Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington DC 20554

In the Matter of	)	
	)	
Fostering Innovation and Investment in the Wireless Communications Market	)	GN Docket No. 09-157
	)	
	)	
A National Broadband Plan for Our Future	)	GN Docket No. 09-51
	)	

COMMENTS OF
THE ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC. AND
THE NATIONAL ASSOCIATION OF BROADCASTERS

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SUMMARY

In its Notice of Inquiry ("NOI") in this proceeding, the Commission asks for spectrum management ideas and information as it works to promote innovation and investment in the wireless marketplace. With 60 years of deep and varied experience with spectrum management issues, the broadcast industry, through MSTV and NAB, offers these suggestions for the Commission's consideration.

The NOI recognizes the importance of "tak[ing] different views on what constitutes an efficient use of spectrum based on the nature of a particular band of spectrum." In assessing the spectrum efficiency of various uses and making other spectrum management decisions, the Commission should be guided by the following core principles:

- Important public policy goals that are associated with particular spectrum allotments should be taken into account in assessing the efficiency of a band's usage. Public policy goals inherent in certain spectrum uses often are not measurable by conventional economic methodologies or financial benchmarks.
- Costs to consumers must be factored into spectrum management decisions.
- Another bedrock obligation is to assess the interference consequences of various spectrum management options.
- Enabling incumbents to utilize their existing spectrum and infrastructure resources can often be the most efficient, effective and fastest way to launch innovative new services.
- When considering spectrum re-allocation proposals, the Commission should take into account any disruptive effects and other costs of reallocation.

In making spectrum management choices, the Commission should also pay heed to practical considerations. Experience has demonstrated that failing to do so can lead to unacceptable costs, delays, and consumer harms. These practical considerations may include (i) the effect that increases in the noise floor have on the deployment and viability of both future and existing wireless communications services, (ii) an appreciation that spectrum management

choices can have different consequences where the licensees in question do not control the receivers for their services, (iii) the cost implications and delays where reallocation decisions would entail significant facility modification or replacement, and (iv) the inadequacy of relying on after-the-fact interference remedies to protect spectrum uses directly relied upon by the public.

Television broadcasting has had a long history of enhancing the public's service by more intensely and more innovatively using spectrum allocated to it. Today, using their 6 MHz channels, broadcasters deliver multiple streams of programming, including in HDTV, and broadcasters are poised to do even more with their existing spectrum assignments, such as mobile video. Efficiency gains in broadcasting have been accompanied by a reduction in the total allocation of spectrum to broadcast television from nearly 500 MHz in the 1970s to approximately 300 MHz today. MSTV and NAB's policy suggestions in this proceeding are based on this extensive past and ongoing experience with spectrum allocation and management issues.

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The Association for Maximum Service Television, Inc. ("MSTV")[1] and the National Association of Broadcasters ("NAB")[2] welcome the Commission's initiation of a Notice of Inquiry ("NOI") concerning innovation and investment in the wireless communications market. MSTV and NAB take particular interest in the NOI's questions about spectrum use and availability. Radiofrequency communications have made possible our national system of free and local television broadcast service that (together with radio broadcasting) is unique among communications technologies in reaching virtually every household in America.[3] Since June 12,

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[1] MSTV is a nonprofit trade association of local broadcast television stations committed to achieving and maintaining the highest technical quality for the local broadcast system.

[2] NAB is a trade association that advocates on behalf of local radio and television stations and also broadcast networks before Congress, the Federal Communications Commission and other federal agencies, and the courts.

[3] Penetration for broadcast television, which is more than 99 percent of U.S. TV households, is much greater than penetration for cable (58.4 percent) and DBS (24.83 percent), and exceeds even penetration for telephone subscribership (95.6 percent). *See* "Hispanic TV Households Outpace Average" (Sept. 14, 2009), http://www.emarketer.com/Article.aspx?R=1007272 (stating that only .6 percent of U.S. TV households were unable to receive DTV Signals as of August 30, 2009); Annual Assessment of the Status of Competition in the Market for the Delivery of Video (continued…)

2009, these services have been provided in an all-digital format that is making over-the-air television more efficient, interactive, and competitive. To assist the Commission as it explores ways to improve access to spectrum and efficiency of spectrum use, MSTV and NAB file these comments based upon over six decades of experience in spectrum management.

I. MSTV AND NAB SUPPORT THE COMMISSION'S EFFORTS TO DEVELOP PRINCIPLES FOR EVALUATING SPECTRUM EFFICIENCY.

The NOI recognizes that evaluating the "efficiency" of a given band requires, in the first instance, a determination of the appropriate "construct" for that evaluation.[4] MSTV and NAB agree that the Commission should "tak[e] different views on what constitutes an efficient use of spectrum based on the nature of a particular band of spectrum."[5] As the NOI recognizes, "there are several possible definitions of efficiency as applicable to the spectrum resource."[6] That view echoes the guidance of the 2002 Spectrum Policy Task Force Report (the "SPTF Report") that "a single objective metric that could be used to compare efficiencies across different radio services is neither possible nor appropriate."[7]

By adopting a framework that embodies the principles described below, the Commission will be better able to make objective, reasoned assessments of the efficiency of current uses of spectrum.

Programming, 24 FCC Rcd. 542, Table 1, ¶ 257 (Jan. 16, 2009); Telephone Subscribership in the United States — Data through March 2009, Wireline Competition Bureau, Industry and Analysis Division (Aug. 2009).

[4] Fostering Innovation and Investment in the Wireless Communications Market, *Notice of Inquiry*, FCC 09-66, ¶ 40 (Aug. 27, 2009) (the "*NOI*").

[5] *Id.*

[6] *Id.*

[7] Spectrum Policy Task Force Report, ET Docket No. 02-135, at 21 (Nov. 2002) ("SPTF Report"), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-228542A1.pdf.

Public Policy Imperatives. Important public policy goals that are associated with particular spectrum allotments should be taken into account in assessing the efficiency of a band's usage. Spectrum allocated to public safety communications provides a good example of this principle. Evaluating the "efficiency" of public safety communications based solely on maximizing spectrum use would yield diminishing returns, because the benefits of any theoretical technological efficiency are likely outweighed by the harm that would be caused due to disruption of the communications infrastructure upon which the Nation's public safety services rely. Likewise, the allotment for the television broadcast service was designed to maximize ubiquity of coverage so that virtually every American has access to local television. If ubiquity and localism were not public policy goals, the television broadcast service would have different technical characteristics. As in the public safety context, to ignore the public policy imperatives underlying the television broadcast service in order to advance the narrow interest of a purely technical definition of "efficiency" would disserve the public interest.[8]

Similarly, purported financial benefits of one use of spectrum over another should not be paramount in all cases. Where uses of a band are intended to serve defined public policy goals (*e.g.*, public safety, localism, competition), the Commission should adhere closely to the Congressional mandate that it not make allocation decisions based upon "expectation of Federal revenues from the use of a system of competitive bidding."[9] This is the principle of "public goods" or "positive externalities," which economists have long recognized as important and

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[8] Approaches to spectrum management that ignore public policy imperatives would also run counter to Section 307(b) of the Communications Act of 1934, which requires "such distribution of licenses, frequencies, hours of operation, and of power among the several States and communities as to provide a fair, efficient, and equitable distribution of radio service to each of the same." 47 U.S.C. § 307(b).

[9] *Id*. at § 309(j)(7)(A).

valid, and which Congress has repeatedly recognized in the spectrum management principles it has mandated for the Commission.[10]

Cost to Consumers. A definition of "efficiency" that shuts out public policy goals will lead to imposition of unreasonable costs on consumers and a failure to heed the public interest priorities of the Communications Act. As the SPTF Report explained:

> Business managers may consider the spectrum and technical efficiency of different services or technologies, but ultimately they must weigh the cost of each service against the value created by each. Just because a service or technology has a high level of spectrum or technical efficiency, it does not follow that it is the most economically efficient. Such efficiency may cost too much relative to the value it provides.[11]

Consumer cost concerns are especially relevant when considering incumbent uses of spectrum that employ an "open" architecture in which the transmitting party does not control the receiving equipment used by consumers. The NOI, for example, envisions an approach by which interference protection would be decreased under the assumption that the incumbent will "replace" existing receivers with newer, more interference-resistant receivers. Yet in an open architecture system, like television broadcasting, the "incumbent" has no control over receivers and consumers naturally have gravitated towards lower-cost receivers. The practical result of a reduction in interference protection will thus be to frustrate consumers' investment-backed

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[10] *See, e.g.*, Brett M. Frishmann, *An Economic Theory of Infrastructure and Commons Management*, 89 Minn. L. Rev. 917 (2004-05); Thomas W. Merrill, *Economics of Public Use*, 72 Cornell L. Rev. 61, 74 (1986-87) ("Moreover, one can say that any activity that generates positive externalities — keeping one's lawn mowed, for example — shares the quality of public goods."); 47 U.S.C § 307(b) ("In considering applications for licenses, and modifications and renewals thereof, when and insofar as there is demand for the same, the Commission shall make such distribution of licenses, frequencies, hours of operation, and of power among the several States and communities as to provide a fair, efficient, and equitable distribution of radio service to each of the same."); *id.* at § 151.

[11] SPTF Report at 6.

expectations in receiving equipment — which in services like television broadcasting amounts to billions of dollars. The Commission should avoid policies that require use of receivers that are prohibitively expensive and therefore non-viable in the consumer marketplace.

Interference. If the introduction of new uses will cause interference to existing uses of spectrum, that interference should be taken into account in assessing the new use's efficiency. The Commission recognized this principle when it refused the request of terrestrial wireless providers to "sever" bands allocated for mobile satellite services ("MSS") into separate terrestrial and satellite licenses, with the terrestrial licenses being assigned at auction. Certain terrestrial wireless carriers had argued that by severing MSS spectrum in this manner and making the terrestrial licenses available for competitive bidding, the Commission would "maximize the spectrum's value to the public and ensure that it is put to its most efficient use."[12] The Commission, however, found that such "same-band, separate operator" sharing would be "impractical and ill-advised" because, among other concerns, of "the need to prevent and resolve recurrent concerns about mutual interference."[13]

Flexibility and Adaptation of Existing Infrastructure to Accommodate New Uses. The potential for existing licensees to provide new services should also be a factor in measuring the efficiency of an allocation. Use of existing infrastructure and existing licensee operations is often the most efficient way to develop and deploy new and innovative services. The television

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[12] Further Comments of AT&T Wireless Services, Inc., Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Band; Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service, IB Docket No. 01-185, ET Docket No. 95-18, at 5 (Apr. 1, 2002).

[13] Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands, *Order on Reconsideration*, 18 FCC Rcd. 13,590, ¶ 54 (July 3, 2003).

broadcasting service illustrates the benefits of permitting flexible spectrum use by incumbents. Local television stations have gone from providing a single, analog-quality programming service to multiple channels of programming, including in HD format, together with new mobile and emergency alert services.

Non-technical objections to more flexible spectrum use by incumbent licensees should be carefully scrutinized. So long as the incumbents continue to provide the service for which they were assigned licenses in the first instance, they should not be prohibited from delivering new or additional services as well. Here again, the Commission's reasoning in allowing MSS operators to use their spectrum for an Ancillary Terrestrial Component ("ATC") is instructive. In response to calls from terrestrial operators that a reclamation of MSS spectrum for terrestrial-only use would be more efficient than allowing MSS operators to make ancillary terrestrial uses, the Commission explained: "The question is not whether terrestrial services represent a more efficient use of spectrum than satellite services, but rather whether allowing MSS licensees to improve the efficiency of their licensed systems better serves the public interest than the status quo."[14]

Avoiding Disruption Caused By Reallocations. As the NOI recognizes, repurposing of spectrum — particularly to the extent that some or all of a band is reallocated from incumbent to new uses — "is done at some cost, particularly where there are incumbents with investments and infrastructure reflecting the former use of the spectrum."[15] These costs include the expense of new or re-tuned equipment, labor, disputes with new incumbents over

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[14] *Id.* at ¶ 22.

[15] *NOI* at ¶ 28.

reimbursement, and, of course, inevitable disruptions in service and delays in the implementation of new services.

Reallocation costs are pronounced in cases where the reallocation involves significant numbers of new transmitting and receiving equipment. In such cases, the Commission should not presume that there will be sufficient resources to complete the relocation in a timely fashion. By way of example, television broadcasters and Sprint Nextel, despite the parties' best efforts, have experienced delays and complications in completing the transition of the Broadcast Auxiliary Service ("BAS") to a new, digital band plan precisely because of equipment and labor shortages. The relatively few manufacturers of BAS equipment simply could not meet the sudden surge in demand for digital BAS equipment, and there were shortfalls in expertise and labor needed for installation of digital BAS equipment. By taking costs of equipment relocation into account, the Commission will avoid imposition of reallocations that, at the end of the day, result in potentially significant inefficiencies.

II. THEORY MUST BE INFORMED BY PRACTICAL CONSIDERATIONS IN ORDER TO ACHIEVE SOUND SPECTRUM MANAGEMENT.

The ultimate success of any changes in spectrum management will be determined in the field. History has shown that there often is great divergence between the theory and practice of spectrum management.[16] MSTV and NAB therefore believe that any evaluation of spectrum reform must be informed by the types of practical considerations discussed below.

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[16] *See, e.g.*, Improving Public Safety Communications in the 800 MHz Band, DA 09-1395, ¶ 3 (June 24, 2009) (postponing the 800 MHz rebanding financial reconciliation "true-up" date to December 31, 2009 and recognizing that the "rebanding projects had been subject to unforeseen complexity and delay").

Noise Floor Increases. As the NOI suggests, the signal created by the sum of all noise sources in a band, known as the noise floor, affects the deployment and viability of services to the public.[17] Television broadcasters and the viewing public have witnessed firsthand the dangers of an increasing noise floor, which appears to be a principal explanation for unanticipated VHF reception problems that have occurred in connection with the completion of the DTV transition.

Specifically, the presence of electromagnetic interference from other electronic devices in the home — such as cordless phones, cable modems, DVRs, personal computers, and the television set or converter box itself — has in many cases, and to the detriment of the public, prevented television receivers and digital-to-analog converter boxes from receiving otherwise adequate VHF digital broadcast signals. This unanticipated situation reflects the modern reality in which consumers have numerous Part 15 devices in their homes; without the use of professional testing equipment it is not possible to determine which device has caused interference to reception of digital television or other wireless services.

Accordingly, whenever considering new uses of spectrum — whether licensed or unlicensed — the Commission should evaluate and take into account the effect of new uses on the noise floor.[18] Increases in the noise floor are a form of spectral pollution, and like other types of pollution, these increases ultimately affect the entire population's use of the spectrum

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[17] *NOI* at ¶ 47.

[18] In addition, to address degradation of existing services caused by increases in the noise floor to date, the Commission should explore means of reducing over time unwanted emissions from unintentional radiators such as cordless phones, laptop computers, PDAs, and other devices that have become common in households. While it would be difficult to lower emissions from existing equipment, reductions in the limit of unwanted emissions allowed for future Part 15 devices would, in time, improve reliability of communications across many bands.

resource. As William J. Baumol, a professor of economics at New York University, has explained, a "policy of unlimited entry . . . is likely to have the same detrimental effects upon spectrum usage that it has on usage of shared resources elsewhere."[19] Such a policy can result, over time, in a "tragedy of the commons" in which the resource (*e.g.*, spectrum) is shared among so many users as to make it of little value for anyone. As Dr. Baumol notes, "interference is inevitable under a spectrum regime in which the market is not constrained by any restrictions that limit entry: in deciding whether or not to enter, each entrant takes into account only the consequences of this decision upon himself, and disregards the effects upon others."[20] The result is "overcrowding and overuse."[21] Experience in the unlicensed 2.4 GHz band is instructive. There, cordless phones have "reap[ed] devastating effects on 802.11b WLANs" because the technologies used are not compatible for minimization of interference.[22]

Even if future technology is able to accommodate some number of additional users within a given swath of spectrum, demand will presumably keep pace and the quality of communications in the spectrum will degrade.[23] As the economist Thomas Hazlett has noted, the history of unlicensed device entry is a "chase up the dial: the 900 MHz ISM band became

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[19] William J. Baumol, *Toward an Evolutionary Regime for Spectrum Governance: Licensing or Unrestricted Entry?*, AEI-Brookings Joint Center for Regulatory Studies, 10 (April 2005).

[20] *Id.* at 11.

[21] *Id.*

[22] *Interference from Cordless Phones*, Wi-Fi Planet (Apr. 15, 2003), *available at* http://www.wi-fiplanet.com/tutorials/article.php/2191241.

[23] Baumol¸ *supra* note 19 at 11.

congested, leading the FCC to open up the 2.4 GHz unlicensed band, which became crowded in major markets, leading the FCC to open up 300 MHz for the U-NII 5 GHz band."[24]

Receiving Technology. While in some bands it may be possible to improve access to spectrum by making receivers more resistant to interference, this approach is not practical for services in which the spectrum licensees have no control over the receiving equipment used. As noted above, digital television is one example of an "open" service for which it is very difficult to control the quality of reception equipment and adoption of mandated receiver performance standards has not been possible for the most part. Even if the Commission could overcome political and legal obstacles to adopting receiver standards, it would face the difficult (at best) task of making extensive technical judgments about the "right" balance between receiver quality, cost, and other factors important to a well-functioning equipment marketplace. Finally, a requirement that consumers use a higher quality of receiving equipment in order to be free from interference would disrupt billions of dollars of investment in existing equipment and the consumer expectations on which that investment was premised.

Inadequacy of Post-Hoc Interference Remedies. One of the Commission's core responsibilities is to manage use of the spectrum resource to prevent interference. Yet some of the concepts described in the NOI suggest approaches to spectrum management that would address interference only after it occurs.[25] Particularly for spectrum uses that directly serve the public, like wireless broadband access and local television, this sort of *post hoc* remedy would

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[24] *Id.*, *quoting* Thomas W. Hazlett, *The Wireless Craze, the Unlimited Bandwidth Myth, the Spectrum Auction Faux Pas, and the Punchline to Ronald Coase's 'Big Joke'*: *An Essay on Airwave Allocation Policy*, 14 Harvard J. L. & Tech. 335, 429 (2001).

[25] *NOI* at ¶ 35.

harm the public's interest in reliable communications. In addition to these consumer harms, lack of certainty as to the reliability of reception will deter investment in wireless communications.

III. THE BROADCAST TELEVISION INDUSTRY HAS SUBSTANTIAL EXPERIENCE AND SUCCESS WITH EFFORTS TO IMPROVE SPECTRUM EFFICIENCY.

Over the past several decades, the Nation's broadcast television service has made substantial advances in spectrum efficiency, all while continuing to provide a free, universal service that uniquely serves the local interests of the public. Innovations through the years have included color, stereo sound, second language audio, more intensive use of the vertical blanking interval, translators, low power television, on-channel repeaters, Distributed Transmission Systems, multicasting, datacasting, and of course the radical shift to all-digital transmissions. Thus, as the Commission considers ways to improve efficiency of spectrum usage, it may wish to take into account experience with the television bands.

At one time, each television station delivered a single, analog programming stream over a 6 MHz channel. Today, broadcasters use the same 6 MHz channels to deliver multiple streams of programming, including in high definition television ("HDTV") format. Broadcast television has gone from standard quality video and stereo sound to the highest quality widescreen theater quality pictures and multi-channel Dolby surround sound. The transmission standard for digital television, known as ATSC A/53, provides wide-area coverage at a data rate of almost 20 Mbps within a 6 MHz channel, making it one of the most efficient transmission systems available for disseminating high bit-rate content to a wide audience.

While the advances in quality and quantity of programming services represent a substantial gain in efficiency of spectrum use, broadcasters are poised to do even more with their existing spectrum assignments, offering new services like mobile video to complement existing programming streams. Hundreds of television stations are members of the Open Mobile Video

Coalition ("OMVC"), an alliance of commercial and public broadcasters formed to accelerate the development and rollout of mobile DTV products and services using existing broadcast spectrum assignments. OMVC envisions a future for mobile services that, in addition to live video, also includes applications such as time shifted TV viewing, interactive capabilities, new advertising models and other advanced features.[26] The Advanced Television Systems Committee ("ATSC") is poised to adopt a final technical standard for mobile DTV in mid-October. Other new uses of broadcasters' digital bandwidth include delivery of data for educational purposes and service as the backbone infrastructure for a new digital emergency alert and warning system.[27]

These efficiency gains have been accompanied by a reduction in the total allocation of spectrum to broadcast television, most recently through reallocation of nearly 25 percent of spectrum allocated to broadcasting at the conclusion of the DTV transition. Today, television broadcasting uses approximately 300 MHz to provide free, over-the-air digital television services, in comparison to a high of nearly 500 MHz in the 1970s.[28] With the conclusion of the DTV transition, broadcast television is the first wireless service ever to

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[26] *See* OMVC Mobile TV Use Cases (Sept. 21, 2009), *at* http://www.omvc.org/_assets/docs/reports/Mobile-DTV-Use-Cases.pdf

[27] *See* Reply Comments of the Association for Public Television Stations and Public Broadcasting Service, MB Docket No. 07-269, at 8-10 (filed Aug. 28, 2009) (providing examples of public television stations that have dedicated portions of their digital bandwidth to provide noncommercial educational data through the "broadband-like pipe" of the DTV 19.4 mbps bitstream, and discussing the Digital Emergency Alert System ("DEAS") deployed over public television digital spectrum in partnership with the Department of Homeland Security).

[28] Spectrum accommodations in which broadcasters have participated include vacating of television channel 1, then of television channels 70 through 83, and most recently of television channels 52-69 and the ensuing repacking of digital channels into the core television spectrum below channel 52. In addition, broadcasters are vacating 35 MHz of spectrum in the 2 GHz band through digital conversion of BAS equipment. These and other steps have accommodated commercial wireless 4G networks, mobile satellite services, land mobile communications, broadband public safety networks, and low power television services, among others.

substantially reduce its spectrum use while providing additional service. Meanwhile, broadcasters have worked with Sprint Nextel to transition the BAS in the 2 GHz spectrum to a narrower, digital band plan that is making available an additional 35 MHz of spectrum for new Advanced Wireless Services and MSS.

Operation within this smaller band plan, in turn, has led to more intensive use of spectrum within the broadcast allocation. Thus, the UHF band (*i.e.*, television channels 14 through 51), which at one time was generally regarded as an underutilized portion of the broadcast allocation, is today used by 75 percent of all full-power television stations. At the same time, wireless microphones, low power television stations, and television translator stations relocating from the 700 MHz band are seeking to operate in the UHF band. Moreover, broadcasters share spectrum with an increasing array of other uses, including land mobile communications for public safety, and wireless microphones and other production equipment.

Broadcasters also have embraced spectrum sharing as a way to deliver broadband access in rural areas. As MSTV and NAB have advocated, one way to improve broadband access in rural areas is through use of "white spaces" spectrum between television channels for fixed broadband access.[29] Because the broadcast bands are used less intensively in rural markets, with appropriate technical protections fixed broadband services can operate in this spectrum without undermining consumers' access to free, over-the-air digital television or new mobile

[29] *See, e.g.*, Joint Reply Comments of MSTV and NAB, ET Docket Nos. 04-186 and 02-380, at 5 (March 2, 2007) (supporting the introduction of fixed devices into the TV white spaces to "provide new broadband services, especially to rural and underserved areas of the United States"); Letter from David Donovan, MSTV and Jane Mago, NAB, GN Docket No. 09-51 (July 21, 2009).

video services.[30] Other parties that have addressed white-space use in connection with the National Broadband Plan have noted its utility in rural areas.[31] The Canadian government has likewise authorized licensed use of television spectrum for broadband access in "rural and remote" areas, similarly reflecting the fact that — unlike in urban markets where virtually all of the broadcast spectrum is used for delivery of free, digital television service to the public and licensed infrastructure such as wireless microphones — in rural areas there is typically sufficient white-space spectrum for fixed wireless broadband access.[32]

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[30] These protections include a prohibition on operation in the channels immediately adjacent to an occupied television channel (the "first adjacent channels"), as the Commission recognized in its *Second Report and Order* in the *TV White Spaces* proceeding. *Second Report and Order and Memorandum Opinion and Order*, ET Docket Nos. 04-186 and 02-380, 23 FCC Rcd 16807, ¶ 10 (rel. Nov. 14, 2008).

[31] *See, e.g.*, Comments of Public Knowledge, Media Access Project, the New America Foundation, and U.S. PIRG, GN Docket No. 09-51, at 32 (June 8, 2009) ("Rural areas would have more white spaces compared to urban regions due to presence of fewer broadcasting channels there"); Comments of Wireless Communications Association International, GN Docket No. 09-51, at 47 (June 8, 2009).

[32] *See* Interim Technical Guidelines for Remote Rural Broadband Systems Operating in the Band 512-698 MHz (TV Channels 21-51), Industry Canada (rel. March 2007).

CONCLUSION

As representatives of an industry that relies upon access to spectrum to deliver a free, universal service to the public, MSTV and NAB welcome the Commission's inquiry into the role of spectrum use and availability in the wireless marketplace. By adopting a principled framework for assessing the efficiency of current uses of spectrum and taking account of practical considerations as it makes spectrum management decisions, the Commission will be well poised to promote innovation and investment in the wireless marketplace.

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