

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

In the Matter of

Revisions to Rules Authorizing the Operation of
Low Power Auxiliary Stations in the 698-806
MHz Band

WT Docket No. 08-166

Public Interest Spectrum Coalition, Petition for
Rulemaking Regarding Low Power Auxiliary
Stations, Including Wireless Microphones, and
the Digital Television Transition

WT Docket No. 08-167

Amendment of Parts 15, 74, and 90 of the
Commission's Rules Regarding Low Power
Auxiliary Stations, Including Wireless
Microphones

ET Docket No. 10-24

COMMENTS OF DELL INC. AND MICROSOFT CORP.

Paul Margie
Edmond J. Thomas*
S. Roberts Carter
Renee R. Wentzel
WILTSHIRE & GRANNIS LLP
1200 Eighteenth Street, NW
Washington, DC 20036
(202) 730-1300

March 1, 2010

* Senior Technology Policy Advisor

TABLE OF CONTENTS

I. INTRODUCTION AND SUMMARY1

II. THE COMMISSION’S RULES SHOULD PROMOTE MORE EFFICIENT WIRELESS MICROPHONE SPECTRUM USE.....3

III. THE FCC SHOULD ADJUST WHITE SPACES RULES BEFORE ALLOWING ANY UNAUTHORIZED MICROPHONES TO USE TV BAND SPECTRUM UNDER PART 156

A. The Commission Must Eliminate the Sensing Requirements for White Spaces Devices Before it Authorizes Part 15 TV Band Microphones7

B. Wireless Microphones Certified for TV Band Use Under Part 15 Should Follow Part 15 TV Band Rules.8

IV. EXPANDING PART 74 WOULD UNDERMINE THE COMMISSION’S COMMITMENT TO PROMOTING WIRELESS BROADBAND AND ACCESS TO UNLICENSED SPECTRUM.9

A. Even a Modest Expansion of Part 74 Would Severely Undermine Wireless Broadband.....11

B. Numerous Options Exist to Accommodate Wireless Microphone Operations.12

V. CONCLUSION15

I. INTRODUCTION AND SUMMARY.

As Chairman Genachowski recently recognized, “the United States does not have nearly enough spectrum to meet its medium- and long-term mobile broadband needs. There may be no greater obstacle to our country having a world-leading mobile broadband infrastructure, and the economic benefits that would bring.”¹ Dell and Microsoft agree, and appreciate the Chairman’s understanding that the growing need for spectrum resources means that the Commission should “free up a significant amount of spectrum in the years ahead for ample licensed and unlicensed use.”² The Commission’s recognition in this proceeding that the needs of narrowband wireless microphone users must be weighed against “other important uses of the spectrum, including new unlicensed devices that can be used for broadband and other applications in portions of the TV-bands,”³ will advance this important goal.

Dell and Microsoft are committed to bringing consumers powerful and innovative wireless broadband technologies using the TV white spaces.⁴ A Commission decision in this proceeding that strikes an appropriate balance between enabling these innovative broadband applications and addressing the needs of unauthorized microphone users will therefore advance the FCC’s efforts to expand broadband access.

¹ Chairman Julius Genachowski, Remarks at the NARUC Conference, Broadband: Our Enduring Engine for Prosperity and Opportunity at 5 (Feb. 16, 2010), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296262A1.pdf.

² *Id.* at 7.

³ *Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band; Public Interest Spectrum Coalition, Petition for Rulemaking Regarding Low Power Auxiliary Stations, Including Wireless Microphones, and the Digital Television Transition; Amendment of Parts 15, 74 and 90 of the Commission’s Rules Regarding Low Power Auxiliary Stations, Including Wireless Microphones*, WT Docket Nos. 08-166, 08-167, ET Docket No. 10-24, Report and Order and Further Notice of Proposed Rulemaking ¶ 108 (rel. Jan. 15, 2010) (“*Further Notice*” or “FNPRM”).

⁴ *See generally Unlicensed Operations in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and the 3 GHz Band*, Second Report and Order, 23 FCC Rcd. 16807 (2008).

Dell and Microsoft urge the Commission to take three actions in this proceeding to strike this balance. First, any new rules the Commission establishes should promote the use of more efficient wireless microphone technologies. As the Commission has recognized, unlike most other wireless applications and services, TV band microphone technologies have been stagnant for decades.⁵ Manufacturers of unauthorized wireless microphones do not have to internalize the costs created by their devices' inefficient spectrum use, and thus, most have not invested in new technologies that use spectrum more efficiently. The Commission therefore should put an end to business practices that depend on unauthorized spectrum access, and certainly should not create any new spectrum rights for unauthorized microphones that would perpetuate the use of inefficient technologies.

Second, Dell and Microsoft agree that, to the extent the Commission seeks to legalize currently unauthorized microphones, it should do so by permitting these microphones to operate in the TV bands on an unlicensed basis under Part 15. This solution is not ideal, and it will undermine consumers' access to wireless broadband. But the vast majority of unauthorized users purchased TV band microphones as a result of the misleading marketing practices of several wireless microphone manufacturers, and it would be understandable if the FCC did not hold individual consumers fully responsible for violating FCC rules. However, if the Commission intends for unauthorized microphones to operate as co-equal Part 15 devices in the TV bands, it must first make changes to its white spaces rules. In particular, the Commission should eliminate the sensing requirement for white space devices before it considers permitting unauthorized

⁵ See FNPRM ¶ 148.

wireless microphones to operate in the TV bands. If the Commission fails to do so, these microphones will prevent white space devices from accessing spectrum to an unacceptable degree, severely impairing consumer broadband access.

Third, the Commission should not expand the Part 74 licensing regime to include currently unauthorized users. It is unlikely that the Commission would be able to draw meaningful distinctions among new groups of general users, and the result would be an uncontrolled influx of users inappropriately claiming Part 74 status. Moreover, because of the extremely stringent protections afforded to Part 74 wireless microphone licensees, even a small increase in the number of licensed users would make white spaces use infeasible in many areas. Finally, there is no need to broaden the scope of Part 74, particularly since most, if not all, unauthorized uses can be accommodated legally today under other services using existing technology, or could have access to TV bands under Part 15.

II. THE COMMISSION’S RULES SHOULD PROMOTE MORE EFFICIENT WIRELESS MICROPHONE SPECTRUM USE.

Dell and Microsoft agree with the *Further Notice*’s observation that long term reforms of its wireless microphone rules should be undertaken “[c]onsistent with [the FCC’s] broader efforts to manage spectrum as effectively and efficiently as possible.”⁶ However, policies to promote more efficient use of TV band spectrum need not wait for “long term” reforms – they can begin today. As the Commission has recognized, “demand for spectrum bandwidth will likely continue to increase significantly, and spectrum availability may become critical to ensuring further innovation and deployment

⁶ FNPRM ¶ 107.

in the wireless sector.”⁷ Indeed, Chairman Genachowski has cautioned that this “looming spectrum crisis” will require improvements in spectrum efficiency to be one of the FCC’s highest priorities.⁸

The benefits of more efficient spectrum use are not an abstraction. As the *Further Notice* observes, wireless microphone manufacturers have derided existing unlicensed spectrum bands as being suitable only for “cordless phones, children’s toys, and microwave ovens.”⁹ Yet the exceptional successes of countless innovators using unlicensed technologies prove that this view is simply wrong. For example, a study by Richard Thanki submitted by Microsoft in the National Broadband Plan proceeding estimates that the annual consumer surplus generated by Wi-Fi in the United States in homes—which accounts for only about 15% of the total projected market for unlicensed chipsets—is between \$4.3 and \$12.6 billion.¹⁰ However, Thanki concludes that the historical lack of unlicensed spectrum allocations below 1 GHz has prevented “the development of longer-range, more reliable and ultra low-power unlicensed applications” that could create far greater value for the American public.¹¹ In other words, the value of existing unlicensed applications using Wi-Fi only hints at the incredible potential that will be derived from the white spaces, assuming that spectrum is not instead restricted to

⁷ *Fostering Innovation and Investment in the Wireless Communications Market, A National Broadband Plan for Our Future*, Notice of Inquiry, 24 FCC Rcd 11322, 11326 ¶ 20 (2009) (“Wireless Innovation NOI”).

⁸ Remarks of Chairman Julius Genachowski, “America’s Mobile Broadband Future,” International CTIA WIRELESS I.T. & Entertainment San Diego, California at 4 (Oct. 7, 2009), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-293891A1.pdf.

⁹ FNRPM ¶ 34 (citing filings by Sennheiser and Shure).

¹⁰ See generally Richard Thanki, *The Economic Value Generated by Current and Future Allocations of Unlicensed Spectrum*, at 27 (Sept. 8, 2009) (“Thanki Report”), attached to Reply Comments of Microsoft Corporation, GN Docket Nos. 09-157, 09-51 (filed Nov. 5, 2009).

¹¹ *Thanki Report* at 44.

accommodate legacy wireless microphones that have operated without the required FCC authorization.¹²

There can be no dispute that, as the Commission has recognized, operating these microphones “can result in inefficient use of valuable spectrum.”¹³ Indeed, the Commission has concluded that the “maximum number of wireless microphones that operate simultaneously in a 6 megahertz TV channel may be as few as six or eight. In other words, only 1.2 – 1.6 megahertz of the 6 megahertz TV channel may be used while the remainder is effectively left fallow.”¹⁴

Recognizing the waste this represents, the Commission seeks comment on the steps it can take to “enable wireless microphones to operate more efficiently.”¹⁵ Unlike virtually every other wireless service, wireless microphones cannot point to a track record of substantially increased spectrum efficiency over time. This is so for one reason – by disregarding the Commission’s rules, manufacturers of unauthorized systems have not had to internalize the costs of spectrum access. By contrast, licensed mobile broadband providers pay substantial sums at auction for the right to access wireless spectrum, and systems designed to access spectrum on an unlicensed basis must design robust, efficient communications protocols designed to account for multiple simultaneous users in these bands. Thus, the most important action the Commission can take to promote wireless

¹² As over 200 pages of analysis and exhibits filed by the Public Interest Spectrum Coalition make clear, certain wireless microphone manufacturers have been illegally marketing and selling microphone systems certified subject to Part 74 limitations that they know are -- and which they fully intend to be -- routinely used in violation of the Commission’s rules. *See generally* Complaint of Public Interest Spectrum Coalition (PISC) Against Shure, Inc., Nady Systems, Inc., VocoPro, Audio2000, Sennheiser Electronic Corporation, Audix Microphones, Electro Voice, Hisonic International, Inc., Pyle Audio, *et al.*; Petition To Create a General Wireless Microphone Service (GWMS), Informal Complaint and Petition for Rulemaking (filed Jul. 16, 2008) (“PISC Petition”).

¹³ FNPRM ¶ 147.

¹⁴ *Id.*

¹⁵ *Id.* at ¶ 148.

microphone efficiency is to ensure that currently unauthorized microphones do not obtain the right – either *de jure* or *de facto* – to exclude other, lawful operators from using TV band spectrum and continue business as usual. The Commission should take this action immediately, before white space devices enter the market, to allow existing users to minimize the disruption to their services as they transition to the more efficient options described below.

III. THE FCC SHOULD ADJUST WHITE SPACES RULES BEFORE ALLOWING ANY UNAUTHORIZED MICROPHONES TO USE TV BAND SPECTRUM UNDER PART 15.

The Commission proposes to allow a large number of currently unauthorized wireless microphones to operate as unlicensed Part 15 devices on a co-equal basis with white space devices using vacant TV band spectrum below 698 MHz.¹⁶ This proposal will, of course, undermine wireless broadband access at these frequencies. Early white spaces networks such as the broadband network set up by Dell, Microsoft, and Spectrum Bridge in Claudville, VA,¹⁷ the high definition video streaming system created by Philips Electronics,¹⁸ and the “White Fi” network serving researchers on Microsoft’s Redmond, WA campus¹⁹ provide a hint of the vast benefits of widespread use of the white spaces. These benefits include affordable broadband access, wireless mesh networking, telemedicine applications, and countless services and applications yet to come. Authorizing additional wireless microphone systems to use vacant TV spectrum

¹⁶ *See id.* at ¶¶ 112-113.

¹⁷ *See* Press Release: First White Spaces Network Brings Broadband Internet to Rural America Over Unused TV Broadcast Airwaves (Oct. 21, 2009), *available at* <http://www.spectrumbridge.com/web/images/pdfs/PR/claudevill-whitespaceproject-pressrelease.pdf>.

¹⁸ *See* Philips Electronics North America Corp., Live Over the Air White Spaces Video Streaming Demonstration, ET Docket No. 04-186 (filed Jun. 24, 2008).

¹⁹ *See generally* Microsoft Research, Networking Over White Spaces, at <http://research.microsoft.com/en-us/projects/knows/>.

necessarily will restrict the utility of white space technologies and undermine innovation. However, the Commission can minimize the negative impact of accommodating unauthorized microphones by ensuring that these devices truly are co-equal to white space devices to the greatest extent possible.

A. The Commission Must Eliminate the Sensing Requirement for White Space Devices Before It Authorizes Part 15 TV Band Microphones.

Under the FCC’s proposal, all TV band wireless microphones authorized under Part 15 must operate with the same status as other Part 15 devices. Indeed, the Commission has determined that, “from a power and spectrum sharing standpoint, one type of device should not have a significant advantage over the other.”²⁰ However, the current white spaces rules would make this approach unworkable because, under those rules, white space devices are required to incorporate geolocation technology *and* spectrum sensing to determine whether a licensed Part 74 microphone is present.²¹ Geolocation-based approaches will permit only Part 74 licensees to register with a database, but spectrum sensing is unable to distinguish microphones that are used for broadcast purposes from those that are not. In other words, the spectrum sensing requirement would create *de facto* broad expansion of Part 74 at the expense of innovative white space operations.

As the *Further Notice* recognizes, numerous parties have requested that the Commission reconsider the requirement that white space devices sense for wireless microphones.²² Indeed, the record in the white spaces proceeding reflects a substantial consensus from the IEEE, public interest organizations, wireless ISPs, and technology

²⁰ See FNPRM ¶ 120.

²¹ See generally 47 C.F.R Part 15, Subpart H.

²² FNPRM ¶ 120 n. 297.

companies that the sensing requirement should be relaxed or eliminated given the substantial protection geolocation provides for Part 74 microphones.²³ This issue must be resolved before the Commission makes any decision that would extend Part 15 to cover unauthorized microphones.

B. Wireless Microphones Certified for TV Band Use Under Part 15 Should Follow Part 15 TV Band Rules.

The *Further Notice* tentatively concludes that certain rules adopted for white spaces devices, including the geolocation/database functionality, are “not likely to be suitable for Wireless Audio Devices.”²⁴ Dell and Microsoft respectfully disagree. While it may be impractical to retrofit existing unauthorized microphone operations with geolocation technology, this should not prevent the Commission from mandating this requirement going forward. This is particularly the case since the primary reason cited by the *Further Notice* for not doing so is the risk that these requirements might result in a “substantial increase in costs for these devices”.²⁵ The large market for consumer products like white space devices will produce economies of scale which will ensure that the expense of adding this functionality to microphones is minimal.

Furthermore, adding geolocation and other TV band device requirements to wireless microphones will yield several significant benefits. Most importantly, requiring microphones to query a database will require microphones to be capable of digital

²³ See, e.g., Dell Inc. and Microsoft Corp., Reply in Support for Petition for Reconsideration, ET Docket No. 04-186 at 2 and n. 1 (filed May 18, 2009) (citing filings by the Public Interest Spectrum Coalition, IEEE 802, Google, Motorola, the Federation of Internet Solution Providers of the Americas, Carlson Wireless Technologies, and the Wireless Internet Service Providers Association).

²⁴ FNRPM ¶ 120. The Commission also notes that “periodic sensing of the airwaves for other devices” may not be practical for wireless microphones. *Id.* However, as noted above, a broad cross-section of commenters has recommended that this requirement be removed for all TV band devices.

²⁵ *Id.*

communications. Adding these components will therefore provide additional incentive for manufacturers to switch over to entirely digital systems – a move made by nearly every other wireless technology – which are significantly more spectrally efficient and less susceptible to interference. Incorporating the ability to communicate with a database will also allow microphones to take advantage of “value added” services proposed by several potential white space database administrators, including an analysis of the channels best suited to their operations at a given place and time. Finally, mandating geolocation for microphones will facilitate future band clearing in the event that broadcasters return licenses to the FCC, or the Commission ultimately establishes rules that reallocate certain TV bands.²⁶

IV. EXPANDING PART 74 WOULD UNDERMINE THE COMMISSION’S COMMITMENT TO PROMOTING WIRELESS BROADBAND AND ACCESS TO UNLICENSED SPECTRUM.

Manufacturers of unauthorized wireless microphones and large corporations that use such microphones argue that the Commission should reward their disregard of FCC rules by expanding Part 74 to legalize their behavior. This proposed expansion would allow previously unauthorized users the right to exclude other users from valuable spectrum cost free. By contrast, the 700 MHz auction winners paid more than \$19 billion dollars in auction fees to obtain such a right.

To support this position, manufacturers claim that an expansion of Part 74 is appropriate because the Commission is powerless to stop them from marketing products for unlawful uses. They even blame their own customers for violating FCC rules, despite the fact that those customers were using their microphones in a manner consistent with

²⁶ See Comments of Dell Inc. And Microsoft Corp. – NBP Public Notice # 26, GN Docket Nos. 09-47, 09-51, 09-137 at 7-8 (Dec. 21, 2009).

manufacturers' marketing materials.²⁷ The advocacy of corporations that use unauthorized microphones to support their multi-million-dollar industries is no less convincing. The primary concerns of larger unauthorized users are financial, such as the assertion that it would be "impossible to secure investor backing" if the Commission does not fashion a new protected service for them, or that only a Part 74 license would allow continued operation "in the tradition to which we have become accustomed."²⁸ But relying for years on unauthorized spectrum access to support a business model is nothing short of negligent, and the Commission should not shift the burden of correcting this problem to the American public by imposing additional restrictions on commercial wireless broadband access.

The Commission can reject these arguments without undermining microphone use by socially important entities because: (1) Part 15 operation will allow continued use of wireless microphones by these parties without crippling the white spaces, and (2) these entities can also use wireless microphones that employ newer technologies and frequencies outside the TV bands. To be clear, Dell and Microsoft do not dispute that unauthorized microphones can be used for socially important purposes. But even important users do not have a license to violate the Commission's rules. Countless socially important wireless users – engaged in telemedicine, distance learning, and public safety – use licensed and unlicensed spectrum responsibly and within the bounds of FCC

²⁷ See generally Reply Comments of the White Spaces Coalition, WT Docket Nos. 08-166, 98-167 (filed Oct. 20, 2008).

²⁸ See FNRPM ¶ 74 (citing CWMU June 25 Ex Parte); ex parte letter of Kenneth J. Newman, Audio Applications, WT Docket Nos. 08-166, 98-167 at 1 (filed Feb. 16, 2010).

regulations. There is no reason for the Commission to treat unauthorized wireless microphone users differently than entities engaged in these critical activities.

A. Even a Modest Expansion of Part 74 Would Severely Undermine Wireless Broadband.

Any substantial expansion of Part 74 eligibility would greatly undermine the ability of white space devices to advance broadband service.²⁹ As Dell and Microsoft have explained in the white spaces proceeding and elsewhere, existing rules intended to protect even the relatively small number of *authorized* wireless microphones operating in the TV bands are significantly overprotective.³⁰ Expanding Part 74 will only make this problem worse. Furthermore, Dell and Microsoft share the Commission’s concern that microphone operators would be tempted to “call for interference protection on all channels on a continuous basis, which could completely block access by TV Band Devices and therefore may lead to less efficient use of the spectrum.”³¹

Moreover, as the *Further Notice* recognizes, large numbers of wireless microphone operations are likely to occur in heavily populated areas, where demand for white space devices is likely to be high.³² Thus, even a modest expansion of Part 74 to accommodate a subset of unauthorized microphone users would render the white spaces completely unusable in many urban areas.³³ Indeed, as Dell and Microsoft have explained in the white spaces proceeding, *expanding eligibility even to one additional*

²⁹ FNPRM ¶ 77.

³⁰ *See, e.g.*, Dell, Inc. and Microsoft Corp., Consolidated Opposition to Petitions for Reconsideration, ET Docket Nos. 04-186, 02-380 at 2-4 (“Dell/Microsoft Opposition”).

³¹ FNPRM ¶ 132.

³² *See id.* at ¶ 134.

³³ *See* Reply Comments of Microsoft Corp., GN Docket Nos. 09-157, 09-51 at 12-15 (filed Nov. 5, 2009).

*class of users could completely deny the public access to otherwise available white spaces spectrum in several urban areas.*³⁴ And unfortunately it would be nearly impossible to expand Part 74 to only one or a few new classes of users. Dell and Microsoft agree with the Commission that it would be challenging to expand Part 74 in a meaningful way that would not result in a situation in which “virtually anyone would be eligible for a license.”³⁵

B. Numerous Options Exist to Accommodate Wireless Microphone Operations.

As the *Further Notice* recognizes, “even if we do not significantly expand eligibility under Part 74, ... users would still be able to operate wireless microphones under our proposed Part 15 rules or under Part 90 rules.”³⁶ These rules, along with the ability to operate on over 600 MHz of other spectrum available under Part 15, provide several options for currently unauthorized users without undermining innovative broadband applications in the TV bands.

First, wireless microphones will still be able to operate in vacant TV band spectrum. Indeed, the Commission has prohibited white space device operations entirely on two channels – a full 12 MHz – in the thirteen markets where private land mobile services are used in the TV bands. Digital technology will allow for much more intensive use of these channels by microphones. For example, Sony’s digital microphones, which are already used in the United Kingdom for professional applications such as electronic newsgathering, yield up to 60 percent more available channels than analog systems, while providing “[c]rystal-clear audio with an excellent frequency response, low distortion and

³⁴ See Dell/Microsoft Opposition at 9-10.

³⁵ FNPRM ¶ 134.

³⁶ *Id.* at ¶ 136.

a wide dynamic range.”³⁷ Other microphone manufacturers offer digital wireless microphone systems capable of operating in the TV bands that are “[i]deal for broadcast applications, conferences, courtrooms, houses of worship, stage and music performances,”³⁸ with “[s]uperb audio quality that rivals a mic cable.”³⁹

Second, digital modulation technologies enable microphones to the use of the ISM bands under Part 15, even for applications that require high fidelity. For instance, Lectrosonics manufactures a digital wireless microphone system that offers “audio quality [that] is suitable for any professional application in film, television and live sound,” using the ISM bands.⁴⁰ Similarly, Line 6, which manufactures digital microphones operating in the ISM bands, notes that its mics “provide[] a ‘wired’ sound with full-range frequency response, wide dynamic range, and excellent transient response.”⁴¹ Indeed, Line 6 specifically cites the advantages of digital operation in the ISM bands, including avoiding licensing issues or being subject to high-powered interference from other TV band operations.⁴²

Third, wireless microphones can operate under the Commission’s ultra wide band (“UWB”) rules. In fact, Audio Technica has already developed a UWB wireless microphone system that is available today. As Audio Technica previously explained in

³⁷ See Sony, Go digital with Sony digital wireless microphones, at http://www.sony.co.uk/biz/view/ShowContent.action?logicalname=dms-DWL%20landing-1107&site=biz_en_GB.

³⁸ See AKG, DMS 700-Digital Microphone System, available at http://www.ake.com/site/products/powerslave.id,1116.pid,1116.nodeid,2_language.EN.html.

³⁹ See Zaxcom, TRX Series Digital Recording Wireless™ - Transmitters, available at <http://www.zaxcom.com/transmitters.htm>.

⁴⁰ See Lectrosonics, D4 Digital Wireless System, available at <http://www.lectrosonics.com/wireless/digital/d4/d4.htm>.

⁴¹ See Line 6, Digital Wireless Vocal Systems, available at <http://line6.com/wireless-microphone>.

⁴² See Line 6 Wireless Microphone Technology Guide at 5-11, available at <http://line6.com/pdf/Line%206%20Wireless%20microphones%20Whitepaper.pdf>.

this proceeding, it began development of its UWB microphone system “in anticipation and support of the FCC’s goals and policies” related to TV band spectrum, presumably including the desire to allow unlicensed broadband access via white spaces.⁴³

Finally, as the Commission notes, many users are eligible to obtain a license to operate wireless microphones under Part 90.⁴⁴ Eligible entities potentially encompass all or nearly all wireless microphone users in this proceeding, as they include entities “engaged in (i) operation of a commercial activity, (ii) operation of educational, philanthropic or ecclesiastical institutions, (iii) clergy activities, or (iv) operation of hospitals, clinics or medical associations.”⁴⁵ Although channels available under Part 90 are narrower in these frequencies (54 kHz vs. 200 kHz in the TV bands), Dell and Microsoft support actions that could enable more efficient use of this spectrum, including rebanding these channels.

⁴³ See Comments of Audio-Technica U.S., Inc., WT Docket Nos. 08-166, 08-167 at 4 (filed Oct. 3, 2008).

⁴⁴ FNPRM ¶¶ 150-151.

⁴⁵ *Id.* at ¶ 13.

V. CONCLUSION.

Dell and Microsoft applaud the Commission for addressing the issue of unauthorized wireless microphone operation in the TV bands, and for recognizing that these uses must be weighed against the need to promote spectral efficiency and enable access to unlicensed spectrum for broadband. By taking the steps outlined above, the Commission can ensure that it allows for continued use of wireless microphones by socially important users, while also allowing white spaces technologies to contribute to Chairman Genachowski's commitment that the U.S. "lead the world in mobile broadband."

Respectfully submitted,



Paul Margie
Edmond J. Thomas*
S. Roberts Carter
Renee R. Wentzel
WILTSHIRE & GRANNIS LLP
1200 Eighteenth Street, NW
Washington, DC 20036
(202) 730-1300

March 1, 2010

* Senior Technology Policy Advisor