Before the
Federal Communications Commission
Washington DC 20554

In the Matter of	)	
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Requests of Aviat Networks and CBF Networks, Inc. d/b/a Fastback Networks for Waiver of Certain Antenna Requirements in the 71-76 and 81-86 GHz Bands	))))	WT Docket No. 15-244

REPLY COMMENTS OF AVIAT NETWORKS

Aviat Networks, through its affiliate Aviat U.S., Inc. ("Aviat"), respectfully submits these reply comments regarding the above-captioned requests for waiver ("Waiver Requests") of certain antenna standards in the 71-76 and 81-86 GHz ("70/80 GHz") bands. Aviat appreciates the Wireless Telecommunications Bureau's efforts to move forward on the Waiver Requests and is grateful for the overwhelming support provided by commenters thus far.

I. THE COMMISSION SHOULD GRANT THE WAIVER REQUESTS IN LIGHT OF THE BROAD INDUSTRY SUPPORT

It is clear there is broad industry consensus that a relaxation of the antenna standards in the 70/80 GHz bands will greatly benefit the U.S. market by, among other things, reducing deployment costs, making more efficient and effective use of spectrum, and supporting deployment of next-generation mobile broadband services.[1] The need for the relief sought by the

[1] *See* Comments of Fastback Networks (filed November 12, 2015); Comments of Radio Frequency Systems (filed November 12, 2015); Comments of Comsearch (filed November 12, 2015). *See also* Letter from Vijay Lewis, Chief Technology Officer for PEG Bandwidth, LLC to Marlene H. Dortch, Secretary, Federal Communications Commission (filed Apr. 10, 2015); Letter from Kathleen O'Brien Ham, Vice President of Federal Regulatory Affairs for T-Mobile USA, Inc. to Marlene H. Dortch, Secretary, Federal Communications Commission (filed Mar. 12, 2015); Letter from Mitchell Lazarus, Counsel for the Fixed Wireless Communications Coalition to Marlene H. Dortch, Secretary, Federal Communications Commission (filed Mar. 23, 2013); Letter from Matthias Fries PhD, Product Line Manager Antennas for Huber+Suhner AG to Mitchell Lazarus, Counsel for the Fixed Wireless Communications Coalition, Forwarded to Marlene H. Dortch, Secretary, Federal Communications Commission (filed Dec. 3, 2013).

Waiver Requests has only increased since Aviat first made its request for waiver: U.S. mobile data traffic grew 120 percent in 2013,[2] global mobile data traffic is projected to grow at a compound annual rate of 57% through 2019,[3] the Commission has taken numerous actions to make even more spectrum available for mobile broadband uses,[4] and rules have already been proposed to help facilitate the deployment of next-generation "5G" mobile services.[5] Meanwhile, registration of links in the 70/80 GHz bands have decreased from 3,205 in 2013 to 1,603 in 2015 (through October), indicating that the bands are being severely underutilized. Comments supporting the Waiver Requests signify that operators are looking for smaller antenna options in these bands to better accommodate current and future needs related to backhaul for mobile services and small-cell deployment. Accordingly, Aviat urges the Commission to take prompt action in granting the Waiver Requests.

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[2] *See* Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update 2014–2019 White Paper, available at http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.html (last visited November 30, 2015).

[3] *Id.*

[4] *See, e.g.*, *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (rel. April 21, 2015).

[5] *See Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Notice of Proposed Rulemaking, GN Docket No. 14-177, FCC 15-138 (rel. Oct. 22, 2015) ("*Above 24 GHz NPRM*"). Aviat notes that one of the Commission's goals in the *Above 24 GHz NPRM* "is to develop flexible [technical] rules that will accommodate a wide variety of current and future technologies" in the millimeter wave bands. *Id.* at para. 3. Granting the Waiver Requests would be consistent with this goal.

II. THE COMMISSION'S 70/80 GHz BAND GOALS AND POLICIES SUPPORT A GRANT OF THE WAIVER REQUESTS DESPITE DASH'S OPPOSITION

Only one commenter, Dash Networks Corporation ("Dash"), opposes the Waiver Requests.[6] But Dash's objections appear entrenched in protecting a more-than-a-decade old proposal for "virtual fiber" technology that has yet to take root, and a mistaken belief that the Commission's goals and policies in creating rules for the 70/80 GHz bands support maintaining the *status quo*. Times have changed, technology has advanced, and the Commission's goals and policies for these bands—even as indicated over a decade ago—compel that its own rules need to be changed or waived.

The Commission adopted service rules for the 70/80 (and 92-95) GHz bands "to promote the private sector development and use of [the bands]."[7] In furtherance of this goal, the Commission, on reconsideration, expressed concern that a "one-size-fits all approach" to antenna equipment would not likely meet the needs of the entire market and "providing licensees the flexibility to select a wider range of equipment that best suits their particular business plans… [would] facilitate development and growth in this service."[8] Accordingly, the Commission decided, as a policy matter, that:

> relaxing the technical parameters to allow for lower-gain, wider beamwidth antennas best serves the public interest by promoting increased development of the nascent 70/80 GHz industry and thereby increase access to the 70/80 GHz bands that might otherwise remain underutilized. *The benefits of smaller antennas in terms of aesthetics and structure loading are undeniable*…[9]

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[6] Comments of Dash Networks Corporation (filed November 12, 2015).

[7] *Allocations and Service Rules for the 71-76 GHz, 81-86 GHz, and 92-95 GHz Bands*, WT Docket No. 02-146, Report and Order, 18 FCC Rcd 23318, ¶ 1 (2003) ("*70/80/90 GHz R&O*").

[8] *Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands*, Memorandum Opinion and Order, 20 FCC Rcd 4889 at 4905 - 4906 (2005) ("*70/80/90 GHz Reconsideration Order*").

[9] *Id.* (emphasis added).

Given the limits in technology at the time, it appears the Commission (and the industry) did not foresee the need to relax the antenna standards in the 70/80 GHz bands even further. However, that need is evident now. The Commission's core objective in creating service rules, and subsequently relaxing the antenna standards in the 70/80 GHz bands, was to promote the commercial utilization of these bands. As the limited number of 70/80 GHz link registrations demonstrates, this objective has not been fully met. The record already developed in this proceeding also indicates that the current antenna standards may be inhibiting the effective utilization of the bands that the Commission intended to promote. Indeed, this is the very predicament intended to be rectified under the Commission's waiver standards.[10] A grant of the Waiver Requests is necessary to ensure that the underlying purpose of the rules is not frustrated.

III. DASH'S OPPOSITION FAILS TO PROVIDE MEANINGFUL CLAIMS TO JUSTIFY A DENIAL OF THE WAIVER REQUESTS

In any case, Dash has not provided any colorable reason for the Commission to deny the Waiver Requests. Significantly, a grant of the Waiver Requests does not—as Dash seems to believe—in and of itself preclude licensees from utilizing larger antennas for the "virtual fiber" applications that Dash advocates. The licensing, coordination and link registration rules for these bands still apply the same regardless of the (compliant) antenna technology utilized: any first-in-time registered link (including those for "virtual fiber") can preclude the registration of a latter link (including those potentially using antennas pursuant to the Waiver Requests).[11]

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[10] The Commission may grant a waiver when "The underlying purpose of the rule(s) would not be served or would be frustrated by application to the instant case, and that a grant of the requested waiver would be in the public interest." 47 C.F.R. § 1.925(b)(3)(i).

[11] As with other Part 101 services, priority is allocated to users who demonstrate a greater need by acting first. The Commission's policy in this regard is to encourage the effective and efficient use of spectrum. Dash, on the other hand, proposes that the Commission continue giving "priority" to Dash's own proposed technological use of the band despite severe

Moreover, the broad assertions made by Dash regarding the characteristics and potential interference effects of smaller antennas under the Waiver Requests' specifications are largely unsupported—Dash offers no meaningful analysis or data to defend its claims.

Despite Dash's protestations, a grant of the Waiver Requests would not change the fundamental nature of transmissions in the 70/80 GHz bands. Transmissions with smaller antennas that meet the Waiver Requests' proposed specifications would still maintain "pencil beam" characteristics. Dash attempts to mislead the Commission in this respect by comparing a 70/80 GHz "pencil beam" to a "microwave wide beam" at one mile.[12] Dash's comparison is not in any way representative of the 70/80 GHz antennas that would comply with the Waiver Requests' proposed specifications.[13]

Dash also fails to provide any support for its claim that "If smaller antennas were to be allowed… some number of connections or circuits would not be possible as shown in Figure 3."[14] In addition to lack of technical data or meaningful analysis, Dash's claim also fails to take into account that many sites and links needing to make use of smaller antennas are likely to be at or nearer to street level. Thus, potential interference with systems operating on rooftops with wider channels is mitigated by clutter effects and, more generally speaking, interference can be readily managed by using good planning practices.[15]

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underutilization over the past decade. Dash Comments at 17.

[12] *See* Figure 2, Dash Comments at 9.

[13] By Aviat's calculations, the beam width of a representative 43dBi flat panel antenna at one mile is approximately 24.5 yards. This is nowhere near the 180 yards (1.5x football field) claimed by Dash.

[14] Dash Comments at 10.

[15] In New York City, for example, there are over 6,100 high rise buildings, with over 228 buildings that rise at least 500 feet. *See* Wikipedia, *List of tallest buildings in New York City*,

Dash believes that smaller antennas are only suitable for lower data rates and shorter links.[16] However, Aviat does not see a technical conflict with a platform using smaller antennas being able to support higher data rates. In any case, a grant of the Waiver Requests does not mandate the use of smaller antennas, restrict link sizes or dictate data rates. It would, however, broaden choice, allowing both deployments where aesthetics are key and also deployments where use of larger antennas is desirable or necessary.

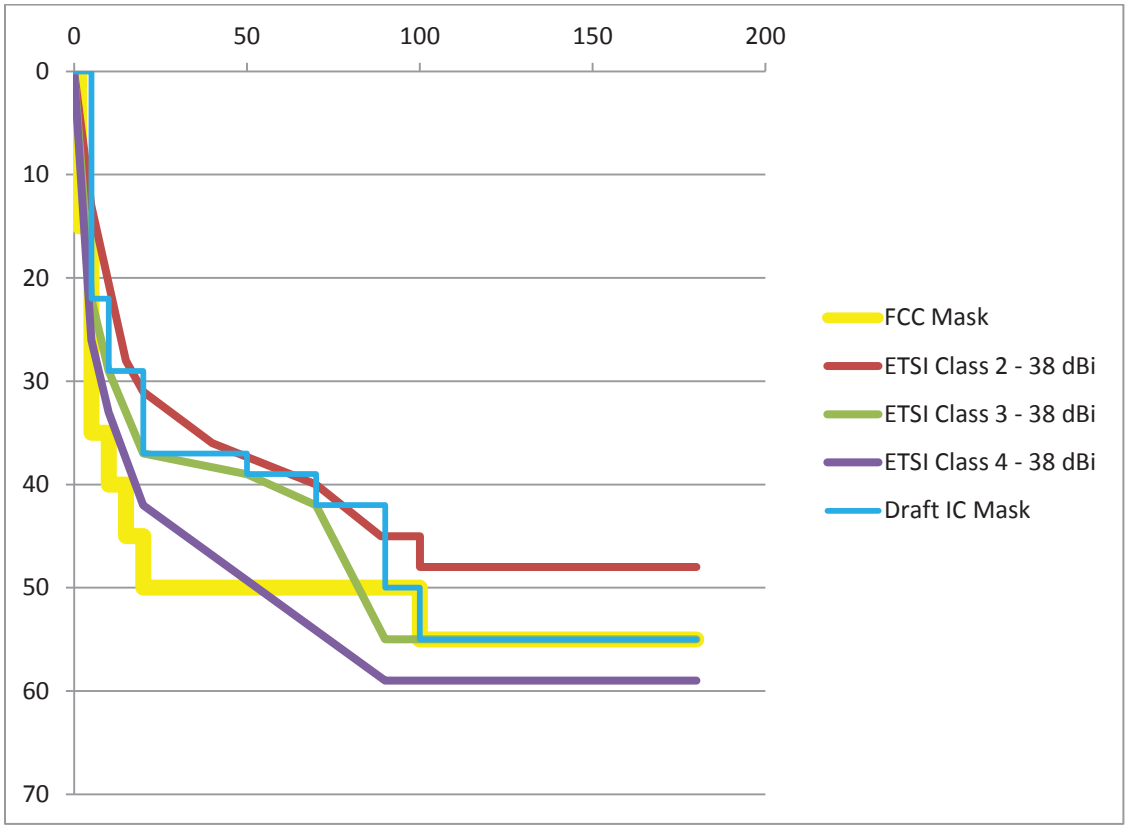

Figure 1: Comparison of the ETSI, FCC and (Proposed) Industry Canada 70/80 GHz antenna specifications (Shared with permission of the RABC.)

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available at https://en.wikipedia.org/wiki/List_of_tallest_buildings_in_New_York_City (last visited, November 30, 2015). Even assuming the "1.5x football field" beam width at one mile claimed by Dash, smaller antenna systems deployed nearer to street level would hardly have an effect on systems strategically deployed on high rise rooftops.

[16] Dash Comments at 14.

Dash incorrectly implies that the international community is opposed to permitting the use of smaller antennas in the 70/80 GHz bands.[17] The Commission may be aware that much of the international community uses the ETSI standard, upon which Aviat has heavily based the proposed specifications in the Waiver Requests.[18] The impact of following the ETSI standard and permitting smaller antennas can be illustrated by the disparity in market penetration for "E-band" equipment. In 2013 and 2014, Russia, which follows the ETSI standard, accounted for 44% and 37% of the E-band market by number of units, while the United States accounted for just 14% and 18%, respectively (figures from Sky Light Research). Moreover, the Radio Advisory Board of Canada ("RABC") is in the final stages of drafting specifications (*see* Figure 1, above) for 70/80 GHz antennas to be adopted by Industry Canada. The draft specifications appear to be in line with the ETSI standard (falling roughly between ETSI Class 2 and ETSI Class 3). Smaller antennas for the 70/80 GHz bands will be widely available and approved internationally, with the U.S. being an exception if the Waiver Requests are not granted or a more permanent relaxation of the rules eventually adopted.

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[17] Dash Comments at 6.

[18] Aviat is not aware of any international regulators expressing concern about spectrum management or utilization of spectrum with the ETSI antenna specifications in use.

CONCLUSION

Grant of the Waiver Requests will reduce costs, further broadband deployment, and benefit U.S. providers and manufacturers, with no adverse effect on any party. Accordingly, Aviat urges the Commission to promptly grant the Waiver Requests.

Respectfully submitted,

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