

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Innovation in the Broadcast Television Bands:)	
Allocations, Channel Sharing and Improvements)	ET Docket No. 10-235
to VHF)	

NOTICE OF PROPOSED RULEMAKING

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By the Commission: Chairman Genachowski, Commissioners Copps, McDowell, Clyburn, and Baker issuing separate statements.

I. INTRODUCTION

1. In this Notice, we initiate a process to further our ongoing commitment to addressing America’s growing demand for wireless broadband services, spur ongoing innovation and investment in mobile and ensure that America keeps pace with the global wireless revolution, by making a significant amount of new spectrum available for broadband. Through this Notice, we take preliminary steps to enable the repurposing of a portion of the UHF and VHF frequency bands that are currently used by the broadcast television service, which in later actions we expect to make available for flexible use by fixed and mobile wireless communications services, including mobile broadband. At the same time, we recognize that over-the-air TV serves important public interests, and our approach will help preserve this service as a healthy, viable medium. The approach we are proposing is consistent with the goal set forth in the National Broadband Plan (the “*Plan*”)¹ to repurpose up to 120 megahertz from the broadcast television bands for new wireless broadband uses through, in part, voluntary contributions of spectrum to an incentive auction. Reallocation of this spectrum as proposed will provide the necessary flexibility for meeting the requirements of these new applications.

2. The specific bands under consideration are the low VHF spectrum at 54-72 MHz (TV channels 2-4) and 76-88 MHz (TV channels 5 and 6), the high VHF spectrum at 174-216 MHz (TV channels 7-13), and the UHF bands at 470-608 MHz (TV channels 14-36) and 614-698 MHz (TV channels 38-51); for purposes of this Notice, we will refer to this spectrum as the “U/V Bands.”² This Notice proposes three actions that will establish the underlying regulatory framework to facilitate wireless broadband uses of the U/V Bands, while maintaining current license assignments in the band. First, we

¹ See *Connecting America: The National Broadband Plan*, Federal Communications Commission, Washington, DC (March 2010); available at <http://www.broadband.gov/plan/>. The *Plan* was developed by the Commission pursuant to the direction of Congress in the American Recovery and Reinvestment Act of 2009 (Recovery Act), see American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009).

² The band 608-614 MHz, *i.e.*, TV channel 37, is used for radio astronomy and is not part of the spectrum being considered for reallocation. See 47 C.F.R. § 2.106., US 74 and US 246.

are proposing to add new allocations for fixed and mobile services in the U/V Bands to be co-primary with the existing broadcasting allocation in those bands. The additional allocations would provide the maximum flexibility for planning efforts to increase spectrum available for flexible use, including the possibility of assigning portions of the U/V Bands for new mobile broadband services in the future. Second, we are proposing to establish a framework that, for the first time, permits two or more television stations to share a single six-megahertz channel, thereby fostering efficient use of the U/V Bands. Third, we intend to consider approaches to improve service for television viewers and create additional value for broadcasters by increasing the utility of the VHF bands for the operation of television services.

3. By taking these important steps to facilitate wireless broadband uses in the U/V Bands, this Notice is the first in a series of actions that will allow us to make progress toward our goal of improving efficient use of the bands and enable ongoing innovation and investment through flexible use. We intend to propose further actions consistent with other of the *Plan's* recommendations for the U/V Bands, including, but not limited to, the process of voluntarily returning broadcast licenses to the Commission and the licensing process and service rules for new fixed and mobile wireless communications services. As part of that process, the Commission will address the *Plan's* proposal for channel re-packing, the band plan for recovered spectrum and other related issues and will provide full opportunity for public comment on those issues at that time.

II. BACKGROUND

4. *The National Broadband Plan.* The *Plan* was issued on March 17, 2010. As required under the Recovery Act, the *Plan* seeks to ensure that every American has access to broadband capability and establishes clear benchmarks for meeting that goal.³ The *Plan* recommends making 500 megahertz of spectrum between 225 MHz and 3.7 GHz newly available to meet the needs of mobile, fixed and unlicensed wireless broadband in the next 10 years and for providing 300 megahertz of that amount for mobile flexible uses within 5 years,⁴ of which up to 120 megahertz would come from the broadcast television bands.⁵

5. *Current Uses of the U/V Bands Spectrum.* The U/V Bands occupy 294 megahertz of spectrum in five frequency bands and are all currently allocated for use by broadcasting services.⁶ In addition, the 470-512 MHz band segment is allocated for fixed and land mobile services on a co-primary basis with broadcasting.⁷ However, use of the fixed and land mobile services in this band is limited to the geographic areas and purposes stated in footnote NG66 to the Table of Allocations. All five bands currently are allocated principally to broadcast television under Part 73 of the rules.⁸ Full power television stations have recently completed a statutorily mandated conversion from analog to digital transmissions. As part of that transition, 108 megahertz of UHF spectrum at 698-806 MHz was recovered for new uses,⁹ including fixed, mobile, and broadcasting; a portion of that spectrum has been set aside for

³ Recovery Act, § 6001(k).

⁴ *Id.* at 84. The frequency range between 225 MHz and 3.7 GHz is generally to be considered the most suitable spectrum for mobile communications.

⁵ *Id.* at 88.

⁶ See 47 C.F.R. § 2.106 (Table of Frequency Allocations); see also 47 C.F.R. § 73.603. The overall VHF and UHF regions occupy the spectrum in the frequency ranges 30 MHz to 300 MHz and 300 MHz to 3000 MHz, respectively.

⁷ See 47 C.F.R. § 2.106, footnote NG66.

⁸ 47 C.F.R. Part 73. In addition, low power television stations (TV translators and low power TV stations) operate under regulations set forth in Part 74 of the Commission's rules.

⁹ See Digital Television and Public Safety Act of 2005 ("DTV Act"), which is Title III of the Deficit Reduction Act of 2005, Pub. L. No. 109-171, 120 Stat. 4 (2006) ("DRA") (codified at 47 U.S.C. §§ 309(j)(14) and 337(e)); see also DTV Delay Act, Pub. L. No. 111-4, 123 Stat. 112 (2009).

public safety uses.¹⁰ Television stations now operate on six-megahertz channels designated 2 to 51 in the five U/V Bands.

6. In addition to full power TV stations, certain other licensed services are permitted to operate in the U/V Bands' TV channels. Class A television stations operate under Subpart J of Part 73 of the rules.¹¹ Low power TV and TV translator stations are permitted to operate under Subpart G of Part 74 of the rules on a "must protect" basis to full power TV stations and on an equal basis with Class A TV stations, provided they meet technical rules to prevent interference to reception of such stations.¹² Part 74 also allows certain broadcast auxiliary operations on TV channels 14-69 on a secondary basis.¹³ In addition, the Part 74 and Part 15 rules permit certain entities to operate wireless microphones and other low power auxiliary transmitters on vacant TV channels on a non-interference basis.¹⁴

7. Pursuant to the fixed and land mobile allocations in the 470-512 MHz band segment (channels 14-20), licensees in the Private Land Mobile Radio Service (PLMRS) under Part 90 of the rules and in the Commercial Mobile Radio Service (CMRS) under Part 20 of the rules operate in 13 metropolitan areas on one to three six-megahertz channels.¹⁵ These operations are for public safety and related land mobile communications and for CMRS backhaul operations. In addition, under Part 15 of the rules medical telemetry equipment is permitted to operate on an unlicensed basis on any vacant TV channels in the range of channels 7-46, and unlicensed remote control devices are allowed to operate on any TV channels above 70 MHz (*i.e.*, above channel 4), except for channel 37.¹⁶ The Offshore Radiotelephone Service uses channels 15-17 in certain regions along the Gulf of Mexico.¹⁷ In Hawaii, channel 17 is reserved for inter-island communications.¹⁸ However, no active licensees currently use this channel in Hawaii. Finally, the Commission has allowed low power unlicensed devices to operate on

¹⁰ See *Sixth Report and Order* in MM Docket No. 87-268, *supra*; see also, *First Report and Order* in WT Docket No. 99-168, 15 FCC Rcd 476 (2000), *Report and Order* in ET Docket No. 97-157, 12 FCC Rcd 22953 (1998) and *Report and Order* in GN Docket No. 01-74, 17 FCC Rcd 1022 (2002).

¹¹ See 47 C.F.R. Part 73 Subpart J. Class A TV stations operate at the power levels permitted for low power television stations under Part 74 of the rules, but have certain protection rights with respect to full service analog and digital TV stations that are not available to TV translator and low power stations.

¹² See 47 C.F.R. Part 74 Subpart G. Collectively, Class A, low power TV and TV translator stations are commonly known as "LPTV stations."

¹³ See 47 C.F.R. § 74.602(h). This rule section permits TV studio-transmitter links, TV relay stations, and TV translator relay stations to be authorized to operate fixed point-to-point service on UHF TV channels 14-69 on a secondary basis, subject to the provisions in Part 74, subpart G.

¹⁴ See 47 C.F.R. Part 74 Subpart H and Part 15, Subpart C.

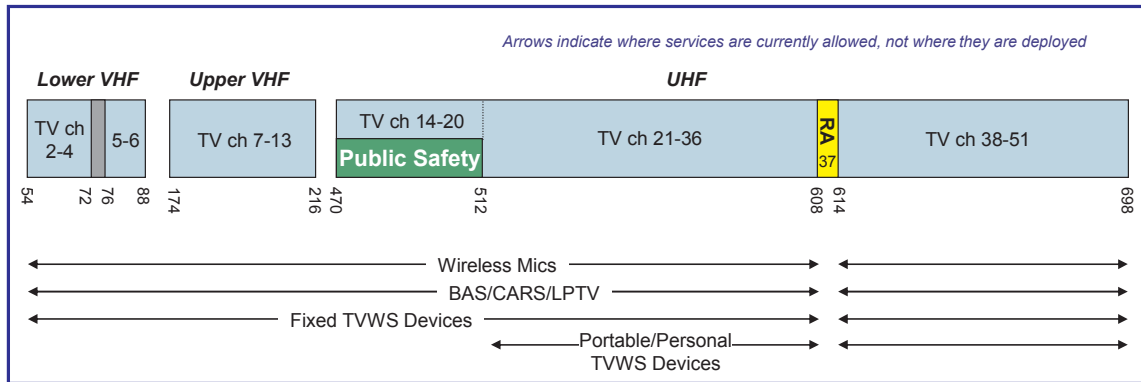
¹⁵ See 47 C.F.R. Part 90 Subpart L and 47 C.F.R. Part 22 Subpart E.

¹⁶ See 47 C.F.R. §§ 15.231, 15.241 and 15.242. Effective October 16, 2002, the Commission ceased granting certifications for new medical telemetry equipment that operates on TV channels, but there is no cutoff on the sale or use of equipment that was certified before that date, see 47 C.F.R. § 15.37(i). To provide spectrum for wireless medical telemetry equipment, the Commission established the Wireless Medical Telemetry Service to operate on a primary basis in 13.5 megahertz of spectrum in three spectrum blocks at 608-614 MHz (TV channel 37, which the WMTS now shares with radio astronomy), 1395-1400 MHz, and 1427-1429.5 MHz. See Amendment of Parts 2 and 95 of the Commission's Rules to Create A Wireless Medical Telemetry Service, *Report and Order*, ET Docket No. 99-255, 15 FCC Rcd 11206 (2000). See also, Amendments to Parts 1, 2, 27, and 90 of the Commission's Rules to License Services in the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands, WT Docket No. 02-8, *Memorandum Opinion and Order*, 18 FCC Rcd 16920 (2003).

¹⁷ See 47 C.F.R. § 2.106 NG66(b) and 47 C.F.R. § 22.1007.

¹⁸ See 47 C.F.R. § 22.591.

unused channels (white space) in the U/V Bands.¹⁹ The Commission has recently finalized rules for these “TV white space” devices and manufacturers can now begin to market products for this category of devices.²⁰ The figure below provides a graphical depiction of the current allocations in the U/V Bands.



8. *Broadcast Spectrum Analysis White Paper*. In June, 2010, the third Omnibus Broadband Initiative technical paper was released, entitled, “Spectrum Analysis: Options for Broadcast Spectrum” (the “Technical Paper”).²¹ This paper describes the opportunity to create value in the U/V Bands by leveraging their favorable technical characteristics for broadband while maintaining the public benefits of over-the-air television. Specifically, the Technical Paper describes a voluntary, market-based process for repurposing a portion of the U/V Bands by enabling individual stations to participate in an incentive auction, including the ability to set minimum prices on the return of broadcast licenses as a means of providing financial certainty. Stations could choose not to participate, or to participate and maintain a primary stream by sharing a channel; and the Commission would administer the process in a manner that recognizes the public interest benefits of free over-the-air television broadcasts. The Technical Paper observes that over-the-air television continues to serve important functions in our society, and recommends an approach that emphasizes that the voluntary, market-based reallocation be implemented in a way to provide additional options for broadcast licensees to serve their communities. In this regard, it suggests that in providing a potential means of one-time financing and the option to reduce operating expenses, longstanding policy goals for broadcast television will be served, such as localism, viewpoint diversity, and competition.²²

9. *Broadcast Engineering Forum*. On June 25, 2010, the Commission’s Office of Engineering and Technology held a Broadcast Engineering Forum (the “Forum”) of industry technical experts to discuss several issues pertaining to topics raised in the Technical Paper.²³ The issues discussed at the Forum included: 1) improving efficiency in broadcasting through use of distributed transmission systems (DTS) and cellularized architecture, 2) methodologies for repacking the channels used by stations to increase the efficiency of spectrum use, including possibilities for recovery of channels nationwide, 3)

¹⁹ See *Second Report And Order And Memorandum Opinion And Order* in ET Docket Nos. 04-186 and 02-380, 23 FCC Rcd 16807 (2008).

²⁰ *Second Memorandum Opinion and Order* in ET Docket Nos. 04-186 and 02-380, adopted and released September 23, 2010, FCC 10-174.

²¹ See [http://download.broadband.gov/plan/fcc-omnibus-broadband-initiative-\(obi\)-technical-paper-spectrum-analysis-options-for-broadband-spectrum.pdf](http://download.broadband.gov/plan/fcc-omnibus-broadband-initiative-(obi)-technical-paper-spectrum-analysis-options-for-broadband-spectrum.pdf).

²² Technical Paper at 30.

²³ Information regarding the *Broadcast Engineering Forum*, including video of its closing session, is available on the Commission’s website at <http://reboot.fcc.gov/workshops/broadcast-engineering-forum>.

improvements in transmission and reception of television signals on VHF channels, and 4) advancements in video compression technology, including use of video compression for stations sharing channels. Separate panels were convened on each of these issues to solicit technical information and input. The reports of each of the four panels, lists of the panel members and other information are available on the Commission's website.²⁴ This information was used in developing the proposals in this Notice regarding channel sharing by broadcast television licensees and will be used also in preparing future proposals in this proceeding.

10. *Allotment Optimization Model.* As part of its effort to improve the efficiency of U/V Band spectrum use, the Commission has undertaken the development of a model for optimizing the assignment of channels to television stations nationwide. This model, the Allotment Optimization Model (the "AOM" or the "Model"), allows the user to optimize broadcast channel assignments when clearing spectrum for new uses, subject to technical and other constraints. An initial version of this model was used by the staff in developing the spectrum analyses underlying the recommendations for recovery of U/V Bands spectrum set forth in the *Plan* and the Technical Paper. We anticipate that the fully developed model will be completed and validated in the near future for use in subsequent stages of this process to increase the efficient use of the U/V Bands and facilitate ongoing wireless innovation.

III. DISCUSSION

11. Wireless broadband services are in high demand by the public and that demand is expected to grow significantly in the coming years. As discussed in the *Plan*, we are concerned that the growth of wireless broadband services will be constrained if sufficient spectrum is not made available to enable mobile network expansion and technology upgrades.²⁵ Without additional spectrum, users of mobile services will be faced with congestion and degraded service, or much higher prices, or both. Specifically, lack of sufficient spectrum will lead to more blocked and/or dropped calls/connections, slower connection rates and significantly higher prices for desirable applications and services. It is essential to our nation's economic future that the demand for a robust mobile broadband infrastructure is met. Given its desirability for use by mobile wireless systems, the UHF spectrum currently occupied by broadcast television, in particular, is one of a number of areas the Commission is looking at to ensure that our spectrum policies address the need for additional spectrum for mobile broadband. For example, we have recently taken actions to make additional spectrum available for mobile broadband services in frequencies currently used by mobile satellite operations and the Wireless Communications Service.²⁶ We are also working with the National Telecommunications and Information Administration to identify additional spectrum that may be made available for flexible commercial use, including wireless broadband services.²⁷

12. We are faced with an important opportunity to provide more flexibility and greater efficiency in use of the U/V bands spectrum. While the ATSC digital television standard used for television

²⁴ *Id.*

²⁵ See *Plan* at 77.

²⁶ See *Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz*, ET Docket No. 10-142, *Notice of Proposed Rulemaking and Notice of Inquiry*, 25 FCC Rcd 9481 (2010); see also *Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band*, ET Docket No. 07-293, 25 FCC Rcd 11710 (2010).

²⁷ See *Plan and Timetable to Make Available 500 Megahertz of Spectrum for Wireless Broadband*, U.S. Department of Commerce, October 2010 and *An Assessment of the Near-Term Viability of Accommodating Wireless Broadband Systems in the 1675-1710 MHz, 1755-1780 MHz, 3500-3650 MHz, and 4200-4220 MHz, 4380-4400 MHz Bands*, U.S. Department of Commerce, October 2010.

broadcasting in this country provides for a data rate of 19.4 mbps,²⁸ that data rate is fixed irrespective of whether it is actually being used for transmission of television programming or other services such that at times a TV channel is essentially idle. For example, if a TV station transmits an HD program that uses an average of 10 mbps and one additional 2.5 mbps video program, approximately 7 mbps of the stations available capacity/bandwidth would be unused. Any applications that use a portion of the capacity of a television signal are constrained to the ATSC transmission system and do not have the option of a radiofrequency return path in the same spectrum. In keeping with our intention to ensure that the spectrum is used as efficiently and effectively as possible, whether in terms of bandwidth or data capacity, we offer the proposals below.

13. This Notice takes the first step towards achieving these important objectives by proposing additional frequency allocations, a framework that will permit two or more television stations to share a single six-megahertz channel, and changes to rules for use of the VHF band to improve its utility for television service. We recognize that broadcast television provides an important service to the public, and our actions in this proceeding will take full account of the vital role played by over-the-air television while increasing the flexible use of spectrum in a manner that meets consumer and business needs. We remain committed to preserving the free, over-the-air broadcast television service and maintaining the diversity of local voices and important informational and entertainment benefits it provides the American public.

14. It is our strong intention to provide for an orderly transition of a portion of the U/V Bands to flexible use, in a manner that will minimize any impact on over-the-air television broadcasting and the consumers it serves, both off-the-air and through multichannel video program distributors. In this regard, broadcast television stations and other primary services operating on the spectrum to be recovered will be co-primary with and be protected from interference from new broadband services for as long as they remain on channels in that spectrum.

15. To facilitate the recovery of underutilized television channels while continuing to maintain existing broadcast television services, we are also proposing in this Notice new rules that would allow a television service licensee to voluntarily reduce its occupation of spectrum by offering to operate on a shared six megahertz channel. Under this provision, all of the stations sharing channels would broadcast their services through the same ATSC digital television signal using that signal's multicasting capabilities. Each licensee would have the same rights and service obligations as a licensee operating from a full channel today, including the right to carriage by cable and satellite providers pursuant to the rules for mandatory carriage or retransmission consent.²⁹ We believe that channel sharing could be beneficial to certain licensees, particularly those that wish to save on their operating costs or minimize the amount of their investment in spectrum or transmission facilities. In addition, channel sharing could provide an incentive for broadcasters to relinquish spectrum for a portion of the proceeds of the revenues of a U/V Band spectrum auction, subject to Congress providing the Commission the authority to conduct an incentive auction. Further, channel sharing could offer opportunities for broadcasters serving minority, foreign language and niche interests that might have smaller audiences and lower income to operate at reduced cost and thereby improve their viability. In allowing stations to share channels, we note that in some instances changes in the operation of television stations could raise the possibility of interference to radioastronomy operations on channel 37 or to services operating on frequencies immediately above channel 51. It is our intent that any channel or other facilities changes that might be requested as part of sharing agreements not result in increased interference to radioastronomy operations on channel 37 or to operations of other services above channel 51. We request comments on specific steps that could be

²⁸ Terrestrial digital television broadcasting in the U.S. is transmitted using the Advanced Television Systems Committee's (ATSC) A/53 (video), A/52 (audio) and A/65 (program and system information protocol) standards. See 47 C.F.R. § 73.682(d)

²⁹ 47 C.F.R. § 76.51-.70.

taken as part of the implementation of our sharing rules to mitigate the potential for such interference. We describe our initial proposed rules for channel sharing by television licensees in this Notice. We also are aware that broadcasters have encountered technical issues in using VHF channels to provide satisfactory service to viewers. We intend to consider rule changes and other alternatives for making the VHF channels more desirable for DTV operation. Our proposals for adding new allocations to the U/V bands, channel sharing by television stations and improving television service from VHF channels are discussed below.³⁰

A. Spectrum Allocations

16. *New Spectrum Allocations.* We are proposing changes to the U.S. Table of Frequency Allocations in Section 2.106 of the rules that would allow us to make a significant portion of the spectrum currently used for broadcast television available for flexible use, including fixed and mobile wireless broadband services.³¹ To facilitate repurposing of a portion of the U/V Bands in a later action, we are proposing in this Notice to add allocations for fixed and mobile services in the U/V Bands (excluding channel 37) for non-Federal use, to be co-primary with that for broadcast services.³² This proposal would also expand the existing land mobile allocation in the areas where PLMRS and CMRS systems operate on specified frequencies in the 470-512 MHz band to be the same more generalized and flexible mobile allocation that would be specified for other frequencies in the U/V Bands.

17. These new allotments would allow us to consider the entire range of the U/V Bands in selecting the specific frequencies to be designated for new licensed and/or unlicensed uses. This approach will provide maximum flexibility in planning for the future assignment of a portion of the U/V Bands for flexible use, including new broadband services. Our goal is to adopt a band plan that will provide for flexible use while continuing to support the needs of the television service. We are not proposing to change or add to the existing allocations for land mobile (medical telemetry and medical telecommand) and radioastronomy that are at 608-614 MHz (at channel 37).³³ We request comment on this proposed plan for adding new allocations to the U/V Bands and invite suggestions for alternative approaches.

³⁰ It is important to note the potential effect the proposals outlined in this Notice may have on technical coordination with Canada and Mexico. The current international agreements with Canada and Mexico identify specific technical criteria and specific stations, with acceptable parameters, in a plan of U.S. and foreign assignments that was negotiated with each country. To the extent, future Commission action causes any broadcast station in the border regions to alter its existing station structure, the Commission will need to coordinate these changes with Canada and Mexico. In addition, the current agreements in place only offer protection for the existing primary services in the U/V bands. The Commission would need to reach new coordination agreements with Canada and Mexico to cover implementation of new wireless broadband services in these frequency bands in the border areas.

³¹ 47 C.F.R. § 2.106.

³² The land mobile service is a mobile service between base stations and land mobile stations, or between land mobile stations. A base station is a land station in the land mobile service. A land mobile station is a mobile station in the land mobile service capable of surface movement within the geographical limits of a country or continent. The fixed service is a radiocommunication service between specified fixed points. 47 C.F.R. § 2.1(c).

³³ The operations of land mobile services on channels 14-20 and the Offshore Radiotelephone Service on channels 15-17 in regions along the Gulf of Mexico and the reservation of channel 17 for inter-island communications in Hawaii could be affected by our proposal to recover U/V Bands spectrum if the bands to be recovered encompassed all or portions of channels 14-20. We would address appropriate changes for the Private Land Mobile Service and the Offshore Radiotelephone Service in the event that we were to decide to recover spectrum now used by those services.

B. Broadcast Television Channel Sharing

18. The *Plan* recommends that, to facilitate the recovery of spectrum, the Commission initiate a rulemaking proceeding to “establish a licensing framework to permit two or more stations to share a six-megahertz channel.”³⁴ We believe that the option of channel sharing, in addition to aiding in the broadband goals of the *Plan*, could also be beneficial to the television industry and to viewers. Television stations operating on shared channels could use the cost savings and additional income from such arrangements to strengthen their financial condition and to develop new and enhanced programming. Channel sharing could also provide existing small- and minority-owned stations an opportunity to enhance or preserve their local program offerings. We anticipate providing broadcast stations an opportunity to voluntarily elect to share a channel. We therefore seek comment in this proceeding on the development of an appropriate regulatory structure for voluntary television channel sharing that will preserve over-the-air television as a healthy, viable medium going forward, in a way that would benefit consumers overall, while establishing mechanisms to make available additional spectrum for flexible broadband uses.

19. We envision, consistent with the *Plan*, that two stations could generally broadcast one primary HD video stream each over a shared six-megahertz channel or more than two stations broadcasting in SD (not HD) could share a six-megahertz channel.³⁵ As noted in the *Plan*, “numerous permutations are possible, including dynamic arrangements whereby broadcasters sharing a channel reach agreements to exchange capacity to enable higher or lower transmission bit rates depending on market-driven choices.”³⁶ In this regard, we observe that at the Broadcast Engineering Forum participants expressed concerns that sharing a single channel would not be practical because it would not provide sufficient transmission capacity for two or more stations to offer the highest quality HD programming simultaneously. Stations were also concerned that channel sharing could impact or eliminate current and future DTV services, such as expansion of high-definition programming and deployment of mobile television service. We intend to consider these issues in this proceeding and welcome comments on these concerns.

20. Other approaches to channel sharing that involve sub-channel services such as mobile broadcast may also be possible. We seek comment on those approaches. The only requirement would be that all stations utilizing a shared channel be required to retain at least enough spectrum to operate one SD channel.³⁷ We seek comment on this approach and whether stations sharing a single channel will be able to continue to comply with the requirement to operate at least one SD channel.

21. In designing a channel sharing plan that will result in the more efficient use of television spectrum and free channels for flexible use, our goal will be to retain as much of our existing policy framework for allocating, licensing, and operating television stations as possible. Despite sharing a single channel and transmission facility, each station will continue to be licensed and operated separately, have its own call sign and be separately subject to all of the Commission’s obligations, rules, and policies. Each station’s programming obligations will remain the same (e.g., children’s programming, political broadcasting, EAS, indecency), and a station will not be responsible for the programming or violations of any other station sharing its channel. In addition, stations sharing a channel will retain their rights to

³⁴ *Plan* at 88.

³⁵ *Id.*

³⁶ *Id.* 90. These arrangements could further mitigate any risk to HD signal quality resulting from reduced bandwidth capacity per station.” *Id.* at note 99.

³⁷ Television stations are required to “transmit at least one over-the-air video broadcast signal provided at no direct charge to viewers.” See *Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service, Fifth Report and Order*, 12 FCC Rcd 12809, 12859 (1997); 47 C.F.R. § 73.624(b) & (c).

mandatory carriage. While the licensees sharing a given channel and facility will independently maintain their own rights and obligations under their respective licenses, we do not envision that channel sharing, from a technological perspective would entail a fixed split of the six-megahertz channel into two three-megahertz blocks. Rather, the capacity of the six-megahertz would be shared and we would leave it up to the licensees to determine the precise manner in which that capacity would be shared. Moreover, we observe that the Commission has licensed spectrum on a shared use basis – with each licensee remaining responsible for its own obligations and holding its own licensed rights – for a variety of services and under a number of different frameworks. For example, during the course of charting out an MSS licensing regime for Big LEO systems, the Commission adopted a plan in which four CDMA systems would each be authorized to operate over 11.35 megahertz of bandwidth in the same 1.6 GHz band, leaving the inter-system coordination to the satellite licensees themselves. Other examples of shared use include certain Part 90 Private Land Mobile Radio Services (where the large number of shared users are coordinated through a system of frequency coordinators), many Part 95 Personal Radio Services (such as the General Mobile Radio Service, where licensees share the same channels through an informal system of cooperation), and the Part 97 Amateur Radio Service (where all frequencies are shared and coordinated by adherence to rules of operation set forth in Part 97). We seek comment on how television broadcast stations can most effectively coordinate their individual rights and responsibilities while operating under the type of sharing arrangement proposed here. Finally, we point out that only where necessary to implement a shared channel licensing scheme will we seek to change our existing policies and rules.

22. We also propose to limit channel sharing to television stations with existing applications, construction permits or licenses as of the date of adoption of this Notice. Our dual intentions in proposing this channel option are to provide 1) a means for stations that may need to be more economically efficient in their operations to share transmission resources and 2) a path for stations to make their spectrum available for new broadband services and continue to operate a broadcast television service. We request comment on this proposal.

1. Basic Qualifications for Channel Sharing

23. Voluntary operation of broadcast stations on shared channels will help to increase the efficient use of the U/V Bands while ensuring that local public interest and service requirements continue to be fulfilled. Since we ultimately seek an appropriate, market-based balance with flexible use in the U/V Bands, we expect that the extent of channel sharing will vary between markets.

a. Commercial and Noncommercial Educational Stations

24. We seek comment on whether commercial and noncommercial educational (NCE) stations should be permitted to share a single television channel. NCE television stations operate on special reserved channels and are prohibited from airing commercial material.³⁸ We contemplate that stations that share a channel will continue to be licensed and operated separately, although they will be sharing a single transmitting facility. Therefore, there would be no overlap of programming between a commercial and NCE station. However, we seek comment on whether a commercial station should be permitted to operate on a shared channel reserved for NCE use. We seek to determine how the new “shared” channel might be partitioned or designated to preserve the NCE status while allowing the channel to be shared by a non-NCE entity.

³⁸ See 47 U.S.C. § 399B; Revised Program Policies and Reporting Requirements Related to Public TV and Radio Programming, *Notice of Proposed Rulemaking*, 87 FCC 2d 716, 730 (1981) and Reexamination of Comparative Standards for Noncommercial Educational Applicants, *Further Notice of Proposed Rulemaking*, 13 FCC Rcd 21167, n.2 (1998).

b. Consideration of Service Losses

25. We seek comment on whether to require that a certain level of television service be preserved in the shared channel environment. Specifically, we seek comment on whether the Commission should consider any prospective loss of television service when determining whether to permit stations to make the modifications to their transmission facilities necessary to achieve channel sharing. Since stations sharing a single television channel must operate from a single transmission facility, changes to one or more of the stations' existing facilities will be necessary for sharing to occur. Such changes could result in a loss of television service to some persons presently able to receive over-the-air signal from one or more of the stations, and could also result in gains to television service.

26. We note that our current policy is to consider losses of service on a case-by-case basis, and we seek comment on continuing that policy in the context of channel sharing arrangements. Although the Commission historically has viewed any loss of service as *prima facie* inconsistent with the public interest, it has been our policy to consider and evaluate any counterbalancing factors an applicant may present to justify service losses.³⁹ This balancing process, to determine whether the projected loss of service will be outweighed by other factors, involves more than a mere comparison of numbers.⁴⁰ The Commission examines the extent of the loss, and whether any "white" or "gray" loss areas will be created.⁴¹ The Commission defines "white area" as an area where the population does not receive any over-the-air television service and "gray area" as one where the population receives only one over-the-air television service.⁴² The Commission may also examine whether the loss area is "underserved," *i.e.*, where the population receives less than five other existing services.⁴³ The Commission may also examine whether the loss involves specialized programming such as that from a network.

27. In terms of counterbalancing factors, the Commission has examined whether gain areas will be created including establishment of first television service, second television service, first network service, etc.⁴⁴ However, the mere fact that total gains exceed losses does not, standing alone, constitute an affirmative factor offsetting those losses.⁴⁵ The Commission may also consider the availability of other television services in the loss area⁴⁶ as well as whether the population which would lose service is outside the station's DMA and is predicted to receive the same network programming from a station in their home DMA. We seek comment on whether to consider these factors in a similar fashion when evaluating losses that result from facility modifications and relocations related to channel sharing.

28. In weighing the public interest benefits that will result from channel sharing, should we consider mitigating circumstances such as the percentage of local cable penetration or satellite use in the loss area? Should sharing stations be allowed to offset otherwise disqualifying service losses by offering to deploy on-channel Digital Transmission Systems (DTS) or other technical measures to restore service

³⁹ See *Hall v. FCC*, 237 F.2d 567, 572 (D.C.Cir.1956).

⁴⁰ See *West Michigan Telecasters, Inc.*, 22 F.C.C.2d 943, *recon. denied*, 26 F.C.C.2d 668 (1970), *aff'd*, 460 F.2d 883 (D.C.Cir.1972).

⁴¹ See *John McCutcheon d/b/a Communications*, 4 FCC Rcd 2079, 2083 n. 3 (1989).

⁴² See *Apogee, Inc.*, 99 FCC 2d 979, ¶ 7 (1985).

⁴³ See *Cambridge and St. Michaels, Maryland*, 19 FCC Rcd 2592 (AD 2004).

⁴⁴ See *John McCutcheon d/b/a MCC Communications*, 4 FCC Rcd 2079 (1989) (permitting modification that resulted in first network service to 30,000 persons).

⁴⁵ See *Central Coast Television*, 14 FCC 2d 985, 1001 (Rev. Bd. 1968).

⁴⁶ See, e.g., *Eagle 22, Ltd.*, 7 FCC Rcd 5295 (1992) (permitting a modification where at least 60 percent of the population in the loss area was within the Grade B contours of between five and 17 full-service stations).

to the loss area?⁴⁷

c. Other Issues

29. In addition to the specific areas set forth above, we seek comment on other areas of interest with respect to channel sharing in conjunction with the recommendations of the *Plan*. For instance, what is the impact of channel sharing on the media ownership rules? We contemplate that stations that share a channel will continue to be licensed and operated separately, although they will be sharing a single transmitting facility. What are the implications of channel sharing for the local TV ownership rule, the radio/TV cross-ownership rule and the newspaper/broadcast cross-ownership rule?

2. Preservation of Must Carry Rights

30. Full power television broadcast stations, and certain qualified low-power television broadcast stations, have a right to carriage on cable systems that the Supreme Court has recognized as essential to preserving “the widest possible dissemination of information from diverse and antagonistic sources.”⁴⁸ Full power broadcasters have similar rights to mandatory carriage on satellite (DBS) systems.⁴⁹ The rules proposed in this proceeding are designed to ensure that stations voluntarily electing to share a channel retain their existing rights to mandatory carriage, and we seek comment on such rules.

31. The Communications Act of 1934, as amended, provides for the mandatory carriage, by cable operators and satellite providers, of certain local broadcast signals.⁵⁰ The Act and our implementing rules⁵¹ establish slightly different thresholds for carriage, depending on whether the station is full power or low-power, or commercial or noncommercial, and also depending on whether carriage is sought on a cable or DBS system. Stations meeting these thresholds are guaranteed carriage of only a single “primary” stream of programming, and carriage for any additional streams must always be negotiated.⁵² It is our intent to adopt a channel sharing framework that will neither increase nor decrease the carriage rights of any broadcaster on any type of system. We anticipate, therefore, that regardless of the number of licensed stations sharing a six-megahertz channel, each would continue to have at least one, but only one, “primary” stream of programming. We seek comment on the specific proposals below and in general on the rules necessary to achieve this result.

32. *Cable Carriage.* A full power commercial station is entitled to carriage on a cable system when it is “licensed and operating on a channel regularly assigned to its community by the Commission,” and that community is within the same DMA as the cable system.⁵³ A qualified noncommercial educational station (“NCE”), on the other hand, can be considered “local,” and eligible for mandatory

⁴⁷ See Digital Television Distributed Transmission System Technologies, *Report and Order*, 23 FCC Rcd 16731 (2008).

⁴⁸ *Turner Broadcasting System, Inc. v. FCC*, 520 U.S. 180, 192-193 (1997) (internal citations and quotations omitted); see also 47 U.S.C. §§ 534 and 535.

⁴⁹ 47 U.S.C. §338.

⁵⁰ See 47 U.S.C. §§ 338, 534, 535.

⁵¹ *Broadcast Signal Carriage Issues*, 8 FCC Rcd 2965 (1993); see also, *Broadcast Signal Carriage Issues*, 9 FCC Rcd 6723 (1994) and *Implementation of the Satellite Home Viewer Improvement Act of 1999*, Report and Order, 16 FCC Rcd 1918 (2000).

⁵² See, *Carriage of Digital Television Broadcast Signals: Amendments to Part 76 of the Commission’s Rules*, CS Docket No. 98-120, *Second Report and Order and First Order on Reconsideration*, 20 FCC Rcd 4516 (2005) (reiterating the Commission’s rejection of mandatory multicast carriage).

⁵³ 47 U.S.C. § 534(h)(1)(A).

carriage on a cable system, in one of two ways. It may either be licensed to a principal community within 50 miles of the system's headend, or place a "Grade B" signal⁵⁴ over the headend.⁵⁵ Under very narrow circumstances, certain low-power broadcasters can also become "qualified" and eligible for must carry.⁵⁶ Among the several requirements for reaching "qualified" status with respect to a particular cable operator, the low-power station must be "located no more than 35 miles from the cable system's headend."⁵⁷

33. *DBS Carriage.* A full power station is entitled to request carriage by a DBS provider any time that provider relies on the statutory copyright license⁵⁸ to retransmit the signal of any other "local" full power station⁵⁹ (*i.e.*, one located in the same DMA⁶⁰). The standards are the same for both commercial and noncommercial broadcasters, and low-power broadcasters do not have DBS carriage rights.⁶¹

34. *Carriage of Shared Signals.* We seek comment on whether the procedures we propose herein would ensure that a television station operating on a shared channel would continue to be:

⁵⁴ In the digital broadcasting context, the Commission uses the digital noise limited service contour ("NLSC"), set forth in 47 C.F.R. § 73.622(e), in place of the analog Grade B contour, set forth in 47 C.F.R. § 73.683(a). *See In the Matter of 2010 Quadrennial Regulatory Review – Review of the Commission's Broadcast Ownership Rules Adopted Pursuant to Section 202 of the Telecommunications Act of 1996*, Notice of Inquiry, 25 FCC Rcd 6086, 6117 n. 148 (2010) (stating that the Commission developed the digital NLSC to approximate the same probability of service as the Grade B contour and has stated that the two are roughly equivalent). This has been true in both cable proceedings and in other settings (satellite proceedings, ownership proceedings, etc.). *See, e.g., Tennessee Broadcasting Partners, Memorandum Opinion and Order*, 25 FCC Rcd. 4857, 4859 at ¶ 6, footnote 14 (2010) (stating that the Commission has treated a digital station's noise-limited service contour as the functional equivalent of an analog station's Grade B contour). Congress has also acted on the presumption that the two standards are roughly equivalent, in the recently adopted STELA legislation, by adopting parallel definitions for households that are "unserved" by analog (measured by Grade B) or digital (measured by NLSC) broadcasters. 17 U.S.C. § 119(d)(10)(A)(i). The two standards define the noise-limited service contours for the respective analog and digital television transmission systems.

⁵⁵ 47 U.S.C. § 535(1)(2).

⁵⁶ 47 U.S.C. § 534(h)(2). The Commission's rules implementing this section state that a low-power station becomes qualified for mandatory carriage if the station conforms to the Commission's LPTV rules, broadcasts for at least the minimum number of hours required of commercial broadcast stations by the Commission, and adheres to certain Commission requirements regarding non-entertainment programming and equal employment opportunity. 47 C.F.R. § 76.55(d)(1), (2). However, an LPTV station will not be qualified unless the Commission determines that the provision of programming by such station would address local news and informational needs not being adequately served by full service television stations, because such full service stations are distant from the LPTV station's community of license. 47 C.F.R. § 76.55(d)(2). In addition, the LPTV station must comply with the Commission's interference regulations for LPTV stations; it must be within 35 miles of the cable system's principal headend and deliver to the headend a good quality over-the-air signal; its community of license and the franchise area of the cable system must both have been located outside of the largest 160 Metropolitan Statistical Areas (MSAs) on June 30, 1990, and the population of the LPTV station's community of license on that date must not have exceeded 35,000; and there cannot be any full service television station licensed to any community within the county or other political subdivision (of a State) served by the cable system. 47 CFR § 76.55(d)(3)-(6).

⁵⁷ 47 C.F.R. § 76.55(d)(4).

⁵⁸ 17 U.S.C. § 122.

⁵⁹ 47 U.S.C. § 338(a)(1) (stating that satellite carriers must carry "upon request the signals of all television broadcast stations located within that local market").

⁶⁰ 17 U.S.C. § 122(j)(2).

⁶¹ 47 U.S.C. §§ 338(a)(1) and (3).

- “licensed and operating on a channel regularly assigned to its community by the Commission (for purposes of cable carriage of a commercial station)”;⁶²
- licensed to a specific “principal community” or configured with technical facilities that have an NLSC that encompasses the cable system’s principal headend (for purposes of cable carriage of a non-commercial station);⁶³ and
- “located within” a designated market area (for purposes of DBS carriage of commercial and noncommercial stations).⁶⁴

35. *NCE Issues.* We seek comment on whether an NCE television station sharing a channel with a commercial television station could affect the NCE station’s continued eligibility for carriage.⁶⁵ This is particularly relevant in the cable context, because, as discussed above, commercial stations and NCEs must meet different criteria in order to be eligible for mandatory carriage. Because we anticipate that sharing stations would continue to be licensed and operated separately, we do not anticipate that an NCE television station would lose its NCE status or eligibility by sharing a channel with a commercial station. We seek comment on this issue.

36. *Technical Issues.* We also seek comment on whether a station sharing a channel with one or more other stations, or the redesignation of a given 6 MHz channel as a “shared” channel, would affect the stations’ ability to request local carriage on cable and DBS systems serving subscribers within the stations’ market. Are there any unique aspects of channel sharing that could prevent a broadcaster, of any type, from achieving the necessary thresholds for mandatory carriage on any cable or DBS system on which it is currently carried? Cable and DBS systems are currently receiving the full 6 MHz signal from broadcasters but only carrying certain streams; would there be any technical differences, from the carrier’s perspective, if two or more of these streams on a shared channel were the “primary” streams of different, individually licensed stations? Are there other technical issues that would be unique to a sharing scenario?

37. *Differing Elections.* Even if a commercial station meets the threshold for carriage, it may elect to pursue retransmission consent agreements with one or more MVPDs.⁶⁶ When a station has made such an election, it may not be carried by the MVPD without its consent. We seek comment on how stations’ carriage rights would be affected if one sharing station elects retransmission consent and the other elects must carry. As noted above, we anticipate that each station operating on a shared channel will be licensed and operated as a totally distinct entity with its own “primary” stream of programming, and that the sharing of a channel would not affect a sharing station’s carriage election options or rights. We seek comment on this issue, particularly any technical implications for carrying one stream of a broadcast channel while not carrying another.

38. *Shared signal issues.* There are certain essential issues inherent to sharing a channel that we expect will be resolved by stations sharing a channel. For example, in addition to the threshold requirements discussed above, local stations are only eligible for mandatory carriage if they provide a “good quality signal” of at least -61 dBm to the cable or satellite provider.⁶⁷ Failure to provide this signal

⁶² 47 U.S.C. § 534(h).

⁶³ 47 U.S.C. § 535(l)(2); *see also, supra* note [X] (discussing the use of the NLSC in place of Grade B).

⁶⁴ 47 U.S.C. § 338(a)(1).

⁶⁵ *See supra* ¶¶ 24, 32.

⁶⁶ 47 U.S.C. § 325(b); *see also* §(b)(2)(A) (noncommercial stations may not elect retransmission consent).

⁶⁷ 47 U.S.C. §§ 338(b), 534(h)(1)(B)(iii). *See also Carriage of Digital Television Broadcast Signals*, First Report and Order and Further Notice of Proposed Rulemaking, 16 FCC Rcd 2598 (2001) (establishing the service level for cable) and *Implementation of the Satellite Home Viewer Improvement Act of 1999: Local Broadcast Signal Carriage Issues and Retransmission Consent Issues*, Second Report and Order, Memorandum Opinion and Order, and Second

level would therefore affect the carriage rights of all stations using the same channel. We anticipate that stations will make any necessary changes to their proposed shared transmission facility to ensure continued carriage for sharing stations. We seek comment on what those changes might be, and, in general, what matters must be resolved by the stations themselves to ensure the success of channel sharing.

39. *New Stations.* Currently, licensees of newly operating stations that are otherwise qualified local stations may seek mandatory carriage of such stations, even outside of the standard election cycle.⁶⁸ If we permit new stations, or permittees with unbuilt stations, to operate on shared channels, will we need any revisions to our rules in order to ensure that they are eligible to seek mandatory carriage as new stations after they commence broadcasting? We seek comment on this issue.

40. *Low-power Stations.* We are considering allowing LPTV, Class A, and translator stations to operate on shared channels, both among themselves and with full power stations.⁶⁹ If we do permit low-power stations to operate on shared channels, we are also proposing to provide that currently qualified low-power stations retain their eligibility for must carry rights, but to create no new rights. We seek comment on these proposals. Are there other issues we should consider with regard to allowing low power stations to channel share?

41. *Other Carriage Issues.* There are a number of other issues that may be relevant to the mandatory carriage of shared signals. For instance, if, as we propose, one stream of each individually licensed station on a single 6 MHz channel will be “primary” for purposes of must carry rights, should sharing broadcasters have any special obligation to identify the “primary” signals at the time they elect carriage?⁷⁰ Given the variety of questions that may have some bearing on the development of these rules, we seek comment on any issues pertaining to the mandatory carriage of shared broadcast signals, including those not specifically raised in this Notice.

C. Improving Reception of VHF TV Service

42. Recognizing that UHF spectrum is highly desirable for flexible use, we are interested in exploring the steps needed to increase the utility of VHF spectrum for television broadcasts. VHF channels have certain characteristics that have posed challenges for their use in providing digital television service. In particular, the propagation characteristics of these channels allow undesired signals and noise to be receivable at relatively farther distances, nearby electrical devices tends to emit noise in this band that can cause interference, and reception of VHF signals requires physically larger antennas that are generally not well suited to the mobile applications expected under flexible use, relative to UHF channels. We recognize that television broadcasters have had some difficulty in ensuring consistent reception of VHF signals, and we seek comment through this Notice on technical changes to Commission rules, broadcast transmission equipment, or television receiver technology, that would improve VHF for television broadcasts, including the costs and benefits associated with such changes. Our intent is to treat stakeholders in a fair and equitable manner through procedures established in later action.

(...continued from previous page)

Further Notice of Proposed Rulemaking, 23 FCC Rcd 5351 (2008) (adopting identical requirements in the satellite context).

⁶⁸ 47 C.F.R. §§ 76.64(f)(5) and 76.66(d)(3); see *supra* ¶[7] for a more general discussion of permitting sharing for new stations.

⁶⁹ See *discussion supra* ¶ 22 for a more general discussion of permitting sharing for low-power stations.

⁷⁰ See *supra* ¶ 31. Currently, although each broadcaster has only a single “primary” stream of programming that is potentially eligible for mandatory carriage, we do not regulate the manner in which that stream is identified by the broadcaster.

43. *Background.* The VHF TV reception difficulties appear to be most common among consumers who use indoor antennas. Complaints from individuals typically have indicated that a consumer who was previously able to receive a station's analog VHF signal was not able to receive that station's digital VHF signal. Most of these reports involved situations where the consumer was using an indoor antenna. In addition, earlier in the transition process it was recognized that use of the low-VHF channels 2-6 for digital service could be particularly difficult because of the generally higher levels of background noise on those channels.⁷¹

44. Independent investigations of currently marketed indoor antennas by the consulting engineering firm of Meintel, Sgrignoli and Wallace (MSW) and our Laboratory staff showed large variability in the performance (especially intrinsic gain) of indoor antennas available to consumers, with most antennas receiving fairly well at UHF and the substantial majority not so well to very poor at high-VHF. The MSW study reported net gain in receiving UHF signals that ranged from +21.0 to -6.2 dB relative to a ½-wave dipole antenna, with the great majority above 6 dBd (negative gain indicates that the tested antenna showed performed worse than the reference half-wave dipole). However, the net gain in receiving high VHF signals was generally much lower, with the substantial majority having negative gain ranging down as low as -25.0 dBd; only three of the 10 tested antennas showed positive gain at high-VHF.⁷² The study by the FCC Laboratory staff similarly showed reception capabilities at high-VHF channels that were lower than a reference biconical antenna.⁷³ We note that neither of these studies examined antenna performance in receiving low-VHF signals. Nonetheless, we would expect that because of the need for longer elements to receive longer wavelength low-VHF signals, it is likely that the reception capabilities of an indoor antenna at low-VHF will generally to be less than at high-VHF. We note that many indoor antennas are not marketed for reception of low-VHF channels.

45. As indicated above, the engineers participating in our Broadcast Engineering Forum indicated the view that the options for improving TV service on the VHF channels, especially those in the low-VHF band, are limited. They indicated that while practical power increases could marginally improve reception there are physical and practical limitations to achieving any significant reception improvement.⁷⁴ Their general opinion was that the effect of a power increase would not be sufficient to compensate for reception problems caused by the increased RF noise level in the band and physical limitations on the size and efficiency of the transmit and receive antennas.⁷⁵ They submitted that VHF power improvement of as much 10 dB would be possible, but difficult, and higher than that would be

⁷¹ To assist consumers in resolving these and other DTV reception problems, the Commission has prepared and made available several Fact Sheets and Consumer Advisories. See for example "Antennas and Digital Television" and "Troubleshooting Guide for Digital-to-Analog Converter Boxes and Digital Televisions, which are available at <http://www.dtv.gov/publications.html>. In addition, the Association for Maximum Service Television and the Commission have jointly published a tip sheet "Consumer Tips for DTV Reception Problems on VHF TV Channels 2-13" and an advisory "Consumer Advisory: Proper Use of Indoor Antennas for Over-the-Air Television Reception"; these are available at www.dtv.gov and <http://www.mstv.org/docs>.

⁷² See *A Report on Television Indoor Antenna Performance Attributes*, Gary Sgrignoli and Dennis Wallace, Meintel, Sgrignoli and Wallace, LLC, Waldorf, MD, May 8, 2007. The MSW study examined 10 indoor antennas (5 passive and 5 active, *i.e.*, with a pre-amplifier). Three of these antennas performed relatively well in both the high-VHF and UHF bands. Those three antennas provided gain at VHF ranging from +7.2 to +24.3 dB.

⁷³ See *Investigation of High VHF Band DTV Reception, Report: TR 09-1004*, Thomas W. Philips, Laboratory Division, Office of Engineering and Technology, Federal Communications Commission, August 12, 2009 (revised September 15, 2009). The FCC Laboratory study examined indoor antenna performance and interference from localized noise sources and; it examined the ability of 12 models of indoor antennas to receive local high-VHF signals off-the-air but did not measure their gain.

⁷⁴ See VHF Report at Slide 21.

⁷⁵ *Id.* at Slide 27.

impractical.⁷⁶ The broadcast engineering panel also indicated reducing the spurious and out-of-band emissions from consumer devices might help.

46. *Solutions for VHF Reception Challenges.* It is plain from the channel choices being made by broadcasters that reception problems are posing problems for use of the VHF channels. We are therefore seeking solutions to the VHF digital TV reception difficulties. In this regard, we are considering changes to our DTV operating rules to mitigate or overcome these challenges. We also intend to consider other solutions, including the possibility of indoor antenna performance standards, to make the VHF channels more useful to broadcasters. We also note that we have seen no indications that there are issues with the performance of television receivers, either traditional models with display screens or stand-alone set-top tuners, in receiving VHF channels.

47. *VHF Band Noise/Power Increases.* One of the problems with indoor VHF reception is noise from nearby (typically in the same room) consumer electronics equipment. While it would be desirable to reduce that noise, the rules limiting spurious emissions from unintentional radiators have been crafted to provide protection of licensed services while allowing production of economically viable devices. Further, any more stringent limits we might impose would not reduce emissions from existing products, nor would such limits reduce noise from incidental emitters (electric motors, switches, etc.), atmospheric disturbances and long range propagation effects that occur in the VHF bands (the latter especially at the low-VHF channels).⁷⁷ Thus, at least at this time, we do not believe it would be fruitful to attempt to reduce the permitted level of noise in the VHF bands. We request comment on whether there are actions we might take to reduce noise levels in the VHF bands used by the television service.

48. The other approach to overcoming noise is to increase the signal-to-noise ratio (S/N ratio) by raising the transmitted power, *i.e.*, effective radiated power (ERP). A number of stations operating on high-VHF channels have already improved their service by increasing their transmitted power.⁷⁸ Those stations received special temporary authorizations from the Commission for power increases that exceed the existing maximum power limits.⁷⁹ In each of these cases, either the power increase does not cause increased interference to other stations or the station licensee has negotiated with another station to accept some minimum level of new interference. While we are cognizant of the views regarding the limited expectations from power increases expressed at the Broadcast Engineers' Forum, we nonetheless believe that, as demonstrated by the stations that have already increased their transmitted power, such increases can provide some level of improvement in reception of VHF television service. We therefore believe it may be desirable to amend our rules to increase the maximum allowed ERP for VHF stations at least in Zone I, where the current maximum power levels are relatively low. We are specifically proposing to raise the nominal maximum allowed ERP for low-VHF stations in Zones I to 40 kW and for high-VHF stations in Zone I to 120 kW if the station's antenna height above average terrain is 305 meters or less. At antenna heights above 305 meters, the maximum power for both low-VHF and high-VHF stations would be lower in accordance with the table in the proposed rules in Appendix A. This proposal would effectively increase the maximum power for low-VHF and high-VHF stations in Zone I by 6 dB, a level

⁷⁶ *Id.* at Slide 14.

⁷⁷ See *First Report and Order* in GEN Docket No. 87-389, 4 FCC Rcd 3493 (1989) at ¶ 75.

⁷⁸ See for example, WHAS-TV, Louisville, KY, Ch. 11, BDSTA-20091014AAM; WABC-TV, New York, NY, Ch. 7, BDSTA-20100108ACK; WUSA, Washington, DC, Ch. 9, BDSTA-20091218ACS; WPVI, Philadelphia, PA, Ch. 6, BLDSTA-20090619ABQ; KRCR-TV, Redding, CA, Ch. 7, BDSTA-20090717ABBADD. These stations were previously operating at power levels below the maximum allowed levels.

⁷⁹ The maximum transmitted power limits for low-VHF and high-VHF stations are set forth in Sections 73.622(f)(6) and .622(f)(7), respectively, 47 C.F.R. §§ 73.622(f)(6) and (f)(7). § Those limits are nominally: 10 kW (Zone I) and 45 kW (Zones II and III) ERP for low-VHF stations and 30 kW (Zone I) and 160 kW (Zones II and III) ERP for high VHF stations.

consistent with that indicated as achievable by the VHF Reception Panel. We are not proposing to raise the maximum power limits for VHF stations in Zones II and III, as the existing limits still afford those stations the ability to provide stronger signals indoors to consumers who view their signals at locations close to their transmitters. The proposed new maximum power limits for VHF stations would allow such stations to provide signal strengths to areas close to their transmitters, *i.e.*, generally their principle community areas, that are higher by an amount that would help to compensate for some of the higher noise levels that tend to be present where consumers use indoor antennas.

49. Stations requesting power increases under the proposed new limits would be subject to affording protection to other full power television stations from new interference under the existing regime of desired-to-undesired (D/U) signals limits.⁸⁰ We believe such an increase would nonetheless allow many VHF stations experiencing difficulties in reaching viewers indoors to raise their signal levels by a reasonable level to overcome localized noise indoors, consistent with maintaining the approximate range of service provided by the existing maximum power limits. We do, however, recognize that higher power operation would increase the service range of VHF stations by as much as 14 km (9 miles). It is not generally our intention to extend the service range of these stations, as such expansions can to some degree limit the potential for introduction of new stations and changes by other co-channel and first-adjacent channel stations by enlarging the service area that must be protected. Nonetheless, we believe the interests of making the VHF channels more useful to stations and consumers outweigh these concerns about limiting opportunities of other stations. We request comment on this proposal and suggestions for alternative approaches, including both power limits and protection of service. In this regard, any increases in VHF power under this proposal by existing stations and new stations that are located within 300 kilometers (183 miles) of our border with Canada or within 400 kilometers (248.5 miles) of our border with Mexico will need to be coordinated with the appropriate foreign administration.

50. We also observe that the provisions governing transmission of television signals in Sections 73.682(a)(14) and 73.625(c) of the rules specify that it shall be standard to employ horizontal polarization. The ERP of a television station is therefore considered to be that of its horizontally polarized component. However, Section 73.682(a)(14) also provides that circular or elliptical polarization may be employed and that, in such cases, transmission of the horizontal and vertical components in time and space quadrature shall be used. Where such polarizations are used, the ERP of the vertically polarized component may not exceed the ERP of the horizontally polarized component. Stations therefore could achieve an increase in signal levels at indoor locations of perhaps 3 dB by using circular polarization. This step could also be combined with an increase in ERP (horizontal ERP) under the proposal to allow higher VHF maximum power levels. We encourage stations to make use of the option to use increased power under the vertical polarization provisions as a means to improve reception of their signals by indoor viewers.

51. A collateral issue that arises in the context of our consideration of increases in the power limits for digital television stations on VHF channels is whether we should also increase the minimum distance requirements for new, post-transition channel allotments with regard to other stations or channel allotments on the same and first-adjacent channels, as specified in Sections 73.616 and 73.623(d) of the rules.⁸¹ Stations on new allotments that operate at the proposed new power limits and are at or close to

⁸⁰ The D/U limits for protection of television service are set forth in Section 73.623(c), 47 C.F.R. § 73.623(c).

⁸¹ Section 73.616 sets forth requirements for protection of existing services from interference resulting from digital television stations operating on new channels added to the post-transition DTV Table of Allotments; these provisions invoke the geographic spacing requirements (distance standards) in Section 73.623(d), *see* 47 C.F.R. §§ 73.616(b) and 73.623(d). Specifically, Section 73.616(b) provides, *inter alia*, that “[a] petition to add a new channel to the post-transition DTV Table of Allotments contained in section 73.622(i) of this subpart will not be accepted unless it meets: the DTV-to-DTV geographic spacing requirements in § 73.623(d) with respect to all existing DTV allotments in the post-transition DTV Table ...”

the current minimum distances with regard to other stations could cause more interference to such stations (and vice versa) than would occur under the current power limits. Increasing those distances would resolve the interference concerns but would also tend to limit opportunities for new stations or for stations desiring to change channels (which necessitates modifying the allotment on which they operate). We generally believe it would be desirable to maintain the current distance standards for new and changed allotments in order to avoid further limiting opportunities for new allotments. We therefore are not proposing to change the minimum distance requirements for new and modified allotments.

52. In taking this approach, we observe that the rules require a station that operates on a new allotment that meets the distance standards to protect other co-channel and adjacent channel stations from new interference in accordance with the desired-to-undesired (D/U) ratio interference protection criteria in Section 73.616(e).⁸² In describing the services to be protected, this paragraph provides that “[f]or this purpose, the population served by the station receiving additional interference does not include portions of the population within the noise-limited service contour of that station that are predicted to receive interference from the post-transition DTV allotment facilities of the applicant ...” The rules are not specific, however, as to the post-transition DTV allotment facilities of the applicant, that is, the facilities that a station would be allowed under the allotment without concern for new interference. We propose to amend Section 73.616(e) to clarify that the post-transition DTV allotment facilities are the maximum facilities allowed currently under Section 73.622(f). Thus, an applicant for a new station would be allowed to operate up to the current maximum facilities of ERP and antenna height on a new allotment that meets the distance requirements.

53. A station on a new allotment could also operate with facilities that exceed the post-transition allotment facilities if such operation would not cause new interference to other stations as defined under Section 73.616(e). In addition, a licensee could apply to operate a station on a new allotment at facilities that exceed the post-transition allotment facilities (up to the proposed new limits) and could possibly cause new interference to another station by taking steps to avoid such interference. Such steps could include use of a directional antenna and/or location if the station’s transmitter at a site that is different from the site of the allotment (such sites are generally farther from any stations that would otherwise receive interference). We request comment on our plan to maintain the existing distance requirements as we increase the maximum allowed power for digital TV stations on VHF channels and on whether we should alternatively increase the minimum distance requirements to match the changes in the power limits. We also ask parties that advocate that we increase the minimum distance requirements to submit suggestions for new minimum distance standards.⁸³

54. *Indoor Antennas.* The antenna used to receive signals is a critical element in the television service path. The antenna component of a TV receive system (which consists of an antenna, connecting cable and receiver) should be able to pick up as much of the available signal energy as possible. If an antenna has a very low ability to receive signals or if the level of the desired signal is low, reception may not be possible.⁸⁴ In view of the observed poor high-VHF reception capabilities of the majority of the indoor antennas examined in the two studies mentioned above and the likelihood that the low-VHF performance of those antennas is even poorer, we intend to consider establishing standards to ensure that indoor antennas are effective for low-VHF channel reception. While we have not regulated these

⁸² See 47 C.F.R. § 73.616(e).

⁸³ We note that the existing minimum distance standards do not provide interference protection that meets the desired-to-undesired signal ratios in Section 73.623(c) and licensees are required to demonstrate that their station will not cause interference in the application process.

⁸⁴ We point out that the presence of spurious noise generally does not exacerbate reception difficulties in cases where the antenna used has low gain. In such instances, a low gain antenna will receive less of the energy of both the noise and desired signal.

products previously, we believe that we have authority to set standards to ensure that the performance of indoor antennas is adequate to allow reception of low-VHF channels by TV receive systems under the All Channel Receiver Act, which is codified in Section 303(s) of the Communications Act of 1934, as amended.⁸⁵ In this regard, Section 303(s) specifically provides that the Commission shall “[h]ave authority to require that apparatus designed to receive television pictures broadcast simultaneously with sound be capable of *adequately* receiving all frequencies allocated by the Commission to television broadcasting...”⁸⁶ Because an antenna capable of adequately picking up low-VHF channels is necessary to allow all-channel reception of over-the-air broadcast signals, we believe that the standards proposed below would further our Section 303(s) mandate. We request comment on our authority to establish standards for the ability of indoor antennas to receive all of the channels allocated for television service.⁸⁷

55. We request comment, information and suggestions regarding the need for, and desirability of, standards for indoor antennas. We are specifically proposing to require that indoor antennas, comply with the industry set standards in ANSI/CEA-2032-A, “Indoor TV Receiving Antenna Performance Standard,” February 2009.⁸⁸ The ANSI/CEA-2032-A standard defines test and measurement procedures for determining the performance of indoor TV receiving antennas. Section 3.2.2 of this standard provides that to meet the standard, an antenna must have measured gain that exceeds:

- -12 dBd on all CEA test channels 2, 4, and 6 in the VHF low band
- -8 dBd on all CEA test channels 7, 9, 11 and 13 in the VHF high band and
- -8 dBd on all CEA test channels contained in the UHF band (channels 14-[51])

ANSI/CEA-2032-A further specifies that the test procedures in CEA-744-B are to be employed to measure the antenna performance.⁸⁹ It also provides standards for active (amplified) antennas, including gain, intermodulation and spurious emission. Further, it provides for labeling antenna packaging and antennas to indicate the channels or bands of channels for which the antenna meets the specified technical requirements. We observe that the high-VHF and UHF performance levels under this industry-developed standard are well within the capabilities of the antennas tested in the MSW and FCC Laboratory studies of indoor antennas. Under this proposal, all indoor television antennas would be required to meet the ANSI/CEA-2032-A standards for reception of low-VHF, high-VHF and UHF signals. In addition, to ensure compliance with these standards indoor antennas would be subject to the Commission’s “verification” equipment procedure in Part 2 of the rules.⁹⁰ This would promote our objective of improving indoor reception in the VHF bands and well as ensure that indoor antennas are able to adequately receive UHF signals. Antennas that are built-in to, or designed for use with, specific devices such as portable television receivers, dongles, laptop computers, and similar TV reception equipment would not be subject to this requirement. Given the findings of the antenna studies by MSW and our Laboratory staff discussed above, we believe that the performance levels set forth in ANSI/CEA-2032-A

⁸⁵ 47 U.S.C. 303(s).

⁸⁶ All Channel Receiver Act, Pub.L. No. 87-529, 76 Stat. 150, codified at 47 U.S.C. § 303(s) (emphasis added). *See Elec. Indus. Assoc. Consumer Elec. Group v. FCC*, 636 F.2d 689, 694-96 (D.C.Cir. 1980) (discussing Act and its legislative history).

⁸⁷ We have seen no indications that there are VHF/UHF performance issues with outdoor antennas that result in consumers not able to receive either VHF or UHF signals. While many outdoor antennas currently on the market are designed for only VHF or only UHF reception, consumers do not seem to have difficulties in identifying and obtaining the outdoor antenna(s) they need to receive the television signals available in their area.

⁸⁸ ANSI/CEA-2032-A is available from Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado 80112-5704, <http://global.ihs.com> or e-mail global@ihs.com.

⁸⁹ *See* CEA-744-B, February 2009. This standard is also available from Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado 80112-5704, <http://global.ihs.com> or e-mail global@ihs.com.

⁹⁰ The verification procedure is set forth in Sections 2.951-2.956 of the rules, 47 C.F.R. §§ 2.951-2.956.

are well within the capabilities of currently available consumer grade television receive antennas.

56. We request comment on whether the ANSI/CEA-2032-A performance standards are sufficient to ensure adequate reception of digital television signals at most indoor locations and whether the CEA-744-B measurement procedures are appropriate for determining compliance. We also ask whether there might be other standards or measurement methods that might be more appropriate. Our intent is to ensure that consumers are able to achieve indoor reception of digital television signals, and especially of VHF signals, that is comparable to indoor reception of the signals of the former analog television system. We also ask for comment an alternative approach under which we would require only that manufacturers measure indoor antennas using the CEA-744-B test procedure and comply with the labeling requirements of ANSI/CEA-2032-A. Under this approach, antennas would also be subject to our verification equipment authorization procedure. We invite interested parties to submit comment, information and suggestions for alternative standards regarding all aspects of the indoor antenna issue.

57. *Other Approaches/Solutions for Improving Reception of VHF TV Services.* In addition to power increases for VHF band stations and standards for indoor antennas, we also intend to consider additional options for improving television service in the VHF bands. Interested parties are invited to submit ideas and suggestions for additional measures we could take to improve reception of television signals on VHF channels. We request that parties submit materials information and analyses describing conditions and phenomenon that contribute to VHF reception difficulties and ideas for overcoming or mitigating them.

IV. PROCEDURAL MATTERS

58. *Initial Regulatory Flexibility Analysis for the Notice of Proposed Rule Making.* As required by Section 603 of the Regulatory Flexibility Act, 5 U.S.C. § 603, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities of the proposals suggested in this document. The IRFA is set forth in Appendix B.

59. *Initial Paperwork Reduction Analysis.* The *Notice of Proposed Rule Making* contains proposed new or modified information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget (OMB) to comment on the information collection requirements contained in this document, as required by the Paperwork Reduction Act of 1995, Public Law 104-13. Public and agency comments are due [X] days after the date of publication in the Federal Register. Comments should address: (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology. In addition, pursuant to the Small Business Paperwork Relief Act of 2002,⁹¹ we seek specific comment on how we might "further reduce the information collection burden for small business concerns with fewer than 25 employees."

60. In addition to filing comments with the Secretary, a copy of any comments on the Paperwork Reduction Act information collections requirements contained herein should be submitted to the Federal Communications Commission via email to PRA@fcc.gov and to Nicholas A. Fraser, Office of Management and Budget via email to Nicholas_A_Fraser@omb.eop.gov or via fax at (202) 395-5167.

61. *Ex Parte Rules – Permit-But-Disclose Proceeding.* This is a permit-but-disclose notice and comment rulemaking proceeding. Ex parte presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed as provided in the Commission's rules. *See generally*

⁹¹ Public Law 107-198, *see* 44 U.S.C. 3506(c) (4).

47 C.F.R. §§ 1.1202, 1.1203, and 1.1206(a).

62. *Comments.* Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using: (1) the Commission's Electronic Comment Filing System (ECFS), (2) the Federal Government's eRulemaking Portal, or (3) by filing paper copies. See *Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: <http://fjallfoss.fcc.gov/ecfs2/> or the Federal eRulemaking Portal: <http://www.regulations.gov>.
- Paper Filers: Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

People with Disabilities: To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

63. *Further Information.* For further information, contact, Alan Stillwell of the Office of Engineering and Technology, at (202) 418-2470, or via the Internet at alan.stillwell@fcc.gov or Hugh Van Tuyl Office of the Engineering and Technology, at (202) 418-2472, or via the Internet at hugh.vantuyl@fcc.gov.

V. ORDERING CLAUSES

64. IT IS ORDERED that pursuant to Sections 4(i), 301, 302, 303(e), 303(f) and 303(r) of the Communications Act of 1934, as amended, 47 USC Sections 154(i), 301, 302, 303(e), 303(f) and 303(r), this *Notice of Proposed Rule Making* IS ADOPTED.

65. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *Notice of Proposed Rule Making*, including the Initial Regulatory Flexibility Analysis to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A
PROPOSED RULES

Parts 2, 15, and 73 of Title 47 of the Code of Federal Regulations are proposed to be amended as follows:

**PART 2 – FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS;
GENERAL RULES AND REGULATIONS**

1. The authority citation for part 2 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

2. Section 2.106, the Table of Frequency Allocations, is amended as follows:

a. Pages 19, 20, 24, and 28 are revised.

b. In the list of Non-Federal Government (NG) Footnotes, footnotes NG66 and NG149 are removed.

§ 2.106 Table of Frequency Allocations.

The revisions read as follows:

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
47-68 BROADCASTING	47-50 FIXED MOBILE	47-50 FIXED MOBILE BROADCASTING 5.162A	47-49.6	47-49.6 LAND MOBILE NG124	Private Land Mobile (90)
			49.6-50 FIXED MOBILE	49.6-50	
5.162A 5.163 5.164 5.165 5.169 5.171	50-54 AMATEUR	54-68 FIXED MOBILE BROADCASTING 5.162A 5.166 5.167 5.167A 5.168 5.170	50-73	50-54 AMATEUR	Amateur Radio (97)
	54-68 BROADCASTING Fixed Mobile			54-72 FIXED MOBILE BROADCASTING	Broadcast Radio (TV)(73) LPTV, TV Translator/ Booster (74G) Low Power Auxiliary (74H)
	5.172			5.162A	
	68-74.8 FIXED MOBILE except aeronautical Mobile			68-74.8 FIXED MOBILE	
5.149 5.175 5.177 5.179	68-72 BROADCASTING Fixed Mobile	68-74.8 FIXED MOBILE 5.149 5.176 5.179	73-74.6 RADIO ASTRONOMY US74 US246 74.6-74.8 FIXED MOBILE US273	NG5 NG14 NG115	
	5.173				
	72-73 FIXED MOBILE			72-73 FIXED MOBILE	Public Mobile (22) Aviation (87) Private Land Mobile (90) Personal Radio (95)
	73-74.6 RADIO ASTRONOMY				
	74.6-74.8 FIXED MOBILE				Private Land Mobile (90)
74.8-75.2 AERONAUTICAL RADIONAVIGATION			74.8-75.2 AERONAUTICAL RADIONAVIGATION		Aviation (87)
5.180 5.181			5.180		
75.2-87.5 FIXED MOBILE except aeronautical mobile	75.2-75.4 FIXED MOBILE		75.2-75.4 FIXED MOBILE		Private Land Mobile (90)
	5.179		US273		

5.175 5.179 5.187 87.5-100 BROADCASTING	75.4-76 FIXED MOBILE	75.4-87 FIXED MOBILE	75.4-88	75.4-76 FIXED MOBILE NG3 NG49 NG56	Public Mobile (22) Aviation (87) Private Land Mobile (90) Personal Radio (95)
	76-88 BROADCASTING Fixed Mobile	5.182 5.183 5.188 87-100 FIXED MOBILE BROADCASTING		76-88 FIXED MOBILE BROADCASTING NG5 NG14 NG115	
	5.185 88-100 BROADCASTING		88-108	88-108 BROADCASTING NG2	Broadcast Radio (FM)(73) FM Translator/Booster (74L)
5.190 100-108 BROADCASTING			US93	US93 NG5	
5.192 5.194 108-117.975 AERONAUTICAL RADIONAVIGATION			108-117.975 AERONAUTICAL RADIONAVIGATION		Aviation (87)
5.197 5.197A 117.975-137 AERONAUTICAL MOBILE (R)			US93 US343		
			117.975-121.9375 AERONAUTICAL MOBILE (R)		
			5.111 5.200 US26 US28 US403		
			121.9375-123.0875	121.9375-123.0875 AERONAUTICAL MOBILE	
			US30 US31 US33 US80 US102 US213	US30 US31 US33 US80 US102 US213	
			123.0875-123.5875 AERONAUTICAL MOBILE		
			5.200 US32 US33 US112		
			123.5875-128.8125 AERONAUTICAL MOBILE (R)		
			US26 US403		
			128.8125-132.0125	128.8125-132.0125 AERONAUTICAL MOBILE (R)	
			132.0125-136 AERONAUTICAL MOBILE (R)		
			US26		
			136-137	136-137 AERONAUTICAL MOBILE (R)	
5.111 5.200 5.201 5.202			US244	US244	

174-223 BROADCASTING	174-216 BROADCASTING Fixed Mobile 5.234	174-223 FIXED MOBILE BROADCASTING	174-216	174-216 FIXED MOBILE BROADCASTING NG5 NG14 NG115	Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H)
	216-220 FIXED MARITIME MOBILE Radiolocation 5.241		216-217 Fixed Land mobile US210 US241 G2	216-219 FIXED MOBILE except aeronautical mobile US210 US241 NG173	Maritime (80) Private Land Mobile (90) Personal Radio (95)
	5.242		217-220 Fixed Mobile US210 US241	219-220 FIXED MOBILE except aeronautical mobile Amateur NG152 US210 US241 NG173	Maritime (80) Private Land Mobile (90) Amateur Radio (97)
	220-225 AMATEUR FIXED MOBILE Radiolocation 5.241		220-222 FIXED LAND MOBILE US241 US242		Private Land Mobile (90)
5.235 5.237 5.243		5.233 5.238 5.240 5.245	222-225	222-225 AMATEUR	Amateur Radio (97)
223-230 BROADCASTING Fixed Mobile		223-230 FIXED MOBILE BROADCASTING			
	225-235 FIXED MOBILE	AERONAUTICAL RADIONAVIGATION Radiolocation 5.250	225-235 FIXED MOBILE	225-235	
5.243 5.246 5.247		230-235 FIXED MOBILE AERONAUTICAL RADIONAVIGATION			
230-235 FIXED MOBILE		5.250	G27		
5.247 5.251 5.252			235-267 FIXED MOBILE	235-267	
235-267 FIXED MOBILE					
5.111 5.252 5.254 5.256 5.256A			5.111 5.256 G27 G100	5.111 5.256	

456-459 FIXED MOBILE 5.286AA 5.271 5.287 5.288		456-459 5.287 5.288		456-460 FIXED LAND MOBILE 5.287 5.288 NG12 NG112 NG124 NG148		Public Mobile (22) Maritime (80) Private Land Mobile (90)	
459-460 FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	459-460 FIXED MOBILE 5.286AA MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C 5.209	459-460 FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	459-460				
460-470 FIXED MOBILE 5.286AA Meteorological-satellite (space-to-Earth)		460-470 Meteorological-satellite (space-to-Earth)		460-462.5375 FIXED LAND MOBILE 5.289 US201 US209 NG124 462.5375-462.7375 LAND MOBILE 5.289 US201 462.7375-467.5375 FIXED LAND MOBILE 5.287 5.289 US73 US201 US209 NG124 467.5375-467.7375 LAND MOBILE 5.287 5.289 US201 467.7375-470 FIXED LAND MOBILE 5.288 5.289 US73 US201 NG124		Private Land Mobile (90) Personal Radio (95) Private Land Mobile (90) Personal Radio (95) Maritime (80) Private Land Mobile (90)	
5.287 5.288 5.289 5.290		5.287 5.288 5.289 US73 US201 US209					
470-790 BROADCASTING	470-512 BROADCASTING Fixed Mobile 5.292 5.293	470-585 FIXED MOBILE BROADCASTING 5.291 5.298	470-608	470-608 FIXED MOBILE BROADCASTING NG5 NG14 NG115	Public Mobile (22) Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H) Private Land Mobile (90)		
	512-608 BROADCASTING 5.297	585-610 FIXED MOBILE BROADCASTING RADIONAVIGATION 5.149 5.305 5.306 5.307	608-614 LAND MOBILE (medical telemetry and medical telecommand) RADIO ASTRONOMY US74	608-614 LAND MOBILE (medical telemetry and medical telecommand) RADIO ASTRONOMY US74		Personal Radio (95)	
	608-614 RADIO ASTRONOMY Mobile-satellite except aeronautical mobile-satellite (Earth-to-space)	610-890 FIXED MOBILE 5.313A 5.317A BROADCASTING	US246	614-698	614-698 FIXED MOBILE BROADCASTING NG5 NG14 NG115	Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H)	
5.149 5.291A 5.294 5.296 5.300 5.302 5.304 5.306 5.311A 5.312	614-698 BROADCASTING Fixed Mobile 5.293 5.309 5.311A	5.149 5.305 5.306 5.307 5.311A 5.320					

PART 15 – RADIO FREQUENCY DEVICES

3. The authority for Part 15 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, 304, 307, 336, and 544a.

4. Section 15.38 is amended by adding new paragraphs (b)(14) and (b)(15) to read as follows:

§ 15.38 Incorporation by Reference.

* * * * *

(b) * * *

(14) ANSI/CEA-2032-A: “Indoor TV Receiving Antenna Performance Standard,” May 2005, IBR approved for § 15.117(l).

(15) ANSI/CEA-744-B: “TV Receiving antenna Performance Presentation and Measurement,” February 2009, IBR approved for § 15.117(l).

5. Section 15.117 is amended by adding new paragraph (l) to read as follows:

§ 15.117 TV Broadcast Receivers.

* * * * *

(l) *Indoor Antennas*. Effective [12 MONTHS AFTER ADOPTION OF THE FINAL ORDER IN THIS PROCEEDING], antennas intended for indoor reception of television broadcast service shall comply with the standards set forth in ANSI/CEA-2032-A: “Indoor TV Receiving Antenna Performance Standard,” May 2005, (incorporated by reference, *see* § 15.38(c)), including the requirement for measurements in accordance with the procedures set forth in ANSI/CEA-744-B: “TV Receiving antenna Performance Presentation and Measurement,” February 2009, (incorporated by reference, *see* § 15.38(c)). Antennas that are built-in to, or designed for use with specific devices, such as portable television receivers, dongles, laptop computers, and similar TV reception equipment are not be subject to this requirement.

PART 73 – RADIO BROADCAST SERVICES

6. The authority for part 73 continues to read as follows:

Authority: 47 U.S.C. 154, 303, 334 and 336

7. Section 73.616 is amended by adding new paragraph (e)(3) to read as follows:

§ 73.616 Post-transition DTV station interference protection.

* * * * *

(e) * * *

(3) The facilities of a post-transition DTV allotment are as follows:

(i) For a station that operates on a channel 2-6 allotment, the allotment ERP is 40 kW if its antenna HAAT is at or below 305 meters and the station is located in Zone I or 45 kW if its HAAT is at or below 305 meters and the station is located in Zone II or Zone III. For a station located in Zone I that operates on channels 2-6 with HAAT that exceeds 305 meters, the allotment ERP, expressed in decibels above 1 kW (dBk) is determined using the following formula, with HAAT expressed in meters:

$$ERP = 92.57 - 33.24 * \log_{10}(HAAT)$$

For a station located in Zone II or Zone III that operates on channels 2-6 with an antenna HAAT that exceeds 305 meters, the allotment ERP level is determined from the following table (the allotment ERP for intermediate values of HAAT is determined using linear interpolation based on the units employed in the table):

Allotment ERP and Antenna
Height for DTV Stations in Zones II or III
On Channels 2-6

Antenna HAAT (meters)	ERP (kW)
610	10
580	11
550	12
520	14
490	16
460	19
425	22
395	26
365	31
335	37
305	45

For a DTV station located in Zone II or Zone III that operates on channels 2-6 with an antenna HAAT that exceeds 610 meters, the allotment ERP expressed in decibels above 1 kW (dBk) is determined using the following formula, with HAAT expressed in meters:

$$ERP = 57.57 - 17.08 * \log_{10}(HAAT)$$

(ii) For a station that operates on a channel 7-13 allotment, the allotment ERP is 120 kW if its antenna HAAT is at or below 305 meters and the station is located in Zone I or 160 kW if its HAAT is at or below 305 meters and the station is located in Zone II or Zone III. For a station located in Zone I that operates on channels 7-13 with HAAT that exceeds 305 meters, the allotment ERP, expressed in decibels above 1 kW (dBk) is determined using the following formula, with HAAT expressed in meters:

$$ERP = 97.35 - 33.24 * \log_{10}(HAAT)$$

For a station located in Zone II or Zone III that operates on channels 7-13 with an antenna HAAT above 305 meters, the allotment ERP level is determined from the following table (the allotment ERP for intermediate values of HAAT is determined using linear interpolation based on the units employed in the table):

Allotment ERP and Antenna
Height for DTV Stations in Zones II or III
On Channels 7-13

Antenna HAAT (meters)	ERP (KW)
610	30
580	34
550	40
520	47
490	54
460	64
425	76
395	92
365	110
335	132
305	160

For a station located in Zone II or Zone III that operates on channels 7-13 with an antenna HAAT that exceeds 610 meters, the allotment ERP expressed in decibels above 1 kW (dBk) is determined using the following formula, with HAAT expressed in meters:

$$ERP = 62.34 - 17.08 * \log_{10}(HAAT)$$

(iii) For a station that operates on a channel 14-51 allotment, the allotment ERP is 1000 kW if its antenna HAAT is at or below 365 meters. At higher antenna HAAT levels, the allotment ERP level for such a station is determined from the following table (the allotment ERP for intermediate values of HAAT is determined using linear interpolation based on the units employed in the table):

Allotment ERP and Antenna
Height for DTV Stations
On Channels 14-51, All Zones

Antenna HAAT (meters)	ERP (kW)
610	10
580	11
550	12
520	14
490	16
460	19
425	22
395	26
365	31

For a station located in Zone I, II or III that operates on channels 14-51 with an antenna HAAT that exceeds 610 meters, the allotment ERP expressed in decibels above 1 kW (dBk) is determined using the following formula, with HAAT expressed in meters:

$$ERP = 72.57 - 17.08 * \log_{10}(HAAT)$$

8. Section 73.622 is amended by revising paragraphs (f)(6) and (f)(7) to read as follows:

§ 73.622 Digital television table of allotments.

* * * * *

(f) * * *

(6) A DTV station that operates on a channel 2-6 allotment will be allowed a maximum ERP of 40 kW if its antenna HAAT is at or below 305 meters and the station is located in Zone I or a maximum ERP of 45 kW if its HAAT is at or below 305 meters and the station is located in Zone II or Zone III. An existing DTV station that operates on a channel 2-6 allotment may request an increase in power and/or HAAT up to these power levels, provided that the increase also complies with the provisions of paragraph (f)(5) of this section.(i) For DTV stations located in Zone I that operate on channels 2-6 with an antenna HAAT that exceeds 305 meters, the allowable maximum ERP, expressed in decibels above 1 kW (dBk) is determined using the following formula, with HAAT expressed in meters:

$$ERP_{max} = 98.57 - 33.24 * \log_{10}(HAAT)$$

(ii) For DTV stations located in Zone II or Zone III that operate on channels 2-6 with an antenna HAAT that exceeds 305 meters, the allowable maximum ERP level is determined from the following table (the allowable maximum ERP for intermediate values of HAAT is determined using linear interpolation based on the units employed in the table):

Maximum Allowable ERP and Antenna
Height for DTV Stations in Zones II or III
On Channels 2-6

Antenna HAAT (meters)	ERP (KW)
610	10
580	11
550	12
520	14
490	16
460	19
425	22
395	26
365	31
335	37
305	45

(iii) For DTV stations located in Zone II or Zone III that operate on channels 2-6 with an antenna HAAT that exceeds 610 meters, the allowable maximum ERP expressed in decibels above 1 kW (dBk) is determined using the following formula, with HAAT expressed in meters:

$$ERP_{max} = 57.57 - 17.08 * \log_{10}(HAAT)$$

(7) A DTV station that operates on a channel 7-13 allotment will be allowed a maximum ERP of 120 kW if its antenna HAAT is at or below 305 meters and the station is located in Zone I or a maximum ERP of 160 kW if its HAAT is at or below 305 meters and the station is located in Zone II or Zone III. An existing DTV station that operates on a channel 7-13 allotment may request an increase in power and/or HAAT up to these power levels, provided that the increase also complies with the provisions of paragraph (f)(5) of this section.

(i) For DTV stations located in Zone I that operate on channels 7-13 with an antenna HAAT that exceeds 305 meters, the allowable maximum ERP, expressed in decibels above 1 kW (dBk) is determined using the following formula, with HAAT expressed in meters:

$$ERP_{max} = 103.35 - 33.24 * \log_{10}(HAAT)$$

(ii) For DTV stations located in Zone II or Zone III that operate on channels 7-13 with an antenna HAAT above 305 meters, the allowable maximum ERP level is determined from the following table (the allowable maximum ERP for intermediate values of HAAT is determined using linear interpolation based on the units employed in the table):

Maximum Allowable ERP and Antenna Height for DTV Stations in Zones II or III On Channels 7-13

Antenna HAAT (meters)	ERP (KW)
610	30
580	34
550	40
520	47
490	54
460	64
425	76
395	92
365	110
335	132
305	160

(iii) For DTV stations located in Zone II or Zone III that operate on channels 7-13 with an antenna HAAT that exceeds 610 meters, the allowable maximum ERP expressed in decibels above 1 kW (dBk) is determined using the following formula, with HAAT expressed in meters:

$$ERP_{max} = 62.34 - 17.08 * \log_{10}(HAAT)$$

● * * * *

APPENDIX B

Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act (RFA),¹ the Commission has prepared this present Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities by the policies and rules proposed in this *Notice of Proposed Rule Making (NPRM)*. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for specified on the first page of this *NPRM*. The Commission will send a copy of this *NPRM*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).² In addition, the *NPRM* and IRFA (or summaries thereof) will be published in the Federal Register.³

A. Need for, and Objectives of, the Proposed Rules

2. In this Notice of Proposed Rulemaking the Commission is initiating a process to address America's growing demand for wireless broadband services, spur ongoing innovation and investment in mobile and ensure that America keeps pace with the global wireless revolution, by making a significant amount of new spectrum available for broadband. Through this Notice, we take preliminary steps to repurpose a portion of the UHF and VHF frequency bands that are currently used by the broadcast television service, which in later actions we expect to make available for flexible use by fixed and mobile wireless communications services, including mobile broadband. This approach is consistent with the National Broadband Plan (the "*Plan*")⁴ recommendation to repurpose 120 megahertz from the broadcast television bands for new wireless broadband uses through revising (repacking) the channel assignments of TV stations and voluntary contributions of spectrum to an incentive auction. Reallocation of this spectrum as proposed will provide the Commission flexibility in providing additional spectrum resources for meeting the needs of these new applications. At the same time, we recognize that over-the-air TV serves important public interests, and our approach will help preserve this service as a healthy, viable medium. We remain mindful of the informational and entertainment benefits broadcast television provides the public, and our goal is to provide additional options for broadcast licensees.

B. Legal Basis

3. The proposed action is authorized under Sections 4(i), 301, 302, 303(e), 303(f), 303(r), of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 301, 302, 303(e), 303(f), and 303(r).

C. Description and Estimate of the Number of Small Entities To Which the Proposed Rules Will Apply

4. The RFA directs agencies to provide a description of and, where feasible, an estimate of the

¹ See 5 U.S.C. § 603. The RFA, see 5 U.S.C. § 601 *et. seq.*, has been amended by the Contract With America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

² See 5 U.S.C. § 603(a).

³ *Id.*

⁴ See *Connecting America: The National Broadband Plan*, Federal Communications Commission, Washington, DC (March 2010); available at <http://www.broadband.gov/plan/>. The *Plan* was developed by the Commission pursuant to the direction of Congress in the American Recovery and Reinvestment Act of 2009 (Recovery Act), see American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009).

number of small entities that may be affected by the proposed rules, if adopted.⁵ The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."⁶ In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.⁷ A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.⁸

5. **Television Broadcasting.** This Economic Census category "comprises establishments primarily engaged in broadcasting images together with sound. These establishments operate television broadcasting studios and facilities for the programming and transmission of programs to the public."⁹ The SBA has created the following small business size standard for Television Broadcasting firms: those having \$14 million or less in annual receipts.¹⁰ The Commission has estimated the number of licensed commercial television stations to be 1,395.¹¹ In addition, according to Commission staff review of the BIA Publications, Inc., Master Access Television Analyzer Database (BIA) on March 30, 2007, about 986 of an estimated 1,395 commercial television stations (or approximately 72 percent) had revenues of \$13 million or less.¹² We therefore estimate that the majority of commercial television broadcasters are small entities.

6. We note, however, that in assessing whether a business concern qualifies as small under the above definition, business (control) affiliations¹³ must be included. Our estimate, therefore, likely overstates the number of small entities that might be affected by our action, because the revenue figure on which it is based does not include or aggregate revenues from affiliated companies. In addition, an element of the definition of "small business" is that the entity not be dominant in its field of operation. We are unable at this time to define or quantify the criteria that would establish whether a specific television station is dominant in its field of operation. Accordingly, the estimate of small businesses to which rules may apply does not exclude any television station from the definition of a small business on this basis and is therefore possibly over-inclusive to that extent.

7. In addition, the Commission has estimated the number of licensed noncommercial educational (NCE) television stations to be 390.¹⁴ These stations are non-profit, and therefore considered

⁵ 5 U.S.C. § 603(b)(3).

⁶ 5 U.S.C. § 601(6).

⁷ 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C. § 632). Pursuant to the RFA, the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register." 5 U.S.C. § 601(3).

⁸ Small Business Act, 15 U.S.C. § 632 (1996).

⁹ U.S. Census Bureau, 2007 NAICS Definitions, "515120 Television Broadcasting" (partial definition); <http://www.census.gov/naics/2007/def/ND515120.HTM#N515120>.

¹⁰ 13 C.F.R. § 121.201, NAICS code 515120 (updated for inflation in 2008).

¹¹ See *FCC News Release*, "Broadcast Station Totals as of June 30, 2009," dated September 4, 2009; http://www.fcc.gov/Daily_Releases/Daily_Business/2008/db0318/DOC-280836A1.pdf.

¹² We recognize that BIA's estimate differs slightly from the FCC total given *supra*.

¹³ "[Business concerns] are affiliates of each other when one concern controls or has the power to control the other or a third party or parties controls or has to power to control both." 13 C.F.R. § 21.103(a)(1).

¹⁴ See *FCC News Release*, "Broadcast Station Totals as of June 30, 2009," dated September 4, 2009; http://www.fcc.gov/Daily_Releases/Daily_Business/2008/db0318/DOC-280836A1.pdf.

to be small entities.¹⁵

8. In addition, there are also 2,386 low power television stations (LPTV).¹⁶ Given the nature of this service, we will presume that all LPTV licensees qualify as small entities under the above SBA small business size standard.

9. **Cable Television Distribution Services.** Since 2007, these services have been defined within the broad economic census category of Wired Telecommunications Carriers; that category is defined as follows: “This industry comprises establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies.”¹⁷ The SBA has developed a small business size standard for this category, which is: all such firms having 1,500 or fewer employees. To gauge small business prevalence for these cable services we must, however, use current census data that are based on the previous category of Cable and Other Program Distribution and its associated size standard; that size standard was: all such firms having \$13.5 million or less in annual receipts.¹⁸ According to Census Bureau data for 2002, there were a total of 1,191 firms in this previous category that operated for the entire year.¹⁹ Of this total, 1,087 firms had annual receipts of under \$10 million, and 43 firms had receipts of \$10 million or more but less than \$25 million.²⁰ Thus, the majority of these firms can be considered small.

10. **Cable Companies and Systems.** The Commission has also developed its own small business size standards, for the purpose of cable rate regulation. Under the Commission’s rules, a “small cable company” is one serving 400,000 or fewer subscribers, nationwide.²¹ Industry data indicate that, of 1,076 cable operators nationwide, all but eleven are small under this size standard.²² In addition, under the Commission’s rules, a “small system” is a cable system serving 15,000 or fewer subscribers.²³ Industry data indicate that, of 6,635 systems nationwide, 5,802 systems have under 10,000 subscribers, and an additional 302 systems have 10,000-19,999 subscribers.²⁴ Thus, under this second size standard, most cable systems are small.

¹⁵ See generally 5 U.S.C. §§ 601(4), (6).

¹⁶ See *FCC News Release*, “Broadcast Station Totals as of June 30, 2009,” dated September 4, 2009; http://www.fcc.gov/Daily_Releases/Daily_Business/2008/db0318/DOC-280836A1.pdf.

¹⁷ U.S. Census Bureau, 2007 NAICS Definitions, “517110 Wired Telecommunications Carriers” (partial definition); <http://www.census.gov/naics/2007/def/ND517110.HTM#N517110>.

¹⁸ 13 C.F.R. § 121.201, NAICS code 517110.

¹⁹ U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, Table 4, Receipts Size of Firms for the United States: 2002, NAICS code 517510 (issued November 2005).

²⁰ *Id.* An additional 61 firms had annual receipts of \$25 million or more.

²¹ 47 C.F.R. § 76.901(e). The Commission determined that this size standard equates approximately to a size standard of \$100 million or less in annual revenues. *Implementation of Sections of the 1992 Cable Act: Rate Regulation*, Sixth Report and Order and Eleventh Order on Reconsideration, 10 FCC Rcd 7393, 7408 (1995).

²² These data are derived from: R.R. Bowker, *Broadcasting & Cable Yearbook 2006*, “Top 25 Cable/Satellite Operators,” pages A-8 & C-2 (data current as of June 30, 2005); Warren Communications News, *Television & Cable Factbook 2006*, “Ownership of Cable Systems in the United States,” pages D-1805 to D-1857.

²³ 47 C.F.R. § 76.901(c).

²⁴ Warren Communications News, *Television & Cable Factbook 2008*, “U.S. Cable Systems by Subscriber Size,” page F-2 (data current as of Oct. 2007). The data do not include 851 systems for which classifying data were not available.

11. **Cable System Operators.** The Communications Act of 1934, as amended, also contains a size standard for small cable system operators, which is “a cable operator that, directly or through an affiliate, serves in the aggregate fewer than 1 percent of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed \$250,000,000.”²⁵ The Commission has determined that an operator serving fewer than 677,000 subscribers shall be deemed a small operator, if its annual revenues, when combined with the total annual revenues of all its affiliates, do not exceed \$250 million in the aggregate.²⁶ Industry data indicate that, of 1,076 cable operators nationwide, all but ten are small under this size standard.²⁷ We note that the Commission neither requests nor collects information on whether cable system operators are affiliated with entities whose gross annual revenues exceed \$250 million,²⁸ and therefore we are unable to estimate more accurately the number of cable system operators that would qualify as small under this size standard.

D. Description of Projected Reporting, Recordkeeping, and other Compliance Requirements for Small Entities

12. The specific bands under consideration are the low VHF spectrum at 54-72 MHz (TV channels 2-4) and 76-88 MHz (TV channels 5 and 6), the high VHF spectrum at 174-216 MHz (TV channels 7-13), and the UHF bands at 470-608 MHz (TV channels 14-36) and 614-698 MHz (TV channels 38-51); for purposes of this Notice, we will refer to this spectrum as the “U/V Bands.”²⁹ This Notice proposes three actions that will establish the underlying regulatory framework to facilitate wireless broadband uses of the U/V Bands, without affecting current license assignments in the band. First, we are proposing to add new allocations for fixed and mobile services in the U/V Bands to be co-primary with the existing broadcasting allocation in those bands. The additional allocations would provide the maximum flexibility for planning efforts to increase spectrum available for flexible use, including the possibility of assigning portions of the U/V Bands for new mobile broadband services in the future. Second, we are proposing to establish a framework that permits two or more television stations to share a single six-megahertz channel, thereby enhancing efficient use of the U/V Bands. Third, we intend to consider approaches to create value for television viewers and broadcasters by increasing the utility of the VHF bands for the operation of television services.

13. By establishing the underlying regulatory framework to facilitate wireless broadband uses in the U/V Bands, this Notice is the first in a series of actions that will allow us to make progress toward our goal of improving efficient use of the bands and enable ongoing innovation and investment through flexible use. We will propose further actions consistent with other of the *Plan’s* recommendations for the U/V Bands, including, but not limited to, the process of voluntarily returning broadcast licenses to the Commission and the licensing process and service rules for new fixed and mobile wireless communications services.

²⁵ 47 U.S.C. § 543(m)(2); see 47 C.F.R. § 76.901(f) & nn. 1-3.

²⁶ 47 C.F.R. § 76.901(f); see Public Notice, *FCC Announces New Subscriber Count for the Definition of Small Cable Operator*, DA 01-158 (Cable Services Bureau, Jan. 24, 2001).

²⁷ These data are derived from: R.R. Bowker, *Broadcasting & Cable Yearbook 2006*, “Top 25 Cable/Satellite Operators,” pages A-8 & C-2 (data current as of June 30, 2005); Warren Communications News, *Television & Cable Factbook 2006*, “Ownership of Cable Systems in the United States,” pages D-1805 to D-1857.

²⁸ The Commission does receive such information on a case-by-case basis if a cable operator appeals a local franchise authority’s finding that the operator does not qualify as a small cable operator pursuant to § 76.901(f) of the Commission’s rules. See 47 C.F.R. § 76.909(b).

²⁹ The band 608-614 MHz, *i.e.*, TV channel 37, is used for radio astronomy and is not part of the spectrum being considered for reallocation. See 47 C.F.R. § 2.106., US 74 and US 246.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

14. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.³⁰

15. We do not propose in this Notice to specify a band plan for the spectrum to be recovered, we do, however, request comment on how we should re-configure the current U/V Bands to ensure that the services involved, *i.e.*, broadcast television as well as new fixed and mobile services, can best be supported. Recognizing that UHF spectrum is useful for mobile services, one approach would be to select the spectrum to be recovered from the upper portion of the UHF band and designate it for use by the wireless communications service (WCS). This would effectively extend the current allocation plan and WCS spectrum in the adjacent WCS bands at 700 MHz (WCS 700 MHz bands) to include new lower adjacent frequencies. Alternatively, it might be technically desirable to configure the bands to provide paired spectrum in separate bands for broadband applications, or to designate a portion of the spectrum for unpaired uses or different wireless services. For example, current rules in the U/V Band allow for unlicensed use of unassigned channels (“white spaces”), and the *Plan* recommended the creation of a nationwide contiguous band for unlicensed use. We also request comment on whether a new U/V Band plan should incorporate an unlicensed block of spectrum, or if other bands would be better suited to this purpose.

16. We seek comment on other areas of interest with respect to channel sharing in conjunction with the recommendations of the National *Plan*. We welcome comments from stations that anticipate that they may participate in channel sharing as well as from other interested parties.

F. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules

17. None.

³⁰ See 5 U.S.C. § 603(c).

**STATEMENT OF
CHAIRMAN JULIUS GENACHOWSKI**

Re: *Innovation in the Broadcast Television Bands: Allocations, Channel Sharing and Improvements to VHF*, ET Docket No. 10-235, Notice of Proposed Rulemaking.

This item is the first of three the Commission is considering today that will help meet our nation's need for cutting-edge wireless services and technologies for the 21st Century – helping spur our economy and create jobs. One way to think of spectrum is as “invisible infrastructure.” Though you can't see it, spectrum is the backbone of our mobile communications infrastructure – and so is essential to one of the most robust and promising sectors of our economy.

We are at an inflection point with our invisible infrastructure. The explosive growth in mobile communications threatens to outpace the infrastructure on which it relies. I've said this before, but it bears repeating and emphasis: If we don't act to update our spectrum policies for the 21st century, we're going to run into a wall – a spectrum crunch – that will stifle American innovation and economic growth and cost us the opportunity to lead the world in mobile communications.

The spectrum crunch threatens to create millions of dissatisfied consumers, who – if we don't tackle this challenge – will be forced to choose between poor service and higher prices.

As we outlined in the National Broadband Plan and more recently at the FCC's Spectrum Summit, we have a two-pronged plan for bridging the gap between spectrum supply and demand. First, we'll pursue policies to drive the most efficient and flexible use of spectrum. Second, we'll seek to bring market forces to bands of spectrum where markets currently aren't given the opportunity to work.

This item advances both goals. It starts what I hope will become a landmark rulemaking to bring efficiency to the use of our TV broadcast spectrum, and lays essential groundwork for market-based policies in the form of voluntary incentive auctions, which I strongly hope Congress authorizes in the near future.

The roughly 300 MHz of spectrum in the TV bands is among the most robust available. Beachfront property. The transition to digital made it possible to transmit over-the-air broadcast programming using less spectrum than before. While some stations are seizing the opportunity to offer multicast streams or mobile TV that serve the public interest, others are not.

We might think of the steady stream of broadcast DTV transmissions as trains with a fixed number of boxcars delivering digital content – but many of the boxcars are empty. This spectrum is too valuable – and our spectrum needs too great – for it to be used inefficiently. Especially given that less than 10% of Americans receive broadcast television only through over-the-air spectrum signals.

Yet our rules currently don't permit certain types of efficient use, such as channel sharing. To stick with the metaphor, channel sharing would allow two or more TV stations to fill the boxcars on a train of spectrum. Today's rulemaking proposes rules for voluntary channel sharing, increased flexibility of allocations, and seeks comment on improving VHF reception. In so doing we lay important groundwork for incentive auctions in the broadcast TV band. Our goal is to be ready to move quickly in the event that Congress authorizes incentive auctions.

I believe that moving forward with incentive auctions is vital to our economy and to American consumers. By bringing market forces to broadcast spectrum, it would free up airwaves for mobile broadband, drive private investment, enhance our global competitiveness, and lead to improved service to consumers. It would also yield significant revenue for the Treasury.

It is fair to broadcasters, providing additional optionality, while recognizing broadcasters' important ongoing obligation to serve the public interest and the needs of viewers who continue to rely only on over-the-air broadcasting.

The action we take today is our first formal step to set the stage for incentive auctions. It's perhaps reminiscent of an action taken more than 20 years ago at the Commission, when the FCC started a process to provide for digital television. While it wasn't headline news at the time, it ultimately led to the emergence of a new generation of TV technology and freed more than 100 megahertz of spectrum that is about to usher in Fourth Generation or 4G wireless services and technologies and new broadband services for public safety.

We know it will not be easy to free up spectrum for mobile broadband from the existing broadcast TV band. Neither was the process that led to the DTV transition and the resulting freeing of spectrum. Yet it is at least as necessary as the process that began more than 20 years ago. And, because of how fast our global competitors are moving, it's essential that we move rapidly. We don't have anywhere close to 20 years.

We can't afford to fall behind, and that is why today, we take this important step to begin the process of freeing up a significant amount of broadcast TV spectrum for mobile broadband.

I thank the staff of the Office of Engineering and Technology, the Wireless Bureau, and the Media Bureau, and the Office of the General Counsel for their hard work on this item. This item is a great example of how we can achieve a great product through close collaboration among Bureaus and Offices.

**STATEMENT OF
COMMISSIONER MICHAEL J. COPPS**

Re: *Innovation in the Broadcast Television Bands; Allocations, Channel Sharing and Improvements to VHF*, ET Docket No. 10-235, Notice of Proposed Rulemaking.

I approach today's Notice with cautious optimism as we begin to contemplate spectrum innovation and how to make the best use of the spectrum we have. I agree that we need to act in a forward-looking manner to realize the tremendous promise of wireless broadband. There are a number of ways to help accomplish this, but we are going to be called upon to think really creatively—and outside the proverbial box—in order to make it a success. I think of this item as contingency planning for the better allocation of spectrum, and that applies to the concept of channel sharing. We don't yet know whether legislative action or economic conditions will allow for implementation of the full range of spectrum recommendations put forth in the National Broadband Plan, but we do know that we need to be smarter about spectrum utilization and that we need to maximize spectrum performance so that it may better serve the many communications needs of the American people.

I am, of course, mightily interested in the future of broadcasting. At the outset, I commend the Notice's recognition of the public value that free-to-all, over-the-air television can bring to American citizens. Many broadcasters have worked hard to turn this value into reality. I believe in the power of broadcasting and the potential for broadcasters to not only survive, but to thrive, if they will but recognize their strengths and the advantages that localism and the public-spirited administration of the airwaves bring to them. It's an advantage that not all—in fact, not nearly enough—broadcasters have pursued. It is no secret that I have been disappointed that so much of the spectrum dividend that accrued to broadcasters as a result of the DTV transition goes dramatically under-utilized. I am not interested in pushing broadcasters somewhere else or in discouraging their enhanced public interest stewardship of the airwaves. But public interest multi-casting remains, all too often, a concept—not a reality. I speak only for myself in saying that had this spectrum been put to such positive use, I would have little interest in contemplating other uses of it. But here we are, trying to divine how scarce and sometimes under-utilized spectrum can best serve consumers and citizens. Between now and such time as channel sharing and incentive auctions and all the rest come our way, maybe more broadcasters will come to see the wisdom of harvesting greater public benefits from the spectrum they are licensed to use.

One of the greatest challenges facing us, as we work to identify spectrum for wireless broadband and other uses, is to make sure that we have a comprehensive understanding of the current spectrum landscape. Surely our future success will depend not only on an understanding of our current spectrum allocations and assignments, but also on its actual use. That's why I am so glad that we continue to make progress on our Spectrum Dashboard—which will require ongoing commitment and resources to achieve its full potential. I know from my experience during the Digital TV transition that major changes in spectrum use can raise many issues, some unforeseen, and require concerted outreach to, and work with, consumers and industry. Consumers generally don't concern themselves much about the arcane details of spectrum allocation, nor should they have to, but they do rightly care that when they turn on a TV or make a call on a smart-phone, it works. And so we must begin a balancing act, weighing the needs and requirements of today and tomorrow.

I am pleased that we ask some difficult questions in this Notice. We need to understand the regulatory framework under which channel sharing would be allowed, the technical implications for broadcasters and viewers, and how any changes would affect over-the-air broadcasting. We also examine ways to improve TV reception in the VHF spectrum. This latter won't be easy, believe me—we looked everywhere we could during the DTV transition, and real remedies were few and far between. Let's hope the months ahead lead us to some genuine innovation.

We do seem to have a consensus that some considerable new amount of spectrum will be required in the wireless world. Without additional spectrum, wireless consumers could face degraded service and/or higher prices. This concerns me. But it also concerns me that—without other safeguards— auctioning off massive amounts of spectrum to incumbent wireless providers may not necessarily result in more consumer-friendly pricing and service. Additional spectrum is, to be sure, an important part of the wireless solution. The whole solution it isn't. I suppose that's the difference between physical spectrum and spectrum policy.

So, this is a good and necessary item. We are teeing up questions that need to be answered, and if there are questions we don't ask, I hope commenters will answer them anyhow. We'll all pay attention! Thank you to Julie Knapp and the team at the Office of Engineering and Technology for the thorough job they did on a very complicated item. Their work continues to amaze me.

**STATEMENT OF
COMMISSIONER ROBERT M. MCDOWELL**

Re: *Innovation in the Broadcast Television Bands: Allocations, Channel Sharing and Improvements to VHF*, ET Docket No. 10-235, Notice of Proposed Rulemaking.

With this Notice, we launch one key initiative in the Commission's larger, ongoing quest to make the most productive use of our nation's spectrum resources. The issue of future uses within the television broadcast band is only part of our overall policy focus on spectrum issues, but it may be the most prominent one. As we go forward in this proceeding, I will remain mindful of the significant public interest benefits that broadcasters deliver. I also understand the need to ensure that any new rules allowing for more flexible uses within the TV band must leave incumbent broadcast licensees with viable opportunities to experiment with their own mix of wireless services, including but not limited to traditional broadcasting.

At the same time, I am excited about the prospects of exploring options for wireless broadband services within the frequencies currently devoted to over-the-air television. Although the Notice directs much of its attention to the concept of voluntary "channel sharing" among broadcasters, I have not reached any conclusion as to whether that approach is the best possible option for getting the most out of the TV band. I would like commenters to tell us more about the feasibility of alternatives that may be used in lieu of, or in conjunction with, channel sharing.

For example, broadcasters already are empowered under Section 336 of the Communications Act to offer a flexible range of "ancillary or supplemental" wireless services in addition to their "primary" broadcast program stream. I've been a longtime proponent of encouraging broadcasters to lease some of their spectrum for wireless broadband purposes, and now is the time to dig into this concept seriously. How would this approach work in the context of increasing the availability of wireless broadband? What are the technical issues, as well as the business feasibility issues? Would this approach be a faster means of getting more spectrum for broadband into the marketplace than the channel-sharing concept? What are the relative strengths and weaknesses of the plan for channel sharing, eventual spectrum-clearing and repacking versus the concept of allowing broadcasting and broadband uses to be interwoven throughout the existing TV band?

I also will review with great interest the submissions we receive on the topic of potential technical improvements for digital broadcasting on VHF channels. As one of the two remaining veteran commissioners of the digital television transition, I have not forgotten the difficult and unanticipated challenges that we and broadcasters on those channels faced at the time of the analog shut-off. Both industry and FCC engineers scrambled throughout the spring and summer of 2009 to try to overcome interference and other reception problems associated with VHF channels. What had been prime real estate in the days of analog broadcasting sometimes became a rough neighborhood in the new digital era. Before the Commission takes action that might lead to more broadcasters

moving back into those channels, I will want to fully understand the ramifications of such a decision.

I thank the staff members in the Office of Engineering and Technology and the Media Bureau for their work on this Notice.

**STATEMENT OF
COMMISSIONER MIGNON L. CLYBURN**

Re: *Innovation in the Broadcast Television Bands: Allocations, Channel Sharing and Improvements to VHF*, ET Docket No. 10-235, Notice of Proposed Rulemaking

I strongly support efforts to encourage more efficient use of all spectrum including broadcast spectrum. So if certain broadcasters are under-utilizing the spectrum we have licensed to them, and for those who are willing to do so on a voluntary basis, I am supportive of any recovery mechanism that would best benefit the public interest. Additionally, I endorse actions that give all of our licensees more flexibility, which will allow for more innovation and competition that will ultimately benefit consumers.

We also have, however, a significant obligation to protect the important public benefits that over-the-air broadcast TV provides for our Nation. As we progress through this, and other proceedings related to the National Broadband Plan's recommendation for reallocating 120 MHz of broadcast spectrum for broadband services, we should carefully study the possible impact that removing broadcast spectrum could have on *all* consumers in local communities.

But I cannot stress enough that we must pay careful attention to those who are most vulnerable to the loss of broadcast television. We learned during the DTV transition that a large number of Americans, such as seniors and the very poor continue to rely on broadcast TV to stay informed. Those communities that heavily depend on broadcast programming should not have to sacrifice those benefits in order for our Nation to attain wireless broadband services. I encourage our staff to work closely with broadcasters and consumer advocates, so that we arrive at a long-term solution that properly balances both of these important interests.

**STATEMENT OF
COMMISSIONER MEREDITH ATTWELL BAKER**

Re: In the Matter of Innovation in the Broadcast Television Bands: Allocations, Channel Sharing and Improvements to VHF, ET Docket No. 10-235 Notice of Proposed Rulemaking

This proceeding is the beginning of a process to evaluate the best means to modernize our spectrum rules for the TV bands. This should be a collaborative process, and we should not begin with preconceived end states or assumptions about particular future uses. Over-the-air broadcasters, mobile broadband providers, and other innovators need the opportunity to help craft rules that will serve the public interest and provide for a robust future for broadcasting and broadband. I believe strongly that we cannot lock in today's technology or business plan for any spectrum user whether it be broadcast or broadband. Central to that principle, we should always aim to provide a future path for innovation and investment, and I am hopeful we can achieve that proper balance in this proceeding. A path focused on future opportunity necessarily requires all stakeholders to demonstrate a willingness to question the status quo and work cooperatively.

We should start every discussion of the TV bands with the recognition that it has only been a year and five months since the full power broadcasters completed their transition to digital. Any successful transition of an additional portion of the TV bands to mobile broadband use should be a consensus-driven process. To facilitate it, we should encourage new technology and innovation in—and more broadly new thinking about—how broadcasters and broadband providers can co-exist.

This Notice takes a number of steps to optimize spectrum usage in the TV bands and provide broadcasters with greater flexibility in how spectrum is used, a hallmark of our modern spectrum policy across bands. To that end, I support the Commission's efforts to add allocations for fixed and mobile services in the UHF and VHF bands. Our overall flexible approach is also evident in the fact that the item does not specify a future band plan for recovered spectrum. I also support proposals to improve operating conditions in the VHF band. As we all know, there were real consequences for reception of VHF signals as a result of the DTV transition.

I accept that this item represents an initial step in updating our TV band rules. Significant and fundamental issues are deferred. In the future, there needs to be a fulsome discussion on additional innovative proposals to address sharing of broadband and broadcast in the TV bands, including the possibility of a broadcast transition from MPEG-2 to MPEG-4, the adoption of a more cellularized broadcast system, or a transition from ATSC to OFDM technologies. These are by no means the only potential approaches and may have their own weaknesses and strengths. And in all fairness, we also should ask additional questions about the future applicability of public interest obligations on broadcast licensees. If the TV bands are to shift towards a more flexible spectrum model, it is only right to ask whether those use restrictions should also be revisited.

We should also acknowledge we need to partner with—and have a good working relationship with—Congress to give us the tools potentially necessary to effectuate our policy decisions. In particular, I am hopeful Congress will soon provide the Commission with authority to conduct incentive auctions as well as other tools to manage spectrum more effectively. These tools can help the Commission offer win-win situations to incumbent and new users of spectrum. Importantly, these are not tools—nor an approach—that should be limited to the TV bands. Indeed, it is critical that we stress that this proceeding is part of a much broader overarching cross-government spectrum reform effort to ensure our nation's long-term competitiveness and a bright future for spectrum-hungry mobile broadband services.

As we fully consider the future of the TV bands, we should also work to avoid the mistakes of the past where the practical impact of allocations in one band had a ripple effect across other users or

inhibited future efforts. In the TV bands, the challenges caused by wireless microphones are the most widely discussed, but the issues surrounding TV channel 51 warrant greater focus. Channel 51 is adjacent to the lower A block in 700 MHz. The presence of high-power broadcast operations in many communities may foreclose the opportunity to build out a broadband offering in 700 MHz. I appreciate that we seek comment on how best to avoid such situations, particularly as it relates to channel 37 and the uppermost channel dedicated to over-the-air broadcasting. If we view the TV bands and our spectrum policy more comprehensively, we can avoid some of these pitfalls going forward. We also cannot ignore the unintended consequences of our prior actions; we need to address existing impediments to investment like the channel 51 issue in an equitable and expedited manner.

I look forward to addressing all of these challenges with my fellow Commissioners. Many thanks to all the Staff who worked on this item.