, putting “America First.”¹⁵⁴ In contrast, delaying 5G is putting “Comcast First.”

Nationwide 5G represents an existential threat to Comcast’s dominant market position for in-home broadband service.¹⁵⁵ Indeed, “[i]f there was ever a business ripe for disruption, it’s

¹⁵¹ See, e.g., C-Band Alliance Comments at 60-61 (stating that the T-Mobile proposal will likely lead to lengthy delays to clarify whether statutory barriers exist to sharing government auction revenues between the federal government and the satellite operators); see also *NPRM* ¶ 112.

¹⁵² See USCC Comments at 4, 7.

¹⁵³ Comcast Comments at 26.

¹⁵⁴ Furthermore, to suggest that members of the C-Band Alliance are somehow incapable of “accomplishing a fair and reasonable transition for the C-Band” because they are “foreign-based entities” is ridiculous. Comcast Comments at 29. The American credentials of Intelsat and SES Americom are beyond dispute.

home Internet broadband.”¹⁵⁶ This fall, Verizon launched 5G Home internet service in four markets – three where Comcast is the main cable and in-home broadband provider – with more cities to follow.¹⁵⁷ AT&T has announced twelve introductory 5G cities.¹⁵⁸ And T-Mobile details its post-merger, in-home broadband plans in the Statement:

New T-Mobile’s robust, nationwide 5G network will eliminate the speed and capacity differential between mobile and in-home wired broadband for many Americans, allowing millions more Americans to free themselves from the grip of traditional in-home broadband providers. The new 5G network’s speeds, capacity, and low prices will allow consumers to “cut the cord” and use their mobile wireless service as their broadband service both inside and outside the home and pocket the savings from eliminating an unnecessary and costly wired broadband bill month after month. New T-Mobile will also offer an aggressively priced wireless in-home broadband solution to compete head-on with the traditional providers.¹⁵⁹

Slowing down the transition of any C-band spectrum to 5G provides a competitive advantage to Comcast. For that reason, Comcast’s calls for the Commission to “proceed

¹⁵⁵ “Along with cord cutting and potential near saturation of the U.S. broadband market, Wall Street has also mulled fears of 5G wireless competition as it has steadily downgraded the North American cable market over the last six months.” Daniel Frankel, *Comcast’s Watson: “We’re very confident in our ability to compete” with 5G*, FierceVideo.com (Apr. 27, 2018), available at <https://www.fiercevideo.com/cable/comcast-s-watson-we-re-very-confident-our-ability-to-compete-5g>.

¹⁵⁶ Dwight Silverman, *Verizon’s upcoming 5G residential service in Houston is a big deal. Here’s why*, HoustonChronicle.com (July 25, 2018), available at <https://www.houstonchronicle.com/techburger/article/Here-s-why-Verizon-s-upcoming-5G-residential-13103987.php>.

¹⁵⁷ Jon Brodtkin, *Hate your Comcast broadband? Verizon might sell you 5G home internet*, ArsTechnica (Oct. 5, 2018), available at <https://arstechnica.com/information-technology/2018/10/hate-your-comcast-broadband-verizon-might-sell-you-5g-home-internet/>.

¹⁵⁸ Daniel Frankel, *Comcast and Charter Brace for Fixed 5G AT&T - Verizon Showdown in Indy*, Multichannel.com (Aug. 31, 2018), available at <https://www.multichannel.com/news/comcast-and-charter-brace-for-fixed-5g-at-t-verizon-showdown-in-indy>.

¹⁵⁹ T-Mobile Public Interest Statement at ii.

cautiously” and develop a deliberate, more “robust record” ring hollow.¹⁶⁰ Its true motivation appears to be to avoid the “C-Band . . . be[ing] fast-tracked into 5G spectrum” and increased competition for in-home broadband.¹⁶¹ Using the administrative process as a roadblock to fast 5G deployment, competition, and increased consumer welfare may serve Comcast’s business interests, but it plainly contravenes the public interest.

IX. THE MARKET-BASED APPROACH ADEQUATELY PROTECTS NON-U.S. C-BAND SATELLITE OPERATORS

ABS Global Ltd. (“ABS”), Hispasat S.A. (“Hispasat”), and Embratel Star One S.A. (“Embratel”) assert that they have “invested substantial capital to construct, launch, and operate satellites serving the U.S. market through the use of the C-Band and other frequency bands.”¹⁶² To the contrary, these operators have limited, if any, ties to the U.S. market and – by their own admission – currently have no U.S. C-band customers or revenue despite assets that have been in service for years.¹⁶³ As a result, the Market-Based Approach adequately protects these operators.

First and foremost, to the extent these operators are able to provide CONUS service pursuant to grants of market access, they are eligible to participate in the Transition Facilitator as proposed in the *NPRM*.¹⁶⁴ Even if they do not join, they will be reimbursed for earth station reconfiguration and relocation costs, to the extent they have any.¹⁶⁵

¹⁶⁰ Comcast Comments at i-iii.

¹⁶¹ *Id.* at iii.

¹⁶² *Ex Parte* Letter of Asia Broadcast Satellite, Hispasat, Star One, Docket No. 18-122, Attachment, at 6 (Oct. 15, 2018) (“Oct. 15 Ex Parte”).

¹⁶³ *Id.*, Attachment at 6.

¹⁶⁴ *See* C-Band Alliance Comments at 22.

¹⁶⁵ *Id.* at 22-23.

Second, ABS, Hispasat, and Embratel acknowledge that they have not “realized revenue from C-Band services to/from US points.”¹⁶⁶ The attempt by these “No Customer, No Revenue”¹⁶⁷ satellite operators to blame the Commission-imposed freeze on new FSS earth station applications or modifications for their lack of U.S. business is belied by facts and public statements that show otherwise.

- Embratel: Embratel Star One C2 was granted market access in 2005 and launched in April 2008.¹⁶⁸ It has no C-band coverage of the Continental United States,¹⁶⁹ so, accordingly, it has no U.S. C-band customers or revenue. Embratel Star One C3 has no grant of market access for C-band, which is not surprising because the satellite has no U.S. C-band coverage.¹⁷⁰ Accordingly, it also has no U.S. C-band customers or revenue. Embratel Star One C1 was granted FCC market access in 2006 and launched in 2007.¹⁷¹ Yet, despite more than a decade of opportunity, it has no U.S. C-band customers or revenue.¹⁷²
- Hispasat: As Hispasat acknowledges, Amazonas-3 has had U.S. market access since 2013, yet it has no U.S. C-band customers or revenue.¹⁷³ In fact, Hispasat willingly chose to fill the Amazonas-3 C-band transponder capacity to serve areas other than the United States.¹⁷⁴ Therefore, Hispasat’s own history refutes its present claim that it “expected to commit much of its C-band capacity to the United States as early as 2019.”¹⁷⁵

¹⁶⁶ Oct. 15 Ex Parte, Attachment, at 6.

¹⁶⁷ Each reference to “No Customer, No Revenue” satellite operators herein refers to the fact that these satellite operators have no CONUS customers and no CONUS revenue.

¹⁶⁸ Embratel, *About Star One C2 Satellite*, available at http://www.starone.com.br/en/internas/satelite_c2/.

¹⁶⁹ *Id.* (click Coverage Map to download PDF).

¹⁷⁰ Embratel, *About Star One C3 Satellite* (click Coverage Map to download PDF), available at http://www.starone.com.br/en/internas/satelite_c3/.

¹⁷¹ *See generally* Star One S.A., Petition for Declaratory Ruling, Call Sign S2677, IBFS File No. SAT-PPL-20050706-00143 (Int’l Bur. granted Mar. 29, 2006).

¹⁷² Oct. 15 Ex Parte, Attachment, at 6.

¹⁷³ Comments of ABS, Hispasat, and Embratel Star One at 5-6 (“ABS Comments”).

¹⁷⁴ *Id.* at 5.

¹⁷⁵ *Id.*

- ABS: After starting service in August 2015, ABS-3A has demonstrated that its true intentions lie outside the U.S. A June 2018 press release confirms that “the ABS-3A satellite has established itself as a prime ‘conduit’ for video contribution services in Europe.”¹⁷⁶ Similar press releases tout expansion to South Africa, Nigeria, Chile, Brazil, and the Middle East.¹⁷⁷ Other than an unconstructed earth station in Hudson, New York with no customers, ABS has no evidence that it intends ABS-3A to serve the United States.¹⁷⁸ Indeed, ABS-3A’s C-band beam only covers a small portion of the U.S. Northeast at less than a 10° elevation angle, which renders U.S. service difficult as a technical matter.¹⁷⁹

¹⁷⁶ Press Release, *MTI Teleport Munich and Sky Germany Chose ABS-3A Capacity to Deliver Live Coverage for the Wimbledon Championships*, ABSatellite.com (June 28, 2018), available at <http://www.absatellite.com/mti-teleport-munich-and-sky-germany-chose-abs-3a-capacity-to-deliver-live-coverage-for-the-wimbledon-championships/>.

¹⁷⁷ *Intersat Sets Up Teleport Services in Nairobi to Launch Broadband Internet on ABS-3A Satellite in Africa*, ABS (Nov. 17, 2017), <http://www.absatellite.com/intersat-sets-up-teleport-services-in-nairobi-to-launch-broadband-internet-on-abs-3a-satellite-in-africa/> (providing broadband to “Sub-Saharan and South Africa, as well as serving French speaking African countries”); *Telecom Satellites TV to Launch a New DTH Platform with ABS-3A at 3°W in Nigeria*, ABS (June 28, 2017), <http://www.absatellite.com/telecom-satellites-tv-to-launch-a-new-dth-platform-with-abs-3a-at-3w-in-nigeria/>; *ABS Provides Occasional Use Capacity for Broadcast Services on the 2017 FIFA Confederations Cup in Russia*, ABS (June 30, 2017), <http://www.absatellite.com/abs-provides-occasional-use-capacity-for-broadcast-services-on-the-2017-fifa-confederations-cup-in-russia/> (providing television service to Chile); *ABS Granted Landing Rights in Brazil for ABS-3A on C and KU-Bands at 3°West*, ABS (Mar. 7, 2016), <http://www.absatellite.com/abs-granted-landing-rights-in-brazil-for-abs-3a-on-c-and-ku-bands-at-3west/>; *ABS and Arabsat Strengthen Partnership on ABS-3A at 3°West*, ABS (Nov. 3, 2015), <http://www.absatellite.com/abs-and-arabsat-strengthen-partnership-on-abs-3a-at-3west/> (adding capacity “for different customer networks within the Middle East and North Africa regions in particular Saudi Arabia.”).

¹⁷⁸ ABS Comments at 4.

¹⁷⁹ Indeed, ABS’s Hudson earth station would only see the satellite at a 5.4° elevation angle, which would render a viable service virtually impossible as a technical matter. Thus, the Commission must specifically reject ABS’s argument that “the regulatory environment has rendered ABS unable to complete construction” of the Hudson earth station. The Commission’s mid-band proceedings have not singled out ABS, and the current regulatory environment would make a poor excuse for missing a construction deadline if ABS truly desires to provide service to the United States using an antenna with a 5.4° elevation angle.

All three companies have had ample opportunity to serve the United States, and all three companies have invested their resources in serving other countries. Any stated “intent” to serve the United States is belied by the facts. Actions speak louder than words.

Finally, under the Market-Based Approach, the No Customer, No Revenue operators will be in the same position as all other FSS operators. Under the Market-Based Approach, all FSS operators will be subject to the same Table of Frequency Allocations and the same FCC rules and will have the ability to continue to utilize the same C-band Downlink spectrum preserved for FSS. Here, the No Customer, No Revenue operators face no problem of accommodating existing customers and can market on a level playing field in the future. Specifically, the No Customer, No Revenue operators will be free to serve the United States – to the extent they change past practice – in the 300 MHz of spectrum that will continue to be available for FSS operation in the United States. If anything, the complicated reconfiguration process may give the No Customer, No Revenue operators an unprecedented opportunity to market their C-band offerings to new customers in the U.S. that are undergoing the necessary repacking to continue to receive C-band services in the remaining satellite spectrum. They will also continue to have access to C-band Downlink frequencies on their satellites to provide service outside the United States in accordance with the regulations of other nations.

In sum, the Market-Based Approach equitably treats the No Customer, No Revenue operators.

X. JUSTIFIABLE OPPOSITION EXISTS TO PROPOSALS TO PERMIT POINT-TO-MULTIPOINT SERVICES IN THE UPPER PORTION OF THE C-BAND DOWNLINK

Commenters overwhelmingly oppose allocating point-to-multipoint (“P2MP”) operations in the C-band Downlink.¹⁸⁰ For example, Luken Communications, LLC opposes sharing the C-band Downlink with P2MP because of the operational burdens that P2MP coordination would impose. Luken explained that, when the AMC-9 satellite unexpectedly failed in June 2017, all Luken-related earth stations had to re-orient to alternative positions and frequencies.¹⁸¹ Although Luken’s transition to the new satellite coordinates took less than 12 hours, some of Luken’s three hundred affiliates required more than a week to make the necessary changes.¹⁸² Had P2MP coordination been required, “it is likely that Luken and its affiliates would have sustained substantial losses of revenue and viewership.”¹⁸³ Moreover, dedicated P2MP service would unnecessarily “encumb[er]” the C-band Downlink and “will only complicate repacking,”¹⁸⁴ thereby undermining the Commission’s primary goal in this proceeding – to free

¹⁸⁰ *See, e.g.*, C-SPAN Comments at 4; CTIA Comments at 25-27; Ericsson Comments at 17; NPR Comments at 13-14; NCTA Comments at 32; Nokia Comments at 9-10; Qualcomm Comments at 6-7; QVC Comments at 9-10; SIA Comments at 24-26; T-Mobile Comments at 20-21; TIA Comments at 7-9.

¹⁸¹ Luken Comments at 5.

¹⁸² *Id.*

¹⁸³ *Id.* Luken also stated that “P2MP services would likely impact and limit future growth of Luken. Specifically, potential affiliates of Luken may be unable to suitably receive Luken’s C-band satellite signal due to terrestrial interference or be dissuaded from affiliating with Luken due to undue and burdensome regulatory issues and coordination efforts with new P2MP services operating in the C-band spectrum.” *Id.*

¹⁸⁴ CTIA Comments at 26. *See also* Ericsson Comments at 17 (“Authorizing a dedicated P2MP service in the 3.7-4.2 GHz band would add encumbrances and, even if limited to the repacked band, would restrict the Commission’s ability to repurpose that spectrum if necessary at a later juncture.”); C-Band Alliance Comments at 40-41 (to shift customers to a more limited amount of spectrum, “FSS operators must have free rein to reallocate transponders and frequency channels among satellite users.”).

up spectrum and “secure U.S. leadership in the next generation of wireless services.”¹⁸⁵ The Commission should therefore reject the Broadband Access Coalition (“BAC”) proposal.

Ignoring the “illogic” of “incentiv[izing] FSS operators to clear spectrum for 5G mobile use while also mandating new P2MP fixed operations,”¹⁸⁶ the BAC pleads for the Commission to “see yesterday” in support of future action. For example, the BAC continues to rely on the technical analysis it filed with Google in March 2018 to support its contention that “P2MP fixed wireless broadband services can effectively and efficiently share use of the 3.7 GHz band with incumbent FSS users.”¹⁸⁷ Taking into account the now more than 17,000 registered antennas, this analysis is no longer relevant. Without an updated technical analysis from the BAC, previously articulated criticisms¹⁸⁸ remain as relevant now as they were six months ago.¹⁸⁹

¹⁸⁵ *NPRM* at ¶ 1.

¹⁸⁶ Joint Comments at 9.

¹⁸⁷ BAC Comments at 14. *See also Ex Parte* Letter of the BAC, GN Docket No. 17-183 and RM-11791, at Attachments 1 and 2 (Mar. 29, 2018) (presenting technical analysis conducted by BAC and Google) (“BAC/Google Ex Parte”).

¹⁸⁸ *See, e.g.,* Comments of the Satellite Industry Association, Public Notice, *Expanding Flexible Use of the 3.7 – 4.2 GHz Band*, GN Docket No. 18-122, DA 18-446, at 9 (rel. May 1, 2018) (*citing* BAC/Google Ex Parte, Attachment 2 at 14-21) (stating that the BAC/Google technical analysis ignores “the true extent of C-band FSS operations,” which include earth stations not included in IBFS, and that the BAC fails to explain how “P2MP operations could possibly adjust quickly enough to accommodate necessary shifts in the frequencies or orientation of receive earth stations”). The SIA argument has even greater force now that the much larger number of earth stations registered to receive C-band service is apparent.

¹⁸⁹ For example, the BAC/Google technical study claimed base stations 9.1 meters in height can co-exist with FSS operations. BAC/Google Ex Parte, Attachment 2 at 28. As noted in the Technical Annex, such a base-station height assumption leads to a lower potential for interference from P2MP into FSS yet is unlikely representative of the most commonly used height for P2MP services. C-Band Alliance Comments, Technical Annex at 17. This fact is borne out by the operating parameters requested in the recent Midcontinent Communications experimental license for the C-band Downlink, requesting antenna heights of 45 meters for its North and South Dakota sites and 80 meters for its Minnesota site. *See* Application of Midcontinent Communications, ELS File No. 0866-EX-CN-2018 (filed Nov. 5, 2018).

Proponents' claims about P2MP benefits for rural America are unsupported and overstated. Devoid of updated technical analysis, proponents merely offer statistics highlighting the disparity in broadband availability between urban and rural areas and assert the importance of wireless Internet service providers ("WISPs") in closing the digital divide.¹⁹⁰ More importantly, parties that support the BAC proposal fail to "document[] any actual need to grant WISPs rights to use C-band frequencies," especially when WISPs "already have access to significant spectrum resources" and are seeking entry into many other new bands.¹⁹¹

As has already been discussed, proponents of the BAC proposal seek special designation for P2MP services in the C-band Downlink to avoid paying any compensation for valuable terrestrial spectrum rights.¹⁹² Such special treatment, however, would run counter to the public interest and "sound spectrum management practices of flexible . . . use."¹⁹³ Furthermore, under the Market-Based Approach, WISPs and other companies interested in P2MP services will not be foreclosed from using spectrum in the C-band Downlink. Instead, they, and parties like Microsoft and Google, will have the opportunity to enter into SMAs to obtain C-band Downlink

¹⁹⁰ See, e.g., BAC Comments at 8-13 (providing statistics on lack of broadband availability in rural areas and asserting that "[i]n many areas of the U.S., consumers can obtain access to fixed broadband service only through a [WISP]"); Google Comments at 2 ("[WISPs] and other rural operators . . . can establish last-mile and backhaul links that will bring 5G wireless broadband to tens of millions of Americans in rural areas.").

¹⁹¹ SIA Comments at 24-25 (discussing the availability of licensed and unlicensed bands, including 500-700 MHz, 902-928 MHz, 2.4 GHz, 2.5 GHz, 3.55-3.7 GHz, 5.15-5.85 GHz, 28 GHz, 39 GHz, and above 40 GHz). See also C-Band Alliance Comments at 45.

¹⁹² T-Mobile Comments at 21.

¹⁹³ *Id.* See also C-Band Alliance Comments at 30 ("Under the Market-Based Approach, the C-Band Alliance will negotiate SMAs with prospective terrestrial mobile service providers and, for obvious reasons, it will not enter into an SMA with more than one terrestrial operator for a specific spectrum block in a given market area.").

spectrum, which could be used for last-mile connectivity¹⁹⁴ without sacrificing the market-based principles that continue to govern spectrum management and have ensured that spectrum goes to its highest-valued use. Furthermore, the C-Band Alliance has clearly expressed its intent “to ensure that smaller regional carriers will have an opportunity to acquire this spectrum,”¹⁹⁵ thus demonstrating its commitment to address small and rural providers’ concerns and “ensure fair and equitable participation from all interested parties.”¹⁹⁶

XI. THE MARKET-BASED APPROACH PROTECTS CRITICAL AVIATION USE IN ADJACENT SPECTRUM

Operating in a band immediately adjacent to the C-band Downlink, radio altimeters operate in the 4.2-4.4 GHz band at a relatively low power level, which increases their susceptibility to interference “both within [their] operational . . . bandwidth as well as from outside this bandwidth.”¹⁹⁷ The C-Band Alliance recognizes the aerospace industry’s safety concerns.¹⁹⁸ Its proposal to make the lower 180 MHz available to the terrestrial mobile service in effect will provide 320 MHz of separation between radio altimeters and the terrestrial mobile

¹⁹⁴ See generally Comments of Google Fiber Inc., RM-11778, at 3 (Jan. 9, 2017) (“Companies such as Google Fiber, Facebook, Starry, and Verizon are developing last-mile fixed wireless systems that can extend fiber-optic networks and bring high-speed broadband services to residential customers.”).

¹⁹⁵ C-Band Alliance Comments at 8. See also C-Band Alliance Comments at 11 (“[T]he design of these secondary market transactions will ensure that the market process is open to all interested parties, *including smaller carriers that serve rural America*, to acquire spectrum.” (emphasis added)).

¹⁹⁶ CCA Comments at 8.

¹⁹⁷ Boeing Comments at 3-4 (quoting *Operational and Technical Characteristics and Protection Criteria of Radio Altimeters Utilizing the Band 4 200-4 400*, ITU-R Recommendation M.2059-0 at 1, 3 and 5 (Feb. 2014) (“ITU-R M.2059-0”)). See also Garmin Comments at 8 (citing ITU-R M.2059-0 at 12-22 for the proposition that “most radio altimeters operate at relatively low power” and are thus susceptible to interference from the signals of “ground-based transmitters in the 3.7-4.2 GHz band”).

¹⁹⁸ See Garmin Comments at 8.

service that may present a risk of harmful interference to such critical safety devices.¹⁹⁹ The C-Band Alliance proposal will similarly ensure that no P2MP services are introduced in a band immediately adjacent to radio altimeter spectrum.

XII. CONCLUSION

For the reasons stated above, the C-Band Alliance urges the Commission to act quickly to ensure U.S. leadership in terrestrial 5G by adopting the Market-Based Approach.

Respectfully submitted,

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¹⁹⁹ See ASRI Comments at 7 (describing the Market-Based Approach as “potentially mitigat[ing] a large part of the aviation concerns for the adjacent [Aeronautical Radio Navigation Service] allocation”).