

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
WASHINGTON, D.C. 20554**

In the Matter of	)	
	)	
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	)	WT Docket No. 10-153
Microwave Licensees	)	
	)	
Request for Interpretation of Section	)	
101.141(a)(3) of the Commission's Rules	)	
Filed by Alcatel-Lucent, Inc., <i>et al.</i>	)	
	)	
Petition for Declaratory Ruling Filed by	)	WT Docket No. 09-106
Wireless Strategies, Inc.	)	
	)	
Request for Temporary Waiver of Section	)	
101.141(a)(3) of the Commission's Rules	)	WT Docket No. 07-121
Filed by the Fixed Wireless Communications	)	
Coalition	)	

To: The Commission

**COMMENTS OF THE  
TELECOMMUNICATIONS INDUSTRY ASSOCIATION**

The Telecommunications Industry Association (TIA) hereby submits comments to the Federal Communications Commission (Commission) in the above-captioned proceeding.<sup>1</sup>

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<sup>1</sup> *In the Matter of 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 Nos. 10-153, 09-106, 07-121 (rel. Aug. 6, 2010) (Backhaul NPRM/NOI).

TIA appreciates the opportunity to comment on ways in which the Commission and industry can enhance backhaul services to meet growing demand.

TIA represents the global information and communications technology (ICT) industry through standards development, advocacy, tradeshow, business opportunities, market intelligence and world-wide environmental regulatory analysis. With roots dating back to 1924, TIA enhances the business environment for broadband, mobile wireless, information technology, networks, cable, satellite and unified communications. Members' products and services empower communications in every industry and market, including healthcare, education, security, public safety, transportation, government, the military, the environment and entertainment. TIA is accredited by the American National Standards Institute (ANSI).

## **SUMMARY**

TIA strongly supports the Commission's efforts as reflected in this proceeding and the National Broadband Plan to make wireless backhaul service robust, efficient, and cost-effective. These efforts recognize the integral role wireless backhaul will play in speeding broadband to all Americans. Enhancing wireless backhaul services will increase competition, speed 4G services, and help meet the incredible demand for high capacity long distance data links.

To meet these goals, the Commission should develop flexible policies when they will increase backhaul reliability and decrease cost. Thus, the Commission should amend its rules to allow adaptive modulation so that Fixed Service (FS) links can maintain

communications during atmospheric fades. Adaptive modulation will dramatically increase backhaul service reliability and efficiency. Further, the Commission should work with the National Telecommunications and Information Administration (NTIA) to allow non-Government users to share the 7125-8500 MHz band. This spectrum is some of the last available that is most suitable for backhaul; making it available for such use will further the Commission's goals of alleviating current and future backhaul capacity challenges.

As the Commission considers methods to maximize microwave resources, it is vital that FS bands not incur increased congestion or interference. Accordingly, TIA opposes the Wireless Strategies, Inc. (WSI) proposal to allow FS licensees to coordinate primary and multiple auxiliary links. Such an allowance will result in increased interference and congestion to longer point-to-point FS microwave links, particularly in the 6 GHz band and the 11 GHz band used by public safety. Lastly, the Commission should consider harmonizing its approach to the 28 GHz Local Multipoint Distribution Service (LMDS) with the proposals of Radio Advisory Board of Canada (RABC) to create market dynamics in for wireless backhaul in a band that is not fully utilized.

## **DISCUSSION**

### **I. THE COMMISSION SHOULD ALLOW LICENSEES TO USE ADAPTIVE MODULATION TO MAXIMIZE SPECTRAL EFFICIENCY.**

As the Commission seeks to decrease the cost of wireless backhaul, make the service more robust, and encourage greater wireless backhaul deployment, TIA urges the

Commission to allow the use of adaptive modulation to avoid zero level payload capacity and to maintain communications during atmospheric fading. To that end, the Commission should, as proposed, revise its Part 101 rules to permit a licensee to temporarily drop below minimum data payload capacity requirements in limited circumstances.<sup>2</sup>

The Commission's current Part 101 rules encourage efficient use of frequencies by microwave links through minimum payload capacity rules.<sup>3</sup> However, the minimum payload capacity requirements may be impossible to meet by FS links as the result of atmospheric changes. These changes result in variations in signal strength, or fading, which increases bit errors and can produce a complete loss of communication.<sup>4</sup>

Adaptive modulation has been proven to effectively mitigate the impact of fades. This process adjusts a data link rate for a short time to allow a receiver to accept a weaker signal when a bit rate is lower. Thus, through adaptive modulation, a communication path is maintained where it would otherwise be dropped.

The capacity to maintain communications during fades is vital to secure greater communications reliability for public safety, critical infrastructure, homeland security,

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<sup>2</sup> See *Id.* at ¶ 36.

<sup>3</sup> See 47 C.F.R. §101.141(a)(3). See also Reorganization and Revision of Parts 1, 2, 21 and 94 of the Rules to Establish a New Part 101 Governing Terrestrial Microwave Fixed Radio Service, *Report and Order*, WT Docket No. 94-148, 11 FCC Rcd 13449, 13476 ¶ 77 (1996). Although this rule does not specify the 'up' time of the microwave link, it has been interpreted as a requirement that applies whenever the link is in service.

<sup>4</sup> See Comments of AT&T, Inc., WT Docket No. 09-106 (filed Jul. 27, 2009) at 2; See Comments of United States Cellular Corporation, WT Docket No. 09-106 (filed Jul. 27, 2009) at 2.

and rural areas.<sup>5</sup> Further, by adjusting a lower data rate in adverse conditions through adaptive modulation, the link will be maintained during propagation fades, and additional outage time required to resynchronize a network will be avoided.

Accordingly, TIA supports the Commission’s tentative conclusion to amend “Section 101.141 of the Commission’s Rules to state that the minimum payload capacity requirements must be met at all times, except during anomalous signal fading, when lower capacities may be utilized in order to maintain communications.”<sup>6</sup> Such a provision will not impose undue restriction on equipment manufacturers that could raise costs, which would be contrary to increasing the efficiency of FS links that maintain critical communications during periods of fading – particularly long links in rural areas.

## **II. THE COMMISSION SHOULD MOVE SWIFTLY TO ALLOW FOR FEDERAL AND NON-FEDERAL SHARING OF THE 7125-8500 BAND.**

As the Commission seeks to evaluate additional modifications to its rules or policies to “promote flexible, efficient and cost-effective provisions of wireless backhaul service,”<sup>7</sup> TIA urges the Commission to permit shared non-Federal fixed use in the 7125-8500 MHz band. Permitting non-Government users to share the 7125-8500 MHz will contribute significantly to meeting the ever-growing demand for wireless backhaul.

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<sup>5</sup> See Comments of AT&T, Inc., WT Docket No. 09-106 (filed Jul. 27, 2009) at 3. See also Fixed Wireless Communications Coalition ex parte WT Docket No. 09-106, Request for Interpretation of Section 101.141(a)(3) to Permit the Use of Adaptive Modulation Systems WT Docket No. 09-114, Amendment of Part 101 of the Commission’s Rules to Accommodate 30 Megahertz Channels in the 6525-6875 MHz Band <http://fjallfoss.fcc.gov/ecfs/comment/view?id=6015394963>, see also Wireless Backhaul NPRM/NOI at ¶ 28 (noting that adaptive modulation “could be particularly important in “facilitating the use of wireless backhaul in rural areas.”).

<sup>6</sup> Backhaul NPRM/NOI at ¶ 39.

<sup>7</sup> *Id.* at ¶ 68.

As the Commission noted, this proposal has been vetted in a separate proceeding.<sup>8</sup> As the FWCC has made clear, there is a growing demand for backhaul spectrum below 10 GHz, which provides for long path lengths.<sup>9</sup> Comsearch has made clear that the Lower and Upper 6 GHz bands are the only frequencies below 10 GHz available to non-Federal users, and that they are congested in many markets to the point of exhaustion.<sup>10</sup>

However, backhaul services can be very effectively provided in the band of Federal fixed spectrum between 7125 and 8500 MHz. Due to its low frequencies and resulting heightened resistance to rain attenuation, the band is ideal to provide longer distances between backhaul hops, which is of particular benefit to cellular sites located in rural areas that must connect with urban switching facilities.<sup>11</sup> TIA also supports the proposals that this coordination be speedy and automated in order to eliminate coordination delays, such as those experienced by users in the 23 GHz band.<sup>12</sup> By implementing coordination processes that employ simultaneous processes, coordination applicants will enjoy faster use approvals and increased certainty, ensuring efficient use of this spectrum for backhaul.

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<sup>8</sup> See Petition for Rulemaking of the Fixed Wireless Communications Coalition In the Matter of Amendment of Parts 2 and 101 of the Commission's Rules to Provide for Federal and Non-Federal Sharing in the 7125-8500 MHz Band, RM-11605 (filed Mar. 16, 2010) (FWCC Petition on 7125-8500 MHz Band).

<sup>9</sup> See FWCC Petition on 7125-8500 MHz Band at 3.

<sup>10</sup> See Comments of Comsearch, RM-11605 (filed Jul. 4, 2010) at 3 (Comsearch Comments).

<sup>11</sup> See Reply Comments of Motorola, Inc., RM No. 11605 at 2-3 (filed Jul. 6, 2010).

<sup>12</sup> See Comsearch Comments at 4.

### **III. THE COMMISSION SHOULD REVIEW THE RADIO ADVISORY BOARD OF CANADA PROPOSALS FOR THE 28 GHz LMDS BAND.**

TIA recommends that the Commission consider harmonizing its approach to the 27.5-28.35 GHz LMDS band with recent proposals of the RABC. LMDS is a wireless distribution technology with the capability to transmit voice, data and video which showed great promise as a means to provide infrastructure competition for broadband video to the home. The Commission auctioned over 1 GHz of spectrum for LMDS in the 28 & 31 GHz bands.<sup>13</sup> Canada has designated the 27.5-28.35 GHz band for Local Multipoint Communication Systems (LMCS), a service similar to that of LMDS.

In an effort to maximize the currently underutilized LMCS spectrum, industry Canada sought proposals on the use of the band 25.25-28.35 GHz band and others.<sup>14</sup> The RABC proposed the following plan for the 27.5-28.35 GHz band: a) A site-based licensing approach be used for the bands 27.5-28.35 GHz instead of geographical licensing used in the LMDS bands in United States; b) Band plans and technical standards should be based on preference given to frequency division duplex (FDD) point-to-point systems; and c) Spectrum in the band 27.5 – 28.35 GHz should be used for fixed service in channel bandwidths from 10-50 MHz.

These proposals could create a spectrum regulatory framework that addresses the shortage of spectrum for wireless backhaul and creates a common band plan that can

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<sup>13</sup> See In the Matter of Rulemaking to Amend Parts 1, 2, 21, and 25 Of the Commission's Rules to Redesignate The 27.5-29.5 GHz Frequency Band, To Reallocate the 29.5-30.0 GHz Frequency Band, To Establish Rules and Policies for Local Multipoint Distribution, CC Docket No. 92-297 (rel. Sept. 12, 1997).

<sup>14</sup> *Consultation on the Use of the Band 25.25-28.35 GHz*, Notice No. DGTP-002-10 (May 14, 2010).

serve to establish a broader market for equipment and services, thus improving its market potential with promises of economies of scale. TIA recommends that the RABC proposals be considered by the Commission as it seeks additional opportunities to identify spectrum for backhaul.

#### **IV. THE COMMISSION SHOULD NOT ALLOW AN FS LICENSEE TO SIMULTANEOUSLY COORDINATE MULTIPLE LINKS.**

TIA opposes the Commission's proposal contemplated in the NPRM to allow an FS licensee to simultaneously coordinate multiple links whose transmitter elements collectively comply with the Commission's antenna standards and frequency coordination procedures.<sup>15</sup> This proposal will significantly impair operations in all Part 101 bands, particularly the 11 GHz, 18 GHz, and the 6 GHz band. This proposal is based on unfounded and flawed technical assumptions regarding spectral efficiency, the need for simultaneous coordination, and available antenna technology. Adopting rules similar to those proposed in the NPRM will only increase interference, degrade performance, and undermine the Commission's goals of promoting increased, efficient wireless backhaul services.

The Commission's proposal is predicated on erroneous and unsupported claims that spectrum located in antenna side lobes is wasted. Point-to-point microwave systems are designed to connect network nodes, and, because Commission rules already allow for the

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<sup>15</sup> Backhaul NPRM/NOI at ¶ 41.

addition of new nodes at any time, licensees can (and do) reuse frequency in close proximity to licensed links, making simultaneous coordination unnecessary.<sup>16</sup>

As the Commission is aware, the 6 GHz band is of critical importance for long-distance point-to-point communications, particularly due to the band's resistance to rain attenuation effects.<sup>17</sup> Further, many public safety entities utilize 11 GHz microwave paths for critical emergency communications. Current technical rules have provided adequate protection for these vital paths. Under the WSI proposal, however, these technical parameters would be enlarged in order to allow for wireless broadband use. The resulting increase in point-to-multipoint use under the WSI proposal would disadvantage point-to-point users with interference, reduce how efficiently spectrum is used, and hamper the desired effects of spectrum relocation efforts, such as those done as part of the 2006 AWS auction.<sup>18</sup> The resulting interference to longer point-to-point FS microwave links would be particularly devastating in the 6 GHz band – one of the few remaining bands nominally affected by precipitation.<sup>19</sup> Further, shorter microwave paths, such as those used in the 11 GHz band for public safety, will be significantly impacted by interference as a result of WSI's proposal.

By allowing for higher equivalent isotropically radiated power (EIRP) and less accurate antenna patterns, the technical parameters in the WSI proposal would increase

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<sup>16</sup> See Comments of Comsearch, WT Docket No. 07-121 (filed Jul. 19, 2007) (Comsearch Comments) at 6-9.

<sup>17</sup> See Reply Comments of the Fixed Wireless Communications Coalition, WTB Docket No. 07-121, DA 07-2684 (filed Apr. 20, 2007) at 12.

<sup>18</sup> See Comments of National Spectrum Managers Association, WT Docket No. 07-121 (filed Jul. 19, 2007) at 7-8.

<sup>19</sup> See Opposition of Alcatel-Lucent to Request for Declaratory Ruling, WT Docket No. 07-121 (filed Jul. 19, 2007) at 11.

interference for point-to-point licensees so that distributed radiating elements (DREs) could operate with as much power as possible.<sup>20</sup> Furthermore, eliminating the requirement that applicants file detailed technical information for each new link within the maximum – as opposed to the actual – radiation power envelope (RPE) will result in the Commission no longer being able to adequately consider the unique characteristics of each point-to-point link (such as antenna type, power levels, types of emissions, duty cycle, location, azimuth, etc.). Creating a presumption that deploying unlimited unlicensed links which fall under the maximum power RPE allowed will increase and diversify the kinds of interference characteristics experienced by licensees.<sup>21</sup>

Thus, TIA urges the Commission to recognize the critical role backhaul microwave communications serve in, and will continue to serve in, providing broadband services by rejecting any proposals to realign use of this band, in so doing degrading the services carried on it.

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<sup>20</sup> See Comments of the Society of Broadcast Engineers, Inc., WT Docket No. 07-121 (filed Jul. 19, 2007) at 5.

<sup>21</sup> See Comments of TerreStar Networks, Inc. and Mobile Satellite Ventures Subsidiary LLC, WT Docket No. 07-121 (filed Jul. 19, 2007) at 3.

