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Marlene H. Dortch, Secretary  
Federal Communications Commission  
445 12th Street, S.W.  
Washington, DC 20554

**Re: WT Docket No. 10-153, *Amendment of Part 101 to Facilitate Wireless Backhaul***

**GN Docket No. 14-177, IB Docket No. 15-256, RM-11664, WT Docket No. 10-112, IB Docket No. 97-95, *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, et al.**

***Ex Parte Communication***

Dear Ms. Dortch:

On behalf of the Fixed Wireless Communications Coalition, Inc. (FWCC),<sup>1</sup> pursuant to Section 1.1206(b)(1) of the Commission's Rules, I am electronically filing this written *ex parte* communication in the above-referenced dockets.

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<sup>1</sup> The FWCC is a coalition of companies, associations, and individuals interested in the fixed service – i.e., in terrestrial fixed microwave communications. Our membership includes manufacturers of microwave equipment, fixed microwave engineering firms, licensees of terrestrial fixed microwave systems and their associations, and communications service providers and their associations. The membership also includes railroads, public utilities, petroleum and pipeline entities, public safety agencies, cable TV providers, backhaul providers, and/or their respective associations, communications

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The FWCC asks the Commission to act on our long-pending requests relating to the 71-76 and 81-86 GHz bands: smaller antennas for fixed point-to-point operations; 45 degree polarization; rules to prevent the accumulation of never-built links in the registration database and to allow certain amendments; and adoption of a channel plan.

We understand the Commission's reluctance to pursue these changes while it was considering mobile and/or unlicensed use in the 70/80 GHz bands, as it proposed three years ago.<sup>2</sup> With an order last November having ruled against those options,<sup>3</sup> the time is right for the Commission to take up our requests.

A few parties have asked the Commission to consider the 70/80 GHz bands for use by satellite systems or high-altitude platforms.<sup>4</sup> None offers anything like a concrete proposal; each just vaguely references possible future activity. Any such applications will be years away, if they come to pass at all. In the meantime, fixed service operators are making economically productive use of the bands. The measures we request here will further and enhance that use, without limiting the Commission's options in the future.

Our requests have undergone changes over time, particularly as to antenna specifications. The Appendix restates all of our pending 70/80 GHz requests in their current form.

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carriers, and telecommunications attorneys and engineers. Our members build, install, and use both licensed and unlicensed point-to-point, point-to-multipoint, and other fixed wireless systems in frequency bands from 900 MHz to 95 GHz. For more information, see [www.fwcc.us](http://www.fwcc.us).

<sup>2</sup> *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Notice of Inquiry, 29 FCC Rcd 13020 at ¶ 81 (2014).

<sup>3</sup> *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Second Report and Order, Second Further Notice of Proposed Rulemaking, Order on Reconsideration, and Memorandum Opinion and Order, GN Docket No. 14-177 *et al.*, FCC 17-152 at ¶¶ 200, 206 (released Nov. 22, 2017).

<sup>4</sup> Elefante Group in GN Docket Nos. 17-183, 14-177, *et al.* at 8 (filed Sept. 8, 2017) (refrain from precluding 71-76 and 81-86 GHz as feeder links for stratospheric airship platforms); CTIA in GN Docket No. 14-177 *et al.* at Attachment 23-24 (filed Sept. 8, 2017) (allow shared access to 71-76 GHz for FSS use; explore 81-86 GHz for exclusive use for satellite uplinks); The Boeing Company in GN Docket No. 14-177 *et al.* at 44 (filed Sept. 30, 2016) (do not preclude operation of satellite or HAPS at 70/80 GHz); ViaSat, Inc. in GN Docket No. 14-177 *et al.* at 16 (filed Sept. 30, 2016) (afford expanded opportunities for satellite growth into 70/80 GHz).

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### **SMALLER ANTENNAS AT 71-76/81-86 GHz**

We originally asked the Commission to allow smaller antennas in these bands in 2012.<sup>5</sup> The growth in popularity of data-intensive mobile devices, particularly tablets, continues to drive a parallel growth in demand for backhaul services, as carriers strive to increase capacity by adding bands and by subdividing and multiplying cells in older bands. The demanding requirements for data capacity limit most backhaul connections to either fiber or point-to-point microwave. In some environments, particularly rough terrain and built-up population centers, fiber is expensive or impossible to install, leaving microwave as the only practicable option. For emerging “small cell” backhaul applications, including the necessarily small cells for 5G services, 70/80 GHz is often the best choice. The very high available radio bandwidth—up to 10 GHz total—can manage needed data loads, while the high directivity and space attenuation simplify designs for frequency reuse. See the Appendix for details.

The coming of 5G fixed wireless access adds urgency. Operators using spectrum above 24 GHz can achieve cell radii of only a few hundred meters, so backhaul services will have to encroach into neighborhoods. Where backhaul antennas must be mounted on light poles, street furniture, etc., communities will insist on esthetically pleasing structures: small, flat antennas rather than bulky parabolic shapes. These can either be mounted externally or integrated into another enclosure for a visually pleasing form factor.

The current rules for the 70/80 GHz band preclude using the small, low-cost, visually attractive antennas that are necessary to fully exploit the potential of this spectrum. Both size and cost are barriers that hold back widespread take-up of these bands.<sup>6</sup>

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<sup>5</sup> Comments of the Fixed Wireless Communications Coalition in Response to the Commission’s Notice Of Inquiry, in WT Docket No. 10-153 (filed Oct. 5, 2012), *amended*, Letter from Mitchell Lazarus, Counsel, FWCC to Marlene H. Dortch, Secretary, FCC in WT Docket No. 10-153 (filed April 4, 2013), *further amended*, Letter from Mitchell Lazarus, Counsel, FWCC to Marlene H. Dortch, Secretary, FCC in WT Docket No. 10-153 (filed March 24, 2014). The amendments concern proposed requirements for co-polar and cross-polar discriminations.

<sup>6</sup> For more information and photographs of antennas compliant with the proposed standards, *see* Aviat Networks, Request for Waiver of Certain Antenna Requirements in the 71-76 and 81-86 GHz Bands, WT Docket No. 15-244 (filed April 5, 2013), *amended*, Amendment to Request for Waiver (filed March 24, 2014). Aviat Networks requests a waiver pending the antenna rulemaking initiated by the Fixed Wireless Communications Coalition.

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The current U.S. rules are out of step with much of the world. ISED Canada has issued its SRSP-371.0 standard with antenna requirements that are more relaxed than those in Part 101.<sup>7</sup> Where an 11 inch antenna is needed to meet the current Part 101 standard, a 4.5 inch antenna can meet the Canadian requirements. The ETSI standards, which apply to dozens of countries across Europe, Africa, and Asia, are more relaxed than the Commission's; and the ETSI TM04 meeting in December 2017 proposed a further relaxation.

We asked the Commission to amend the current requirements to include both Category A and Category B antenna standards, in line with the rules for most other Part 101 bands. The more stringent Category A antennas we suggest are suited to point-to-point rooftop interconnections, while the adoption of a Category B will allow the deployment of small, visually inoffensive planar antennas for installation closer to street level in support of high-capacity, small-cell urban backhaul. This would also better harmonize with Canadian requirements, which have Category A and B rules.

#### **45 DEGREE POLARIZATION AT 71-76/81-86 GHz**

We renew our request for rules that allow polarizations at  $\pm 45$  degrees, in addition to the conventional horizontal and vertical polarizations, to give operators an additional tool for avoiding interference.

#### **71-76/81-86 GHz REGISTRATION ISSUES**

A user can register and begin operating a link in the 70/80 GHz bands more quickly and more easily than in the fully-licensed microwave bands, without the need for a formal prior coordination process. The rules work well in most respects. After several years of experience, however, it has become clear to database managers and users that two kinds of changes are needed.<sup>8</sup>

#### ***Construction certificates***

The first-in-time priority regime of 70/80 GHz registrations encourages licensees to submit their link registrations early, often while they are still negotiating site leases and finalizing system plans. For a registration to be compliant with the Commission's rules, however, it must be accurate to within one second (longitude/latitude) and one meter (vertically).<sup>9</sup> Predictably, licensees sometimes submit multiple

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<sup>7</sup> ISED Canada, *SRSP-371.0 – Technical Requirements for Fixed Line-of-Sight Radio Systems Operating in the Bands 71-76 GHz and 81-86 GHz* (May 2017), available at <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11217.html>

<sup>8</sup> We originally made these requests in *Ex Parte* Filing of the Fixed Wireless Communications Coalition in WT Docket No. 10-153 (filed Nov. 10, 2016).

<sup>9</sup> 47 C.F.R. §101.21(e) (note).

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registrations at various locations and heights for a single transmit site, seeking priority protection while not yet knowing precisely where their equipment will be deployed. This leads to registrations in the database that are not operational and never will be.

The Commission should require 70/80 GHz registrants to file a certification of construction when a link has been placed into operation, showing the site location and frequencies actually in use. As with other Part 101 fixed microwave links, a registration that has no construction certification when the construction period has lapsed would automatically terminate. This will clear unneeded and unused registrations from the database.

The Part 101 rules provide: "Failure to timely begin operation means the authorization cancels automatically."<sup>10</sup> This language appears to apply to the 70/80 GHz bands. In the absence of a requirement to certify construction, however, the Commission has no way of knowing that operation has not begun.

Our proposal will require a mechanism for the Commission to receive construction certificates (possibly through ULS) and to pass them on to the database managers. (Alternatively, the Commission could require certification directly to the database managers.) The database managers already have the authority to remove from the database links that were never built.<sup>11</sup> But that authority does not appear in the C.F.R.; and in practice it is unhelpful unless the database managers have a systematic way of identifying unbuilt registrations.

Further, a renewing licensee should have to list registrations under the license that are beyond the construction deadline and, as to each, either certify its construction or identify it for removal from the database. This will rid the database of unbuilt registrations whose construction periods expired before the certification requirement took effect.

The NPRM considered requiring 70/80 GHz construction certificates.<sup>12</sup> In deciding not to, the Commission said, "We reserve the discretion to revisit this issue if our experience indicates that additional measures are necessary."<sup>13</sup> The experience to date justifies adding the requirement.

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<sup>10</sup> 47 C.F.R. § 101.63(c).

<sup>11</sup> "If a database manager or other user (whether a Federal Government operation or non-Federal Government licensee) finds that a link is unconstructed after the required timeframe, the database manager is instructed to remove it from the registry." *Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands*, Report and Order, 18 FCC Rcd 23318 at ¶ 80 (2003) (70/80 GHz R&O).

<sup>12</sup> *Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands*, Notice of Proposed Rule Making, 7 FCC Rcd 12182 at ¶ 87 (2002).

<sup>13</sup> 70/80 GHz R&O at ¶ 80.

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### *Amendment of Registrations*

The existing rules do not allow registrations to be amended—for example, to upgrade to more spectrally-efficient equipment. The first-in-time priority principle encourages a registrant to continue using less efficient technologies, rather than forfeit its protection by filing a later registration that shows an upgrade. The Commission can address this issue by permitting minor modifications of a registration, including equipment upgrades. Roughly speaking, we propose that the Commission allow changes that do not increase the potential for interference to other users, present or future.<sup>14</sup>

### **CHANNEL PLAN**

We renew our request that the Commission adopt a channel plan for 71-76/81-86 GHz. As we explained earlier, the present *ad hoc* channelization will likely lead to unnecessary interference cases owing to overlapping channels, particularly if the Commission adopts the antenna standards proposed above.<sup>15</sup>

Please contact us with any questions.

Respectfully submitted,



Cheng-yi Liu  
Mitchell Lazarus  
Counsel for the Fixed Wireless  
Communications Coalition

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<sup>14</sup> As a starting point for permitted changes, we suggest looking to minor modifications for microwave systems under Section 1.929(d).

<sup>15</sup> See Comments of the Fixed Wireless Communications Coalition in Response to the Commission's Notice of Inquiry, in WT Docket No. 10-153 at 6-7 (filed Oct. 5, 2012).

## APPENDIX – Pending FWCC Requests as to 71-76/81-86 GHz

### 1. SPECIFICATIONS FOR SMALL ANTENNAS

We ask the Commission to adopt these antenna standards to meet the needs described in text above:

Frequency (MHz)	Category	Maximum beamwidth to 3 dB points (included angle in degrees)	Minimum antenna gain (dbi)	Minimum radiation suppression to angle in degrees from centerline of main beam in decibels						
				5° to 10°	10° to 15°	15° to 20°	20° to 30°	30° to 100°	100° to 140°	140° to 180°
71,000 to 76,000 (co-polar)	A	2.2	38	22	28	32	35	37	55	55
81,000 to 86,000 (co-polar)	A	2.2	38	22	28	32	35	37	55	55
71,000 to 76,000 (cross-polar)	A	2.2	38	35	35	40	42	47	55	55
81,000 to 86,000 (cross-polar)	A	2.2	38	35	35	40	42	47	55	55
71,000 to 76,000 (co-polar)	B	2.2	38	13	20	28	31	32	48	48
81,000 to 86,000 (co-polar)	B	2.2	38	13	20	28	31	32	48	48
71,000 to 76,000 (cross-polar)	B	2.2	38	33	33	33	38	40	48	48
81,000 to 86,000 (cross-polar)	B	2.2	38	33	33	33	38	40	48	48

We further request these changes to Section 101.115(b)(2) (table) n.14 to facilitate the design and manufacture of small, visually inoffensive antennas:<sup>a</sup>

Antenna gain less than 50 dBi (but greater than or equal to ~~43~~ 38 dBi) is permitted only with a proportional reduction in maximum authorized EIRP in a ratio of 2 dB of power per 1 dB of gain, so that the maximum allowable EIRP (in dBW) for antennas of less than 50 dBi gain becomes  $+55-2(50-G)$ , where G is the antenna gain in dBi. In addition, antennas in these bands must meet two additional

<sup>a</sup> For explanations as to why these changes are needed and will not cause harm, *see* Letter from Mitchell Lazarus, Counsel, FWCC to Marlene H. Dortch, Secretary, FCC in WT Docket No. 10-153 (filed March 24, 2014); Letter from Mitchell Lazarus, Counsel, FWCC to Marlene H. Dortch, Secretary, FCC in WT Docket No. 10-153 (filed April 4, 2013).

standards for minimum radiation suppression: At angles between ~~1.2~~ 2.5 and 5 degrees from the centerline of the main beam, co-polar discrimination must be ~~G-28~~ G-33, where G is the antenna gain in dBi; and at angles of less than 5 degrees from the centerline of main beam, cross-polar discrimination must be at least ~~25~~ 21 dB.

## **2. 45 DEGREE POLARIZATION**

We ask the Commission to permit the coordination and registration of 71-76/81-86 GHz antennas using  $\pm 45$  degree polarization as an alternative to H/V polarization.<sup>b</sup>

## **3. CHANGES TO REGISTRATION RULES**

We ask the Commission to:

- require construction certifications by the end of the construction period;
- at renewal time, require the identification of registrations that are beyond the construction period and construction certifications for those that are built and in operation;
- cancel and delete from the database those registrations that remain unbuilt beyond the construction period.

## **4. CHANNEL PLAN**

We renew our request that the Commission adopt a channel plan for 71-76/81-86 GHz.<sup>c</sup>

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<sup>b</sup> See Comments of the Fixed Wireless Communications Coalition in Response to the Commission's Notice of Inquiry, in WT Docket No. 10-153 at 7-8 (filed Oct. 5, 2012).

<sup>c</sup> See *id.* at 6-7.