

**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
)	
Petition for Rulemaking to Amend and)	RM-11791
Modernize Parts 25 and 101 of the)	
Commission's Rule to Authorize and)	
Facilitate the Deployment of Licensed)	
Point-to-Multipoint Fixed Wireless)	
Broadband Service in the 3.7-4.2 GHz Band)	
)	
Fixed Wireless Communications Coalition,)	RM-11778
Inc., Request for Modified Coordination)	
Procedures in Band Shared Between the)	
Fixed Service and the Fixed Satellite Service)	
)	

REPLY COMMENTS OF CHARTER COMMUNICATIONS, INC.

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REPLY COMMENTS OF CHARTER COMMUNICATIONS, INC.

INTRODUCTION AND SUMMARY

Charter Communications, Inc. (“Charter”) files these reply comments in the above-captioned proceedings.¹ Charter is excited about the opportunities 5G presents and the broader future of connectivity. The company is actively investing in a future that will combine its high-capacity, high-compute wireline network with innovative Wi-Fi and wireless access technologies including 4G LTE and 5G to deliver ultrafast, low latency broadband to customers across the 41 states it serves. Charter is testing a variety of these new technologies for mobile and fixed wireless services using millimeter wave and 3550-3700 MHz (“3.5 GHz”) spectrum in several

¹ *In re Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Order and Notice of Proposed Rulemaking, GN Docket No. 18-122, FCC 18-91 (rel. July 13, 2018) (“*3.7-4.2 GHz Band NPRM*”).

urban and rural markets across the country, including Tampa, Charlotte, Denver, Lexington, Los Angeles, and New York—with many additional sites planned.²

Currently, Charter’s robust Wi-Fi network supports over 300 million wireless devices, carrying roughly 80 percent of the data from smart phones provided by wireless carriers in the home and office. Charter also recently launched Spectrum Mobile, an MVNO that combines our robust Wi-Fi network with Verizon’s network, to create a cost-effective, ubiquitous, seamless connectivity experience for its customers. In transitioning from a nomadic Wi-Fi network to one that supports full mobility, Charter is emphasizing an “Inside-Out” strategy, focusing first on wireless solutions inside the home and office, and then gradually expanding outdoors. Informed by these trials, our next step will be to evaluate the use of Charter’s existing infrastructure to deploy LTE licensed small cells and 4G LTE and 5G wireless access technologies to enhance our wireless products.

In light of Charter’s emerging wireless leadership and in light of its interest to provide its customers with an unrivaled 5G experience, Charter is very supportive of efforts to free up spectrum in the 3.7-4.2 GHz Band (or “C-Band”) for terrestrial use. This band holds tremendous promise for ubiquitous 5G that will power the Internet of Things, advanced telemedicine, Smart Cities, Artificial and Virtual Reality applications, and rural broadband, as it provides both meaningful bandwidth and satisfactory RF propagation characteristics.

Congress has charged the Commission with responsibility for setting spectrum policy in the public interest. Because this spectrum is so important to 5G and the future of connectivity, it must be made available in the most fair, efficient, and transparent way possible. This requires

² Charter has also conducted limited testing in the 3.7-3.8 GHz Band, *see* File No. 1523-EX-ST-2018 (granted Sept. 17, 2018) and has recently applied to do 3.7-4.2 GHz Band testing, *see* File No. 1971-EX-ST-2018 (granted Dec. 11, 2018).

that all qualified parties have an opportunity to bid for the spectrum and that it is ultimately awarded to the highest and best use.

A private arrangement, such as the one proposed by the C-Band Alliance (the “Alliance”), would undertake a significant reallocation and reassignment of the C-Band through a privately-administered scheme that the Alliance seeks to shield from public review and Commission oversight and that will inevitably favor the self-interests of the organizers. Given the important public interest at stake, namely ensuring competition and the widespread deployment of 5G including to rural areas, the FCC should manage the reallocation of this spectrum and reassign it through a transparent, market-based auction.

I. THE 3.7 GHz-4.2 GHz BAND IS IMPORTANT 5G SPECTRUM

Charter agrees with commenters that the 3.7-4.2 GHz Band has the potential to be an essential component in the deployment of 5G.³ As Commissioner O’Rielly has acknowledged, “a global shift in the future of spectrum [has] occurred and the world [is] eyeing mid-band spectrum . . . for 5G deployment. . . . Given the limitations and difficulties elsewhere in mid-band, the 3.7 to 4.2 GHz band . . . provides a wide swath of spectrum.”⁴ The amount of spectrum potentially available in this band would enable wider channel bandwidths for true 5G speeds while also offering much better RF propagation characteristics than millimeter wave spectrum.

³ See, e.g., Comments of CTIA, at 2-3, GN Docket No. 18-122 (Oct. 29, 2018) (“CTIA Comments”); Comments of Verizon, at 2-3, GN Docket No. 18-122 (Oct. 29, 2018).

⁴ *3.7-4.2 GHz Band NPRM*, Statement of Commissioner Michael O’Rielly.

While Charter is very interested in the 3.5 GHz Band and also views it as important mid-band spectrum,⁵ that band will have smaller channels than what is possible in the C-Band and it will be encumbered by Federal and other incumbent users. Charter and other new entrants will therefore be at a disadvantage if they are limited to the 3.5 GHz Band. Charter therefore believes the Commission should seek to maximize the amount of spectrum that is made available in the C-Band for terrestrial use by adopting a clear and predictable band plan. This band plan should allow for unencumbered and wider channels while also promoting competition and the deployment of 5G by efficiently allocating this spectrum. That said, it is imperative that the Commission do so in a manner that continues to protect the delivery of video programming.

II. THE COMMISSION, NOT PRIVATE ENTITIES, SHOULD OVERSEE THE REALLOCATION OF THE C-BAND AND ASSIGN TERRESTRIAL LICENSES THROUGH AN FCC AUCTION

Congress has long charged the Commission with the responsibility to facilitate and manage spectrum in a manner that promotes the public interest.⁶ Reallocation of the C-Band to terrestrial use raises significant and far reaching issues of spectrum policy that the Commission cannot delegate to private parties.⁷ The airwaves are a public resource, and the Commission,

⁵ See Comments of Charter Communications, Inc., at 2-3, GN Docket No. 18-122 (Oct. 29, 2018) (“Charter Comments”).

⁶ See, e.g., *Am. Radio Relay League, Inc. v. FCC*, 617 F.2d 875, 877 (D.C. Cir. 1980) (“As part of the regulatory scheme, Congress created the Federal Communications Commission and gave that agency broad authority to regulate the use of space on the radio spectrum.”); *In re Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993*, Twentieth Report, 32 FCC Rcd 8968, 8992 ¶ 37 (2017) (“Recognizing the importance of spectrum in the provision of mobile wireless services, Congress, under the Communications Act, requires that the Commission implement spectrum policies that promote competition, innovation, and the efficient use of spectrum to serve the public interest, convenience, and necessity.”).

⁷ 47 U.S.C. § 303(c) (“[T]he Commission . . . as public convenience, interest, or necessity requires, shall . . . [a]ssign bands of frequencies to the various classes of stations . . .”). While the Alliance acknowledges that the Commission must revise the table of allocations to permit terrestrial use of the C-Band, the Commission’s role in reallocation must also include

rather than a self-interested private entity, is best suited to make transparent and fair decisions to maximize public good.

Likewise, the most appropriate method for assigning new terrestrial licenses in the C-Band is through an auction managed by the Commission.⁸ Auctions “ha[ve] demonstrated the ability to award licenses to productive users, to encourage the emergence of innovative uses and technologies, to generate valuable market information, and to raise revenues for the public.”⁹ They are an effective and public means of resolving mutual exclusivity among prospective licensees.¹⁰ Auctions also best promote efficient and intensive use of spectrum because they motivate licensees to quickly put the spectrum to use and achieve a return on their investment.¹¹

establishing the terrestrial band plan for this spectrum rather than leaving that critical decision to the satellite companies. *See* Comments of the C-Band Alliance, at 4, GN Docket No. 18-122 (Oct. 29, 2018) (“Alliance Comments”).

⁸ Such an approach would be consistent with bipartisan legislation pending in Congress that requires an auction of this band. *See* AIRWAVES Act, S. 1682, 115th Cong., § 6(a) (2017); AIRWAVES Act, H.R. 4953, 115th Cong., § 6(a) (2018). Contrary to the Alliance’s suggestion, the ORBIT Act does not prohibit the auction of C-Band terrestrial licenses for domestic use. *See* Alliance Comments at 38. That Act only deprives the Commission of the authority to use auctions to assign “orbital locations or spectrum used for the provision of *international* or *global* satellite communications services.” *See* 3.7-4.2 GHz Band NPRM ¶ 109 (emphasis added).

⁹ *In re FCC Report to Congress on Spectrum Auctions*, Report, WT Docket No. 97-150, FCC 97-353, 1997 WL 629251, at *2 (rel. Oct. 9, 1997) (“FCC Spectrum Auctions Report”).

¹⁰ *Id.* at *7-8 (“ [T]he Commission’s [auction] experience . . . shows that competitive bidding is a more efficient mechanism to assign spectrum in cases of mutual exclusivity than any previously employed methods.”); *see also In re Implementation of Section 309(j) of the Communications Act – Competitive Bidding for Commercial Broadcast and Instructional Television Fixed Service Licenses*, First Report and Order, 13 FCC Rcd 15,920, 15,926 ¶ 16 (1998) (“Our determination to subject mutually exclusive . . . applications to competitive bidding is additionally supported by the absence of another viable method for resolving instances of mutual exclusivity in a timely and efficient manner.”).

¹¹ *See* Thomas W. Hazlett et al., *What Really Matters in Spectrum Allocation Design*, 10 Nw. U. J. Tech. & Intell. Prop. 93, 123 (2012) (“Auctions can be highly useful in eliminating the costs of secondary market recontracting, one of the reasons that random distribution of licenses (as was done by lottery for most cellular permits in the United States) is inefficient.”), <https://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1159&context=njtip>; Peter Cramton

With an FCC auction, all participating parties also can be assured that the key decisions will be made openly, after opportunity for public comment. These decisions include the mechanism for determining the amount of spectrum to be repurposed; auction design and procedures; service rules for terrestrial use; the number and geographic distribution of terrestrial licenses and any eligibility requirements to promote competition; spectrum clearing procedures and timelines; and the appropriate means for compensating incumbent licensees and users affected by the reallocation of this spectrum.

A public process ensures public confidence that the rules adopted on these matters do not favor any particular party or parties, and that no party has access to more information regarding reallocation and licensing than any other. Adherence to these basic principles of fairness is fundamental to the assignment of valuable public resources such as spectrum. A transparent and fair process is also more likely to draw wider participation from parties who have confidence in the integrity of the auction process.

et al., *Using Spectrum Auctions to Enhance Competition in Wireless Services*, 54 J.L. & Econ. S167, S167 (2011) (“Since their introduction in 1994, spectrum auctions have been remarkably successful in assigning and pricing spectrum. . . . These licenses have been put to use by wireless operators to create a competitive and rapidly growing wireless industry.”), <http://www.cramton.umd.edu/papers2010-2014/cramton-kwerel-rosston-skrzypacz-spectrum-auctions-and-competition.pdf>; *In re Service Rules for the 698-746, 747-762 & 777-792 MHz Bands*, Second Further Notice of Proposed Rulemaking, 23 FCC Rcd 8047, 8106 ¶ 169 (2008) (use of auction “enables the assignment of licenses to parties that value them more highly than others and are more likely to put the licenses to efficient and effective use.”); *In re Implementation of Section 309(j) of the Communications Act—Competitive Bidding*, Second Report & Order, 9 FCC Rcd 2348, 2358 ¶ 58 (1994); *see also* Comments of the Pacific Bell & Nevada Bell, PP Docket No. 93-253, attached Affidavit of Paul R. Milgrom and Robert B. Wilson, at 7 ¶ 18 (Nov. 10, 1993) (“Since a bidder’s abilities to introduce valuable new services and to deploy them quickly, intensively and efficiently increase the value of a license to a bidder, an auction design that awards licenses to those bidders with the highest willingness to pay tends to promote the development and rapid deployment of new services in each area and the efficient and intensive use of the spectrum.”).

By contrast, the Alliance proposes to undertake this major change in spectrum policy through a privately-organized secondary market transaction, which would inappropriately arrogate many of the Commission’s established responsibilities to a self-selected subset of the affected parties.¹² Such an approach would inevitably lead to closed-door negotiations, asymmetric information sharing with interested parties, and ultimately, the inefficient redistribution of spectrum. The Alliance is very clear that it intends to operate without public accountability or even reasonable Commission oversight.¹³ Under the Alliance’s proposal, a small group of foreign satellite companies would receive a substantial financial windfall at the expense of the Federal Government and American taxpayers.¹⁴

¹² Acting in effect as a shadow FCC, the Alliance proposes to determine all aspects of repurposing the C-Band, from setting the clearing target to determining protection for the remaining incumbent users. The Alliance would decide the amount of spectrum to be repurposed for terrestrial use (Alliance Comments at 24-25), which the Alliance equates to the operation of “market forces” (*id.* at 24); use the change to the table of allocations that it requests from the Commission as leverage to force holdout satellite providers to participate in the Alliance’s scheme (*id.* at 28); establish and run the process for applying for terrestrial C-Band licenses (boldly making the essentially unenforceable promise that “[n]o interested party will be shut out”), presumably selecting the “winning” applicants to whom the Commission would then award an authorization (*id.* at 11); establish conditions for the terrestrial licenses (*id.* at 4, 29-30); oversee the repacking of existing satellite users and their customers (*id.* at 8); determine protection requirements for satellite operations that remain in the C-Band (*id.* at 24); and establish the terms and conditions (which would be “announced through FCC [p]ublic [n]otice”) for determining which earth stations will be eligible to receive interference protection from terrestrial stations (*id.* at 23).

¹³ See Alliance Comments at 22 (“extensive FCC oversight of the Transition Facilitator is unnecessary”); *id.* at 23 (“submission of a ‘Transition Facilitation Plan’ would divert resources to a needless administrative exercise”; “[e]ven [periodic reports on the status of negotiations and efforts underway to clear spectrum for terrestrial 5G use] may be unnecessary” (footnote omitted)); *id.* at 26-27 (FCC licensing process “will obviate the need for additional regulation of the C-Band Alliance, its membership, or its spectrum clearing targets and process.”).

¹⁴ Reflecting this potential windfall, Intelsat’s stock price rose by more than 17 percent in July 2018 after the Commission adopted its 3.7-4.2 GHz Band NPRM in anticipation that the Alliance’s plan would be adopted. See Keith Noonan, *Why Intelsat S.A. Stock Gained 17% in*

While the Alliance argues against a Commission-led auction,¹⁵ it is in effect proposing a privately-managed auction with none of the transparency or public accountability that should be part and parcel of such a major reallocation and distribution of critical spectrum resources. In addition to the lack of transparency and accountability in the Alliance's proposal, neither the Alliance nor any other private entity has the resources, experience, or legal authority that the Commission possesses to conduct a successful auction of terrestrial licenses in the C-Band. While the Alliance has retained a third party for management and staffing purposes and hired a few auction and consulting experts to help it develop a framework for executing the transition of the C-Band,¹⁶ the Commission has experienced auction staff and dedicated infrastructure in place. It can draw on the expertise of dozens of agency employees in multiple bureaus and offices, as well as outside consultants, to address the technical and legal issues raised by repurposing the C-Band, design and run an auction that will be open and fair, and manage this transition from satellite to terrestrial use. Only the Commission has the legal authority to make rules ensuring that the integrity and fairness of the auction process is the public interest, and no private entity has the array of enforcement tools available to the Commission to enforce those rules. Importantly, Congress gave auction authority *to the Commission* as means of discharging its basic statutory responsibility for assigning radio frequencies,¹⁷ and the Commission may not delegate this significant authority to a private entity.¹⁸

July, Nasdaq (Aug. 8, 2018), <https://www.nasdaq.com/article/why-intelsat-sa-stock-gained-17-in-july-cm1004452>.

¹⁵ See Alliance Comments at 6.

¹⁶ See Alliance Comments at 1-2.

¹⁷ 47 U.S.C. § 309(j).

¹⁸ 47 U.S.C. § 151 (the Commission “shall execute and enforce the provisions of this [Act].”); see also FCC Spectrum Auctions Report, 1997 WL 629251, at *1 (“Congress authorized the

A privately-managed transition of this magnitude, run by self-interested stakeholders, would leave lingering questions about the fairness of the process, undermining the statutory objectives of “promot[ing] economic opportunity and competition.”¹⁹ An auction designed by the Commission can provide that assurance, which is a critical predicate to participation in the auction and confidence in its results. As T-Mobile states, “[a]uctioning the [3.7-4.2 GHz Band] will generate more broadband spectrum – and more public interest benefits for consumers and taxpayers – than the [Alliance’s] proposal.”²⁰

Protecting the delivery of critical programming to Charter’s over 16.5 million residential and business customers remains a threshold issue for the company.²¹ But as long as its customers’ viewing experiences are not adversely impacted and Charter’s costs associated with any relocation are reimbursed,²² Charter supports the Commission making more, rather than less, spectrum available for 5G use.²³ Given the keen interest demonstrated by both the Commission and the Administration in the swift deployment of 5G, Charter is confident the Commission could bring the necessary resources to bear to set rules and hold an auction of this spectrum under an expedited schedule. An accelerated rulemaking and auction would not only benefit

Federal Communications Commission to use auctions to award licenses for the rights to use the radio spectrum.”).

¹⁹ 47 U.S.C. § 309(j)(3)(B).

²⁰ Comments of T-Mobile USA, Inc., at 2, GN Docket No. 18-122 (Oct. 29, 2018).

²¹ *See* Charter Comments at 3-4.

²² For example, as Charter explained in comments, fiber delivery is vastly more expensive than use of established earth stations, due to the need for multiple paths of redundancy and the greatly increased expenses for installation and maintenance. *See* Charter Comments at 3-4.

²³ Notably, the House and Senate both have pending bipartisan legislation that addresses this point. Specifically, the AIRWAVES Act directs the FCC to identify 500 megahertz of additional spectrum between 3.7 and 4.2 GHz for commercial licensed use by December 31, 2019, with an auction of these frequencies by December 2022. *See supra* note 8.

Charter and all potential bidders interested in putting this spectrum into the marketplace quickly, but also the American public. Simply put, spectrum that is this important to the future of 5G should be allocated in the fairest, most competitive, and most efficient way possible, which is a Commission-run auction.

III. SERVICE RULES FOR THE 3.7-4.2 GHz BAND SHOULD ENCOURAGE COMPETITION AND FACILITATE NEW ENTRANTS INTO THE WIRELESS MARKETPLACE

Apart from the fundamental questions of who should be responsible for reallocating new terrestrial use and how much spectrum to reallocate to such use, the Commission should carefully consider appropriate service rules for the terrestrial portion of the C-Band. These service rules will be critical in determining the amount of spectrum to be reallocated, maximizing the usability of the reallocated spectrum, and ensuring uninterrupted services for adjacent bands.

In particular, the Commission must ensure that there is a sufficient amount of spectrum in a geographic licensing area in order to provide both existing wireless carriers and new entrants with an opportunity to obtain access to this spectrum. Charter agrees with CTIA that the Commission should adopt its proposal “to license the 3.7-4.2 GHz spectrum made available for flexible use on an exclusive, geographic area basis.”²⁴ To accomplish this, the Commission should generally adopt similar licensing rules for the 3.7-4.2 GHz Band as it recently adopted in the 3.5 GHz Band proceeding, including using counties as the geographic licensing area for the band and implementing a renewable ten-year license term.²⁵ As indicated above, any plan for

²⁴ CTIA Comments at 20-21.

²⁵ See *In re Promoting Investment in the 3550-3700 MHz Band*, Report & Order, GN Docket No. 17-258, FCC 18-149 ¶¶ 19, 46 (rel. Oct. 24, 2018).

terrestrial use of the C-Band should also allow for unencumbered, wider channels in the band as this will be an integral element in building a competitive mobile business.

One key issue that must be resolved is how services in adjacent bands will affect and be affected by the deployment of 5G technology. In the lower portion of the band, any power limits the Commission adopts must be compatible with the 3.5 GHz Band. Specifically, out of band emissions for 3.7-4.2 GHz Band mobile operations must ensure existing and future users of both the 3.5 GHz and the 3.7-4.2 GHz Bands are protected from harmful interference. In addition, the Commission must consider whether 5G services operating in spectrum adjacent to video services will be subject to constraints that do not exist in the middle of the band.

Any decisions the Commission makes with respect to power limits and out of band emissions for the 3.7-4.2 GHz Band, and the remaining service rules more broadly, will significantly affect the value of this spectrum as well as adjacent spectrum bands, particularly if certain portions of the 3.7-4.2 GHz Band will be encumbered. Performance requirements for terrestrial operators should be developed to maximize use of this important spectrum. The Commission must evaluate all the relevant technical considerations in adopting its service rules to ensure that the portions of the 3.7-4.2 GHz Band available for terrestrial use can be deployed in an efficient and timely manner without adversely affecting incumbent users who remain in the band.

CONCLUSION

Charter supports the FCC reallocating the 3.7-4.2 GHz band and assigning licenses using a public auction as the best way to deploy this important 5G spectrum quickly and in a widespread manner across the country in a competitively neutral way. The Commission is the expert body in allocating spectrum and is in the best position to ensure existing satellite incumbents and those that rely on their services are protected while also ensuring that all

qualified entities have an opportunity to bid on this spectrum so important to the future of mobility, facilitating the American public's interest in winning the global 5G race.

Respectfully submitted,

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