

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 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 Modernize	)	RM-11791
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	)	
	)	
Fixed Wireless Communications Coalition, Inc.,	)	RM-11778
Request for Modified Coordination Procedures in Band	)	
Shared Between the Fixed Service and the Fixed	)	
Satellite Service	)	

**REPLY COMMENTS OF T-MOBILE USA, INC.**

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**REPLY COMMENTS OF T-MOBILE USA, INC.**

T-Mobile USA, Inc. (“T-Mobile”)<sup>1/</sup> submits these reply comments in response to the comments filed on the *Public Notice* in the above-referenced proceedings inviting additional input on certain proposals for repurposing the 3.7-4.2 GHz band (“C-band”).<sup>2/</sup>

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<sup>1/</sup> T-Mobile USA, Inc. is a wholly-owned subsidiary of T-Mobile US, Inc., a publicly traded company.

<sup>2/</sup> See *Wireless Telecommunications Bureau, International Bureau, Office of Engineering and Technology, and Office of Economics and Analytics Seek Focused Additional Comment in 3.7-4.2 GHz Band Proceeding*, Public Notice, DA 19-678 (rel. July 19, 2019) (“*Public Notice*”); Letter from Ross Lieberman, Senior Vice President, Government Affairs, ACA Connects – America’s Communications Association, *et al.*, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed July 2, 2019) (“*ACA Connects Coalition Proposal*”); Letter from Henry G. Hultquist, Vice President, Federal Regulatory, AT&T Services, Inc., to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed May 23, 2019) (“*AT&T Proposal*”); Letter from Claude Aiken, President & CEO, WISPA, to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed July 15, 2019) (“*WISPA/Google/Microsoft Ex Parte Letter*”); Reed Engineering, *3.7-4.2 GHz FCC and Fixed Wireless Access Co-channel Coexistence Study* (July 2019) (“*Reed Study*”), attached to WISPA/Google/Microsoft *Ex Parte Letter*.

## I. INTRODUCTION AND SUMMARY

In its comments,<sup>3/</sup> T-Mobile urged the Commission, in evaluating all proposals, to continue to focus on the primary objective in this proceeding – maximizing the amount of C-band spectrum available for next-generation wireless services, including fifth-generation (“5G”) technologies. It also urged the Commission to recognize that transitioning incumbent earth station users to fiber and other alternative transmission media is an effective means to achieve that goal. To the extent the Commission determines that it is necessary to preserve some C-band spectrum for satellite use, T-Mobile recommended that the Commission minimize any unnecessary protection of continued satellite operations to the greatest extent feasible. Finally T-Mobile asked the Commission to reject proposals to permit any new fixed wireless point-to-multipoint (“P2MP”) services in the C-band that could not otherwise be accommodated through now-standard flexible-use wireless authorizations.

Commenters join T-Mobile in urging the Commission to make hundreds of megahertz of C-band spectrum available for terrestrial use. Commenters also broadly agree that C-band spectrum should be made available through a Commission-led process rather than a private transaction that directs all financial gains to a handful of satellite companies. While some parties question the viability of fiber as an alternative transmission mechanism to free up C-band spectrum, those concerns are overstated and are fully addressed in the record. Indeed, the record demonstrates that the majority of incumbent earth station operators can be transitioned to fiber because it is widely available and can provide reliable service. In addition, earth station

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<sup>3/</sup> See Comments of T-Mobile USA, Inc., GN Docket No. 18-122, *et al.* (filed Aug. 7, 2019) (“T-Mobile Comments”).

operators can be transitioned to fiber in a manner that is timely and cost-effective, without the launch of new satellites or other alleged complexities.

For remaining incumbent operations in the C-band, commenters agree that the Commission should not rely on the overly restrictive protection thresholds proposed by the C-Band Alliance (“CBA”) – a fact now conceded by the CBA itself. Finally, commenters agree with T-Mobile that there is no reason for the Commission to designate a portion of the C-band exclusively for fixed wireless broadband P2MP service. Not only would dedicated P2MP operations in any portion of the C-band complicate the transition of the band for terrestrial use, but P2MP proponents have failed to explain why they cannot be accommodated through new C-band terrestrial licenses or existing spectrum resources.

## **II. AS MUCH C-BAND SPECTRUM AS POSSIBLE SHOULD BE MADE AVAILABLE FOR TERRESTRIAL USE THROUGH AN FCC-LED AUCTION**

Throughout this proceeding, T-Mobile has urged the Commission to focus on making available for 5G wireless services the greatest amount of C-band spectrum possible.<sup>4/</sup> Others agree. For example, AT&T points out that “a substantial amount of mid-band spectrum [is needed] in the near term” for 5G.<sup>5/</sup> CTIA likewise emphasizes the importance of clearing a significant amount of C-band spectrum in order to accommodate 5G networks.<sup>6/</sup> Qualcomm supports designating the entire 500 megahertz of C-band spectrum to support 5G deployment in the U.S.<sup>7/</sup>

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<sup>4/</sup> See *id.* at 1.

<sup>5/</sup> Comments of AT&T, GN Docket No. 18-122, *et al.*, at 4 (filed Aug. 7, 2019) (“AT&T Comments”).

<sup>6/</sup> See Comments of CTIA, GN Docket No. 18-122, *et al.*, at 5-6 (filed Aug. 7, 2019) (“CTIA Comments”).

<sup>7/</sup> See Comments of Qualcomm Incorporated, GN Docket No. 18-122, *et al.*, at 1 (filed Aug. 7, 2019) (“Qualcomm Comments”).

Commenters across industries also agree that the C-band spectrum should be made available through an FCC-led auction rather than the CBA’s proposed private sale of spectrum. U.S. Cellular explains that a public auction is the “only practical and legally-viable mechanism” for repurposing the C-band for mobile wireless use.<sup>8/</sup> T-Mobile agrees with these commenters and the Dynamic Spectrum Alliance, which recommends that the Commission assign C-band spectrum through a public, FCC-led auction instead of “delegating assignment to a private administrator engaging in opaque individual transactions,” as the CBA proposes.<sup>9/</sup>

### **III. FIBER IS AN EFFECTIVE AND RELIABLE ALTERNATIVE TRANSMISSION MEDIUM**

#### **A. Fiber is Widely Available Today and its Availability Will Increase Over Time**

T-Mobile’s June 21, 2019 *ex parte* letter demonstrated that for approximately \$1 billion, fiber can reach nearly all current earth station locations, making the C-band spectrum available for terrestrial use.<sup>10/</sup> Some commenters continue to disagree, asserting that fiber cannot be a

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<sup>8/</sup> Comments of United States Cellular Corp., GN Docket No. 18-122, at 11 (filed Aug. 7, 2019) (“USCC Comments”); *see also* Comments of Frontier Communications Corporation and Windstream Services, LLC, GN Docket No. 18-122, *et al.*, at 3 (filed Aug. 7, 2019) (“Frontier and Windstream Comments”) (“Frontier and Windstream also strongly support a public process associated with the spectrum and a continued focus on enabling rural fixed wireless use cases. All major U.S. spectrum policy decisions to date have been made through a public process, and a private sale risks thwarting the public interest and failing to ensure this spectrum achieves its highest and best use.”). The Public Interest Spectrum Coalition similarly points out that a public auction is the quickest and most efficient option that is consistent with the Commission’s clear statutory authority. *See* Comments of the Public Interest Spectrum Coalition, GN Docket No. 18-122, at 20-27 (filed Aug. 7, 2019); *see also* Comments of NTCA – The Rural Broadband Association, GN Docket No. 18-122, *et al.*, at 4 (filed Aug. 7, 2019) (“NTCA Comments”) (“The Commission has clear statutory authority to reallocate the C-band for terrestrial use and then award the resulting terrestrial licenses through a system of competitive bidding that satisfies the requirements of the Communications Act.”).

<sup>9/</sup> Comments of the Dynamic Spectrum Alliance, GN Docket No. 18-122, *et al.*, at 2-3 (filed Aug. 7, 2019).

<sup>10/</sup> *See* Letter from Steve B. Sharkey, Vice President, Government Affairs, Technology and Engineering Policy, T-Mobile USA, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed June 21, 2019) (“T-Mobile June 21 *Ex Parte* Letter”).

substitute for the C-band.<sup>11/</sup> The record demonstrates otherwise. Fiber is widely available and offers an attractive alternative for content delivery.<sup>12/</sup> As NTCA observes, “the majority of MVPDs already have access to fiber.”<sup>13/</sup> ACA Connects, which represents many small MVPDs, agrees.<sup>14/</sup> Verizon likewise notes that “[f]iber-based content delivery is happening today” and “much C-band traffic can be transitioned to fiber where fiber is readily available.”<sup>15/</sup>

Because there are extensive existing fiber networks, national greenfield deployment will not be required to serve earth station locations but will take advantage of the extensive existing fiber networks as documented in the Roberson study.<sup>16/</sup> Moreover, fiber transmission control protocol/Internet protocol hubs are commonplace and, indeed, represent the very backbone of the Nation’s Internet economy. Businesses and governments use these systems for mission-critical operations, such as security, air traffic control, along with video distribution today.

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<sup>11/</sup> See, e.g., Comments of Globecast America, Incorporated, GN Docket No. 18-122, *et al.*, at 2 (filed Aug. 7, 2019) (“Globecast Comments”); Comments of Cumulus Media Inc. and Westwood One, LLC, GN Docket No. 18-122, *et al.*, at 2 (filed Aug. 7, 2019) (“Cumulus Media Comments”); Comments of the Content Companies, GN Docket No. 18-122, at 5 (filed Aug. 7, 2019) (“Content Companies Comments”); Comments of the North American Broadcasters Association, GN Docket No. 18-122, *et al.*, at 3 (filed Aug. 7, 2019) (“NABA Comments”); see also Comments of the C-Band Alliance, GN Docket No. 18-122, *et al.*, at 10 (filed Aug. 7, 2019) (“CBA Comments”); Comments of LinkUp Communications Corporation, GN Docket No. 18-122, at 2 (filed Aug. 3, 2019) (“LinkUp Communications Comments”).

<sup>12/</sup> See, e.g., Comments of Verizon, GN Docket No. 18-122, *et al.*, at 13 (filed Aug. 7, 2019) (“Verizon Comments”); NTCA Comments at 2; CTIA Comments at 7; USCC Comments at 1, 12-13; Comments of Airspan Networks Inc., GN Docket No. 18-122, *et al.*, at 1 (filed Aug. 7, 2019) (“Airspan Networks Comments”).

<sup>13/</sup> NTCA Comments at 3.

<sup>14/</sup> See Letter from Ross Lieberman, Senior Vice President, Government Affairs, ACA Connects – America’s Communications Association, *et al.*, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed July 9, 2019) (“ACA July 9 *Ex Parte* Letter”); Cartesian, *C-band Spectrum Clearing Plan*, at 8 (July 8, 2019) (“Cartesian Study”), *attached to* ACA July 9 *Ex Parte* Letter; see also ACA Connects Coalition Proposal at 4.

<sup>15/</sup> Verizon Comments at 13, 17 (internal quotations omitted).

<sup>16/</sup> Roberson and Associates LLC, *Estimating Cost of Fiber Replacement for C-Band Sites* (June 19, 2019), *attached to* T-Mobile June 21 *Ex Parte* Letter.

And fiber availability, including in rural areas, is only expected to increase. The Commission reported that fiber was deployed to more new homes in 2018 than in any other year.<sup>17/</sup> And the Commission recently proposed establishing a fund – the Rural Digital Opportunity Fund (“RDOF”) – that would commit at least \$20.4 billion over the next decade to support high-speed broadband networks in rural America.<sup>18/</sup> Like its predecessor, the Connect America Fund Phase II auction,<sup>19/</sup> the auction of RDOF support is expected to encourage significant fiber builds across the country. Indeed, the Fiber Broadband Association recently highlighted that the RDOF “holds out the promise of bringing high-performance broadband service, especially all-fiber broadband service, to unserved areas throughout the country.”<sup>20/</sup>

Even where fiber is not available, T-Mobile has explained how the cost of any new fiber required can be covered by designating a portion of auction proceeds for that purpose.<sup>21/</sup>

Together with other Commission and private efforts, this will ensure an unprecedented

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<sup>17/</sup> See *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2019 Broadband Deployment Report, FCC 19-44, ¶ 3 (rel. May 29, 2019) (“During 2018, for example, broadband providers, both small and large, deployed fiber networks to 5.9 million new homes, the largest number ever recorded.”); see also generally T-Mobile June 21 *Ex Parte* Letter.

<sup>18/</sup> See *Rural Digital Opportunity Fund; Connect America Fund*, Notice of Proposed Rulemaking, FCC 19-77 (rel. Aug. 2, 2019) (“*RDOF NPRM*”).

<sup>19/</sup> See, e.g., Conexon Press Release, *Rural Electric Cooperative Consortium Awarded \$186M in FCC’s Connect America Fund Phase II Auction* (Aug. 28, 2018), <https://www.conexon.us/news-events/rural-electric-cooperative-consortium-awarded-186m-in-fccs-connect-america-fund-phase-2-auction/> (“The consortium of member-owned co-ops will be awarded \$186 million over a 10-year period to build fiber-to-the-home networks to more than 66,000 locations across rural America from Virginia to Oregon.”).

<sup>20/</sup> Fiber Broadband Association Press Release, *FBA Statement on Proposed Rural Digital Opportunity Fund* (Aug. 1, 2019), <https://www.fiberconnect.org/blog/fba-statement-on-proposed-rural-digital-opportunity-fund>.

<sup>21/</sup> See T-Mobile June 21 *Ex Parte* Letter at 3; Letter from Steve B. Sharkey, Vice President, Government Affairs, Technology and Engineering Policy, T-Mobile USA, Inc., to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed July 12, 2019) (“T-Mobile July 12 *Ex Parte* Letter”).



expansion of fiber capacity. Expansion of connectivity, including through fiber, remains a key Commission goal.<sup>22/</sup> This proceeding represents a unique opportunity to help achieve that end through what is effectively private financing – proceeds generated by an auction of C-band spectrum. The additional fiber will help satisfy the twin goals of making C-band spectrum available for terrestrial use and extending broadband connectivity to areas where it may not be available today.

T-Mobile recognizes that, particularly in remote areas like Alaska, fiber availability may be more limited, new fiber builds may be inefficient, and C-band spectrum may continue to be required to serve earth stations.<sup>23/</sup> But, as T-Mobile explained, C-band spectrum need not be reserved on a nationwide basis for satellite use.<sup>24/</sup> T-Mobile’s incentive auction approach would take the relative value of the C-band for satellite use (because of lack of alternatives) into account on a market-by-market basis. Even if the Commission does not adopt T-Mobile’s approach, it may be appropriate to continue to permit C-band earth stations to operate in Alaska and certain other remote, sparsely populated rural areas where access to fiber may be challenging.

**B. Fiber Provides a Reliable Form of Content Delivery and Other Alternatives to Current Earth Station Operations are Also Available**

Some commenters continue to question the reliability of fiber.<sup>25/</sup> As T-Mobile has demonstrated, fiber provides an effective and reliable alternative transmission medium for

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<sup>22/</sup> See *RDOF NPRM* ¶¶ 1, 3-4.

<sup>23/</sup> See generally, e.g., Comments of Alaska Telecom Association, GN Docket No. 18-122, *et al.* (filed Aug. 7, 2019); Comments of Alaska Communications Internet, LLC, GN Docket No. 18-122, *et al.* (filed Aug. 7, 2019); Comments of GCI Communication Corp., GN Docket No. 18-122, *et al.* (filed Aug. 7, 2019).

<sup>24/</sup> See T-Mobile Comments at 11.

<sup>25/</sup> See, e.g., Comments of PSSI Global Services, LLC, GN Docket No. 18-122, *et al.*, at 4 (filed Aug. 7, 2019) (“PSSI Global Comments”); Content Companies Comments at 6-8; Cumulus Media

incumbent earth station operators.<sup>26/</sup> Commenting parties agree.<sup>27/</sup> Verizon, for example, reiterates that fiber “offers lower latency than C-band connectivity, greater capacity, and greater security from radio frequency interference.”<sup>28/</sup> Commenters also agree that concerns about fiber outages can be addressed by deploying redundant fiber.<sup>29/</sup> As the Fiber Broadband Alliance has pointed out “[a]ll-fiber network providers offer Service Level Agreements and multi-path connectivity that ensure the level of redundancy that video program delivery requires. As a result, we have been seeing for years the natural evolution of video programming delivery from satellite to fiber, particularly in larger markets. MVPDs operating in smaller communities and more rural areas would similarly benefit from moving to fiber.”<sup>30/</sup>

In addition, some commenting parties incorrectly assume that the ACA Connects Coalition’s proposal requires all earth station operators to transition to fiber alone<sup>31/</sup> and argue

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Comments at 2; Globecast Comments at 2, 4-6; Comments of the National Association of Broadcasters, GN Docket No. 18-122, at 3-5 (filed Aug. 7, 2019) (“NAB Comments”); NABA Comments at 3-5; LinkUp Communications Comments at 2.

<sup>26/</sup> See T-Mobile Comments at 3, 7-8; T-Mobile June 21 *Ex Parte* Letter at 3.

<sup>27/</sup> See, e.g., CTIA Comments at 7; Comments of the Church of Jesus Christ of Latter-day Saint, GN Docket No. 18-122, *et al.*, at 3 (filed Aug. 7, 2019) (“LDS Comments”); Verizon Comments at 13; NTCA Comments at 2; USCC Comments at 1, 12-13.

<sup>28/</sup> Verizon Comments at 17 (internal quotations omitted).

<sup>29/</sup> See, e.g., Content Companies Comments at 7 (recognizing that it may be possible to develop a fiber system with higher levels of reliability through redundant links and carrier diversity); see also PSSI Global Comments at 3-7 (suggesting that redundant fiber must be incorporated to avoid negatively affecting service quality); LinkUp Communications Comments at 2; NAB Comments at 5-6; Comments of Riverfront Broadcasting, LLC, GN Docket No. 18-122, at 2 (filed Aug. 5, 2019) (“Riverfront Broadcasting Comments”); Comments of WTVY-TV, GN Docket No. 18-122, at 2 (filed Aug. 7, 2019) (“WTVY-TV Comments”).

<sup>30/</sup> Letter from Lisa R. Youngers, President and CEO, Fiber Broadband Association, to Ms. Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, at 1 (filed July 26, 2019).

<sup>31/</sup> See, e.g., Comments of the Wireless Internet Service Providers Association, GN Docket No. 18-122, at 5-6 (filed Aug. 7, 2019) (“WISPA Comments”); Comments of ABS Global Ltd., Hispasat S.A., and Claro S.A., GN Docket No. 18-122, *et al.*, at 3-5 (filed Aug. 7, 2019) (“SSO Comments”); AT&T Comments at 10-11; see also Comments of QVC, Inc. and HSN, Inc., GN Docket No. 18-122, *et al.*, at ii, 3 (filed Aug. 7, 2019) (“QVC Comments”).

that fiber by itself is insufficient to satisfy their existing needs.<sup>32/</sup> But the ACA Connects Coalition’s proposal does not “compel” the use of fiber over other distribution technologies.<sup>33/</sup> As T-Mobile explained and others agree, fiber can be used alone *or* in combination with other spectrum bands or other technologies.<sup>34/</sup> T-Mobile agrees with The Church of Jesus Christ of Latter-day Saints that earth station owners should be allowed to select a solution that best suits their needs and that this can be accomplished through a variety of mechanisms that do not require use of the C-band.<sup>35/</sup>

### **C. The Transition to Fiber Can be Implemented Promptly**

Some commenters claim that transitioning to fiber is more complex than the ACA Connects Coalition recognizes.<sup>36/</sup> These concerns are overstated. The use of fiber as an alternative transmission medium is not a new or complex undertaking. As noted above, an existing fiber network is already an established component of the Nation’s communications ecosystem. Far from being costly or complex, fiber is basic, reliable, effective, and fundamental to the Internet economy. Moreover, the ACA Connects Coalition’s proposal to transition the majority of earth station users to fiber is premised on information provided by existing

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<sup>32/</sup> See, e.g., PSSI Global Comments at 3-7; see also Airspan Networks Comments at 2-3; NAB comments at 3-5.

<sup>33/</sup> See WISPA Comments at 5-6.

<sup>34/</sup> See T-Mobile Comments at 7-10; see also AT&T Comments at 11 (“Other users might determine that switching to fiber or Ku-band (or some combination of all three) meets their service quality and reliability needs, and they should also be free to implement those arrangements.”); LDS Comments at 4; CTIA Comments at 7.

<sup>35/</sup> See LDS Comments at 2-3; see also Verizon Comments at 17 (“[T]echnological and market-based alternatives should be part of the conversation.”); AT&T Comments at 11 (“[A] reallocation framework must be broad enough that all impacted stakeholders retain control of their technology choices.”).

<sup>36/</sup> See, e.g., CBA Comments at 7, 8-9; Airspan Networks Comments at 2-3; SSO Comments at 3-4; PSSI Global Comments at 18-20; Content Companies Comments at 5; Cumulus Media Comments at 8; Globecast Comments at 2, 4-6; LinkUp Communications Comments at 1-2, 3-4; NAB Comments at 3-6; Riverfront Broadcasting Comments at 1-2, 3.

incumbent users who agree that a transition to fiber is technically feasible.<sup>37/</sup> Many other commenters also recognize that a transition to fiber is achievable.<sup>38/</sup>

In contrast, preserving an unnecessary level of C-band capacity for satellite use would require the implementation of the significantly more costly and complex CBA plan.<sup>39/</sup> The following are just some of the steps that would be necessary to execute the CBA's plan:

- design and build new satellite space stations;
- integrate the space stations into a launch vehicle;
- secure multiple launch authorizations in particular geographic locations suitable for positioning each space station in its predetermined orbit;
- successfully launch and operate the rocket;
- successfully deploy and position satellites in the desired orbit;
- successfully communicate with those satellites to orient them to a set of earth stations located approximately 23,000 miles from their point of operation;
- successfully test those new space-station platforms against existing infrastructure, all or most of which will require new filters and other never-before-used hardware at the earth stations; and

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<sup>37/</sup> See ACA Connects Coalition Proposal at 1 (explaining that the ACA Connects Coalition represents a “diverse group of incumbent and prospective users”); *see also id.* at 4.

<sup>38/</sup> See, e.g., Airspan Networks Comments at 2; LDS Comments at 3; NTCA Comments at 2; Verizon Comments at 17; CTIA Comments at 7; QVC Comments at ii, 3-4.

<sup>39/</sup> See Letter from Jennifer D. Hindin, Counsel for the C-Band Alliance, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed Apr. 9, 2019) (discussing details regarding the CBA's Transition Implementation Process, which includes the launch of several new satellites, providing new filters, etc.). ACA Connects estimates that the cost of transitioning non-MVPD earth stations within the satellite band would be approximately \$3-4 billion plus satellite launch costs. Cartesian Study at 10. In contrast, T-Mobile has demonstrated that relocating users (including non-MVPD users) to fiber would only cost approximately \$1 billion.

- perfect and sustain the space-to-earth and earth-to-space communications without changing or upgrading any satellite hardware from the original design – not feasible in space – and with only limited opportunities for software updates based on the technology that was available at the time of design and integration years prior to launch.

Some commenters complain that the ACA Connects Coalition’s proposal fails to explain how the transition to fiber will be managed,<sup>40/</sup> noting that the role of the Transition Facilitator is unclear. To the extent its use is required, a Transition Facilitator is not a novel concept. For example, the Commission designated an entity known as UTAM, Inc. to coordinate and manage the transition and introduction of Unlicensed Personal Communications Service devices in the 1910-1930 MHz band.<sup>41/</sup> The Commission provided for an independent Transition Administrator to oversee the 800 MHz band reconfiguration process and also established a clearinghouse model to relocate users from the AWS-1 bands.<sup>42/</sup> A Transition Facilitator for the C-band could be modeled on these past approaches with appropriate modifications to accommodate C-band incumbents and with the Commission retaining, as PSSI Global suggests, ultimate responsibility for the transition.<sup>43/</sup>

Some commenters similarly question the ACA Connects Coalition’s timeline for transitioning earth stations.<sup>44/</sup> The ACA Connects Coalition’s proposed timetable for

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<sup>40/</sup> See, e.g., CBA Comments at 5-6; Content Companies Comments at 8; Cumulus Media Comments at 6-7; LinkUp Communications Comments at 3.

<sup>41/</sup> See *Service Rules for Advanced Wireless Services H Block – Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz Bands*, Report and Order, 28 FCC Rcd 9483, ¶ 157 (2013).

<sup>42/</sup> See *Improving Public Safety Communications in the 800 MHz Band et al.*, Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, and Order, 19 FCC Rcd 14969, ¶¶ 190-200 (2004); 47 C.F.R. §§ 27.1160; 27.1176.

<sup>43/</sup> See PSSI Global Comments at 12-13.

<sup>44/</sup> See, e.g., Airspan Networks Comments at 2-3; SSO Comments at 3-8; CBA Comments at 8-16; PSSI Global Comments at 7-9; Content Companies Comments at 9-11; Cumulus Media Comments at 1-

transitioning earth stations to fiber is reasonable, if not conservative.<sup>45/</sup> In any case, the timeline is much more reasonable than, as discussed above, the process required to convert the band to the type of satellite use envisioned by the CBA. While T-Mobile does not oppose including a process to extend the transition period where it is needed,<sup>46/</sup> the Commission should also ensure that new terrestrial licensees can engage in post-auction clearing negotiations to encourage incumbents to transition more quickly from the C-band.<sup>47/</sup> Commenting parties agree that winning bidders could help facilitate the transition by providing additional funds and resources in order to help earth stations relocate in a more timely fashion.<sup>48/</sup>

#### **D. The Cost to Transition to Fiber Could be Covered by Auction Proceeds**

Some commenters express concerns about the cost to transition to fiber.<sup>49/</sup> While the costs for deploying fiber can vary, incumbent earth station operators should be able to choose whatever means best suits their geographic needs – buried fiber or aerial fiber, with or without use of another spectrum band. And, as T-Mobile and the ACA Connects Coalition have repeatedly stated, the costs to transition to fiber would be covered by the proceeds from

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2; Globecast Comments at 2, 4-6; LinkUp Communications Comments at 1-2; NAB Comments at 3-5; QVC Comments at 5-8; Riverfront Broadcasting Comments at 1-2; WTVY-TV Comments at 1-2.

<sup>45/</sup> See ACA Connects Coalition Proposal at 4.

<sup>46/</sup> See NTCA Comments at 3.

<sup>47/</sup> See T-Mobile Comments at 13-14.

<sup>48/</sup> See, e.g., USCC Comments at 8 (recognizing that “incumbents could receive compensation beyond their relocation costs – perhaps calculated as a percentage of auction revenues – in order to incentivize their cooperation in ensuring a smooth and timely transition”).

<sup>49/</sup> See, e.g., CBA Comments at 7; Content Companies Comments at 12-13; Cumulus Media Comments at 7; LinkUp Communications Comments at 3; NAB Comments at 7-8; QVC Comments at 4-5, 11-12; Riverfront Broadcasting Comments at 2-3; WTVY-TV Comments at 2-3.

reallocation of the C-band.<sup>50/</sup> The Commission can ensure that an auction of C-band spectrum does not close unless the anticipated costs are covered.

The National Association of Broadcasters asserts that concentrating content distribution in the hands of fiber providers could lead to price increases that would curtail programming investment and undermine the value of content.<sup>51/</sup> But unlike the two dominant satellite operators that control much of the satellite distribution of content over the C-band, there are multiple providers of fiber networks. Competition among those providers can not only help keep connectivity prices low, but can also ensure that ongoing operating costs remain competitive.

Finally, deploying fiber now could save costs in the future. As The Church of Jesus Christ of Latter-day Saints points out, “a move away from C-band earth stations would inoculate earth station operators against further costs and institutional disruptions from future restructuring of the band . . . .”<sup>52/</sup>

#### **IV. TERRESTRIAL OPERATIONS IN THE C-BAND SHOULD NOT BE SUBJECT TO OVERLY CONSERVATIVE TECHNICAL RESTRICTIONS**

While T-Mobile continues to urge the Commission to consider how fiber and other mechanisms can replace nearly all C-band capacity, it recognizes that there may continue to be earth stations in some or all of the C-band that require protection from terrestrial operations. The record reflects broad agreement that the protection criteria proposed by the CBA are excessive.<sup>53/</sup>

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<sup>50/</sup> See, e.g., T-Mobile Comments at 7; Comments of T-Mobile USA, Inc., GN Docket No. 18-122, *et al.*, at 9-10 (filed July 3, 2019); ACA Connects Coalition Proposal at 5; see also USSC Comments at 8.

<sup>51/</sup> See NAB Comments at 7-8.

<sup>52/</sup> LDS Comments at 3 (“If operators like the Church are required to install filters and stay within the C-band now, they likely will be required to transition yet again to another solution in the near future.”).

<sup>53/</sup> See Letter from Jennifer D. Hindin, Counsel for the C-Band Alliance, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, Attachment (filed Mar. 4, 2019) (“CBA Mar. 4 *Ex Parte* Letter”).

CTIA, for example, notes that the 150-meter protection zones proposed by the CBA would “needlessly expand predicted interference levels to protect areas where no registered earth stations exist . . . .”<sup>54/</sup> And Qualcomm points out that the CBA’s proposed out-of-band emissions (“OOBE”) limits of -65 dBm/MHz for user equipment would “force 5G mobile devices” to significantly reduce in-band transmit power throughout the band.<sup>55/</sup> Indeed, even the CBA has recognized its proposed criteria were unrealistic, agreeing to relax its proposed antenna elevation angle restrictions, reduce its protection and coordination zones, improve the antenna filter mask, and increase the maximum emissions levels.<sup>56/</sup>

The Commission should therefore adopt reasonable interference protection rules, including OOBE limits, that are consistent with and rely on 3GPP standards.<sup>57/</sup> In addition, as some commenters suggest, the Commission should afford new licensees the flexibility to remediate interference concerns with incumbents and engage in negotiations that may result in more permissive 5G operations than the technical rules would otherwise allow.<sup>58/</sup> Incumbent operators and new terrestrial licensees are in the best position to know and understand their own operating parameters as well as how they can best accommodate one another. A flexible approach to interference protection criteria will ensure that earth station operations are protected, while still allowing for robust 5G deployments.

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<sup>54/</sup> CTIA Comments at 8-9; *see also* Comments of Google LLC, GN Docket No. 18-122, *et al.*, at 15 (filed Aug. 7, 2019) (“Current protection zones extend enormous distances.”) (“Google Comments”).

<sup>55/</sup> Qualcomm Comments at 4; *see also* Comments of Nokia, GN Docket No. 18-122, *et al.*, at 2 (filed Aug. 7, 2019).

<sup>56/</sup> *See* CBA Mar. 4 *Ex Parte* Letter at Attachment at 2; Letter from Jennifer D. Hindin, Counsel for the C-Band Alliance, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, Attachment (filed May 13, 2019).

<sup>57/</sup> *See* Verizon Comments at 10-12.

<sup>58/</sup> *See, e.g.*, CTIA Comments at 11.



## V. THE COMMISSION SHOULD NOT ALLOW POINT-TO-MULTIPOINT FIXED WIRELESS BROADBAND SERVICES ON AN EXCLUSIVE BASIS IN ANY PORTION OF THE C-BAND

Finally, the Commission should reject requests to designate a portion of the C-band for fixed wireless P2MP services based on the Reed Study.<sup>59/</sup> *First*, commenters point out that allowing P2MP in any portion of the C-band would complicate both existing satellite operations as well as new terrestrial operations.<sup>60/</sup> Commenters note that allowing P2MP operations in any portion of the C-band that is reserved for satellite operations would make it more difficult to repack the band and create interference risks to those incumbent earth station operators that may remain.<sup>61/</sup> Moreover, commenters agree that allowing P2MP in the portion of the C-band reallocated for terrestrial use would encumber future mobile deployments.<sup>62/</sup>

*Second*, P2MP operators have alternative means by which to provide their services. AT&T agrees with T-Mobile that P2MP providers will have the opportunity, like mobile wireless carriers and all other interested parties, to acquire licenses for C-band spectrum at auction or through the secondary market, including through spectrum leases.<sup>63/</sup> P2MP providers may use those authorizations for flexible-use services, including P2MP. AT&T and others note that P2MP proponents have yet to articulate why obtaining C-band licenses to provide their

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<sup>59/</sup> See, e.g., Comments of Broadband Connects America Coalition, GN Docket No. 18-122, *et al.*, at 10 (filed Aug. 7, 2019); WISPA Comments at 8; Google Comments at 4.

<sup>60/</sup> See, e.g., Content Companies Comments at 13 (noting that permitting new P2MP operations in any portion of the C-band “would be fatal to the Commission’s efforts to repurpose C-band spectrum while protecting incumbent uses”); see also CBA Comments at 3 (explaining that “[a]s a technical matter, the [Reed] study fails to account for aggregate interference from all terrestrial sources (*i.e.*, terrestrial mobile and P2MP) to incumbent earth stations”).

<sup>61/</sup> See, e.g., Verizon Comments at 17; CTIA Comments at 13; NAB Comments at 9; NABA Comments at 3; Content Companies Comments at 14; LDS Comments at 5 (“The Church is concerned that, even with the efforts proposed to reduce or eliminate interference in a shared environment, it will experience issues in the field that will be expensive and time consuming to identify and resolve.”).

<sup>62/</sup> See, e.g., CBA Comments at 3; see also CTIA Comments at 11; Verizon Comments at 17.

<sup>63/</sup> See AT&T Comments at 12.

services is insufficient or why they need dedicated access to the C-band when other spectrum is already available for P2MP operations.<sup>64/</sup> To the contrary, both the Satellite Industry Association and AT&T correctly point out that providers of P2MP services currently have access to ample spectrum resources, including several hundred megahertz of unlicensed spectrum.<sup>65/</sup>

*Finally*, claims that P2MP will help serve the broadband needs of rural communities are unsubstantiated.<sup>66/</sup> As CTIA notes, the Reed Study is flawed, including its claims that introducing a new fixed service in 300 megahertz of C-band spectrum will make broadband available to more than 80 million Americans, “particularly those in underserved communities.”<sup>67/</sup> T-Mobile agrees with CTIA that the Reed Study is unreliable in this context because its results are based on a “3GPP mobile service propagation model [that was] designed for an entirely different purpose and rel[ies] on parameters that are inconsistent with the 3GPP model’s range of inputs.”<sup>68/</sup> Rather than allow dedicated P2MP operations in the C-band to facilitate rural broadband, the Commission could, as some parties suggest, pursue enabling rural fixed wireless as part of the Rural Digital Opportunity Fund or other strategies.<sup>69/</sup>

## **VI. CONCLUSION**

T-Mobile appreciates the Commission’s continuing efforts to evaluate the C-band for next-generation wireless technologies and its careful review of the proposals in this proceeding. The record reflects that the Commission should adopt a repurposing mechanism that will make

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<sup>64/</sup> See Comments of the Satellite Industry Association, GN Docket No. 18-122, *et al.*, at 2-4 (filed Aug. 7, 2019) (“SIA Comments”).

<sup>65/</sup> See AT&T Comments at 12-13; SIA Comments, at 2-4; CBA Comments at 20.

<sup>66/</sup> See, *e.g.*, CBA Comments at 20; CTIA Comments at 13.

<sup>67/</sup> CTIA Comments at 13 (internal quotations omitted).

<sup>68/</sup> See *id.* at 13-14.

<sup>69/</sup> See Frontier and Windstream Comments at 4.

hundreds of megahertz of C-band spectrum available for terrestrial wireless use primarily through a transition to fiber and reasonable interference protection criteria to protect any remaining incumbents. The Commission, however, should reject proposals to dedicate a portion of the C-band exclusively for P2MP services.

Respectfully submitted,

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