

Before the
Federal Communications Commission
Washington DC 20554

In the Matter of)	
)	
Amendment of Part 101 of the)	
Commission’s Rules to Facilitate the Use of)	WT Docket No. 10-153
Microwave for Wireless Backhaul and Other)	
Uses and to Provide Additional Flexibility to)	
Broadcast Auxiliary Service and Operational)	
Fixed Microwave Licensees)	
)	
Request for Interpretation of Section)	
101.141(a)(3) of the Commission’s Rules)	WT Docket No. 09-106
Filed by Alcatel-Lucent, Inc., <i>et al.</i>)	
)	
Petition for Declaratory Ruling Filed by)	WT Docket No. 07-121
Wireless Strategies, Inc.)	
)	
Request for Temporary Waiver of Section)	
101.141(a)(3) of the Commission’s Rules)	
Filed by Fixed Wireless Communications)	
Coalition)	

**COMMENTS OF THE
FIXED WIRELESS COMMUNICATIONS COALITION**

The Fixed Wireless Communications Coalition (FWCC)¹ files these comments in response to the August 9, 2011, *Further Notice of Proposed Rulemaking* in the above-captioned proceeding.²

¹ 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 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.

A. THE WIRELESS BACKHAUL ORDER

The FWCC applauds the Commission's recognition of the indispensable role that fixed wireless services play in the nation's telecommunications infrastructure, including the provision of backhaul to serve the expansion of mobile broadband. The FWCC particularly welcomes the new rules allowing adaptive modulation, which will allow Fixed Service operators to maintain link integrity while upholding reasonable efficiency standards. Fixed Service sharing in the 7 and 13 GHz bands is a step in the right direction and will permit some new Fixed Service operations in lightly populated areas. By itself, however, 7/13 GHz sharing will not resolve the nationwide need for wireless backhaul spectrum, particularly in high-demand parts of the country. We urge the Commission to consider allocating additional bands for Fixed Services—in particular, to implement Federal/non-Federal sharing in the 7125-8500 band.³

B. FURTHER NOTICE OF PROPOSED RULEMAKING

In the *Further Notice*, the Commission seeks comment on: (1) Part 101 antenna standards; (2) efficiency standards in rural areas; (3) wider channels in the 6 GHz and 11 GHz bands; (4) geostationary orbital intersections; (5) revised definitions for efficiency standards; and (6) eliminating legacy voice circuit designations from Section 101.141. These proposals are common-sense approaches to providing additional flexibility to Fixed Service operations. The FWCC comments on each in turn below.

² *Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul*, FCC 11-120, Docket 10-153, at ¶¶ 69-98 (released Aug. 9, 2011) ("*Further Notice*").

³ The FWCC has pending a Petition for Rulemaking to permit nationwide shared Federal and non-Federal fixed use in the 7125-8500 band (RM-11605).

1. Part 101 Antenna Standards

With slight modifications, the FWCC supports the Commission’s proposal to adopt the specific Category B technical parameters for the table in 47. C.F.R. § 101.115(b) that were submitted by Comsearch. We emphasize that the smaller antennas permitted under the new “B2” category *would not replace* the existing Category B standard, which would be retained under the “B1” category. Manufacturers and operators would remain free to meet either standard (unless required to meet category A).

The FWCC also recommends similar additions to the standards for the 70 and 80 GHz bands (71,000- 76,000 MHz and 82,000 to 86,000 MHz).

The Comsearch Proposal. The standards proposed by Comsearch will allow smaller, high performance antennas in the 6 GHz, 18 GHz, and 23 GHz bands.⁴ As several parties have explained, smaller antennas are less expensive to manufacture, install, and maintain, and pose fewer siting difficulties.⁵ The tower rental savings for smaller antennas would be far greater than the equipment and installation cost savings over the lifetime of the link.⁶ However, savings would also be realized at installation. For comparison, the estimated price difference between installing a 2-foot antenna and a 6-foot antenna would be:

Up to 100 ft center line - main antenna	\$1,575
101-200 ft center line - main antenna	\$1,800
201-300 ft center line - main antenna	\$2,025
301-400 ft center line - main antenna	\$2,070

⁴ Comsearch *Ex Parte* Presentation, Docket 10-153, <http://fjallfoss.fcc.gov/ecfs/document/view?id=7021238104> (filed April 14, 2011).

⁵ *Further Notice*, *supra* note 2, ¶ 73.

⁶ As Aviat explained in its comments, the typical cost of renting space for an antenna on a tower is \$400 + \$100 per foot (diameter) per month. So a link consisting of two 6-foot antennas will cost $2 \times (400 + 6 \times 100) = \2000 per month, i.e., \$24,000 per year. If the antenna diameter could be reduced to 2 feet, the cost is reduced to $2 \times (400 + 2 \times 100) = \1200 per month, i.e. \$14,400 per year, for a saving of \$9,600 per year on a single link. Aviat Comments, Docket 10-153, at 3 (filed October 25, 2010).

In principle, smaller antennas have a greater potential for interference due to their broader front radiation pattern, as well as more side and back radiation. The proposed amendments, however, only apply to Category B, so smaller antennas would only be permitted in areas where congestion is not a problem. This will protect other users from interference. When interference does occur, or is predicted for a new path, the rules should require an upgrade from Category B to A within a set time period.

The FWCC supports the technical parameters submitted by Comsearch for the 6 GHz band. At 18 GHz, however, we propose one alteration: 55° as the minimum radiation suppression at both 100°-140° and 140°- 180° (rather than 57° and 59°, respectively).

Smaller antennas in the 70 and 80 GHz bands. The same considerations given above apply equally to relaxing antenna standards in the 70 and 80 GHz bands. In high-density urban areas, or anywhere else aesthetics are a particular concern, smaller antennas would provide the flexibility to deploy integral antenna equipment, *i.e.*, dish antenna and radio in a single piece of equipment. The current FCC requirements, coupled with current antenna technology, anticipate 70/80 GHz equipment deployment as separate antenna and radio units.

Integrating the antenna with the radio has several advantages. First, it lowers the cost of equipment due to simpler design and less expensive antennas. In addition, the equipment becomes more aesthetically pleasing, as the Commission has previously recognized.⁷ This latter point is important, as the major application for fixed link technology in this band is pico-cell backhaul, where the backhaul radio is likely to be mounted in plain view, such as on lampposts or building corners.

⁷ *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 ¶ 34 (2005).

Use of similar equipment in Europe is governed in some countries by a “light licensing” self-coordination regime that is first-come-first-serve, *i.e.*, later links have to coordinate with existing links. This regime is proving successful, and shows that the reduction in antenna specification does not cause more interference or require a complex and expensive licensing procedure.

The beamwidth, gain, and minimum radiation suppression needed to accommodate smaller antennas and integral antenna/radio equipment in the 70 and 80 GHz bands are shown in the following proposed modification to the table at § 101.115(b) of the Commission’s rules:

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	N/A	1.4	38							
81,000 to 86,000	N/A	1.4	38							

These proposed antenna standards would give Fixed Service operators greater flexibility to make efficient and economical use of these bands, while still protecting other users from risk of interference.

2. *Efficiency standards in rural areas*

The FWCC continues to support lowering minimum traffic loading payload percentages for rural areas, while maintaining a requirement that the payload capacity of the equipment be capable of meeting the minimum in the rules.⁸ Sparse traffic and greater distances make it impractical to maintain minimum traffic loading payloads in rural areas. But there is a risk of

⁸ See FWCC Comments, Docket 10-153 (filed October 25, 2010), at 14.

locking in inefficient usage if an area becomes non-rural over the lifespan of a facility. Accordingly, the FWCC recommends forbearing from applying the minimum traffic loading payload percentages for rural links, while maintaining the current minimum payload capacities. That way, rural areas will be relieved of unrealistic loading requirements, but the equipment will be capable of meeting the minimum bit rate in the future, should circumstances change.

We suggest a link be considered “rural,” for purposes of payload requirements, if both ends are in rural areas as defined in *Opportunities for Rural Telephone Companies to Provide Spectrum Based Services*.⁹

3. Wider channels in the 6 GHz and 11 GHz bands

The FWCC is the original proponent of wider channels in the lower 6 and 11 GHz bands.¹⁰ We proposed giving operators in these bands greater flexibility by allowing them to treat adjacent pairs of 30 or 40 MHz channels as a single 60 or 80 MHz channel, respectively. Currently, if a Fixed Service link requires greater capacity than the current rules allow (and they increasingly do), the operator must coordinate signals on separate 30 or 40 MHz channels. The extra level of complexity involved in coordinating separate channels is expensive and can affect reliability.

Wider channels should not exacerbate congestion any more than the current practice of coordinating two separate channels. In fact, as the National Spectrum Management Association (NSMA) points out, combining adjacent channels will facilitate frequency coordination by reducing adjacent channel interference.¹¹ While certain areas may be too congested to permit either approach, the benefits of wider channels should be available where they can be realized.

⁹ 19 FCC Rcd 19078 at ¶ 11 (2004) (county or equivalent having population density of 100 persons per square mile or less).

¹⁰ FWCC Petition for Rulemaking, Docket RM-11602 (filed May 14, 2010).

¹¹ NSMA Comments, Docket RM-11602, at 3 n.3 (filed July 6, 2010).

Fixed service operators have every incentive to ensure that their links operate with a high payload. Indeed, the driving force behind the proposal for wider channels is the need for higher payloads to support data-intensive applications. Any remaining concerns are fully addressed by the conditions for wider channels proposed by NSMA:

- Showing of necessity and availability
- Designation of “preferred” slots for wider channels
- Per-MHz minimum payload requirements proportional to those listed in Section 101.141(a)(3).

The FWCC agrees with Conterra that additional spectrum is needed for fixed wireless backhaul.¹² However, as Conterra recognizes, the pressure of increased high-speed data has already required operators to run signals on separate channels to reach the necessary capacity. The proposal for wider channels will allow greater flexibility when a link requires greater capacity than a single polarization can provide, without any negative effects on other spectrum users. There is no reason to condition wider channels on the availability of additional spectrum, as Conterra suggests.

4. Geostationary orbital intersections

The FWCC supports Comsearch’s request to conform Section 101.145(b) and (c) of the Commission’s rules to the ITU Radio Regulations regarding fixed wireless transmitters pointing near the geostationary arc. This modification would reduce the need for waivers and allow more Fixed Service links to operate under conditional authority, without increasing the risk of interference to satellites.¹³

¹² Conterra Comments, Docket RM-11602, at 2 (filed July 6, 2010).

¹³ Comsearch Comments, Docket 10-153, at 29-34 (filed October 25, 2010).

5. *Revised definitions for efficiency standards*

FWCC also supports Comsearch's proposal to define "payload capacity," as used in Section 101-141(a)(3) of the Commission's rules, as excluding overhead data transmitted for routing and other network purposes. This definition is in conformity with regulatory purposes and industry usage.

6. *Elimination of legacy voice circuit designations from Section 101.141.*

Paragraph 97 of the NPRM proposes to "de-emphasize" the legacy voice-based designations in Section 101.141(a)(3), and instead to employ a suitable efficiency requirement in terms of bits-per-second-per-hertz. The FWCC supports this proposal. As the Fixed Service, with the rest of the of the telecommunications industry, migrates from dedicated circuits to Internet protocol and other modern interfaces, the voice-based designations become increasingly irrelevant to the actual traffic being carried.

As a starting point, we urge the Commission to consider the bits-per-second-per-hertz efficiency requirements adapted by Industry Canada.¹⁴ Those are summarized in the following table, with FWCC recommendations for cases where Industry Canada specifications are missing or inappropriate:

¹⁴ See generally http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf06130.html

Band	Frequency Range (MHz)	Channel Bandwidth (MHz)	Spectral Efficiency Required (bits/sec/Hz)	Industry Canada Standard Radio System Plan
4 GHz	3700-4200	20, 30, 40 MHz	4.4	303.7
Lower 6 GHz	5925-6425	2.5, 3.75, 5 MHz	2.4	305.9
		10, 30 MHz	4.4	
Upper 6 GHz	6425-6930	1.5, 2.5, 5 MHz	2.4	
		10, 20, 30 MHz	4.4	
7 GHz	6590-6770; 6930-7125	20 MHz	FWCC proposes: same as Upper 6 GHz	306.5
10.5 GHz	10,550-10,680	1.245, 2.5, 5 MHz	FWCC proposes: same as other low capacity bands (2.4)	310.5
11 GHz	10,700-11,700	1.25, 2.5, 3.75, 5 MHz	2.4	310.7
		10, 20, 30, 40 MHz	FWCC proposes: 3.0	
13 GHz	12,700-13,150; 13,200-13,250	FWCC proposes: same as 11 GHz		312.7
18 GHz	17,800-18,300; 19,300-19,700	all	1.0	317.8
23 GHz	21,800-22,400; 23,000-23,600	all	0.8	321.8

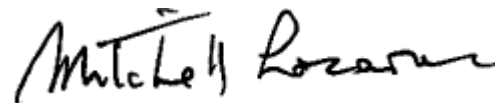
Similarly, we support dropping the voice circuit designations in Sections 101.141(a)(6) and 101.141(a)(7), and relying instead on bits-per-second-per-hertz throughout.¹⁵

¹⁵ Section 101.141(a)(6) could be revised to read, “Digital systems using bandwidths of 10 MHz or larger will be considered 50 percent loaded when the following conditions are met; at least 50 percent of their total payload capacity is being used.

CONCLUSION

The FWCC supports the Commission's ongoing efforts to facilitate the use of wireless backhaul. The proposed measures in the *Further Notice* will provide additional flexibility for the Fixed Service to satisfy the demand for high-capacity wireless backhaul without risk of harm to other users.

Respectfully submitted,

A handwritten signature in black ink that reads "Mitchell Lazarus". The signature is written in a cursive style with a prominent initial "M".

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