

**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
)	

**COMMENTS OF
THE NATIONAL ASSOCIATION OF BROADCASTERS**

October 29, 2018

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I. INTRODUCTION AND SUMMARY

The National Association of Broadcasters (NAB)¹ submits the following comments in response to the Commission’s Notice of Proposed Rulemaking concerning expanded operations in the 3.7-4.2 GHz band (the C-band).²

¹ The National Association of Broadcasters (NAB) is the nonprofit trade association that advocates on behalf of free local radio and television stations and broadcast networks before Congress, the Federal Communications Commission and other federal agencies, and the courts.

² *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Order and Notice of Proposed Rulemaking, GN Docket No. 18-122, GN Docket No. 17-183, FCC 18-91 (July 13, 2018) (NPRM).

Every day, all across the country, tens of millions of Americans tune in to the radio or their local broadcast TV stations, multichannel video programming distributors (MVPDs) or over-the-top video distributors. Without ever knowing it, those viewers and listeners depend on C-band spectrum to receive many of their favorite programs, including news, sports and entertainment. Thus, any changes to the amount of spectrum currently being used for this purpose, including the rules governing C-band use, could have a profound impact on consumers.

In the wireless industry's "Race to 5G" it is critical for the Commission to not sacrifice the nation's position as the world leader in content. The American media and entertainment industry produces the most valuable programming in the world, and content is one of our most successful exports. Indeed, it is this world leadership that is driving much of the desire for a new generation of wireless technology. If premium programming – including live sports, entertainment and news – cannot be reliably distributed, the fastest 5G network in the world will have far less value and the prize for winning will be a participation trophy instead of a substantial economic boost.

With this backdrop in mind, the Commission should take three important steps in this proceeding. First, in recognition of the critical role the C-band plays for content delivery, the Commission must ensure that existing C-band operations are fully protected in any plan to allow expanded operations in the band. That means requiring a documented, enforceable and fully-funded plan for accommodating existing users. Second, the Commission should proceed judiciously in making reallocation decisions in the band and balance public interest considerations of both future wireless operations and future expansion of content distribution requirements as video programming evolves. If, in haste to slip on a pair of running shoes, the Commission focuses only on reallocating as much spectrum as possible, it could inadvertently

stifle consumer benefits such as 4K and high dynamic range video programming. Third, under no circumstance should the Commission degrade satellite C-band use by allowing shared operations in the non-reallocated portion of the band. Such an approach would risk harmful interference now and restrict operations in the future.

Small missteps in this proceeding will have dramatic ramifications that threaten the stability and reliability of the infrastructure that distributes content American viewers and listeners enjoy, and in which programmers invest billions of dollars every year. Viewers and listeners may have never even heard of the C-band, but they will notice if their favorite programming becomes susceptible to periodic, let alone unnecessary, outages.

II. THE C-BAND IS CRITICAL FOR VIDEO AND AUDIO CONTENT DISTRIBUTION

A. Consumers Rely on the C-Band for Programming

Based on comments on the record of its mid-band inquiry, the Commission is already aware of the extensive and critical nature of existing C-band operations across the U.S. today. The C-band is used to deliver television programming to over 1,000 broadcast television stations affiliated with national networks as well as thousands of MVPD head-ends and over-the-top service providers.³ Further, cable system operators have stated that, despite the expansion of fiber networks, “C-band earth stations remain a primary means of receiving content for distribution to customers.”⁴ Broadcasters, MVPDs and other distributors rely on the C-band as a key component of a near-flawlessly reliable distribution network that is free of service interruptions and outages that plague fiber optic networks and higher-frequency

³ Comments of the Content Companies at 2, GN Docket No. 17-183 (Oct. 2, 2017).

⁴ Comments of NCTA – The Internet & Television Association at 3, GN Docket No. 17-183 (Oct. 2, 2017).

satellite systems. Such interruptions and outages would cause severe financial harm and consumer disruption.

Radio content also relies heavily on dependable access to the C-band. National Public Radio has stated that the public radio system depends on the C-band, “for reliable distribution of programming to the 475 public radio earth stations that together broadcast public radio programming to 42 million Americans each week.”⁵ Commercial radio stations also rely on the C-band for distribution of sports and syndicated programming to tens of millions of Americans. C-band satellites are uniquely suited for the delivery of programming nationwide because they are “resistant to rain fade and capable of covering large areas, enabling coast-to-coast coverage with high availability.”⁶

The creation and delivery of premium content to viewers and listeners represents tens of billions of dollars in ongoing investment and is integral to lives of hundreds of millions of Americans who enjoy that content. However they enjoy programming, whether by broadcast radio, broadcast television, MVPD or over-the-top provider, it is content that drives the viewer and listener experience. Content providers, in turn, rely on a ubiquitous and near-flawlessly reliable distribution architecture to recoup their investment in premium content. A 5G ecosystem where content providers find themselves unable to distribute content reliably to recoup the substantial investment they make in that content will be of little use no matter how fast the 5G network is. NAB is confident that the “Race to 5G” is not being driven by the desire solely to have John Legere’s tweets (@JohnLegere) reach AT&T’s and Verizon’s

⁵ Letter from Adam Shoemaker to Marlene H. Dortch, GN Docket No. 17-183 (Nov. 8, 2017).

⁶ Comments of the Satellite Industry Association at i, GN Docket No. 17-183 (Oct. 2, 2017) (SIA Comments).

customers more quickly. A lack of planning for the C-band will have negative and long-lasting effects for content providers, consumers and 5G providers.

Reasonable alternatives to the C-band – alternatives that can provide the broad, reliable coverage upon which content providers and viewers and listeners depend – are not readily available. Fiber is not a realistic option. Fiber is far from ubiquitous, particularly in rural America, and even where available it is unreliable and may not be an economically viable alternative. There are frequent reports of fiber outages affecting consumers and businesses as the result of planned or unplanned fiber cuts from infrastructure projects,⁷ as the FCC can confirm through its NORS database. To avoid the service interruptions associated with these issues, broadcasters electing to use fiber often require connections along two diverse routes, which can significantly increase costs. Services providers, such as Amazon Web Services, often will not divulge routing information, leaving no way for broadcasters to ascertain the existence or extent of diverse fiber routing. Finally, regionalized programming, such as Sunday football games, would pose special challenges for fiber deployments.

NAB is also aware of no other satellite spectrum band that can replace the C-band. Satellite services offered in other bands are either congested, subject to reliability concerns, or do not provide nationwide coverage. Above 10 GHz, rain attenuation is the dominant impairment to radio wave propagation through the atmosphere.⁸ Many areas of the country

⁷ See, e.g., Todd Kunz, “Cut Internet and fiber cable affecting schools, homes and businesses,” KIDK/KIFI (Sept. 26, 2018) available at: <https://www.localnews8.com/news/cut-internet-and-fiber-cable-affecting-schools-homes-and-businesses/799855115>; Hannah Pike, “Two separate fiber cuts cause Oklahoma Verizon outage,” (June 13, 2018) newsok, available at: <https://newsok.com/article/5597975/verizon-service-out-in-oklahoma-due-to-cut-fiber>.

⁸ Louis J. Ippolito, Satellite Communications Systems Engineering (West Sussex: John Wiley & Sons, 2008), p. 163.

are subject to periodic heavy rainfall. The C-Band is the only commercial satellite band below 10 GHz. Even small changes in the level of reliability provided by C-band distribution could lead to service disruptions and outages that would frustrate consumers and cause severe financial harm to broadcasters, MVPDs and programmers.

B. Whatever Approach the Commission Adopts It Should Protect Existing Users

Because of the vital role the C-band plays in content distribution today, any consideration of expanded operations in the C-band should start with the protection and preservation of the capabilities the C-band offers users: a seamless and reliable content distribution system that can serve every corner of the nation. Accordingly, whether the Commission ultimately chooses to reallocate some portion of the C-band through a private arrangement, a government-administered auction or some other mechanism, the Commission should take three important steps to ensure that making additional spectrum available for mobile use does not upend the nation's content distribution architecture.

First, in the event the Commission reallocates a portion of the C-band for mobile use, the Commission should require a specific, documented, actionable and public plan for accommodating existing users. This plan should reflect input from C-band users, including broadcasters, and should spell out in detail whether users will need filtering or other technical fixes to prevent harmful interference from wireless operations, with technical analyses demonstrating that these fixes will prevent interference in real world conditions. If the plan contemplates relocating some users to alternative distribution paths, it should specify those paths and demonstrate their availability and reliability. 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. The Commission should not rely on voluntary

commitments or unsubstantiated claims that users can be successfully accommodated in any particular proposal. C-band users as well as the Commission must be able to see “under the hood” of any accommodation plan.

Second, costs for implementing such a plan should be entirely borne by the beneficiaries of any private or public spectrum transaction: either the satellite operators or the mobile carriers who acquire spectrum usage rights. The Commission should require a documented analysis of the financial commitment required to implement such a plan, which should include consideration of whether a smaller C-band will result in higher operating costs for current users if satellite operators increase transponder leasing rates.⁹ To protect against changes to the financial condition of the party or parties the Commission makes financially responsible for implementing an accommodation plan, the Commission should consider securing that financial commitment through an irrevocable letter of credit or similar instrument in the amount of estimated costs. The Commission imposed this requirement previously with respect to the reconfiguration of the 800 MHz band, which also involved accommodating a large group of existing users.¹⁰ However, the Commission should not cap the financial obligation to implement an accommodation plan in any way; if actual costs exceed the estimate, those costs must still be fully funded. The repacking of television stations following the broadcast spectrum incentive auction is a recent and extremely relevant example of how initial cost estimates for large relocation projects can quickly become outdated.

⁹ NPRM at ¶ 63.

¹⁰ The Commission imposed such a requirement on Nextel as part of the reconfiguration of the 800 MHz band. *Improving Public Safety Communications in the 800 MHz Band*, Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, and Order, 19 FCC Rcd 14969, ¶ 30 (2004).

Third, any accommodation plan must include capacity for robust expansion as the video marketplace evolves. For example, if 4K video programming becomes widespread, C-band users will need additional capacity to distribute and receive that programming. There is no public interest in stifling innovation in the video programming market for the sake of allowing innovation in the wireless delivery market.

To that end, we urge the Commission not to add a mobile service allocation to the entire 3.7-4.2 GHz band, but rather only to the portion of the band that is reallocated in this proceeding. Allocating the entire band to mobile will only foster uncertainty regarding the future of the band and undermine investment in content that will ultimately drive the 5G ecosystem.

III. THE COMMISSION CAN MOVE BOTH EXPEDITIOUSLY AND JUDICIOUSLY TO BALANCE PUBLIC INTEREST CONSIDERATIONS IN THE C-BAND

NAB fully supports the Commission's goal of ensuring that America remains a world leader in innovation. Of course, the fastest networks in the world are of little benefit if users cannot reliably enjoy the content they seek. A 5G ecosystem that is fast and innovative, *but undermines the reliable distribution of the most valuable content*, does not serve the public interest. As the Commission balances appropriate policy considerations in this proceeding, it should keep in mind the importance of the C-band to the content distribution architecture upon which Americans currently rely, and the paucity of suitable substitutes.

Accordingly, the Commission should exercise care in evaluating proposals that rely more heavily on marketing catchphrases than fulsome analysis. In previous spectrum proceedings, slogans intended to create a sense of urgency have not matched up with eventual real-world results.

For example, in the years running up to the broadcast spectrum incentive auction, the wireless industry cautioned of a “looming spectrum crisis”¹¹ or, more evocatively, a spectrum *crunch* that would stifle investment, stagger mobile service and harm American competitiveness.¹² AT&T stated that the incentive auction would be “the last spectrum auction of comparable scope that the Commission will conduct for many years, and the decisions the Commission makes here will have economic and technological consequences lasting a generation.”¹³ CTIA warned that “the spectrum crunch is likely more dire than even the startling statistics on mobile data usage suggest, and the Commission must take rapid action to make more spectrum available for mobile broadband services.”¹⁴ Then as now, the urgency of spectrum policy was fashioned as an urgent “race,” rather than a matter of balancing the public interest to ensure the Commission arrived at the correct outcome.¹⁵ Outside observers caught spectrum fever and stressed that the crunch “threatens to increase the number of dropped calls, slow down data speeds and raise customers’ prices.”¹⁶

¹¹ Letter from Christopher Guttman-McCabe, Vice President, Regulatory Affairs, CTIA – The Wireless Association, to Chairman Julius Genachowski, Commissioner Michael J. Copps, Commissioner Robert M. McDowell, Commissioner Mignon Clyburn, Commissioner Meredith Atwell Baker, GN Docket No. 09-51 (Sept. 29, 2009).

¹² Comments of CTIA – The Wireless Association at 2, GN Docket Nos. 09-51, 09-47, 09-137 (Oct. 23, 2009) (CTIA NBP Comments).

¹³ Comments of AT&T Inc. at 1, GN Docket No. 12-268 (Jan. 25, 2013).

¹⁴ Comments of CTIA – The Wireless Association at 8, GN Docket No. 12-268 (Jan. 25, 2013).

¹⁵ “Winning the Global Bandwidth Race: Opportunities and Challenges for Mobile Broadband,” Prepared Remarks of FCC Chairman Julius Genachowski (October 4, 2012) available at: <https://www.fcc.gov/document/chairman-genachowski-winning-global-bandwidth-race>

¹⁶ David Goldman, “Sorry America: Your wireless airwaves are full” (February 21, 2012) available at: https://money.cnn.com/2012/02/21/technology/spectrum_crunch/index.htm?iid=SF_T_Lead.

These dire predictions did not pan out. In fact, only one of the four national wireless carriers participated in the auction in a meaningful way. The other three carriers managed to survive the long bread lines of the spectrum crunch without crippling their service, ceasing investment or surrendering global competitiveness. Meanwhile, some of the additional spectrum resources the Commission has made available, including mid-band spectrum held by DISH, continue to lay fallow. DISH also participated in the incentive auction, adding low-band spectrum that was supposed to be critical for wireless carriers to its ever-expanding warehouse.

NAB respectfully submits that it is just as important to ensure the finish line is in the right place as it is to be the first across it. We believe the Commission can proceed both expeditiously *and* judiciously in this proceeding by beginning with the propositions that: (1) as discussed above, any proposal to reallocate a portion of the band, or to allow expanded operations in the remainder of the band, must explain in detail how content distribution can be protected without sacrificing the reliability and ubiquity of existing C-band operation; and (2) industry-generated spectrum targets should not outweigh other public interest considerations.

With respect to the second point, the FCC's spectrum policy should not be driven solely by a never-ending quest to reallocate spectrum for mobile use. For example, at the 11th hour before the comment deadline, the C-Band Alliance issued a press release upping its proposal for reallocation from 100 megahertz to 200 megahertz. The C-Band Alliance's revised proposal appears to stem from wireless industry pressure to set a larger target for the sake of largeness; but the Commission need not succumb to these same pressures in assuming that a 200 megahertz allocation is reasonable or appropriate.

It is important to note that 100 megahertz represents a *massive* reallocation of spectrum for mobile purposes. The recent incentive auction made 70 megahertz of spectrum available, and the previous major spectrum auction, the AWS-3 auction, made 65 megahertz available. Meanwhile DISH continues to sit on its substantial spectrum holdings – more than either of those recent auctions – with no credible plan beyond continuing to accrue spectrum to buttress the value of its existing portfolio and/or make itself an attractive merger candidate. The Commission should consider whether its ongoing and extensive efforts to make additional spectrum available are being undermined by its previous successes because auctioned spectrum is not being put to use. If DISH is sitting lazily on roughly 95 megahertz of low-band and mid-band spectrum, that may well represent a more immediately useful allocation than a similarly-sized C-band clearing.

More fundamentally, we urge the Commission not to be swayed by industry rhetoric into setting an arbitrary clearing target for its own sake. Instead, the Commission should determine whether and how existing users can realistically be accommodated in a reduced spectrum footprint while preserving the content distribution network that allows more than 100 million American households to receive the content they enjoy today.

IV. SHARED OPERATIONS IN THE C-BAND ARE INFEASIBLE

The worst outcome the Commission could achieve in this proceeding would be to assume that existing users can easily be accommodated in a smaller band or relocated to alternative spectrum or fiber. That is why we urge the Commission to require a specific accommodation plan for C-band operations that serve over 100 million American households to ensure viewers and listeners continue to have access to the premium content they enjoy today. The second-worst outcome would be for the Commission to require such an accommodation plan and immediately undermine it by forcing C-band operations into a

smaller spectrum band that is further degraded by additional operations on a co-frequency basis based on unproven sharing technologies. Such a result would severely undermine the value of the remainder of the C-band for existing users and risk impairing the content distribution architecture that currently serves America's viewers and listeners.

This is particularly so because no stakeholder, including the Commission, yet understands the effect that mobile operations will have on adjacent C-band operations. The FCC has not yet reached a determination as to how much spectrum will be reallocated, nor has it established technical rules for mobile operations in the C-band including, for example, the band plan, the transition band, power, antenna height, out-of-band emissions, interference filter rejection and insertion loss. These unknowns make it impossible to analyze the spectrum environment in which existing C-band users would be expected to co-exist with shared operations.

Proposals for sharing in the C-band to date have rested on the assumption that the 4,700 C-band earth stations previously registered or licensed with the Commission represented the universe of operations that a sharing mechanism would need to take into consideration. During the Commission's current registration window, however, thousands of additional C-band earth stations have been registered. As of October 26, there were approximately 16,500 C-band earth stations registered in the Commission's IBFS system. Even assuming this figure reflects *all* current C-band operations, this represents a dramatically different operating environment than previously assumed.

Even assuming that updated analysis suggested that co-frequency sharing could be possible with appropriate exclusion zones, co-frequency sharing in the C-band would limit flexibility in two important ways. First, it would presume that existing C-band operations would be locked in place forever. Broadcasters and MVPDs could not move earth stations to new

locations or expand capacity without potentially coming into conflict with newly authorized point-to-multipoint fixed service operating in the band.

Second, sharing would likely require the Commission to eliminate or constrain its longstanding and highly successful full-band, full-arc earth station licensing policy, under which earth stations may coordinate across the entire frequency band over the entire geostationary arc. Preserving the longstanding flexibility that full-band, full-arc licensing provides is essential to broadcasters and other users that rely on satellite services. It allows earth stations to access other satellites and frequencies in case of unanticipated interference or equipment problems or failures. Flexibility in both satellite choice and transponder frequency are absolute necessities to assure reliable operation and are key components of the near-flawless reliability that C-band service provides today. Even small reductions in this level of reliability would significantly degrade the value of the band and risk significant service interruptions that viewers and listeners would notice and resent.

Most problematically, there is simply no proven mechanism for co-channel sharing in the C-band. Well-documented inaccuracies in the white spaces database demonstrate the inadequacy of such an approach to spectrum sharing without significantly expanded safeguards.¹⁷ Given white spaces database debacle,¹⁸ there is no basis to believe a database approach can be successfully implemented.

¹⁷ Emergency Motion for Suspension of Operations and Petition for Rulemaking, RM-11745 (March 19, 2015); Letter from Patrick McFadden to Marlene H. Dortch, RM-11745, ET Docket No. 14-165 (June 25, 2015); Letter from Patrick McFadden to Marlene H. Dortch, ET Docket No. 16-56 (July 15, 2016); Letter from Patrick McFadden to Marlene H. Dortch, ET Docket Nos. 16-56, 14-165 (Nov. 17, 2016).

¹⁸ Petition for Reconsideration of the National Association of Broadcasters, ET Docket No. 04-186 (October 9, 2018) (demonstrating that the latest approved database administrator provides incorrect channel information at three out of four sites studied.)

Alternatives, such as Dynamic Frequency Selection (DFS) are ineffective and unreliable for preventing interference. In theory, DFS operates through a device listening for authorized transmissions and not transmitting if it detects such transmissions. DFS has repeatedly and demonstrably failed to prevent interference to FAA radars and weather radars used by TV stations over the course of several years.¹⁹ The FCC's experience with DFS plainly demonstrates that the technology is wholly inadequate to protect licensed services, and FCC enforcement has not resolved these issues. There is no basis for believing that DFS will become an effective means for sharing spectrum in the near term, and the Commission should not authorize expanded operations based only on an assumption that the technology will at some point improve.

V. CONCLUSION

As the Commission continues to look for ways to support investment and innovation in the mobile industry it should be mindful of the need to protect investment, and allow innovation, in the premium content that consumers demand. That consumer demand is what drives the desire for expanded mobile capacity and speed; a 5G ecosystem that undermines the value of the content consumers want would be an abject failure.

Accordingly, in any plan to allow expanded C-band operations, the Commission must avoid destabilizing the content distribution architecture on which most Americans rely by requiring a documented, enforceable and fully-funded plan for accommodating existing users. The Commission should also preserve the possibility of future expansion of content distribution requirements as video programming evolves, to ensure that consumers can

¹⁹ Comments of the IEEE Broadcast Technology Society at 3-4, GN Docket No. 17-183 (Nov. 2, 2017).

continue to enjoy expanded and improved service offerings. Finally, consistent with both the need to protect existing users and allow for future expansion, the Commission should not degrade satellite use of a reduced C-band by allowing shared operations in the band. NAB looks forward to working with the Commission and other stakeholders to reach a balanced outcome in this proceeding.

Respectfully submitted,

**NATIONAL ASSOCIATION OF
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A handwritten signature in black ink, appearing to read "Rick Kaplan", with a long horizontal line extending to the right.

Rick Kaplan
Patrick McFadden
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October 29, 2018