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

In the Matter of:	)	
International Comparison and Consumer Survey Requirements in the Broadband Data Improvement Act	)	GN Docket No. 09-47
A National Broadband Plan for Our Future	)	GN Docket No. 09-51
Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act	)	GN Docket No. 09-137

COMMENTS OF MOTOROLA, INC.—NBP PUBLIC NOTICE # 26

Motorola, Inc. ("Motorola") respectfully submits these comments in response to the above-captioned Public Notice issued by the Federal Communications Commission ("FCC" or "Commission") that seeks comments on the use of the spectrum currently licensed to broadcast television stations.[1] These comments supplement Motorola's statements in other phases of the National Broadband Plan proceeding, and should be considered in conjunction with those earlier filings.[2]

[1] *See* Data Sought On Uses of Spectrum, NBP Public notice # 26, *Public Notice*, GN Docket Nos. 09-47, 09-51, 09-137, DA 09-2518 (rel. Dec. 2, 2009) ("*Public Notice*").

[2] *See, e.g.*, Comments of Motorola, GN Docket Nos. 09-47, 09-51, 09-137 (filed Oct. 23,2009) ("Motorola Broadband Spectrum Comments"); Comments of Motorola, GN Docket No. 09-51 (filed June 8, 2009) ("Motorola Broadband Plan Comments").

I. INTRODUCTION

In the *Public Notice*, the Commission seeks additional data and comment on the costs and benefits of repurposing a portion of the broadcast television spectrum for wireless broadband use. An analysis of the potential for repurposing some of the television broadcast spectrum is compelled by Section 336(g) of the Telecommunications Act of 1996 and, therefore, the Commission should open a rulemaking proceeding on this matter. Significant amounts of additional spectrum are required to meet the foreseeable growth in wireless broadband demand. Meanwhile, the demand for over the air broadcast services appears to be shrinking. These facts, combined with the inefficient use of the television broadcast spectrum, renders the television broadcast spectrum as an attractive candidate for reallocation.

Motorola supports repurposing a portion of the television broadcast spectrum for commercial mobile use as discussed in the *Public Notice*. At the same time, Motorola also supports making portions of any repurposed broadcast spectrum available for public safety and enterprise uses. In repurposing spectrum, the Commission should consider the needs of all potential users, including commercial, public safety, utilities, and enterprise constituents while also considering the benefits of both unlicensed and licensed means of putting spectrum to use.[3]

II. SECTION 336(G) REQUIRES A REEXAMINATION OF BROADCAST SPECTRUM USE

The Commission seeks comment on subsections (2) and (3) of Section 336(g) of the Telecommunications Act of 1996.[4] Section 336(g) directs the Commission to evaluate the potential alternative uses of television broadcast spectrum, including public safety applications, and the extent to which the Commission has been or will be able to reduce the amount of

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[3] *See generally*, Motorola Broadband Spectrum Comments.

[4] *See Public Notice* at 2.

spectrum allocated to television broadcast.[5] According to the statute, the Commission is required to conduct this analysis within ten years of first issuing additional licenses for advanced television services.[6] As CTIA pointed out in a recent letter to the Commission, the first advanced television licenses were issued in February of 1999, and thus the Commission's evaluation is now timely.[7] As Section 336(g) is a mandatory requirement of the Communications Act, with which the Commission must comply, the Commission should commence the required analysis immediately.

The repurposing of television broadcast spectrum will be a complicated and time consuming process—one which the Commission should undertake in a careful and deliberate manner to ensure that the spectrum is put to the most effective purpose, while also addressing the needs of those consumers that rely on over-the-air broadcast services in the affected bands. To this end, although the instant Public Notice is an excellent first step in the Commission's execution of its Section 336(g) responsibilities. The Commission should not conduct the complete examination of broadcast spectrum in conjunction with the National Broadband Plan

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5 "Within 10 years after the date the Commission first issues additional licenses for advanced television services, the Commission shall conduct an evaluation of the advanced television services program. Such evaluation shall include - (1) an assessment of the willingness of consumers to purchase the television receivers necessary to receive broadcasts of advanced television services; (2) an assessment of alternative uses, including public safety use, of the frequencies used for such broadcasts; and (3) the extent to which the Commission has been or will be able to reduce the amount of spectrum assigned to licensees." Telecommunications Act of 1996, Pub. L. No. 104-104, §336(g), 110 Stat. 56 (1996) (codified at 47 U.S.C. § 336 (g).

6 *Id.*

7 *See also* Letter from Steve Largent, President and CEO, CTIA – The Wireless Association, and Gary Shapiro, President and CEO, Consumer Electronics Association, on behalf of Wireless Broadband Proponents, to FCC Chairman Julius Genachowski and Commissioners Michael J. Copps, Robert M. McDowell, Mignon Clyburn, and Meredith Attwell Baker, GN Docket 09-51 at 2 (Nov. 17, 2009) (*citing* Public Notice, "Additional Application Processing Guidelines for Digital Television (DTV)," (rel. Aug. 10, 1998) at 18, *available at* http://www.fcc.gov/Bureaus/Mass_Media/Public_Notices/TV_Notices/pnmm8116.pdf.

and its significant time constraints. Rather, the Commission should immediately initiate a separate rulemaking proceeding in which it can examine the alternative uses and potential for repurposing of television broadcast spectrum with the requisite level of detail.

III. THERE IS A DEMONSTRATED NEED FOR ADDITIONAL MOBILE BROADBAND SPECTRUM

Even absent the requirement of Section 336(g), the Commission should be thinking creatively about identifying additional spectrum for mobile broadband uses. The record in the Commission's National Broadband Plan proceeding and statements by various Commissioners demonstrate that there will be a pressing need for such spectrum in the United States in the near future. Statements by CTIA, TIA, UTC and others explain that as new applications are made possible through next generation mobile broadband networks, consumer, enterprise, critical infrastructure and public safety users alike will find current spectrum allocations insufficient to support their demands.[8] In contrast, as the Commission noted in the *Public Notice*, video consumption trends have long been moving "away from mass-market 'appointment' viewing to more fragmented and time-shifted viewing."[9] The Commission previously indicated that as of June 2006, nearly 87 percent of TV households use a subscription video service.[10] Time shifting is becoming increasingly prominent as consumers embrace new means to access high quality

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8 Letter from Christopher Guttman-McCabe, Vice President, Regulatory Affairs, CTIA, to Chairman Julius Genachowski, *et al*, Federal Communications Commission, GN Docket No. 09-51, September 29, 2009; Comments of the Telecommunications Industry Association, GN Docket Nos. 09-51, 09-157 at 3-10 (filed Sept. 29, 2009); The Utility Spectrum Crisis: A Critical Need to Enable Smart Grids, Utilities Telecommunications Council, January 2009, at Section V.

9 *See Public Notice* at 2.

10 *See, Thirteenth Annual Report*, MB Docket No. 06-189, Assessment of the Status of Competition in the Market for the Delivery of Video Programming, 24 FCC Rcd 542, 546 ¶ 8 (2009).

content over wired and wireless broadband networks.[11] As consumers continue to embrace the "on-demand" video paradigm and broadcasters explore new ways to deliver content to viewers,[12] the economics of utilizing broadcast spectrum for alterative uses become more compelling.[13]

CTIA, based upon studies and industry forecasts, has asserted that an additional 800 MHz of mobile broadband spectrum will be required to meet next generation mobile broadband demands.[14] Although Motorola, CTIA and others vocally espouse the benefits of making additional spectrum available through exclusive licensing with flexible use for commercial purposes, Motorola urges the Commission to consider a wide range of interest and methods of bringing more mobile broadband spectrum online.

As discussed in Motorola's comments submitted in response to NBP Public Notice #6, there is an identified need for spectrum to meet the needs of public safety that are most appropriately considered separate and apart from the spectrum requirements of the commercial

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[11] *See e.g.*, Motorola Solutions Paper, *Mobile Entertainment Services for Sports Verticals available at* http://www.motorola.com/staticfiles/Business/Global_Services_New/Global%20Services%20for%20Wireless%20Service%20Providers/Applications%20Services/_Documents/_staticFiles/MOT_TuVista_Software_SP_0509_FINAL.pdf?localeId=33 (describing Motorola TuVista service that allows time-shifted delivery of live event coverage directly to mobile devices over commercial mobile networks).

[12] *See, e.g.*, Motorola, *Motorola Mobile TV*, *available at* http://www.motorola.com/staticfiles/Business/Global%20Services%20%28New%29/Global%20Services%20for%20Wireless%20Service%20Providers/_Documents/Mobile_TV_Brochure.pdf (describing Motorola mobile TV devices that allow broadcasters to partner with commercial mobile providers to deliver time-shifted content directly to consumers)

[13] *See, e.g.*, Coleman Bazelon, The Brattle Group, The Need for Additional Spectrum for Wireless Broadband: The Economic Benefits and Costs of Reallocations (2009) attached to Comments of the Consumer Electronics Association, GN Docket Nos. 09-47, 09-51, 09-137 at 11 (filed Oct. 23, 2009) (discussing the "significant gains from reallocating the broadcast spectrum" that could accrue to all parties).

[14] Letter from Christopher Guttman-McCabe, Vice President, Regulatory Affairs, CTIA, to Chairman Julius Genachowski, *et al*, Federal Communications Commission, GN Docket No. 09-51, Sept. 29, 2009.

mobile industry.[15] The need for additional public safety broadband and narrowband spectrum has been compellingly demonstrated in the record of the pending waiver requests filed by multiple public safety agencies to build regional 700 MHz broadband networks.[16] Currently planned public safety allocations do not fully satisfy these requirements, especially in light of the increased potential for real time video and other bandwidth-intensive data operations which will become increasingly appealing to public safety users in performing their missions. Motorola and the public safety community have been clear that reallocating the 700 MHz D-block must be part of the solution for meeting public safety's spectrum requirements. The Commission must make consideration of public safety needs a top priority in any spectrum repurposing NPRM.[17]

Television broadcast frequencies are directly adjacent to land mobile radio services throughout the current broadcast allocation. Significantly, the frequencies between 470 MHz and 512 MHz, which are used for UHF television broadcast channels 14-20 in most parts of the country, are currently being used for public safety and other land mobile radio (LMR) services in eleven markets. There is a real and serious need for additional LMR allocations in the UHF band, as evidenced in the numerous requests for waiver submitted by public safety agencies seeking to expand their authorizations.[18] In order to preserve and expand functionality for

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15 Motorola Broadband Spectrum Comments at 4-6.

16 *See, e.g.*, City of Boston Amended Request for Waiver, PS Docket No. 06-229 (filed May 28, 2009), as amended by City of Boston Erratum (filed June 19, 2009); City and County of San Francisco, City of Oakland, City of San Jose Amended Request for Waiver, PS Docket No. 06-229 (filed May 27, 2009).

17 Indeed, included in Section 336(g)(2) is a specific instruction for the Commission to consider the possible alternative public safety uses of the television broadcast spectrum. 47 U.S.C. § 336(g)(2).

18 *See, e.g.*, Request for Waiver of Sections 90.303, 90.305, 90.307, 90.309, and 90.311 of the Commission's Rules, ULS File Nos. 0003047481 and 0003047654, at 1 (May 31, 2007); Request for Waiver Filed by Syosset Fire District, New York to Modify Its Public Safety Station WPYJ816 Using a Part 22 Trunked Mobile Frequency, ULS File No. 0003065700 (filed June 11,

current public safety users who rely on this allocation the Commission should consider repurposing additional spectrum in the 470 MHz to 512 MHz band for public safety and other land mobile use.[19] This would allow for quick deployment of this new reallocation, as devices and standards for public safety communications in this band are currently readily available.

In addition to commercial and public safety uses, additional spectrum is required for various other enterprise, educational, and health care applications. For example, the Utilities Telecommunications Council (UTC) estimates that an additional 30 MHz of dedicated spectrum is required for new data applications such as Smart Grid, as well as for expanded critical mobile voice operations for utilities.[20] Unlicensed devices should also play a role in any spectrum repurposing plan that the Commission adopts. Many educational, health care and enterprise users employ unlicensed devices to provide advanced wireless broadband networks throughout their buildings and campuses. Unlicensed spectrum can also be an effective solution for the provision of fixed wireless broadband Internet access services, as demonstrated by numerous

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2007, amended June 19, 2007, November 25, 2008, and December 2, 2008); Applications and Waiver Request of Woodbridge Township, New Jersey Under Section 337(c) of the Communications Act of 1934, As Amended, ULS File Nos. 0003424274 and 0003424276 (May 1, 2008).

[19] In February, 2009, the National Public Safety Telecommunications Council filed a petition for rulemaking seeking amendment to the Commission's rules affecting land mobile use in the 470-512 MHz band and expansion of the areas around each of the eleven markets where public safety and other land mobile users can locate licensed operations. *See* Petition for Rulemaking By The National Public Safety Telecommunications Council, RM 11527 (submitted Feb. 18, 2009). Motorola renews its previously expressed support for this petition, which would take an important step towards giving public safety users the tools they need to pursue their missions. *See* Statement of Motorola in Support of Petition For Rulemaking, RM 11527 (submitted May 7, 2009). The Commission should take the opportunity of a spectrum repurposing NPRM to adopt the NPSTC proposal, as well as to make additional markets available for public safety and other land mobile use in the 470-512 MHz band.

[20] The Utility Spectrum Crisis: A Critical Need to Enable Smart Grids, Utilities Telecommunications Council, January 2009, at Section V.

Wireless Internet Service Providers (WISPs).[21] In short, when considering alternative uses for broadcast spectrum, the Commission should consider the spectrum needs of public safety, utility, and enterprise as well as commercial users, and the Commission should consider the role of unlicensed as well as licensed services.

IV. TELEVISION BROADCAST SPECTRUM MAY BE SUITABLE FOR PARTIAL REPURPOSING

There are technical and practical reasons why the television broadcast allocation may be an appropriate source for additional wireless broadband spectrum. As an initial matter, the current television broadcast model has certain built-in technical inefficiencies. High power transmissions from multiple non-collocated sites require significant spectral separation between active channels to provide interference protection. The result is large amounts of noncontiguous partially occupied white spaces. In the spectrum repurposing NPRM, the Commission should create incentives for or require broadcasters to move to more efficient uses of their spectrum that would enable increased reuse and free up additional contiguous spectrum. For example, collocating antennas from multiple licensees within an area would further allow a reduction in spectral separation. Also, a distributed antenna-based model relying upon multiple antennas transmitting at lower power would more efficiently allow licensees to serve an area, while also giving the benefits of more effective spectrum reuse, less interference, and enabling the repacking of unused spectrum.

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[21] *See* Comments of the Wireless Internet Service Providers Association, GN Docket No. 09-51, submitted June 8, 2009.

The technical suitability of many broadcast frequencies for mobile broadband services due to their favorable propagation characteristics is well established.[22] However, the case for repurposing some television broadcast spectrum is further strengthened by the fact that the spectrum is adjacent to current commercial, public safety, and enterprise mobile allocations. The Commission recently made a significant amount of spectrum in the 700 MHz band available for commercial and public safety uses. Allocating additional adjacent spectrum for similar uses would enable economies of scale in device manufacture and infrastructure deployment. Furthermore, as discussed above, television broadcast spectrum is directly adjacent to several land mobile radio bands and could be rapidly put to effective use by public safety and enterprise users if repurposed. Aside from the UHF frequencies discussed above, significant portions of the VHF spectrum would be highly useful for enterprise and public safety communications, despite being less than ideal for consumer mobile broadband use because of the difficulty of installing appropriate antennas in small form factor handsets.

Repurposing broadcast spectrum will not be without its challenges. Market penetration rates of cable and other subscription video services are not uniform and over the air broadcast services continue to be of significant importance in many communities. The Commission must take care to ensure that incumbent users who rely upon the public benefits of over the air broadcast are not stranded. In issuing an NPRM on repurposing of television broadcast spectrum, the Commission should consider whether a transition is more feasible and cost effective in certain areas, and the Commission should consider methods of funding any

[22] *See, e.g.*, Reply Comments of CTIA—The Wireless Association, GN Docket Nos. 09-47, 09-51, 09-137 at 22-23 (filed Nov. 13, 2009) (discussing characteristics of broadcast spectrum making it well-suited for wireless broadband uses).

relocation costs or service subsidies that would need to be distributed to the former users of repurposed broadcast spectrum.

V. CONCLUSION

Section 336(g) requires the Commission to conduct an examination of potential alternative uses of the television broadcast spectrum and the extent to which it may reduce the amount of spectrum allocated to television broadcasting. The necessity for this examination is underscored by the demonstrated imminent need for additional wireless broadband spectrum. In fulfilling this obligation, the Commission should consider a wide range of potential uses of the spectrum, including commercial, public safety, and enterprise services as well as both licensed and unlicensed uses. Ultimately, Motorola expects that the Commission's examination will conclude that some additional television broadcast spectrum can be efficiently repurposed for other uses.

Respectfully submitted,

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Dated: December 21, 2009