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
	)	
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 COMCAST CORPORATION AND NBCUNIVERSAL MEDIA, LLC

WILLKIE FARR & GALLAGHER LLP
1875 K Street, N.W.
Washington, D.C. 20006

Counsel for Comcast Corporation

Kathryn A. Zachem
David M. Don
Brian M. Josef
Regulatory Affairs,
Comcast Corporation

Francis M. Buono
Ryan G. Wallach
Legal Regulatory Affairs,
Comcast Corporation

Margaret Tobey
Regulatory Affairs, NBCUniversal

COMCAST NBCUNIVERSAL
300 New Jersey Avenue, N.W.
Suite 700
Washington, DC 20001

December 11, 2018

Table of Contents

I. INTRODUCTION AND SUMMARY 1

II. THE RECORD REMAINS DEVOID OF ANSWERS TO CRITICAL QUESTIONS. 3

III. THE C-BAND IS INTENSIVELY AND EFFICIENTLY USED FOR SERVICES THAT ARE HIGHLY IMPORTANT TO CONSUMERS AND MUST BE FULLY PROTECTED. 7

IV. THE COMMISSION SHOULD REJECT THE C-BAND ALLIANCE'S "MARKET-BASED" PROPOSAL. 9

A. The C-Band Alliance's Proposal is Inconsistent with Congressional Intent and Statutory Limitations. 9

B. The C-Band Alliance's Proposal Is Contrary to the Public Interest. 11

V. EVIDENCE MUST BE INTRODUCED UPON WHICH THE COMMISSION CAN MAKE A REASONED DECISION. 15

VI. THE COMMISSION SHOULD CONSIDER RULES THAT PROTECT INCUMBENTS AND ENCOURAGE ROBUST 5G DEPLOYMENTS AND COMPETITION. 18

VII. CONCLUSION 20

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
	)	
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
COMCAST CORPORATION AND NBCUNIVERSAL MEDIA, LLC

Comcast Corporation and NBCUniversal Media, LLC (collectively, "Comcast") hereby submit these reply comments in response to the Order and Notice of Proposed Rulemaking ("*Notice*") in the above-captioned docket.[1]

I. INTRODUCTION AND SUMMARY

The record in this proceeding is not clear-cut, beyond widespread agreement about the importance of the C-Band for delivering video to more than 100 million American households, and the promise of next-generation wireless services. Proponents of new, non-satellite uses of

[1] *Expanding Flexible Use of the 3.7 to 4.2 GHz Band, et al.*, Order and Notice of Proposed Rulemaking, 33 FCC Rcd. 6915 (2018) ("*Order*" or "*Notice*," respectively).

C-Band spectrum urge the Commission to move forward with great speed, but reasoned – not rushed – determinations should guide the Commission's rulemaking, while still proceeding in a timely manner.

The Commission should be particularly wary of the C-Band Alliance's ("CBA") call for the Commission to play a limited role in the band transition, and its desire to avoid meaningful transparency, oversight, or enforcement mechanisms. Permitting private entities to fundamentally transform a band and transfer new rights to others with only minimal Commission oversight and without Congress's authorization would be extraordinary. This is particularly true where Congress has expressly stated that, if sharing in this band is proven to be feasible, any assignment of new licenses should be by competitive bidding. The CBA's failure to put key facts in the record and its call for the Commission to adopt its "take-it-or-leave-it" proposal without fully accounting for public interest considerations also should give the Commission pause. Proceeding with a novel and privately-managed transition while failing to fully examine key factors to ensure continuity of existing operations would be a misstep, inviting controversy and uncertainty that could leave the C-Band in limbo for years. Such an outcome would benefit no one and would carry significant risk of harm to hundreds of millions of American video consumers.

Instead, the Commission should heed the voices calling for diligence in examining its legal and public interest obligations. Any reallocation of intensively used spectrum must begin with a complete factual record. Only then can the Commission proceed expeditiously and lead with certainty to implement a transparent, enforceable framework that both protects incumbent services and their customers while allowing new services to flourish.

II. THE RECORD REMAINS DEVOID OF ANSWERS TO CRITICAL QUESTIONS.

Since Intel and Intelsat first put forward their "market-based" proposal,[2] which has continued to evolve into the CBA's current proposal, proponents for reallocating the C-Band have had multiple opportunities to formally explain the technical underpinnings and implementation details of their proposals.[3] Over the past year, commenters, including Comcast, have examined their proposal and have raised specific questions on the record in an effort to prompt proponents to fully explain their proposals in detail. For instance:

- How will interference risks related to repacking the band be mitigated, given that channel occupancy and spectral density would increase, thus raising the risk of interference at earth stations from adjacent satellite links? What evidence is there that any proposed mitigation strategy would be effective in the real world?
- How would any such mitigation strategy accommodate changes in video technology, such as the introduction of new modulation and compression methods for 4K and High Dynamic Range ("HDR") video and the resulting increases in required data rates, which render such signals much more sensitive to interference such that they require much higher signal-to-noise ratios?
- What steps would have to be taken to ensure that C-Band earth stations would not experience harmful interference from mobile devices, particularly given that filters only mitigate and cannot eliminate harmful interference?
- What alternative arrangements would be available for C-Band operations that filters cannot protect?
- To the extent video distribution operations would have to cease relying on C-Band spectrum, how could they continue to exist, particularly given ample evidence in the record that neither the Ku-band, the Ka-band, nor fiber can fully serve this role?
- Even assuming alternatives exist, what would they cost? Would MVPDs have to relocate headends? Would new earth stations have to be installed to receive a different type of

---

[2] *See* Joint Comments of Intelsat License LLC and Intel Corp., GN Docket No. 17-183, at 6-9 (Oct. 2, 2017).

[3] *See generally* CBA Comments. Unless otherwise noted, all comment citations are to comments filed in GN Docket No. 18-122 on or around October 29, 2018.

signal? Would those earth stations be compatible with current equipment? Would they take up the same amount of space, or more? Who would bear all of these costs?

- What framework would be instituted to maximize the utility of the spectrum, to ensure fair and nondiscriminatory access, and to safeguard the substantial investments incumbents have already made?

- Would exclusion zones be required to protect C-Band earth stations from adjacent-band mobile operations in a repacked band? If so, how large would they need to be, and how would they be managed and enforced?

- Would repacking lead to interference or other impacts on international users of C-Band spectrum?

- How would repacking affect the resiliency and reliability of current networks?

Additional stakeholders also have identified numerous questions raised by the CBA proposal as well as other reallocation proposals.[4]

Despite the many specific questions in the record, and numerous opportunities to respond adequately, the CBA's proposal and underlying technical analyses remain unspecific and opaque. The CBA offers vague assurances that it will "protect[] C-band services in the United States and the rest of the world," but only if the Commission adopts its proposal "in all material respects."[5] This is simply not enough. The Commission cannot accept CBA's assurances in the absence of record evidence. This is particularly critical when it involves ceding to satellite

[4] *See, e.g.*, Letter from American Cable Association, National Association of Broadcasters, National Public Radio, Inc., and NCTA – The Internet & Television Association, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 17-183 & 18-122 (June 15, 2018) (asking 82 questions addressing 44 different issues that fall into three categories: Repacking/Arc Reduction Questions; Alternative Distribution Questions; and Sharing Questions).

[5] *See* Letter from Jennifer D. Hindin, Wiley Rein LLP, Counsel for CBA, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 17-183 & 18-122, Attach. 1 (Oct. 17, 2018) ("Alliance Commitment").

operators control over the framework for next-generation wireless services in spectrum that currently carries video programming on which hundreds of millions of U.S. consumers rely.[6]

Other commenters similarly raise doubts about the lack of detailed information in the public record. For instance, AT&T notes that "[m]any additional details regarding the principles and mechanisms of this market-based proposal are obviously necessary, and [it] looks forward to reviewing a comprehensive plan from CBA for the secondary market reallocation of this spectrum."[7] The Telecommunications Industry Association ("TIA") similarly awaits further details.[8] The Competitive Carriers Association ("CCA") states that "[a]dditional clarification is necessary to determine how any private market process would occur."[9] As multiple commenters with both video and wireless interests have stated, the Commission should not reach any conclusions or take action unless and until the open issues identified in this proceeding are thoroughly considered and resolved in light of concrete, detailed information.[10] A more detailed

---

6 Trust in the CBA may also be misplaced even vis-à-vis other satellite operators. *See* ABS Global, *et al.* ("Small Satellite Operators") Comments at 11 ("[T]he CBA so far has rebuffed efforts by the SSOs to ensure fair participation by all affected satellite operators, despite inquiries by the SSOs concerning the CBA's plans for the private-sector solution it has proposed.").

7 AT&T Comments at 16.

8 TIA Comments at 6.

9 CCA Comments at 8.

10 *See* Satellite Industry Association ("SIA") Comments at 18-19 (arguing that the FCC must base its decisions for introducing new terrestrial services in any part of the C-Band downlink spectrum on "rigorous technical analysis of interference issues based on the real-world characteristics of existing technology, not predictions that lack any empirical basis"); American Cable Association ("ACA") Comments at 10-11 (calling for "a neutral, objective assessment" of key "technical arguments"); Content Companies Comments at 4-5 (noting the lack of detail in reallocation proposals); National Association of Broadcasters ("NAB") Comments at 8 (suggesting that reallocation proposals on the table "rely more heavily on marketing catchphrases than fulsome analysis"); North American Broadcasters Association ("NABA") Comments at 2-3 (stressing the need for rigorous testing to inform the Commission's decisionmaking); GCI Comments at 18 n.43 (stressing the importance of public comment on a detailed transition plan);

record would allow the Commission to move forward expeditiously and provide greater certainty that it has diligently balanced all interests. What is clear based on the current record, however, is that there is insufficient information upon which the Commission could base a reasoned decision that would satisfy its obligations under the Communications Act and the APA.[11]

NCTA Comments at 29 (same); Nokia Comments at 2 (taking issue with the CBA's lack of an adequate explanation for various aspects of its proposal).

[11] *See Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (holding that an agency rule would be arbitrary and capricious under 5 U.S.C. § 706(2)(A) where the agency has "entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise"); *see also FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service that Share Terrestrial Spectrum, et al.*, Second Report and Order, 17 FCC Rcd. 2002 ¶ 10 (2002) (terminating its consideration of that proposal after finding that "the record is not sufficiently developed to permit [it] to issue rules."); *Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees, et al.*, Report and Order, Further Notice of Proposed Rulemaking, and Memorandum Opinion and Order, 26 FCC Rcd. 11614 ¶¶ 61-63 (2011) (declining to move forward after determining that "there is an insufficient record for [it] to conclude that auxiliary stations can coexist with the existing microwave operations without causing interference"); *Proposed Amendments to the Service Rules Governing Public Safety Narrowband Operations in the 769-775/799-805 MHz Bands, et al.*, Seventh Report and Order and Notice of Proposed Rulemaking, 28 FCC Rcd. 4783 ¶ 28 (2013) (after seeking comment through an NPRM, declining to relax maximum power limits "because there is insufficient record evidence (a) that [the] proposed changes could be implemented without increasing the potential for adjacent channel interference, and (b) that the changes are necessary to achieve greater spectrum efficiency in the band"); *Improving Public Safety Communications in the 800 MHz Band, et al.*, Notice of Proposed Rulemaking, 17 FCC Rcd. 4873 ¶ 88 (2002) (urging commenters to be as "complete and comprehensive as possible" in proposing resolutions to issues commenters have identified in connection with the restructuring of the 800 MHz public safety band, because "[a]t present, there is an insufficient record on which to base any immediate relief"); *Deployment of Wireline Services Offering Advanced Telecommunications Capability*, First Report and Order and Further Notice of Proposed Rulemaking, 14 FCC Rcd. 4761 ¶ 64 (1999) (after seeking comment, finding the record insufficient to address certain "long-term spectrum compatibility issues," and accordingly adopting a Further Notice to resolve those issues); *Amendment of the Commission's Rules Relative to Allocation of the 849-851/894-896 MHz Bands*, Notice of Proposed Rulemaking, 3 FCC Rcd. 2436 ¶ 4 (1988) (explaining that the Commission denied a request to allocate certain spectrum due to the insufficiency of the record, and instead launched a rulemaking to "explore" the proposal "more fully").

III. THE C-BAND IS INTENSIVELY AND EFFICIENTLY USED FOR SERVICES THAT ARE HIGHLY IMPORTANT TO CONSUMERS AND MUST BE FULLY PROTECTED.

The premise that C-Band spectrum is underutilized and could easily accommodate 5G services has been thoroughly debunked.[12] Many commenters argue that the already-authorized and important services delivered to consumers via the C-Band require full, and fully-enforceable, protection from any newly authorized terrestrial operations.[13] Rather than starting with arbitrary amounts of spectrum to clear,[14] reallocation for terrestrial use should be based on a determination about exactly how consumers will continue to receive services, whether via C-Band spectrum, or other means.[15]

---

[12] *See, e.g.*, SIA Comments 3-4, 9-10, 16-17; CBA Comments at 11-12; Society of Broadcast Engineers ("SBE") Comments at 3; Comcast Comments at 3-4, 7-8, 32; Content Companies Comments at 2, 4-5; ACA Comments at 3-5, 12; NCTA Comments at 3, 5, 16-17; Altice Comments at 1; Charter Comments at 1, 4; Local Broadcasters Comments at 2, 4-8; NAB Comments at 3-6; C-SPAN Comments at 2.

[13] *See* Content Companies Comments at 5 (stating that core incumbent protections must be codified in the Commission's rules and made a condition of any license of any entity benefiting from C-Band clearing).

[14] *See* CBA Comments at 5 (committing to clear 200 megahertz); Motorola Comments at 2-3 (advocating for 100-200 megahertz to be cleared); Verizon Comments at 3 (advocating for "[s]everal hundred" megahertz to be cleared); Ericsson Comments at 3 (same); CTIA Comments at 9-10 (same); United States Cellular Corporation ("USCC") Comments at 4 (arguing that the whole band should be cleared); Nokia Comments at 6-7 (same). To the extent such targets *are* based on analysis, that analysis and the data on which it is predicated need to be in the public record – neither the Commission nor stakeholders can simply "take it on faith" that this is the right amount, as the CBA has stated they should. *See* ITIF, *Mid-band Spectrum: Transitioning the C-Band and More*, YouTube, https://www.youtube.com/watch?time_continue=4425&v=aA6x-f_bj_U, at 1:13:50 (Nov. 13, 2018) (remarks of Preston Padden, Head of Advocacy & Government Relations, CBA).

[15] *See* Speedcast Comments at 7 ("Only after the needs of existing FSS services are met should the Commission consider opening some or all of the remaining 3.7-4.2 GHz spectrum . . . ."); NABA Comments at 2-3 (arguing that the amount of spectrum to be cleared should be determined based on rigorous lab and field testing); Lockheed Martin Comments at 4 (stating that an assessment of whether and how FSS use can be accommodated elsewhere "should have been completed prior to the development of the detailed reallocation proposals that are advanced in the *NPRM*"); Cumulus/Westwood Comments at 8-9 (stressing the need for the

Commenters arguing that current C-Band operations can be relocated to fiber or the Ku- or Ka-band as a substitute have offered no new support for that theory, whereas cable operators, broadcasters, satellite operators, and others have set forth several compelling reasons why these concepts are not feasible.[16] The CBA claims that reduced capacity in a repacked band will not be a problem, because it will build and launch new C-Band satellites;[17] but it has provided no details nor has it proposed any mechanism to hold it to that assurance. At the same time, it resists reasonable checks on the Transition Facilitator's conduct.[18]

Numerous parties support elimination of the full-band, full-arc coordination policy, but these proponents do not rebut the fact-based arguments in the record that this policy is indispensable to the functionality of C-Band video distribution operations.[19] Even AT&T, whose

---

Commission to fully and accurately assess the number of earth stations, the effect of relocation on incumbents, the feasibility of interference mitigation strategies, and all of the costs of any proposed relocation, *before* deciding whether or not to reallocate any C-Band spectrum at all); AT&T Comments at 8 (arguing that any gains from increasing the value of the 3.7-4.2 GHz band for terrestrial services should not come at the expense of customers relying on unique C-Band characteristics for "crucial services"); PSSI Comments at 15-16 (explaining that every additional megahertz taken away from incumbent uses damages PSSI's business). *Compare Notice* ¶ 81 ("[W]e should strive to adopt a mechanism that will repurpose a socially efficient amount of spectrum in the band."), *with* NCTA Comments at 8 (noting that repurposing C-Band spectrum will only be socially efficient if incumbent uses are accommodated with no adverse impact and adequate margin for anticipated growth and requisite backup capacity).

16 *See, e.g.*, NCTA Comments at 5-6, 9-10, 14-15; Content Companies Comments at 3-4; CBA Comments at 14-15; Altice Comments at 2-3; Eutelsat Comments at 4-5; GCI Comments at 10; Charter Comments at 4; Cumulus/Westwood Comments at 4-7; NAB Comments at 5; NABA Comments at 4; SIA Comments at 13-15; PSSI Comments at 4; Speedcast Comments at 3-4; C-SPAN Comments at 2-4; *see also* Comments of Comcast Corp. and NBCUniversal Media, LLC, GN Docket No. 18-122, at 16-17 (May 31, 2018).

17 CBA Comments at 9, 18, 28, 54, 55.

18 *See* CBA Comments at 21-27; Eutelsat Comments at 9; Intel/Intelsat/SES Comments at 3, 7.

19 *See, e.g.*, NCTA Comments at 24-28; Cumulus/Westwood Comments at 12-14; NABA Comments at 4; NPR Comments at 7-8; PSSI Comments at iii; Content Companies Comments at

wireless business would presumably benefit from an aggressive C-Band reallocation for 5G, has advised the Commission that C-Band video distribution would be "unsustainable" without the full-band, full-arc policy – particularly in a repacked band – and has urged the Commission to retain it.[20]

IV. THE COMMISSION SHOULD REJECT THE C-BAND ALLIANCE'S "MARKET-BASED" PROPOSAL.

A. The C-Band Alliance's Proposal is Inconsistent with Congressional Intent and Statutory Limitations.

The Commission's statutory authority to hand the C-Band transition and resulting windfall to a small group of private entities is questionable. This is particularly true given the precedent of other significant reallocations, which were premised on clear authority from Congress and overseen by the Commission.[21] For example, the Public Interest Spectrum Coalition ("PISC") notes that Congress's authorization through the Spectrum Act of a "*legitimate* 'market-based approach'" – i.e., incentive auctions – calls into question any notion that Congress intended to authorize the more radical approach CBA contemplates here.[22] PISC also points to Congress's concern when the Commission proposed in 2001 to permit a massive

---

9-10; CBA Comments at 41-44; GCI Comments at 12-13 (all noting the importance of the full-band, full-arc policy).

20 AT&T Comments at 12, 14-15.

21 *See, e.g.*, Dynamic Spectrum Alliance ("DSA") Comments at 19 (stating that Congress's approach to the incentive auction suggests that the Commission should not depart from its longstanding tradition of spectrum auctions); Comcast Comments at 24 ("Given the magnitude of such a non-traditional reallocation, the Commission first should request clear Congressional direction and legal authority . . . ."); Google Comments at 10 ("[T]ensions may exist between using a private Transition Facilitator to clear C-band spectrum and the Commission's obligation to assign spectrum in the public interest.") (internal quotation marks omitted); USCC Comments at 10-11 (arguing that the Commission's emphasis on speed to market risks harm to the public interest that would be inconsistent with Section 309(a)).

22 PISC Comments at 26 (emphasis in original).

windfall to licensees that had never paid for their spectrum by adopting the Spectrum Clearing Alliance's proposal to clear 700-MHz broadcast spectrum via a "market-based" mechanism.[23]

Adopting the CBA's hands-off (or else) approach would transgress limits on subdelegations of legislative authority, subjecting the Commission to risk of legal challenges that could further delay efforts to reallocate spectrum. "[S]ubdelegations to outside parties are assumed to be improper absent an affirmative showing of congressional authorization."[24] Here, Congress has expressly entrusted the Commission with allocating spectrum for flexible use[25] and using its own market-based mechanisms.[26] Congress *expects* Commission oversight to ensure that C-Band incumbents are fully protected.[27] In fact, in the recent RAY BAUM'S Act of 2018, Congress contemplates a Commission-led auction as the *only* mechanism that could be used to permit new commercial wireless services in the C-Band, assuming that such a reallocation would be feasible in the first place.[28] Specifically, the Act requires the Commission to submit a report

---

23 *Id*. at 28-30.

24 *U.S. Telecom Ass'n v. FCC*, 359 F.3d 554, 565 (D.C. Cir. 2004).

25 *See* 47 U.S.C. § 303(y); *see also id*. §§ 301, 303(c), 309.

26 *See id.* § 309(j).

27 *See* Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, Division P, Title VI, § 605(c)(3) (directing the Commission to submit a report on how to "ensure shared licensed or unlicensed services [in the 3.7-4.2 GHz band] would not cause harmful interference to Federal or non-Federal users already operating in" the band); Letter from Sen. Jerry Moran & Sen. Tom Udall, to Ajit Pai, Chairman, FCC (Nov. 13, 2018), http://www.nab.org/documents/newsRoom/pdfs/111318_Moran_CBand.pdf ("[A]s the FCC considers repurposing spectrum to meet the growing demand for wireless broadband, it must ensure that the needs of existing users and the millions of consumers who enjoy the content delivery services that rely on those same spectrum bands can continue to be met"); *id*. at 2 ("The FCC must ensure that necessary content delivery to American consumers is not harmed as a result of [its] policymaking.").

28 *See* Consolidated Appropriations Act, 2018, § 605(c)(4).

including "an identification of . . . frequencies . . . most suitable for sharing with commercial wireless services *through the assignment of new licenses by competitive bidding*."[29]

To be sure, the Commission regularly reallocates spectrum for new uses, and parties often sell or lease previously-issued spectrum licenses in the secondary market. But what is being proposed here is something else entirely. This is a request by the CBA to allow it to sell licenses it does not have, for services that are not authorized, and can only be obtained from the FCC through competitive bidding. As CCA observes, "incumbent satellite providers effectively are proposing a mechanism in which they would play a central role in allocating terrestrial rights that they do not currently possess."[30] The CBA's proposal, in which a holder of a Part 25 *satellite* license could freely begin to offer Part 27 *terrestrial* services, is fundamentally different from a secondary market transaction. The notion of permitting private entities to fundamentally transform a band and transfer new rights to others with only minimal Commission oversight and without Congress's express authorization is "unprecedented" and "raises serious concerns."[31]

B. The C-Band Alliance's Proposal Is Contrary to the Public Interest.

For nearly a century, the Commission has been tasked with managing spectrum, and has led the world in innovative market-based spectrum policy while keeping the public interest front-of-mind.[32] The Commission should maintain its focus on protecting the public interest in this proceeding. Indeed, the CBA raises serious public interest concerns, as its "Commitment to C-

---

29 *Id.* (emphasis added).

30 CCA Comments at 7-8.

31 *Id.*

32 *See, e.g.*, *Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-248, Report and Order, FCC 18-149 (rel. Oct. 24, 2018) ("*2018 CBRS Order*"); *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report and Order, 29 FCC Rcd. 6567 (2014).

band Users" is expressly conditioned on the Commission's acceptance of *all* of its proposed terms.[33] The CBA's commitments would appear to no longer apply if the Commission modified the CBA's terms to ensure a fair process that protects all affected parties and enables new services to flourish.

The Commission should not perform its statutorily-mandated spectrum allocation role in name only, as suggested by the CBA. Rather, numerous commenters agree on the necessity of appropriate transparency, oversight, and enforcement mechanisms of the implementation details.[34] In fact, even some commenters expressing support for a market-based approach recognize the need for Commission oversight and review.[35] The Commission must undertake a careful and critical review of any potential transition mechanism, accompanied by notice and comment.[36] Yet the CBA's take-it or leave-it terms would preclude even limited oversight. The CBA and its advocates see no Commission role when it comes to implementation, arguing

---

33 *See* Alliance Commitment at 1 ("We will stand by this commitment, *assuming our proposal is adopted by the FCC in all material respects*.") (emphasis added).

34 *See* DSA Comments at 17-18 (noting that private negotiations are inherently "opaque" and often lead to "sweetheart deals" antithetical to the Commission's goals); NAB Comments at 6-8 (stating that any reallocation should be a fully transparent process); GCI Comments at 17-18 (arguing that the Transition Facilitator approach requires more transparency); PISC Comments at 22 (identifying the market-based approach's opacity as a "severe[] flaw[]"); ACA Comments at 10-11 (noting the unclear and "perplex[ing]" basis for the CBA's shifting its reallocation target from 100 to 200 megahertz); NAB Comments at 6 ("Any accommodation plan should be fully transparent; it should be submitted to the Commission for approval, reflect substantial input from C-band users, and provide remedies in the event any C-band user is not fully protected or successfully relocated.").

35 *See, e.g.*, Verizon Comments at i, ii, 16; NPR Comments at 12-13.

36 *See Notice* ¶ 88 (considering requiring notice and comment on the Transition Facilitation Plan); Charter Comments at 4; NCTA Comments at 29-31; Small Satellite Operators Comments at 12; Google Comments at 13-14; TIA Comments at 6-7; NAB Comments at 6.

against the idea of even *filing* its Transition Facilitation Plan with the Commission, much less seeking public comment on that filing.[37]

Furthermore, under the CBA's approach, commenters have noted that the satellite "operators that acquired their C-Band rights from the Commission at no cost, would reap a significant financial windfall."[38] Indeed, as PISC notes, "[A] private sale would set a dangerous precedent, suggesting that incumbent licensees should always wage maximum resistance against giving up or sharing unused spectrum unless the Commission agrees to give them *all* the public revenue that until now has always, with few exceptions, flowed back to the public . . . ."[39]

Given the legal risks and public interest harms, the Commission should carefully scrutinize the proposed benefits of the CBA plan.[40] The CBA rests its case on getting the spectrum to the wireless market quickly, yet it has provided no detailed plan or proposed any enforceable requirements that would assure an expedited transition, nor could it – a private transition of this magnitude is unprecedented, so there is no basis in the record to predict how long it would actually take.[41] To be clear, the limited rule changes the CBA has proposed would

---

37 *See* CBA Comments at 23.

38 Google Comments at 11; *see also id.* at 11-13 (noting that efficient spectrum allocation requires balancing the social value of current broadcast and cable uses against that of alternative services, and that negotiations between satellite operators and mobile carriers would not take all stakeholders interests into account); DSA Comments at 16-17 (arguing that a Commission-run auction would be more "market-based" than a private administrator, because auctions ensure spectrum is allocated to its most valued use, whereas a private administrator would seek to maximize its own profits or reduce the supply of spectrum to drive up prices).

39 *See* PISC Comments at 22 (emphasis in original).

40 USCC Comments at 11; *see also id.* (arguing that, under Section 309(a) of the Communications Act, speed to market cannot not justify harms to the public interest).

41 *Id*. (calling the CBA's timeline "largely [] speculative given the untested, and likely extremely complex, nature of this approach and the large number of parties that would need to voluntarily make binding commitments and take specific actions within rather tight timeframes").

actually do nothing to guarantee a rapid assignment of spectrum for 5G. Under those proposed rules, the CBA would remain free to sell (or withhold from sale) any and all 3.7-4.2 GHz spectrum at its discretion and on its own non-public and unenforceable timeline.[42] Not to mention that adoption of this proposal would likely lead to litigation that could take years to resolve, defeating the claim that it would lead to faster deployment than a Commission auction.[43] By contrast, there may be some merit to considering other approaches raised in the record, such as a transparent, market-based auction that is consistent with Section 309(j) of the Communications Act.

While it remains important for the Commission to continue to find viable spectrum for 5G and the C-Band could offer part of the solution, even the fiercest advocates for the market-based approach have advised the Commission that there is no crisis-level shortage of spectrum for 5G. For example, the CBA itself stresses that the 3.7-4.2 GHz band "is only one of several *substitutable* mid-band spectrum segments being considered for terrestrial mobile operations," noting that the Commission and the National Telecommunications and Information Administration ("NTIA") "have identified several hundred megahertz of additional mid-band spectrum—other than the C-band Downlink—for terrestrial mobile operations in the U.S."[44] The

---

42 *See* CBA Comments at 11. *But see* Google Comments at 12-13 ("The Commission is painfully familiar with the 800 MHz rebanding effort. There, Sprint, as the largest commercial spectrum holder in the [800 MHz] band, agreed to undertake the role of Transition Administrator so that interference problems that had enmeshed 800 MHz incumbents in increasingly ineffective *ad hoc* solutions, could be resolved on a more long-term basis. The 800 MHz rebanding commenced on June 27, 2005, with a planned duration of 36 months. More than a dozen years later, the effort is still ongoing with Sprint's creditable expenses in connection with the rebanding initiative exceeding $2.8 billion.") (internal quotation marks omitted).

43 DSA Comments at 18-19; USCC Comments at 10-11.

44 CBA Comments at 35-36 (emphasis added). Specifically, plans are in motion to clear spectrum in the 3.5 GHz, 2.5 GHz, 3.1-3.5 GHz, and 4.9 GHz bands for 5G. *Id*. at 36-37.

CBA also has advised the Commission that "mid-band spectrum is only one portion of a typical carrier's spectrum portfolio."[45]

At the same time, mobile network operators have told the Commission that they need *more* than three years to "standardiz[e] a new frequency band, develop[] and certify[] new equipment, introduc[e] a new band into end-user devices," and other initial steps.[46] Accordingly, if the only benefit of the proposed CBA plan is time-to-market, but the spectrum cannot be put to use quickly by Mobile Network Operators ("MNOs"), it is unclear how the risks and harms to the public interest would be outweighed by the contingent and delayed benefit to 5G.[47]

V. EVIDENCE MUST BE INTRODUCED UPON WHICH THE COMMISSION CAN MAKE A REASONED DECISION.

If a viable video distribution ecosystem is to be preserved, the Commission must take care to ensure that the protections it adopts for incumbents are robust and *proven* to be effective.[48] Importantly, while certain technical parameters may be desired for MNOs' vision of 5G operations,[49] the record is devoid of evidence showing how adjacent C-Band earth stations –

---

45 *Id*. at 37. It is indisputable that demand for mid-band 5G spectrum is reduced where supply is increased.

46 Comments of T-Mobile USA, Inc., GN Docket No. 17-258, at 4 (Dec. 28, 2017) (arguing that a ten-year timeframe is more practical to allow for these processes).

47 *See Promoting Investment in the 3550-3700 MHz Band; Petitions for Rulemaking Regarding the Citizens Broadband Radio Service*, Notice of Proposed Rulemaking and Order Terminating Petitions, 32 FCC Rcd. 8071, 8111 (2017) (Statement of Commissioner Michael O'Rielly) (disagreeing that delay concerns should preclude a more careful reconsideration of the 3.5 GHz licensing rules, and stating: "If tweaks need to be made this is the ideal time to do it. It is better than going through years of proceedings after the fact, like in WCS.").

48 NAB Comments at 6-8; NABA Comments at 1; NPR Comments at 13; SBE Comments at 2; Content Companies Comments at 4-7; AT&T Comments at 1-2; CCA Comments at 4.

49 *See, e.g.*, AT&T Comments at 18-20; CTIA Comments at 20-24; T-Mobile Comments at 31-35; Verizon Comments at 23-26; CBA Comments at 20 & Technical Annex Part III; Ericsson Comments at 18-22; Motorola Comments at 5; Nokia Comments at 10-16; Qualcomm Comments at 8-9.

including recently-allocated, adjacent-band CBRS services – will be protected from those operations.[50]

The CBA's "Technical Annex" suffers from significant shortcomings and inconsistencies, both on the details for 5G operations and incumbent protections, and it inadvertently reveals a critical flaw in its proposal.[51] First, the CBA's proposal relies heavily on the existence of filters to address interference to FSS earth stations, but the record casts doubt on this speculative solution.[52] Second, it is unclear what fundamental assumptions the CBA has made with respect to adjacent-channel 5G operations. 3GPP Release 15 waveforms and 20-megahertz channels appear to be contemplated, but nowhere is a detailed band plan or other critical information provided.[53]

Most notably, the CBA concedes that the out-of-band emissions specifications in 3GPP Release 15 are "inadequate for the protection of satellite signals."[54] CBA's analysis of interference protection also assumes that for 5G base stations, "the [in-band] limit *must* be set at 66 dBm/100 MHz," and that "higher power levels, such as 75 dBm as referenced in paragraph

---

50 *See* Qualcomm Comments at 9 (recommending a -13 dBm/MHz out-of-band emissions limit because it is "consistent with countless other wireless services" in other bands, but providing no additional analysis).

51 *See generally* CBA Comments, Technical Annex.

52 *See* Comcast Comments at 22-23; Speedcast Comments at 9 ("There are no currently available filters that completely and reliably suppress the unwanted signals while allowing the desired signals to pass, meaning that, in many cases, the LNB itself must be replaced with one that is insensitive to the frequencies used by terrestrial mobile base stations.").

53 *See Notice* ¶¶ 165-166 (correctly identifying an adjacent-channel band plan and signal characteristics as fundamental to determining the appropriate rules to prevent harmful interference); *see also* Ericsson Comments at 12-14 (noting that the feasibility of adjacent-channel sharing between earth stations and terrestrial wireless base stations depends on factors including unwanted emission limits, antenna height, elevation angle to the satellite, separation distance, guard band, propagation, and mitigation assumptions).

54 CBA Comments, Technical Annex at 7.

165 in the *NPRM* will not allow for continued satellite operations in the remaining satellite spectrum."[55] The CBA also calls for more stringent Out-Of-Band-Emissions ("OOBE") limits than the Commission proposes.[56] The CBA nowhere explains how it measured and reached its determinations, nor does it address how to resolve the conflict between its desired limits and the Commission's and MNOs' deployment and operational assumptions.[57]

The credibility of the CBA's analysis is also undermined by the fact that its approach to determining FSS protection criteria shifts significantly depending on whether it is analyzing the impacts of adjacent-channel 5G operations – which it supports – or adjacent-channel point-to-multipoint ("P2MP") operations – which it opposes. For example, the CBA's analysis of potential P2MP adjacent-channel interference points out that the combined effects of multiple base stations and ground clutter need to be taken into account.[58] But its analysis of potential 5G adjacent-channel interference is based on simplistic grid assumptions, with no account taken of or margin provided for the effects of multiple base stations or ground clutter.[59] There is no reasoned basis for this discrepancy; these factors are plainly relevant to both services.

Similarly, for 5G, the CBA proposes a carefully tailored OOBE mask that is more stringent than the 3GPP Release 15 specification,[60] whereas its analysis of P2MP adjacent-channel interference mechanically applies the relatively loose emission mask of Section

---

55 *Id.* at 9 (emphasis added).

56 *Compare* CBA Comments, Technical Annex at 9-10, *with Notice* ¶¶ 168-170.

57 *See infra* Part VI.

58 *See* CBA Comments, Technical Annex at 23.

59 *See id*. at 8-11.

60 *See id*. at 7. Notably, it is unclear whether such a strong mask could be practical to implement, given that any power amplifier nonlinearities in a base station generally have the effect of increasing OOBE. Such restrictions could severely undermine the viability of any 5G operations.

101.111(2)(i) of the Commission's rules with virtually no supporting analysis or acknowledgement that a different mask might be considered.[61] The CBA also correctly recognizes the desirability of greater antenna heights in P2MP deployments and grapples with the concern that higher antennas can lead to increased interference,[62] but it fails to incorporate into its analysis or even mention that the same considerations apply equally to 5G deployments, and it proposes no 5G antenna height limits. These problems with the CBA's technical analysis underscore the importance of the Commission's insistence on rigorous testing and data in the public record so that results can be validated by both the Commission and stakeholders.

VI. THE COMMISSION SHOULD CONSIDER RULES THAT PROTECT INCUMBENTS AND ENCOURAGE ROBUST 5G DEPLOYMENTS AND COMPETITION.

Given the disruption to the C-Band ecosystem that would follow any reallocation of the band, to realize a net benefit, the Commission must also ensure that next-generation services and competition for such services are able to flourish in a repurposed band. A robust record is needed on issues including block sizes; block configuration; geographic licensing; service areas; eligibility; mobile spectrum holdings policies; license term; performance requirements; renewal term construction obligations; power limits; transition/guard band size; OOBE limits; coexistence with adjacent services; field strength limits and market boundaries; and antenna height limits.[63] These details matter both for the protection of incumbent operations and for the

---

61 *See id*. at 14.

62 *See id*. at 17.

63 *See Notice* ¶¶ 133-188; *see also* TIA Comments at 9-10 ("Given the fast-moving developments in this docket, TIA also plans to address remaining issues including band plans, licensing, and technical rules in reply comments and/or at later stages of this proceeding, especially given the significant effects that any higher-level outcome regarding the Alliance proposal might have on those issues.").

viability of any new service in a reallocated band.[64] The record reflects advocacy for new service rules in the 3.7-4.2 GHz band by current MNOs and their vendors, including proposals for power levels, OOBE emissions limits, antenna heights, and other technical criteria to support their future deployment objectives.[65] But while such parameters may be desired for MNOs' vision of 5G operations, the record is devoid of evidence showing how adjacent C-Band earth stations will be protected from those operations.[66]

Service areas and meaningful performance requirements are key considerations for the Commission to ensure buildout. A potential combination of nationwide or extremely large license areas with population-based performance requirements could allow CBA-favored carriers to deploy only in densely populated areas while still meeting their build-out requirements. Such an outcome would contravene Congress's and the Commission's goals of ensuring that its service rules "facilitat[e] access to spectrum by both small and large providers" and "encourag[e] deployment . . . in rural areas and Tribal lands."[67] Recognizing these goals, the Commission has recently adopted county-based license areas in a variety of spectrum bands.[68] Regardless of the

---

64 For example, the recently-amended CBRS rules were carefully crafted to balance various incumbents' and new operators' needs. *See generally 2018 CBRS Order*.

65 *See, e.g.*, AT&T Comments at 18-20; CTIA Comments at 20-24; T-Mobile Comments at 31-35; Verizon Comments at 23-26; CBA Comments at 20 & Technical Annex Part III; Ericsson Comments at 18-22; Motorola Comments at 5; Nokia Comments at 10-16; Qualcomm Comments at 8-9.

66 *See supra* note 50.

67 *Notice* ¶ 139.

68 *See Use of Spectrum Band Above 24 GHz for Mobile Radio Services, et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014 ¶ 35 (2016); *id.* ¶¶ 191, 209; *2018 CBRS Order* ¶¶ 27-28, 33; *see also id.* ¶ 39 (agreeing with commenters citing the "negative effects" of adopting larger license areas); *id.* ¶ 28 (suggesting such areas are generally appropriate for bands that "will be an important part of the next generation wireless ecosystem, including 5G and IoT applications").

exact license size, however, the Commission should avoid establishing problematic nationwide license areas, which have no support in the record and which would undermine the Commission's goals.[69]

VII. CONCLUSION

The record before the Commission makes clear that the C-Band is heavily utilized for video transmission in the U.S., and an incautious reallocation for terrestrial use risks impairing existing services. The record also does not support hasty adoption of the CBA's unprecedented and legally risky approach to spectrum reallocation. Despite the passage of time and requests for additional information, the record remains full of generalities and unenforceable commitments from the CBA in particular, rather than specific information about how incumbent services and their customers will not be harmed. The Commission should diligently, yet expeditiously, evaluate proposed transition methods and rules for new services in the C-Band, and take

[69] *See* Ericsson Comments at 17 n.38 (advocating for "licensing areas that are less than nationwide"); *see also* Nokia Comments at 11 (recommending PEA-based licensing); T-Mobile Comments at 25-26 (same); Verizon Comments at 18-19 (recommending EA-based licensing); USCC Comments at 12-14 (recommending CMA-based licensing).

appropriate measures to ensure that any reallocation and assignment process is transparent, in the public interest, and subject to meaningful Commission oversight.

Respectfully submitted,

COMCAST CORPORATION &
NBCUNIVERSAL MEDIA, LLC

/s/ Kathryn A. Zachem
Kathryn A. Zachem
David M. Don
Brian M. Josef
Regulatory Affairs,
Comcast Corporation

Francis M. Buono
Ryan G. Wallach
Legal Regulatory Affairs,
Comcast Corporation

Margaret Tobey
Regulatory Affairs, NBCUniversal

COMCAST NBCUNIVERSAL
300 New Jersey Avenue, N.W.
Suite 700
Washington, DC 20001

WILLKIE FARR & GALLAGHER LLP
1875 K Street, N.W.
Washington, D.C. 20006

Counsel for Comcast Corporation

December 11, 2018