Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz	)	GN Docket No. 17-183
	)	

To: The Commission

REPLY COMMENTS OF THE BROADBAND ACCESS COALITION

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The Broadband Access Coalition ("Coalition") hereby submits its Reply Comments in response to certain of the Comments filed in the above-captioned Notice of Inquiry ("*Mid-Band NOI*").[1]

I. Introduction And Summary

In its Comments, the Coalition urged the Commission to expeditiously issue a Notice of Proposed Rulemaking ("NPRM") to authorize the deployment of high-throughput, licensed, point-to-multipoint ("P2MP") fixed wireless broadband services in the 3700 – 4200 MHz band (the "4 GHz Band"). These P2MP links can facilitate the rapid deployment of much-needed gigabit and near-gigabit fixed broadband service to consumers, businesses and anchor institutions in rural and other underserved areas.

In its Petition for Rulemaking ("Petition"), the Coalition proposed specific and concrete rule changes that would enable the immediate introduction of P2MP broadband service into the 4 GHz Band without disrupting incumbent Fixed-Satellite Service ("FSS") operations.[2] As the Petition explained, implementing P2MP services can be done rapidly and simply, using existing

[1] *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Inquiry, GN Docket No. 17-183, FCC 17-104 (rel. Aug. 3, 2017). Comments were filed on or before October 2, 2017 in GN Docket No. 17-183.

[2] Petition for Rulemaking of the Broadband Access Coalition, RM-11791 (filed June 21, 2017).

Part 101 frequency coordination procedures. The Petition also explained that the Commission can and should implement rules now for the immediate deployment of P2MP broadband that will not preclude later entry into the 4 GHz Band by mobile services.

II. The Commission Should Expeditiously Issue A Notice Of Proposed Rulemaking Premised On The Coalition Petition

A. The Record Established By The Initial Comments In This Proceeding Demonstrates Strong And Increasing Support For The Coalition Proposal

In response to the *Mid-Band NOI*, a large number of commenters representing a wide range of interests voiced strong support either for the Coalition proposal itself or for the general spectrum allocation approach that it advances as the most appropriate model for new spectrum sharing in the 4 GHz Band. For example, Google advocated shared use of the full 4 GHz Band for fixed broadband access systems, and noted that the propagation characteristics of the band "naturally mitigate interference concerns."[3] Microsoft, while differing slightly with the Coalition and Google on the precise range of frequencies to be allocated for a new fixed wireless service, supported the Coalition's approach in concept, and in most of its specifics. Microsoft agreed that the Commission should issue a notice of proposed rulemaking "to authorize a new licensed fixed point-to-multipoint wireless service … which offers the potential to be part of last-mile broadband access solutions in less densely populated areas."[4]

Major incumbent carriers, including Frontier and Windstream, expressed specific support for moving forward with a rulemaking proceeding rooted in the Petition.[5] The Carrier

[3] Comments of Google LLC and Alphabet Access (collectively, "Google") at 7.

[4] Comments of Microsoft Corporation at 7.

[5] *See, generally,* Comments of Frontier Communications Corporation, Windstream Services, LLC, and Consolidated Communications, Inc. ("Carrier Comments").

Comments observed that the 4 GHz Band "is prime spectrum for rural fixed wireless broadband deployment," and that allocation of this band for P2MP service would enable "high-bandwidth applications while still allowing for non-line-of-sight deployments over considerable distance."[6] They observed that "the [Coalition] proposal builds on a well-understood, existing framework, Part 101, and appears to make the framework readily updateable," concluding that the Coalition's "proposal offers a straightforward path to unleashing this spectrum, and it may be the best way to start ensuring this spectrum starts paying dividends to rural America."[7] These carriers, together with wireless internet service providers, provide the vast majority of broadband to rural areas, and their views on how best to improve rural broadband service should carry significant weight.

While maintaining a neutral stance "at this time" on the specifics of the Petition, the Dynamic Spectrum Alliance ("DSA") nonetheless expressed strong support for opening up this band for shared use, "recognizing that sharing is the only reasonable path forward to increase utilization by both new and incumbent users."[8] DSA concluded that "[o]ld approaches to spectrum management, based largely on band clearing and exclusive licensing, are ill-equipped to deliver" connectivity in a timely fashion to meet existing service needs within the next few years.[9]

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[6] *Id.* at 4.

[7] *Id*. at 7 - 8. *See also* Comments of NetMoby, Inc. at 1 n.2 (we "fully support the proposal and efforts of the Broadband Access Coalition ("BAC") to fully maximize the efficient use of the 3700 - 4200 MHz spectrum").

[8] Comments of DSA at 3.

[9] *Id*. at 22.

Significantly, even some parties that rely on the transmission services of the incumbent FSS operators in the 4 GHz Band recognized that a new mechanism for spectrum sharing in these frequencies would yield substantial public interest benefits, provided that adequate safeguards are adopted to protect existing FSS operations. The American Cable Association, for example, affirmatively "Welcomes More Intensive Use of the Band, with Appropriate Safeguards."[10] Both Charter Communications and the NCTA similarly did not reject spectrum sharing, but urged the Commission to ensure that existing users are protected from harmful interference.[11] As discussed below, the Coalition agrees that actual FSS users should be appropriately protected from harmful interference under Part 101 frequency coordination procedures.

Given the strong support for the Coalition's proposals, the Commission should adopt an NPRM to rapidly advance further discussion on the benefits to the public interest of the new rules proposed in the Petition.

B. A Point-To-Multipoint Service Will Provide Essential High-Throughput Broadband Service To Currently Unserved And Underserved Areas, Including Rural America

As described in Coalition's Petition, the Commission has determined that approximately 34 million Americans lack access to broadband speeds that meet the requirements of advanced communications, and that more than two-thirds of these citizens reside in rural areas.[12] In rural tribal lands specifically, more than two-thirds of the population lack access to this necessary

[10] Comments of the American Cable Association at 19.

[11] *See* Comments of Charter Communications, Inc. at 3 - 4; Comments of NCTA – The Internet & Television Association at 4.

[12] *See* Petition at 9, *citing 2016 Broadband Progress Report*, 31 FCC Rcd 699, 731 (2016).

level of internet connectivity.[13] Modernizing the Part 25 and Part 101 rules to enable licensed P2MP deployment would provide vital spectrum resources to address this critical shortfall in broadband access, greatly advancing the Commission's long-term and continuing efforts to close the digital divide, particularly in rural and other underserved areas.[14]

Critically, making additional spectrum available for licensed P2MP deployment on a nationwide basis will foster private sector investment in advanced broadband networks that will serve rural and other underserved communities. In these communities, cost-effective last-mile wireless connectivity is essential to broadband deployment because ubiquitous fiber deployment is not financially feasible due to a variety of factors, including insufficient population density.[15] By contrast, fixed wireless P2MP service can be deployed for a much lower cost per home served in less densely populated areas.

In short, if broadband providers were able to utilize a sufficient amount of contiguous mid-band spectrum licensed under Part 101, they would be able to deploy cost-effective broadband at gigabit and near-gigabit speeds, resulting in more affordable, reliable, accessible, and robust broadband service. As the DSA noted, the Coalition's proposal would facilitate "use of the fallow spectrum in the band to improve broadband service across the country, especially in rural and other underserved areas where high-capacity wireline service is too costly to deploy or where consumers lack a competitive alternative."[16] And the incumbent rural carriers agreed that

[13] *See id. citing 2016 Broadband Progress Report* at 732.

[14] *See, e.g.*, "A Digital Empowerment Agenda," Remarks of FCC Commissioner Ajit Pai at The Brandery, Cincinnati, Ohio (rel. Sept. 13, 2016).

[15] *See, e.g.*, Comments of CenturyLink, Inc. at 2 ("in more rural areas of the country … traditional wireline facilities are exceedingly difficult or expensive to place").

[16] Comments of DSA at 9 - 10.

the "relatively less intensive mobile usage in rural areas" makes the 4 GHz Band a perfect fit for fixed P2MP,[17] such that "[u]nleashing this spectrum on an accelerated basis in rural areas would further the Commission's goal of closing the digital divide."[18]

C. The Coalition Proposal Can Be Implemented Rapidly To Meet The Unmet Broadband Access Needs Of Unserved and Underserved Americans

The Coalition proposal includes comprehensive detail that is not found in any other initial submission in this docket.[19] The Coalition proposes specific and concrete changes to Commission regulations to allow for new service on a shared basis;[20] no other commenter has provided this kind of specific roadmap for modification of Commission rules. Accordingly, the Commission is in a position to move forward expeditiously to issue an NPRM and, ultimately, to adopt these proposals to enable service providers to quickly implement cost-effective licensed P2MP deployments that will meet currently unmet broadband access needs in rural and other underserved areas throughout the country. As the Carrier Comments state, "[t]ime is of the essence" – and the quicker the Commission can make new licensed fixed wireless spectrum available, the more likely it is that providers will be able to deploy broadband service to greater numbers of unserved locations, as well as to upgrade broadband speeds to rural and other

[17] Carrier Comments at 9.

[18] *Id.* at 8.

[19] *See* Petition at 26 - 35.

[20] *See id.*

underserved Americans.[21] The Commission therefore should promptly adopt an NPRM to invite comment on the rule changes proposed in the Petition.

D. The Commission May Wish To Seek Comment On Complementary Proposals That Accommodate Both Fixed And Mobile Terrestrial Use

The Coalition urges the Commission to make its proposal the centerpiece of an NPRM. The Coalition recognizes, however, that the Commission also may wish to seek comment on complementary proposals that could accommodate both fixed and mobile terrestrial use, while protecting – rather than relocating – incumbent users.

First, the Commission may wish to seek comment on a Part 101 spectrum access approach where both fixed and mobile operators would be permitted to operate in fallow spectrum after coordination with incumbent FSS and FS operators. This approach would enable fallow spectrum to be put to use almost immediately by both fixed and mobile operators. Mobile operators would likely choose to operate in dense urban areas where demand for spectrum *capacity* is the highest, while fixed operators would likely focus on serving less densely populated areas, including rural and other underserved areas, where demand for high-speed broadband service *coverage* is highest.[22] This coordination-based approach would enable consumer demand to determine whether fixed and/or mobile services would be deployed in a given area at a given time, while not precluding the simultaneous operation of fixed and mobile services within unused spectrum in any given geographic area.

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[21] Carrier Comments at 5.

[22] In order to prevent spectrum warehousing, the Commission will need to adopt the strict build-out and incremental spectrum licensing parameters set forth in the Petition, including a build-out period of 12-months and a maximum initial spectrum block of 40 megahertz. *See* BAC Petition at 33 – 34. For mobile operations, the Commission should adopt similar build-out requirements to ensure against a "spectrum land grab" that will tie up unused spectrum and preclude use by others.

Second, and similarly, the Commission may wish to seek comment on proposals to divide and allocate the 4 GHz Band by population density. In densely populated urban areas, where the demand for spectrum *capacity* for 5G and small cell service is highest, the 4 GHz Band could be reserved for mobile use. In less densely populated areas, where the demand for high-speed broadband *coverage* to premises is highest, the 4 GHz Band could be reserved for fixed use. This geographic division approach would enable the Commission to make all 500 megahertz of spectrum available in any given geographic area: 500 megahertz of spectrum for capacity in densely populated urban areas and 500 megahertz of spectrum for P2MP broadband in less densely populated areas – while ensuring that there would be no conflict between fixed and mobile services in any given geographic area.

Third, the Commission may wish to seek comment on dividing the 500 megahertz of spectrum such that one portion of the band would be allocated for fixed services and another portion would be allocated for mobile services. This spectrum division would ensure that there would be no conflict between fixed and mobile services in any given portion of the 4 GHz Band, and ensure that one type of service will not have a preclusive impact on the other type of service.

All three of these approaches could be supplemented by elements of the concept set forth in the joint comments filed by Intelsat License LLC and Intel Corporation (collectively, "Intel/sat"), which proposed using private deals to move FSS incumbents off spectrum actively used by those incumbents.[23] However, for reasons explained in Section III below, the Coalition opposes the Intel/sat concept as a stand-alone solution.

[23] *See* Joint Comments of Intel/sat.

Finally, with regard to global harmonization, the Coalition points out the inaccurate and misleading statements advanced by various mobile industry commenters arguing that allocating the 4 GHz Band to mobile services would promote global harmonization.[24] With the exception of Japan, no country or region is actively considering a proposal to allocate mobile services in the 3800 – 4200 MHz band.[25] By contrast, many countries and regions have proposed mobile services in portions of the 3400 – 3600 MHz band, sometimes extending to 3800 MHz. SES Americom, Inc. identified the same inaccuracy:

> [T]he record includes inaccuracies regarding the extent to which other countries are pursuing the 3.7 – 4.2 GHz band for terrestrial services. Specifically … only a handful of administrations globally are considering making any spectrum in this range available for mobile service, and those few mainly are focused on only the lowest portion of the band, below 3.8 GHz.[26]

III. The Intel/sat Concept Is Badly Flawed And Should Not Be Considered As A Stand-Alone Solution

Intel/sat asked the Commission "to allow co-primary terrestrial mobile operations in the 4 GHz Band through commercial agreements between terrestrial and mobile interests and primarily affected FSS satellite operators."[27] The Coalition opposes the Intel/sat concept as a stand-alone solution. The path from concept to meaningful implementation would likely be quite

[24] *See, e.g.*, Comments of Nokia at 5; Comments of CTIA at 7; Comments of Verizon at 14; Comments of T-Mobile at 7 – 10.

[25] *See* Comments of Verizon at 8 – 9 and n. 29 – 38 ("China is seeking comment on plans to use the 3.3 – 3.6 GHz band for 5G;" "Japan issued a public consultation considering use of the 3.6 – 4.2 GHz band for 5G operations;" "Singapore issued a public consultation on 5G identifying the 3.4 – 3.6 GHz band for mobile use;" "Hong Kong intends to issue a public consultation on re-allocating the 3.4 – 3.7 GHz band for 5G mobile services;" "South Korea intends to auction spectrum in the 3.4 – 3.7 GHz band;" "India has proposed to hold an auction of the 3.3 – 3.4 GHz band and the 3.4 – 3.6 GHz band;" The United Kingdom, Ireland, and Italy are considering making available and/or auctioning spectrum in the 3.4/3.6 – 3.8 GHz band for 5G mobile use.

[26] *Ex Parte* Letter, SES Americom, Inc., GN Docket No. 17-183 (filed October 30, 2017).

[27] Joint Comments of Intel/sat at 2.

lengthy and delay terrestrial commercial use of the band, and the outcome would be highly uncertain. The public interest would be much better served by specific and concrete proposals that will truly expedite deployment of P2MP in rural and other underserved areas to address the digital divide.

Undoubtedly, implementing the Intel/sat concept would be difficult and complicated. As a threshold matter, implementation would require the full cooperation of all C-band FSS operators, on a market-by-market basis. The other FSS operators use the same 500 megahertz of spectrum. So, even if Intelsat arranges to clear xx megahertz in a market, the other FSS providers would have to clear the same frequencies in that market. Nearly all cable head-ends and TV stations take service from at least two satellite operators, often using the same frequency bands. Notably, no other FSS satellite operator, satellite customer or earth station operator has embraced the Intel/sat concept.

Implementation also would require the full cooperation of program distributors (FSS customers) and FSS earth station operators (not customers), again on a market-by-market basis. The licenses and/or registrations to operate in the 4 GHz Band are held by the earth station operators, not the satellite operators. The satellite operators would have to negotiate complex, multi-party agreements to clear the spectrum. It is not clear whether mobile operators would be part of these negotiations (which would add to the complexity), nor is it clear whether, and if so how, mobile operators would negotiate among themselves for access to this spectrum. In all events, the parties would face high transaction costs in getting these complicated transactions completed.

The estimated time frame of 1 – 3 years to implement this scheme is wildly optimistic.[28] Band-clearing deals must be made on a market-by-market basis. As noted above, deals will require the full cooperation of all other C-band satellite operators, as well as program distributors and earth station operators. Assuming that deals can even be made, the multi-party complexity of such agreements will take a long time to negotiate – and then more time for the parties to implement them. There is a substantial possibility that few, if any, deals would be made. In that event, little or no spectrum would be made available. The Commission would then have to go back to the drawing board, having wasted years of valuable time to the detriment of consumers.

Finally, as a stand-alone plan, the Intel/sat concept does nothing to help bridge the digital divide in rural and other underserved areas. Worse yet, the idea of moving FSS earth stations from urban areas to rural areas – a possibility raised by Intel/sat – would make it more difficult for operators to deploy P2MP service in the areas that need it the most. This is a classic "externality" – congested spectrum in one geographic area would be freed up by moving the burden to another geographic area. This is also likely to be impractical in many cases, for the simple reason that construction of a new fiber route to a remote rural location would cost millions of dollars and could take years to complete.

IV. The Commission Should Act As Soon As Possible To Gather Accurate Data From The FSS Industry

A. The Satellite Earth Station Database Must Be Updated

The commenters broadly agree that the satellite earth station database ("IBFS") needs to be updated irrespective of the procedural path the Commission chooses. Efficient sharing of the

[28] *Id.* at 18.

band will not be possible if new users must protect earth stations that no longer exist. Google reported that "approximately 29% of … registered locations are clearly not being used for satellite services despite being registered in IBFS."[29] DSA urged the Commission "to act immediately to clean up the 3.7 – 4.2 GHz licensing database" and "not wait for the resolution of this proceeding to improve the accuracy of the earth station registration data."[30]

Even commenters expressing concern about sharing agree that the database must be updated. For example, the Satellite Industry Association ("SIA") agreed that "a clean-up of the Commission's [IBFS] database … is appropriate to ensure its ongoing accuracy and completeness."[31] AT&T recommended that "the FCC should … conduct[ ] a rigorous audit of the C-band …."[32]

The Commission must also obtain additional data from FSS earth station operators. Specifically, the Commission needs to collect the following data: accurate geographic coordinates; frequencies being used; and orbital location being accessed. The Coalition agrees with DSA that "[u]pdating FSS earth station registrations with complete and accurate location, frequency use, and other information to enable dynamic sharing is a prerequisite to more efficient utilization of the [B]and …."[33] As Google noted "[o]nce the FSS registrations have

[29] Comments of Google at 4.

[30] Comments of DSA at 7.

[31] Opposition of SIA, RM-11791 (filed Aug. 7, 2017), at 8. The Coalition has no objection to SIA's proposal that the Commission offer "amnesty" to earth station operators that provide accurate information on a timely basis in a manner specified by the Commission.

[32] Comments of AT&T at 9.

[33] Comments of DSA at 6; *accord* Comments of BAC at 8 - 9.

been updated, IBFS will accurately reflect greater opportunities to share the C-band with [Fixed Broadband Access] systems."[34]

B. Operating Earth Stations Seeking Interference Protection Must Be Required To Register By A Date Certain

Several commenters in the FSS industry argue that there are many unregistered receive-only earth stations, and that these earth stations must be protected from interference.[35] Section 25.131(b) of the Commission's Rules is quite clear that receive-only earth stations that do not register with IBFS are not entitled to interference protection. It is, of course, impossible for new users sharing the spectrum to protect an unknown incumbent user, and they should not be required to protect phantom or abandoned locations. The Commission needs to set a tight, but realistic, deadline for operating earth stations to register in order to be protected from interference from later entrants to the 4 GHz Band.

V. Conclusion

For the reasons set forth above, the Broadband Access Coalition urges the Commission to expeditiously issue an NPRM to authorize the deployment of high-throughput, licensed, P2MP fixed wireless broadband services in the 4 GHz Band. The rapid deployment of P2MP access

[34] Comments of Google at 6.

[35] *See, e.g.*, Comments of SIA at 18 - 19, 22 – 24; Comments of American Cable Association at 4 n.4; Comments of National Association of Broadcasters at 3 – 4.

points will significantly help to address the digital divide by enabling much-needed gigabit and near-gigabit fixed wireless broadband service to rural and other underserved areas.

Respectfully submitted,

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