Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	
Modernizing and Expanding Access to the 70/80/90 GHz Bands	WT Docket No. 20-133
Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees	WT Docket No. 10-153
Aeronet Global Communications Inc. Petitions for Rulemaking to Amend the Commission's Allocation and Service Rules for the 71-76 GHz, 81-86 GHz, and 92-95 GHz Bands to Authorize Aviation and Maritime Scheduled Dynamic Datalinks	RM-11824 (Aviation) RM-11825 (Maritime)
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 (Terminated)

COMMENTS OF 5G AMERICAS

5G Americas, the voice for 5G and LTE in the Americas, submits these comments and the attached White Paper on *Innovations in 5G Backhaul Technologies*[1] in response to the Commission's Notice of Proposed Rulemaking ("*Notice*" or "*NPRM*") in the above-referenced proceedings on modernizing and expanding access to the 70/80/90 GHz bands. Currently

[1] 5G Americas, *Innovations in 5G Backhaul Technologies* (June 2020) ("*Innovations in 5G Backhaul*").

chaired by AT&T, 5G Americas has a broad membership of leading wireless operators and vendors of 5G core and radio access network equipment. 5G Americas facilitates and advocates for the advancement and transformation of LTE, 5G and beyond throughout the Americas.[2]

The Commission opens its NPRM by noting that it is initiating a proceeding to explore innovative uses of the 71–76 GHz, 81–86 GHz, 92–94 GHz, and 94.1–95 GHz bands (collectively, the "70/80/90 GHz bands").[3] 5G Americas has previously filed in the Part 101 proceeding to urge antennae rule changes that would enable 71–76 GHz and 81–86 GHz (the "E-Band") to be a more effective band to backhaul mobile traffic as 4G and 5G networks are densified.[4] 5G Americas supports the Commission's proposed rule change for antenna standards in Part 101.115(b)(2) to permit a minimum antenna gain in the E-Band of 38 dBi. 5G Americas is also pleased that the Commission decided to address Aeronet's Petition for Rulemaking for aviation and maritime applications and others' proposals for the 70/80/90 GHz band holistically, to ensure cooperative use of the band.

Rule changes that allow smaller antennas for backhaul as mobile networks are densified will help offset challenges with deployment in our current economic environment. Recent work at 3GPP has underscored the promise of the E-Band as the backhaul link in a new, even more efficient technology: Integrated Access and Backhaul ("IAB"). Backhaul for densified 5G networks may be provided through other solutions, and in other bands, but due to recent

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[2] 5G Americas Board of Governor members include AT&T, Cable & Wireless Communications, Ciena, Cisco, Commscope, Crown Castle, Ericsson, Intel, Mavenir, Nokia, Qualcomm, Samsung, Shaw, T-Mobile USA, WOM, and Telefónica.

[3] *Modernizing and Expanding Access to the 70/80/90 GHz Bands*, Notice of Proposed Rulemaking and Order, 35 FCC Rcd. 6039, ¶ 1 (2020) ("NPRM").

[4] Letter from Chris Pearson, President, 5G Americas to Marlene H. Dortch, Secretary, FCC, WT Docket No. 10-153, GN Docket No. 14-177, IB Docket Nos. 15-256 & 97-95, WT Docket No. 10-112 (filed May 6, 2019).

developments at 3GPP, 5G Americas takes this opportunity to discuss options for the E-Band. IAB will help speed the deployment of 5G networks where fiber is not readily available, as well as provide operators cost-efficient choices for backhaul where it is. 5G Americas supports the Commission's proposed Part 101 rule changes for the E-Band to provide greater flexibility in deploying 5G wireless backhaul over smaller, lighter antennas.[5] Adoption of the Commission's proposed rule changes for the E-Band will facilitate 5G backhaul, including through innovative backhaul technologies such as IAB.

Integrated Access and Backhaul

Integrated Access and Backhaul or IAB represents a fundamental evolution in 5G networks.[6] IAB allows re-use of the 5G access link for backhaul by multiplexing access and backhaul in the time, frequency, and/or space domain.[7] The attached 5G Americas *Innovations in 5G Backhaul Technologies* white paper notes that IAB can be used in any frequency band in which a 5G New Radio (NR) can operate. However, it is anticipated that millimeter wave spectrum will be the most relevant spectrum for the backhaul link.[8] IAB also allows a more seamless aggregation of one spectrum band for backhaul like the E-Band with another band for the mobile access link. In IAB, the access link may either operate in the same frequency band as the backhaul link (known as in-band operation) or by using a separate frequency band (out-of-band operation). High-capacity links operating in the E-Band can today deliver 10 Gbps of capacity and with low latency over a single channel. Millimeter wave spectrum like the E-Band

[5] NPRM at ¶ 10.

[6] *Innovations in 5G Backhaul* at 16.

[7] *Id*. at 14.

[8] *Id.* at 11.

provides an opportunity to leverage a large amount of new spectrum for backhaul. The beam steering capability in massive MIMO allows for the spatial separation between the backhaul and the access link, increasing spectrum efficiency. This type of solution allows mobile operators to improve coverage by installing denser networks, without having to lay fiber, or at least delaying the large and difficult investment of laying fiber for backhaul until market conditions permit. In this way, IAB facilitates and reduces the costs of very dense deployments, improving cellular coverage.[9]

Existing LTE spectrum is often too expensive to be used for backhaul.[10] With delays in some localities for wireless infrastructure siting and/or challenges to acquiring cost-efficient fiber backhaul, the industry has more recently focused on ways to more affordably obtain wireless backhaul. Key features of IAB included in 3GPP's Release 16 study items were completed in June 2020.[11] Under these work items, the deployment of IAB nodes should not require new user equipment features or additional standardization for the access link.[12] Hence, any rule changes the Commission adopts under Part 101 for E-Band backhaul should enable IAB. A new work item has begun at 3GPP for Release 17 on IAB, which is expected to be completed by the end of next year (December 2021).[13] The Release 17 IAB work item aims to enhance Release-16 IAB in terms of robustness, spectral efficiency, latency, and end-to-end performance.[14]

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[9] *Id*. at 14.

[10] *Id*. at 15.

[11] *Id*.

[12] *Id*.

[13] *Id*. at 16.

[14] *Id*.

90 GHz Band

The Commission asks how to make innovative use of the 90 GHz band, specifically 92–94 GHz and 94.1–95 GHz, which is under-utilized today.[15] The industry is looking to open new millimeter spectrum, specifically in the "W-Band" (75–110 GHz), and D band (110–170 GHz), which will enable delivery of wireless links in the order of 100 Gbps.[16] Like 5G Americas urged the Commission last year in its *Spectrum Horizons* proceeding, it should make a substantial amount of commercial spectrum available in and above the 90 GHz range for exclusive licensed use, making at least one band segment available with channelization of 20 GHz.[17] 5G Americas argued then that a 20 GHz band will provide a needed supplement to fiber optic technology for both mobile backhaul and fixed services.[18] Today, traditional microwave spectrum can support 5G backhaul and high-layer splits, while millimeter wave spectrum can be used for low-layer splits, due to the capacity and latency requirements.[19] Whether the Commission moves forward in this proceeding, or in *Spectrum Horizons*, 5G Americas urges the Commission to make available in the near term a sufficient amount of spectrum in the 90 GHz range and above for commercial use on an exclusively licensed basis.

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[15] *See* NPRM at ¶ 1.

[16] *Innovations in 5G Backhaul* at 12.

[17] Letter from Chris Pearson, President, 5G Americas to Marlene H. Dortch, Secretary, FCC, ET Docket No. 18-21 (filed May 6, 2019).

[18] *Id*.

[19] *Innovations in 5G Backhaul* at 12.

Conclusion

5G Americas supports the Commission's proposed rule changes for Part 101 antenna standards applicable to the 71–76 GHz and 81–86 GHz bands. Regarding whether those rule changes should apply to both Category A and B devices, 5G Americas does not believe that any standard other than Category A is necessary, so long as the Commission's Category A rules align with the European standards organization for communications and information technology ETSI Class 3 and the Canadian regulator Innovation, Science and Economic Development ("ISED") Envelope A. However, if new rules for Category B are adopted by the Commission, those rules should be aligned with ETSI Class 2 and ISED Envelope B, to ensure harmonization with antenna standards in Europe and Canada. Such harmonization will provide economies of scale for U.S. consumers.

Industry has developed features for IAB that would be ideal for deployment in millimeter wave spectrum. Broader technological advances such as artificial intelligence and machine learning make IAB an even more efficient technology to speed the deployment of 5G by enabling self-configuring networks, as well as to satisfy Quality of Service requirements. A fully digital IAB architecture allows for efficient beamforming, which in turn facilitates faster beam tracking and management. A digital IAB architecture enables blockage resilience, high throughput, and more adaptive network deployment, which will improve the user experience, as well as support timely 5G build-out.[20] For the above reasons, 5G Americas supports the Commission's proposed rule changes to Part 101 for 71–76 GHz and 81–86 GHz.

[20] *See id*. at 33.

Respectfully submitted,

Chris Pearson

President of 5G Americas
5G AMERICAS
1750 112th Avenue NE, Suite B220
Bellevue, WA 98004

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