

**Before the
Department of Commerce
National Telecommunications and Information Administration
1401 Constitution Avenue, NW
Washington, D.C. 20230**

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United States Spectrum Management Policy) Docket No. 040127027-4027-01
for the 21st Century)
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To: Norbert Schroeder, Strategic Spectrum Planning and Reform Division, NTIA

COMMENTS OF THE ASSOCIATION OF PUBLIC TELEVISION STATIONS

The Association of Public Television Stations (“APTS”) hereby submits comments in the above-captioned proceeding.¹ APTS is a nonprofit organization whose members comprise the licensees of nearly all of the nation’s 357 CPB-qualified noncommercial educational television stations. APTS represents public television stations in legislative and policy matters before the Commission, Congress, and the Executive Branch and engages in planning and research activities on behalf of its members.

APTS believes that as the Administration develops and implements a modernized United States spectrum policy in accordance with President Bush’s Executive Memorandum on Spectrum Policy,² it should be aware of a number of issues where federal policy can lead to a more efficient use of scarce electromagnetic spectrum. In

¹ Department of Commerce, National Telecommunications and Information Administration, United States Spectrum Management Policy for the 21st Century, Notice of Inquiry, 69 FR 4923 (Feb. 2, 2004).

² Presidential Memorandum on Spectrum Policy for the 21st Century, 69 FR 1568 (Jan. 9, 2004).

particular, the Administration should support the transition of broadcast television from analog to digital, a transition of which public television has been an enthusiastic proponent.

In this regard, public television has been exploring the conditions under which an early return of analog spectrum may be possible while furthering public television's unique mission to deliver an over-the-air broadcast service to all Americans. An early return of analog spectrum has distinct advantages for public television stations, which must shoulder the substantial costs of operating both digital and analog stations for a period of time likely extending much beyond the end of 2006. An early analog return also has advantages for the wireless industry, as well as the public safety community, which would like to see portions of the television band above channel 51 cleared as soon as possible. In addition, the American public would benefit from an early return as the availability of this prime spectrum could generate economic activity substantially greater than the mere value of the spectrum auction proceeds deposited within the U.S. Treasury.³

However, without mandatory cable and satellite carriage of digital signals, it will be impossible to reach the more than 85 percent of households that access local programming over these pay platforms, which in turn would make an early return of analog spectrum a very difficult proposition indeed. APTS urges the Administration to support mandatory carriage on all such platforms to encourage the transition to digital and the early return of spectrum. Additionally, APTS urges the Administration to assist

³ It has been estimated, for instance, that the value of the additional economic activity generated from the return of this spectrum could be between \$14 billion to \$127 billion each year. Communications Daily, Mass Media Notes (Feb. 23, 2004).

in developing a means of ensuring that the remaining over-the-air analog viewers can receive digital signals through set-top converters or by other means.

In addition, to preserve universal service, APTS urges the Administration to support the promulgation of rules to ensure the reception of public television signals via low power and spectrum efficient digital translators and repeaters. Millions of Americans living in rural communities rely on translators for over-the-air reception and for cable reception of television service. When considering its spectrum policy for the 21st Century, the Administration should pay particular attention to ensuring that Rural America is not left behind in the digital transformation of this nation's telecommunications infrastructure.

Lastly, APTS urges the Administration to continue to provide full funding of the Public Telecommunications Facilities Program within the Department of Commerce. This critical program provides much needed funding for digital capital construction, improvement and repair and will continue to assist the smooth roll-out of the digital transition for public broadcasting.

A. Digital Television Will Use Less Spectrum and Result in Expanded Noncommercial Educational Broadcast Service

It has been amply documented that digital over-the-air broadcasting is a technically more spectrum-efficient means of delivering such services, as channels can be allocated with fewer unused buffer channels in each market, resulting in a significant reduction of the amount of spectrum the TV broadcast service will occupy.

Since the inception of the digital proceedings, APTS has been an enthusiastic proponent of digital television. With its higher quality images and sound, and its inherent flexibility to broadcast either a high-definition or multiple standard definition streams, along with additional streams of data, digital television gives public television stations new and exciting tools to expand their educational mission in ways that were not possible in the analog world.

For instance, public television stations are regularly producing new and exciting high-definition digital programming for national, regional and local distribution. In addition, multicasting will bring new services to the public that could not be made available under the constraints of a single analog program stream, including an expanded distribution of formal educational services, workforce development services, children's programming, locally-oriented public affairs programming, and programming addressed to traditionally unserved or underserved communities. Lastly, a number of public television stations have plans to provide various educational or public safety services over their digital allotment through "datacasting," with data embedded in the digital programming stream.

B. Public Television Is Exploring a Possible Early Return of Analog Spectrum

As the American media landscape is undergoing this fundamental transformation to a wholly digital infrastructure, public television stations have therefore embraced digital technology as a means to revitalize and expand the distribution of noncommercial educational broadcast services. Yet despite this great promise, and the best efforts of the FCC, Congress and the broadcasting industry, it is likely that few communities will have

successfully crossed the bridge to digital-only broadcasting by the projected date of December 31, 2006. A more protracted digital broadcast transition is highly probable.

However, it has quickly become apparent that the costs of a protracted transition could be severely detrimental to the financial health of public television stations. There are therefore major advantages for public television stations to end analog transmission and embrace a date certain for converting to digital transmission only. First, it is projected that analog cessation would save public television \$36 million dollars a year in analog electricity costs alone. Second, early return of analog spectrum would allow public television stations to focus all of their energy and resources on the future, rather than on maintenance and replacement of an aging analog distribution system.

An early return of analog spectrum also has advantages for the wireless industry and the public safety community, which both benefit from having portions of the television band above channel 51 cleared as soon as possible. In addition, as indicated above, the American public would benefit from an early return as the availability of this prime spectrum could generate substantive economic activity.

The white paper attached at Appendix A, which was commissioned by the APTS Board of Trustees, explores the possibilities and conditions under which public television could support either a date-certain or early return of analog spectrum. It explores two potential models to achieve this end and discusses the successful digital transition underway in Europe for purposes of comparison. In addition, this paper examines in turn six critical policy questions that were identified by the APTS Board of Trustees.

- *What is public television's "universal service" responsibility for serving the remaining over-the-air analog audience, and what do we know about*

the population of viewers who get all or a combination of their programming through over-the-air analog transmissions?

- *How reliable is the ATSC Standard for over-the-air digital reception?*
- *What are the costs for consumers to purchase digital equipment and receive digital signals?*
- *What partnerships does Public Television need in order to successfully return analog spectrum early?*
- *What regulatory and legislative strategies are necessary to achieve early return of analog spectrum?*
- *Is the European experience applicable to the United States?*

Lastly, this paper presents a compressed outline of a possible action plan to implement digital-only broadcasting.

- This plan suggests the continuation of FCC policy to encourage band-clearing, coupled with amendments to the Communications Act to establish a series of rolling “hard” transition dates (based on DMA, over-the-air reliance, or some other objective measure) and to mandate a gradual decrease in analog power to effectuate a “fade to black.”
- The plan also suggests that some limited subsidy be created to ensure that the economically disadvantaged have access to digital signals when analog service ceases. This would most likely come in the form of a one-time subsidy or tax credit for the purchase of inexpensive over-the-air set-top boxes.
- To supplement over-the-air reception, the plan also calls for changes to the Communications Act to either mandate full cable and satellite carriage of digital signals after the transition or, alternatively, to mandate the seamless inclusion of ATSC tuners in all digital cable and satellite set-top boxes, without which an early return of analog spectrum would be impossible.
- In addition, the plan suggests that there be a comprehensive and complete publicity campaign regarding the timing of analog cessation and the means of continuing to receive broadcast TV signals, modeled on the success of the Berlin approach.
- The plan also suggests that a successful transition to digital-only broadcasting can only occur through the strategic partnership of public

broadcasters, commercial broadcasters, equipment manufacturers, consumer and affinity groups and others.

- Lastly, the plan notes that a transition to digital-only broadcasting could be facilitated (but is not dependent on) the creation of the U.S. equivalent to Britain's Freeview service in order to encourage consumer adoption of digital over-the-air services through robust market forces.

As the Administration considers its plans for a modernized spectrum policy, APTS urges it to consider the spectrum efficient proposals made in the attached white paper and the associated need for policy changes to support the final outcome of a successful digital transition.

C. Creating Rules to Allow for the Operation of Digital Translators Will Ensure A Means of Preserving Universal Service to Rural America That is Both Technologically Feasible and Spectrum Efficient

Since May 29, 2002, public television has been advocating that the FCC issue rules to allow for the operation of digital translators⁴ and on-channel repeaters.⁵ On August 29, 2003, the FCC released a comprehensive Notice of Proposed Rulemaking concerning the upgrade of translators, repeaters and other low power television station to digital operation.⁶ In addition Congress has repeatedly voiced its interest in a federal policy that supports rural access to free, broadcast service by appropriating nearly \$30 million dollars in federal funds to the Rural Utilities Service in the U.S. Department of

⁴ A digital translator typically operates at low power and receives the signal of either the main transmitter or another translator on one channel and "translates" it into another channel for output to a local area unable to receive the main signal.

⁵ A digital on-channel repeater receives the signal of a main transmitter on one channel while distributing that signal on the same channel to a local area that is unable to receive the main signal.

⁶ Amendment of Parts 73 and 74 of the Commission's Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations, Notice of Proposed Rulemaking, FCC 03-198, MB Docket No. 03-185 (rel. Aug. 29, 2003).

Agriculture for the construction of a digital infrastructure in rural areas, including the funding of digital translators.⁷

APTS supports the rulemaking and hopes that the rules issued at the conclusion of this proceeding will preserve universal service and bring enhanced digital services to rural America through a means that is both technologically feasible and spectrum efficient. Appendix B to this comment reproduces the most recent of public television's FCC filings in this proceeding.

Through its system of full-power transmitters and over 700 translators, public television provides services to 99 percent of television households to support its statutory mandate to provide universal service to all Americans.⁸ Without rules to facilitate the conversion of translators to digital operation, millions of rural Americans will likely not receive critical educational and public safety services over digital broadcast technology.⁹ Indeed, the importance of translators to the delivery of local service is dramatically illustrated when one examines typical cases in the western states. A review of the FCC database reveals, for example, that of the over 700 public television translators in service

⁷ Pursuant to Congressional directive, the Department of Agriculture's Rural Utilities Service has announced the award of approximately \$15 million in grants to fund equipment -- including digital translators -- designed to facilitate the delivery of digital television signals to rural areas. See <http://www.usda.gov/Newsroom/0079.04.html>. See also Sen. Rep. 107-223, p. 123 (Jul. 25, 2002) (appropriating \$15,000,000). Because the needs of rural America were greater than the available funding in fiscal year 2003, Congress has recently appropriated an additional \$14 million for fiscal year 2004. See H. Rep. 108-401, pp. 23-24 (Nov. 25, 2003).

⁸ 47 U.S.C. §§ 396(a)(5), (7).

⁹ See Association of Public Television Stations, Public Broadcasting Service and Corporation for Public Broadcasting, Petition for Rulemaking, Enhancement of Broadband Access Through the Preservation of Public Television Translator Service and the Development of Digital Translators and Digital On-Channel Repeaters (May 29, 2002); Comments of the Association of Public Television Stations, the Corporation for Public Broadcasting and the Public Broadcasting Service, RM-10666 (May 16, 2003); and Reply Comments of the Association of Public Television Stations, the Corporation for Public Broadcasting and the Public Broadcasting Service, RM-10666 (June 16, 2003).

nationwide, over 70 are located in rural Utah, repeating the signals of KUED, KULC and KBYU to communities that are otherwise unable to receive these signals. Similarly, Idaho Public Television operates five transmitters and 34 translators covering 80 percent of the state's population,¹⁰ while the public television stations in New Mexico operate over 50 translators to deliver noncommercial educational services to residents throughout that state. Moreover, although national figures are unavailable, numerous small cable systems in rural areas rely on the reception of television translator signals at their headends to provide service to their customers.¹¹ Providing for the licensing of digital translators and on-channel repeaters would therefore ensure distribution of digital signals both to rural citizens who rely on over-the-air reception and to rural cable subscribers as well.

Digital translators and on-channel repeaters are both a technically feasible and a spectrum efficient means of accomplishing the goal of universal access to digital broadcast service. A number of field trials, for instance, have demonstrated that it is feasible to use low power television translators to deliver DTV signals to rural and other remote areas. For instance, using a two-year experimental license from the FCC, Kent Parsons, an engineer with the University of Utah's public television stations, has been able to confirm that digital translators can deliver studio-quality television signals to rural

¹⁰ Reply Comments of Idaho Public Television, Rural and Small Market Access to Local Television Signals, National Telecommunications and Information Agency, Docket No. 000208032-0032-01, (May 15, 2000), p. 1.

¹¹ For instance, it has been reported that in Utah, "Cable companies use the translators to provide the Salt Lake City television stations to rural viewers. Therefore, if a translator goes off the air, the cable company can't provide the station carried by the translator to its viewers." Bill McClure, "Free Rural Television May Soon Be A Thing of the Past," the Richfield Reaper (April 5, 2000), p. 1-A. "This system [of translators] not only fills the free airwaves, but also feeds local broadcasts to the cable systems, such as Peak Cablevision." Martin Renzhofer, "Rural Utah May Lose Free Television Feed," The Salt Lake Tribune (March 15, 2000),p. D1.

viewers with high reliability and reasonable cost.¹² On March 22, 2004, the FCC will host an in-depth tutorial on these real-world experiments with digital television translators. Similar experimental tests have demonstrated the feasibility and reliability of on-channel DTV repeater technology as well.¹³

Moreover, DTV translator and digital on-channel repeater technologies are especially spectrum-efficient and supplement the DTV Table of Allotments in ways that make the most of this limited national resource. First, because translator and repeater channels are a secondary service, they are not allocated frequencies in an established table of allotments; rather they are specifically engineered to fit between established allocations to serve rural and geographically isolated areas. As such, they inherently take advantage of unused spectrum due to terrain shielding and other factors that make reception of allocated frequencies otherwise difficult. Second, both DTV translator and digital repeater technologies use digital modulation, which is more spectrum-efficient and less prone to cause interference with adjacent channels and other services than analog technology. Third, while DTV translators are spectrum-efficient, digital repeater technology is even more spectrum-efficient, as it uses the same channel for both input

¹² See “DTV Goes to the Country: TV Engineer Successfully Tests 8-VSB Over Challenging Terrain,” *Broadcasting and Cable* (April 9, 2001), available at: www.broadcastingandcable.com. See also “Multi-hop DTV Translators at Work in Utah,” *Broadcast Engineering* (May 1, 2001), available at: www.broadcastengineering.com.

¹³ Comments of the Merrill Weiss Group, MM Docket No. 00-39, p. 21 (May 17, 2000), *citing* S.A. Lery, W.H. Paik, and R.M. Rast, “Extending HDTV Coverage using Low Power Repeaters—a Cellular Approach,” *IEEE Transactions on Broadcasting*, Vol. 38, No. 3, pp. 145-150 (Sept. 1992). See also Charles Rhodes, “Engineering and On-Channel Off-Air DTV Repeater,” *TV Technology* (June 28, 2000); and Khalil Salehian, Michele Guillet, Bernard Caron, and Andre Kennedy, “On-Channel Repeater for Digital Television Broadcasting Service,” *Communications Research Centre, Ottawa, Ontario*, presented to the IEEE Broadcast Symposium (October, 2001, Washington, DC) (reporting on successful tests of on-channel repeaters using the 8-VSB standard).

and output, reducing by half the number of frequencies needed to transmit a local television broadcast service.

Moreover, as indicated above, Congress has made its commitment to the digital upgrade of rural translators clear through its most recent appropriations. Pursuant to Congressional directive, the Department of Agriculture's Rural Utilities Service announced on February 20, 2004 the award of approximately \$15 million in grants to fund the digital conversion of 26 translators. Because the needs of rural America were greater than the available funding in fiscal year 2003, Congress has appropriated an additional \$14 million for the same program for fiscal year 2004. However, this funding cannot be used to bring digital services to Rural America until the FCC issues final rules.

APTS therefore urges the Administration to support the issuance of digital translator rules as soon as possible to preserve and enhance the broadcast service for Rural America.

D. The Public Telecommunications Facilities Program Should be Fully Funded

Lastly, APTS urges the Administration to continue to support full funding of the Public Telecommunications Facilities Program (PTFP) within the Department of Commerce. This critical program provides much needed funding for digital capital construction, improvement and repair and will continue to assist the smooth roll-out of the digital transition for public broadcasting. However, the President's Fiscal Year 2004 Budget proposes eliminating any new appropriations for PTFP, except for a minimum

amount designed to ensure the monitoring of existing grants and miscellaneous administrative costs.¹⁴

PTFP is a competitive, matching-grant program created for the purpose of building and repairing public broadcasting's facilities and equipment. Established in the 1960s, PTFP is the primary provider of federal funding for public television equipment and infrastructure. As such, PTFP has played an important role in the federally mandated transition from analog to digital technology. Of the approximately \$300 million that the federal government has provided to date for the digital conversion, just over \$130 million, or slightly over 40 percent, has been funded through PTFP.

Although not a large program by federal standards, PTFP plays an indispensable role in providing seed money for infrastructure – attracting many more non-federal dollars, which in turn deliver innovative new programs and services. In a sense, PTFP is to public broadcasters what venture capital markets are to private technology firms: investing in physical capital to increase innovation, productivity and overall quality in the services provided.

For example, in 2003, NTIA awarded 56 grants totaling \$25 million to licensees in 31 states covering 103 stations. Those 2003 PTFP grants once again represented a solid investment for the federal government, as they helped to attract many times more non-federal dollars to public television in the form of matching funds to fulfill the terms of the grant, and funding to provide the new digital services made possible by the station's upgrade as a result of the PTFP award.

¹⁴ Budget of the United States Government, Fiscal Years 2004, Executive Office of the President of the United States, Office of Management and Budget, Appendix, pp. 224-225 (2003).

Public television stations are seeking \$55 million to be appropriated to PTFP for fiscal year 2005. Without adequate funding through PTFP, public television stations will be hard-pressed to continue the purchase of much-needed equipment and to continue with necessary analog and digital repairs during the digital transition. We request that the Administration support our FY 2005 funding request and include continued funding for PTFP in the President budget for fiscal year 2006.

Conclusion

For the above stated reasons, public television is interested in exploring the possibility of an early return of analog television spectrum and urges the Administration to support the necessary changes in federal policy in furtherance of this goal. This includes mandatory carriage of digital signals on cable and satellite platforms, and a means of assuring that the remaining over-the-air analog viewers, particularly those that are disadvantaged, have access to set-top converters that would allow them to receive digital signals. In addition, public television urges the Administration to support FCC rules to authorize the operation of digital translators and on-channel repeaters to ensure continuity of service and to bring the digital revolution to rural America. Lastly, public television urges the Administration to continue to provide full funding of the Public Telecommunications Facilities Program (PTFP) within the Department of Commerce.

Respectfully submitted,

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March 18, 2004

APPENDIX A: Digital-Only Broadcasting



DIGITAL-ONLY BROADCASTING

***A ROADMAP FOR EARLY RETURN OF PUBLIC TELEVISION'S ANALOG
SPECTRUM***

Written by:

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March 2004

Executive Summary

The American media landscape is undergoing a fundamental transformation as the television broadcast service transitions to a wholly digital infrastructure. Public television stations have embraced this transition as a means to revitalize and expand the distribution of noncommercial educational broadcast services. Yet despite this great promise, and the best efforts of the FCC, Congress and the broadcasting industry, it is likely that few communities will have successfully crossed the bridge to digital-only broadcasting by the projected date of 2006. A more protracted digital broadcast transition is highly probable.

However, it has quickly become apparent that the costs of a protracted transition could be severely detrimental to the financial health of public television stations. There are therefore major advantages for public television stations to end analog transmission and embrace a date certain for converting to digital transmission only. First, it is projected that analog cessation would save public television \$36 million dollars a year in analog electricity costs. Second, early return of analog spectrum would allow public television stations to focus all of their energy and resources on the future, rather than on an aging analog distribution system. Third, it could help public television in securing post-transition digital carriage on cable and satellite systems – either through direct negotiations, FCC regulation or legislation. Finally, it could give public television stations crucial leverage in any efforts to retain the proceeds from the subsequent government auction of analog TV spectrum.

The following white paper explores the possibilities and conditions under which public television could support either a date-certain or early return of analog spectrum. It explores two potential models to achieve this end and discusses the successful digital transition underway in Europe for purposes of comparison. In addition, this paper examines in turn the following six critical policy questions.

- *What is public television's "universal service" responsibility for serving the remaining over-the-air analog audience, and what do we know about the population of viewers who get all or a combination of their programming through over-the-air analog transmissions?*
- *How reliable is the ATSC Standard for over-the-air digital reception?*
- *What are the costs for consumers to purchase digital equipment and receive digital signals?*
- *What partnerships does Public Television need in order to successfully return analog spectrum early?*
- *What regulatory and legislative strategies are necessary to achieve early return of analog spectrum?*
- *Is the European experience applicable to the United States?*

Lastly, this paper presents a compressed outline of a possible action plan to implement digital-only broadcasting. This plan suggests the continuation of FCC policy

to encourage band-clearing, coupled with amendments to the Communications Act to establish a series of rolling “hard” transition dates (based on DMA, over-the-air reliance, or some other objective measure) and to mandate a gradual decrease in analog power to ensure a “fade to black.” The plan also suggests that some limited subsidy be created to ensure that the economically disadvantaged have access to digital signals when analog service ceases. This would most likely come in the form of a one-time subsidy or tax credit for the purchase of inexpensive over-the-air set-top boxes. To supplement over-the-air reception, the plan also calls for changes to the Communications Act to either mandate full cable and satellite carriage of digital signal after the transition or, alternatively, to mandate the seamless inclusion of ATSC tuners in all digital cable and satellite set-top boxes. In addition, the plan suggests that there be a comprehensive and complete publicity campaign regarding the timing of analog cessation and the means of continuing to receive broadcast TV signals, modeled on the success of the Berlin approach. The plan also suggests that a successful transition to digital-only broadcasting can only occur through the strategic partnership of public broadcasters, commercial broadcasters, equipment manufacturers, consumer and affinity groups and others. Lastly, the plan notes that a transition to digital-only broadcasting could be facilitated (but is not dependent on) the creation of the U.S. equivalent to Britain’s Freeview service in order to encourage consumer adoption of digital over-the-air services through robust market forces.

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I. THE MEDIA LANDSCAPE

A. *The DTV Transition*

Federal law requires that after December 31, 2006, all television licensees must broadcast solely in digital unless the Federal Communications Commission (“FCC”) extends the deadline in a particular local television market because, among other factors, direct DTV reception, or indirect reception of DTV signals via cable or satellite, is not widely available to at least 85 percent of households in that market. In this regard, extensions of the deadline occur under any one of the three following circumstances:

(A) one or more of the stations in that market licensed to or affiliated with one of the four largest national television networks is not broadcasting a digital signal;

(B) digital-to-analog converter technology is not generally available in that market; or

(C) fifteen percent or more of the television households in the market do not subscribe to a “multichannel video programming distributor” that carries the DTV signal of each of the television stations broadcasting in DTV in the market, and do not have either:

(1) at least one DTV television receiver or

(2) at least one analog television receiver equipped with digital-to-analog converter technology.¹

At the end of the DTV transition, the spectrum not needed for digital operation must be returned to the federal government for reallocation through auctions.²

To initiate this conversion, the FCC allocated to nearly all full-power broadcast television stations an additional 6 MHz channel with which to begin digital broadcasts,³

¹ 47 U.S.C. § 309(j)(14)(B).

² 47 U.S.C. § 309(j)(14)(B). In encouraging the development of DTV and in managing the statutory mandate to convert all television broadcasting to digital, the FCC has articulated a number of goals. They are: (a) to preserve a free, universal broadcasting service; (b) to foster an expeditious and orderly transition to DTV; (c) to recover contiguous blocks of spectrum; (d) to ensure that the spectrum will be used to serve the public interest; (e) to ensure confidence and certainty in the DTV transition; (f) to increase the availability of new products and services to consumers; (g) to encourage technological innovation and competition; and (h) to minimize regulation and to ensure that those regulations that are adopted do not last any longer than necessary. Advanced Television Systems and Their Impact on the Existing Television Broadcast Service, Fifth Report & Order, 12 FCC Rcd 12809, ¶ 4 (1997) (“Fifth R&O”).

³ Advanced Television Systems and Their Impact on the Existing Television Broadcast Service, Sixth Report & Order, 12 FCC Rcd 14588 (1997) (“Sixth R&O”).

required these stations to construct DTV facilities according to a graduated schedule,⁴ and set forth operational rules governing the nature of digital broadcast operations, including requirements concerning replication of the analog coverage area,⁵ maximization beyond the analog coverage area,⁶ analog-digital simulcasts,⁷ minimum hours of operation,⁸ and penalties for unexcused failure to construct digital facilities on time.⁹ A key feature of the FCC's plan to migrate television broadcast operations solely to digital operation was a transition period during which television licensees would be required for a period of time to operate both their analog and their digital stations. In this regard, it was determined that a transitional period was necessary to ensure continuity of service until digital reception capability becomes so widespread that the cessation of analog service would create a minimal adverse impact on the public.¹⁰

While a successful transition to a fully digital broadcast service may seem to simply be a matter of time and consumer acceptance, there are a number of factors affecting the pace of the digital transition. Such factors include the widespread distribution of digital programming content, an effective means by which digital programming content is protected against illegal copying and distribution, the inclusion of over-the-air receivers in all DTV sets or related devices, standards for the connection of "cable ready" sets to cable systems, and carriage of local broadcast DTV signals by multichannel video programming distributors, such as cable or satellite. Recently, the FCC has made great strides to address all of these issues, save the remaining issue of cable carriage. It has encouraged the production of quality digital content.¹¹ It has recently adopted rules mandating that by July 1, 2005 all digital equipment capable of receiving broadcast digital signals should recognize a "broadcast flag" designed to protect digital broadcast content from illegal piracy.¹² It has mandated the phased-in inclusion of over-the-air digital tuners in all television sets over a certain size.¹³ And it

⁴ Fifth R&O, ¶ 76 and 47 C.F.R. § 73.624(d).

⁵ Sixth R&O, ¶ 33 and Fifth R&O, ¶¶ 74 n. 161, 91 (allowing initial broadcast of low power signal).

⁶ Sixth R&O, ¶ 31, and 47 C.F.R. § 73.622(f)(5).

⁷ 47 C.F.R. § 73.624(f).

⁸ See 47 C.F.R. § 73.624(b) and Second Period Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television, Order, DA 03-1292 (rel. April 29, 2003).

⁹ Remedial Steps for Failure to Comply with Digital Television Construction Schedule, Report and Order and Memorandum Opinion and Order on Reconsideration, 68 Fed. Reg. 43329 (rel. April 16, 2003).

¹⁰ Fifth R&O, ¶¶ 2-4.

¹¹ See Letter from Michael K. Powell to Rep. W.J. Tauzin, CS Docket No 98-120 (April 4, 2002).

¹² The "broadcast flag" is a digital code that can be embedded into a digital broadcasting stream. It signals DTV reception equipment to limit the indiscriminate redistribution of digital broadcast content. See Digital Broadcast Content Protection, Report and Order and Further Notice of Proposed Rulemaking, FCC 03-273 (Nov. 4, 2003).

¹³ Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television, Second Report and Order and Second Memorandum Opinion and Order, 17 FCC Rcd 15978 (Aug. 9, 2002), *aff'd Consumer Electronics Association v. FCC*, 347 F.3d 291 (D.C. Cir. 2003).

has conditionally approved an industry agreement to facilitate the connection of consumer electronics reception equipment and digital cable systems.¹⁴ While the FCC has yet to effectively deal with the issue of transitional and multicast cable carriage of digital broadcast television signals, having last issued a tentative decision in January of 2001 that was not favorable to broadcasters, the FCC has been reconsidering that decision and is slated to resolve the matter in the first quarter of 2004.

B. The Public Television Digital Build-Out

Since the inception of the digital proceedings, Public Television has played a leadership role in, and has been an active participant in, and enthusiastic proponent of, digital television.¹⁵ With its higher quality images and sound, and its inherent flexibility to broadcast either a high-definition or multiple standard definition streams, along with additional streams of data, digital television gives public television stations new and exciting tools to expand their educational mission in ways that were not possible in the analog world.

For instance, public television stations are regularly producing new and exciting high-definition digital programming for national, regional and local distribution. In addition, multicasting will bring new services to the public that could not be made available under the constraints of a single analog program stream, including an expanded distribution of formal educational services, workforce development services, children's programming, locally-oriented public affairs programming, and programming addressed to traditionally unserved or underserved communities. Lastly, a number of public television stations have plans to provide various educational or public safety services over their digital allotment through "datacasting."

However, despite the promise that digital broadcasting holds to enhance and expand the educational mission of public television, public television stations are facing a number of obstacles to completing the digital build-out. Although the digital construction deadline for public television stations was May 1, 2003, 197 public stations had applied to the Commission for six month extension of time to construct their digital facilities due to a number of factors that were beyond their control, including a critical lack of funding, technical problems, equipment delays, weather problems and legal issues

¹⁴ "FCC Eases Digital TV Transition for Consumers," Federal Communications Commission Press Release (Sept. 10, 2003), available at: <http://www.fcc.gov/headlines.html>.

¹⁵ Public television played an active role in developing the transmission standard for digital television and served on the Commission's Advisory Committee on Advanced Television Service, whose recommendations gave rise to the adoption of the "ATSC Standard." In addition, PBS was one of the founding members of the Advanced Television Test Center, which conducted laboratory tests of the Grand Alliance System. PBS also conducted field tests of the Grand Alliance system in Charlotte, North Carolina. WMVT, the public television station in Milwaukee, was the first broadcaster to provide an HDTV satellite test signal. And in 1998, KCTS in Seattle was the first public broadcaster to begin transmitting digital signals using the ATSC standard and was the first station in the United States to produce HDTV programming.

that have made conversion difficult.¹⁶ All of the initial noncommercial applications for extensions of time have been either approved by the FCC or been rendered moot by the station having later gone on-air with a digital signal. By December 24, 2003, the FCC reported that 130 public television stations had applied for a second six month extension of time.¹⁷ Presently, 237 public television stations out of 357 CPB-qualified stations (or 66%) are on-air with a digital signal. Those stations serve markets that include 85% of U.S. television households, although actual reception by households may be lower because many stations are on-air with low power facilities pursuant to FCC-approved special temporary authority.¹⁸

Regarding the financial cost of the digital conversion, it has been estimated that it will cost public television stations a total of \$1.63 billion to fully convert.¹⁹ While public television stations have raised a substantial amount of digital conversion funds, totaling \$733 million, from state, local and private sources,²⁰ to date, the Federal government has

¹⁶ In this regard, 24% cited funding difficulties; nearly 80% cited technical difficulties (including lack of tower crews, delays in obtaining necessary equipment, and interference disputes); and 43% cited legal obstacles (such as zoning disputes or delays in obtaining necessary permissions from authorities). In addition, fifteen state licensees (with multiple transmitters) had filed for an extension of time to construct at least one of their digital transmitters.

¹⁷ <http://www.fcc.gov/mb/video/files/dtvsum.html>. Of the extension requests, 83.3% cited technical reasons, 19% cited funding reasons, 31.8% cited legal reasons, and 19.9% cited other reasons for the delay.

¹⁸ www.pts.org. On October 31, 2003, PBS has reported that of their member stations on air as of November, over 75% were operating at over 50% power or greater, with the remaining stations committed to increasing to full power levels as soon as their funding permits. The FCC separately reported that as of November 19, 2003, of the 219 DTV NCE stations were on-air, 90 were broadcasting with STAs. See www.fcc.gov/mb/video/files/dtvonairsum.html. (Nov. 19, 2003).

¹⁹ Corporation for Public Broadcasting Appropriation Request and Justification FY 2004 and FY 2006, Submitted to the Labor, Health and Human Services, Education and Related Agencies Subcommittee of the House Appropriations Committee and to the Labor, Health and Human Services, Education and Related Agencies Subcommittee of the Senate Appropriations Committee, p. 9 (February 2003), available at: http://www.cpb.org/about/reports/appropriation/fy04_fy06/index.html. Conversion of public radio will cost \$171 million, which added to the television digital conversion costs yields \$1.8 billion.

²⁰ Approximately \$473 million in state funds have gone to aid in the digital conversion and well over \$260 million in private funds have been raised for the digital transition. http://www.cpb.org/digital/funding/dig_funding.html. The Association of Public Television Stations reports a slightly different number of \$771 for private and state funding for the digital conversion. See <http://www.pts.org/html/digital/dtv/funding.htm>.

allocated only \$313.84 million.²¹ In addition, a number of public television stations are facing severe financial challenges due to current economic conditions and state budget crises. Meanwhile stations throughout the nation are simultaneously facing the increased operations cost associated with operating two stations – one analog and one digital—until the DTV transition has run its course.²² In fact the analog electricity costs alone for public television stations during the transition are estimated to be approximately \$36 million each year. This figure represents almost 10% of the amount of money Congress appropriated to the Corporation for Public Broadcasting (CPB) for FY 2003 – and almost 20% of the total amount of money CPB distributed to public television stations last year as CSGs.

C. Advantages of Early Analog Return

It may, therefore, be in the best interests of public television stations to consider the advantages of an early cessation of analog service.

- First, it is projected that analog cessation would save public television \$36 million dollars a year in analog electricity costs.
- Second, it has been argued that early return of analog spectrum would allow public television stations to focus all of their energy and resources on the future, rather than on an aging analog distribution system.
- Third, it could help public television in securing post-transition digital carriage on cable and satellite systems – either through direct negotiations, FCC regulation or legislation.
- Finally, supporting a hard date for cessation of analog service could give public television stations crucial leverage in any efforts to retain the proceeds from the return and government auction of the analog spectrum.

In view of the above, in an APTS survey in the summer of 2003, 88 percent of APTS member stations who participated in APTS' online consultation indicated they would

²¹ This includes approximately \$131.87 million in digital funds through the Department of Commerce Public Telecommunications (\$14.1 million for FY 2000, \$34.7 million for FY 2001, \$36.2 million for FY 2002, \$25 million for FY 2003, and \$21,870,200 for FY 2004), <http://www.ntia.doc.gov/otiahome/ptfp/awards/earlieryears.htm>; \$153.05 million for CPB digital appropriations (\$20 million for FY 2001, \$25 million for FY 2002, \$48.4 million for FY 2003, and \$59,646,000 for FY 2004), http://www.cpb.org/digital/funding/dig_funding.html; and \$28.92 million through the Rural Utilities Service for digital upgrades in rural areas (\$15 million for FY 2003 and \$13.92 million for FY 2004), Department of Agriculture, Rural Utilities Service, Public Television Station Digital Transition Grant Program, Notice of Funds Availability, 68 Fed. Reg. 42680 (July 18, 2003).

²² Comments of the Association of Public Television Stations, the Corporation for Public Broadcasting and the Public Broadcasting Service, MB Docket 03-15, p 10 (April 21, 2003).

support a hard date for cessation of analog service in return for certain policy concessions.

D. Early Analog Return: Two Models

To effectuate an early return of analog spectrum, public television stations may enter either of two courses of action. On one hand, they may voluntarily return their analog allotments early under the current regulatory structure. On the other hand, they may support legislative changes to the Communications Act to ensure a mandatory hard date for return of analog spectrum.

1. Voluntary Early Return Under Current FCC Rules

Under the first course of action, public television stations may voluntarily return their analog allotments to the FCC early within the confines of current regulatory policy. Current FCC policy states that if a television licensee with dual analog-digital channels wishes to return one of its channels to the FCC prior to the end of the DTV transition, it must demonstrate that cessation of analog service is in the public interest. The public interest considerations vary slightly depending on the channel allotment that is being returned.

If a station returns its analog channel in order to facilitate the clearing of channels 59 through 69, early return of the spectrum is presumed to be in the public interest if the applicant demonstrates compliance with a number of public interest factors, *including a demonstration that there would not be a loss of a community's sole service on a channel reserved for noncommercial educational broadcast service.*²³ This last requirement may be particularly problematic for those public television stations which are the sole station in their community but less problematic for stations operating in markets with multiple public television stations (so-called "overlap" markets).

With regard to the early return of channels 52 through 58, an applicant must demonstrate compliance with substantially similar public interest factors – including the same requirement that there *not be a loss of a community's sole service on a channel reserved for noncommercial educational broadcast service.*²⁴ Because the FCC has not required mandatory band-clearing for channels 52 through 58, it will not presume that

²³ See Service Rules for the 746-764 and 776-794 MHz Bands and Revisions to Part 27 of the Commission's Rules, Carriage of the Transmissions of Digital Television Broadcast Stations, Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking, 15 FCC Rcd 20845, FCC 00-224, ¶ 61 (June 30, 2000); and Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, Third Report and Order, FCC 01-25, ¶16 (rel. Jan. 23, 2001).

²⁴ Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52 -59), Report and Order, FCC 01-364, ¶ 184 (rel. Jan. 18, 2002).

cessation of analog service for those channels would be in the public interest. Following this model, Commonwealth Broadcasting, licensee of WNVT in Goldvein, VA successfully petitioned the FCC to return its analog channel allotment at reserved channel 53 and to operate solely in digital on reserved channel 30.²⁵ WNVT was required to demonstrate that early return of analog spectrum was in the public interest and to assure the FCC that analog service would be replicated either through down-converted analog cable subscription or the purchase of DTV receivers for certain local schools. Importantly, WNVT was not a sole noncommercial educational service in any community it served, so its applicability as a model for other public television stations, which may in fact be the sole NCE service in their community, may be limited.

Lastly, the FCC has not yet considered what public interest factors will apply where a licensee desires to return channels 2 through 51 prior to the end of the DTV transition.

2. *Mandatory Early Return Pursuant to Legislative Changes to the Communications Act*

An alternative approach would be to support legislative action to delete the market extension provisions of the Communication Act. This would have the effect of creating a mandatory hard date for cessation of analog service without having to apply to the FCC and satisfy the public interest factors outlined above. Although December 31, 2006 would be the current default date of analog return, it is important to note that a mandatory hard-date may be later than the end of 2006 and need not be the same in all markets. Rather, it may be expedient to create several, phased-in hard dates, with some markets having an earlier deadline and other markets having a later deadline (based, perhaps, on DMA size, geography, over-the-air reliance, or some other objective measure). In addition, it may be expedient to mandate that stations in markets slated for analog shut-off should slowly reduce the power of their analog operations according to an established schedule to effectuate a “fade to black.” These possibilities are considered in more detail at Part II.B.3 of this paper.

E. The European Experience

While the U.S. has yet to implement mandatory early return of analog spectrum, some portions of Europe have already completed portions of this process or will soon

²⁵ See Letter to John M. Burgett, Esq. from Barbara Kreisman, Media Bureau, File 1800E3-JLB, DA 03-2845 (Sept. 3, 2003).

require it.²⁶ In this regard, the experience of Berlin-Brandenburg and the United Kingdom may be instructive.

1. Berlin-Brandenburg: The First Digital-Only Region

In Berlin-Brandenburg, an area with high cable and satellite penetration,²⁷ the government successfully shut down analog television service on August 4, 2003 – the first region in the world to go digital-only. Berlin engaged in a massive publicity program through a wide range of media, coupled with a subsidy for the purchase of over-the-air set-top boxes for those on the social welfare rolls, to successfully shut down all TV broadcast analog operations with a minimum of social discomfort.²⁸

The analog shut-off occurred in three stages. At stage one, at least one high-power analog channel was switched to digital transmission to demonstrate the quality of digital television broadcasts and to provide some orientation for the households affected regarding the need to purchase new receivers. During stage two, (a) all high-power transmitters were switched to digital transmission; (b) the analog transmissions of all national commercial broadcasters ceased; and (c) “public-sector” services continued analog transmission but only via lower power frequencies. Lastly, at stage three, all analog frequencies were switched off completely.²⁹

The publicity program entailed a concerted communication with the public from October of 2002 through August of 2003 and involved (a) broadcast spots, running bar information and local news and current affairs coverage by broadcasters; (b) a letter sent to every home in February of 2003; (c) leaflets, brochures and newsletters distributed in local shops; (d) close communication with the Berlin tenants’ association and local consumer associations; (e) a telephone hotline; and (f) an Internet website.³⁰ The costs

²⁶ The eEurope 2005 Action Plan requires member states of the EU to publish their analog-to-digital switchover plan by the end of 2003. “Digital Broadcasting and Switchover,” Press Release, European Commission (Sept. 22, 2003), available at: http://europa.eu.int/rapid/start/cgi/guesten.ksh?p_action.getfile=gf&doc=IP/03/1276|0|RAPID&lg=EN&type=PDF. For the full policy document, see: http://europa.eu.int/information_society/topics/ecommerce/doc/shortcuts/digital_broadcasting/acte_en_vf.pdf.

²⁷ In Berlin, which has 1.8 million television households, 160,000 homes relied on over-the-air reception and 90,000 homes received over-the-air signals for second and third television sets. Mark Landler, “German Way to Go Digital: No Dawdling,” *New York Times* (Nov. 3, 2003).

²⁸ Mark Landler, “German Way to Go Digital: No Dawdling,” *New York Times* (Nov. 3, 2003). See also “Berlin Goes Digital: the Switchover of Terrestrial Television from Analogue to Digital Transmission in Berlin-Brandenburg, Experiences and Perspectives,” available at: http://www.digital-law.net/switch-off/berlin_project_report.pdf.

²⁹ “Berlin Goes Digital,” p. 4.

³⁰ *Id.* at p. 6.

were shared between broadcasters and the Berlin-Brandenburg regulatory authority (mabb) and remained well below the budgeted €1.2 million.³¹

To ensure a successfully switchover in a socially acceptable manner, the authorities devised two separate subsidy programs. The first subsidy program was private and market-driven, with the receiver industry providing digital-to-analog over-the-air set-top boxes for €8.50 per month to entice purchase by low income homes. However little use was made of this offer.³² The second subsidy was targeted to homes entitled to a TV set under German social security rules. Homes dependent on terrestrial reception were entitled to a government-paid subsidy of 25% for boxes that cost approximately €100 (equivalent to \$127) each over an estimated 6,700 sets.³³

2. *United Kingdom: From Pay DTV to Freeview*

In the United Kingdom, over-the-air digital television was initially introduced as a subscription service (ITV Digital), which subsequently failed to gain consumer acceptance due to a number of factors.³⁴ After the government reclaimed spectrum from the failed subscription venture and reassigned it, the BBC, BSkyB and Crown Castle (a transmitter company) engaged in a joint marketing effort, called Freeview, whereby homes with the ITV Digital boxes could receive about 30 over-the-air channels (in addition to other services like music channels) for free. Additional households could purchase over-the-air digital set-top boxes to allow them to view digital signals on their analog sets. Prices for the boxes have dropped to an average of £80-100 (equivalent to \$136-170).³⁵ By December 17, 2003, there were 1.8 million sales, with average sales approaching 100,000 per month (and in the middle of November, 100,000 sales in a week), prompting projections that Freeview would be in 2.5 million homes and that 50% of the 24.9 million homes would have digital television by the end 2003.³⁶ Of those

³¹ *Id.*

³² *Id.* at p. 8.

³³ *Id.* at pp. 8, 15. See also Mark Landler, "German Way to Go Digital: No Dawdling," *New York Times* (Nov. 3, 2003), and Thomas Hazlett, "Finally, Something Good on German TV: Berlin has digital television. Why can't the U.S. follow?" (Oct. 7, 2003), available at: <http://slate.msn.com/id/2089424/>.

³⁴ These included a limited number of channels that failed to compete with BSkyB's 500 channels and a costly deal to cover the Football League. Stephen Dowling, "Freeview marks its first year" *BBC News*, (Oct. 30, 2003), available at: http://news.bbc.co.uk/go/pr/fr/-/1/hi/entertainment/tv_and_radio/3197802.stm.

³⁵ "Freeview reaches first birthday," *BBC News* (Oct. 30, 2003), available at: http://news.bbc.co.uk/go/pr/fr/-/1/hi/entertainment/tv_and_radio/3225241.stm. See also Matt Wells, "Digital TV at turning point as converts top 50%," *The Guardian* (Dec. 17, 2003).

³⁶ "Half of UK 'Getting Digital TV,'" *BBC News* (Dec. 17, 2003); Matt Wells, "Digital TV at turning point as converts top 50%," *The Guardian* (Dec. 17, 2003). The 2.5 million figure is derived from adding sales of Freeview-type boxes to existing ITV boxes that already receive the Freeview service. The 50% figure is derived from adding up Sky's 7 million subscribers, the 2.2 million digital cable subscribers, owners of integrated digital sets, owners of ITV boxes and Freeview boxes. Matt Wells, "Digital TV at turning point as converts top 50%," *The Guardian* (Dec. 17, 2003). See also BBC Press Release About the Success of Digital TV, (Dec. 17, 2003), available at: www.digitag.org/news/newsdetail.php?Id=334.

households that have adopted Freeview, consumer profiles apparently reflect those of the general population, with Freeview attracting consumers who would not ordinarily consider subscribing to a pay television service.³⁷ Interestingly, households with Freeview still watch more than half of their total viewing via the analog signal, bypassing their Freeview box altogether.³⁸ The UK plans on ceasing all analog television broadcasts by 2010.³⁹

F. Issues of Concern

Despite the apparent advantages of some sort of early analog return (either voluntary or mandatory), and the apparent success of digital broadcasting in two European nations, Public Television in the United States must consider a number of issues of concern as well, including the following, which will be addressed in turn:

- *What is public television's "universal service" responsibility for serving the remaining over-the-air analog audience, and what do we know about the population of viewers who get all or a combination of their programming through over-the-air analog transmissions?*
- *How reliable is the ATSC Standard for over-the-air digital reception?*
- *What are the costs for consumers to purchase digital equipment and receive digital signals?*
- *What partnerships does Public Television need in order to successfully return analog spectrum early?*
- *What regulatory and legislative strategies are necessary to achieve early return of analog spectrum?*
- *Is the European experience applicable to the United States?*

³⁷ BBC Press Release About the Success of Digital TV, (Dec. 17, 2003). See also Independent Television Commission and the BBC, "A Report on Progress Towards Digital Switchover," pp. 24 et. seq. (April 2003), available at: http://www.digitaltelevision.gov.uk/pdfs/ITC_BBC_switchover_report.pdf.

³⁸ Clair Cozens, "Freeview Fails to Boost Multichannel Ratings," The Guardian (Dec. 19, 2003). See also Broadcast, Communications Daily (January 8, 2004) (reporting on British Home Office study stating that while almost 50% of homes have digital television, 13% planned not to use it).

³⁹ "Half of UK 'Getting Digital TV,'" BBC News (Dec. 17, 2003).

II. PRESERVING UNIVERSAL SERVICE

A. *Universal Service: the Challenge*

1. *Background*

Public Television in the United States operates under a federal mission to provide a free, noncommercial educational television service to all Americans.⁵⁴ This is not only a statutory mission but also a political expectation that provides the condition for continued federal funding. Without additional safeguards, this mission may be compromised if the free, over-the-air analog service is replaced with a free digital over-the-air service that requires either a substantially prohibitive investment in reception technology or a prohibitively expensive subscription to a digital pay service for some Americans. Thus, if analog over-the-air service were to be shut-down and replaced with its digital counterpart, some mechanism, or combination of mechanisms, must be in place, as a matter of political expediency and fundamental fairness, to ensure continuity of service for the following constituencies:

- Consumers who, for whatever reason, rely exclusively on over-the-air reception;
- Consumers who subscribe to a digital multichannel television service but who possess additional television sets that are not connected;
- Consumers who subscribe to analog cable service only, unless their cable system is willing to down-convert a DTV-only station to analog for their analog customers; and
- Consumers who subscribe to a local-into-local service via satellite, which relies on the uplink of local analog stations pursuant to the Satellite Home Viewer Improvement Act of 1999.

To understand the extent and nature of the problem, and to craft effective solutions, it is necessary to examine how many households rely on over-the-air reception – either directly or indirectly—and to understand the reasons for such reliance.

⁵⁴ 47 U.S.C. §§ 396(a)(5), (a)(7), (a)(9).

2. *Exclusive Reliance on Over-the-Air Reception*

Approximately 15 percent of all U.S. television households rely exclusively on over-the-air reception of television signals (“OTA households”), although the figure may be somewhat higher depending on the methodology used to count such households.⁵⁵ This statistic, however, is an average. Over-the-air reliance is not uniform throughout the nation because in some geographic areas, reliance on over-the-air reception may be greater than in other areas.⁵⁶ For a detailed information on the percentage of television households that rely on over-the-air reception in each DMA, see Appendix C to this report.

Among those households that rely exclusively on over-the-air reception, we know the following, based on Nielsen data.

- OTA households are much more likely to have lower incomes and much less likely to be in the highest income category:

HH Income	National Average	OTA	Difference
Less than \$40K	44%	62%	18%
\$40K to \$60K	18%	18%	0%

⁵⁵ Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, Tenth Annual Report, FCC 04-5, ¶ 7 (Rel. Jan. 28, 2004) (85.25% of all TV households subscribe to a multichannel video programming distributor; by implication 14.75% do not). This average figure has not substantially declined over the past year. See Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, Ninth Annual Report, FCC 02-338, Table B-1 (Dec. 31, 2002) (figures as of June, 2002). This does not account for additional over-the-air reliant television sets in households with cable or DBS attached to one set. One way to account for this is to count TV sets, not households. See Comments of the National Association of Broadcasters, *In the Matter of Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, CS Docket 01-129 (Aug. 3, 2001) (46.5 million television sets rely on OTA reception). According to information supplied by PBS, at present 16% of Nielsen households (837 out of 5,191) receive their television over the air. According to Dennis Haarsager, who conducted a November 2003 analysis of Television Bureau of Advertising (TVB) and Nielsen data, 17.5 million, or 16.1 % of 108,462,735 TV Households rely exclusively on over-the-air reception. In addition, a number households that subscribe to DBS but not to local-into-local rely on over-the-air reception for local stations. These total approximately 3.2 million additional households, raising the total reliance on over-the-air reception to 20.7 million or 19.1% of all television households.

⁵⁶ For instance, even in the largest DMA’s over-the-air reception approaches 21% of TV Households in the Los Angeles and Chicago DMAs; 10% in New York; and 12% in Washington, DC. Among the smallest DMA’s, a similar variation exists, with 12% over-the-air reception in North Platte, NE (DMA 209); 6% in Clarksburg-Weston, WV (DMA 165); and 34% in Fairbanks (DMA 203) and 40% in Harlington, TX (DMA 97). Similarly, Dennis Haarsager has estimated that the national average of cable penetration (67.6% of all TV Households) is also subject to geographic variation, with penetration is as high as 89.4% in the Honolulu DMA and as low as 40.5% in the Boise DMA. In addition, while satellite subscription rates (excluding C-Band) are 18.6% of all TV Households on average, a similar geographic variation for this service exists among DMAs as well.

\$60K +	38%	20%	18%
\$75K +	27%	13%	14%

- African-American households (defined by Nielsen) are more likely to rely on OTA (18% OTA vs 12% general population).
- Households headed by women with children are slightly more likely to rely on OTA.
- Older Americans (55+) are slightly less likely to rely on OTA.
- There was no significant difference in the following categories:
 - o Head of households with college attainment (4+ years of college)
 - o Location of the households in a metro, suburban, small town or rural county.

On first blush it would seem that the socially disadvantaged segments of the United States population are more likely to rely exclusively on over-the-air reception, including the poor, the elderly and minorities. However, family income is not necessarily a good predictor of over-the-air reliance. For instance, while 62% of households with less than \$40K income per year demonstrate reliance, the converse is even more striking: 48% do not rely exclusively on over-the-air reception. These results are consistent with the findings of a 1998 study that concluded that household income was not a significant influence on the decision to subscribe, although it did influence whether subscribers would purchase additional cable services beyond the basic tier.⁵⁷ Based on data from a variety of sources, the 1998 study concluded that “even for households in the lowest income bracket, the decision not to subscribe to cable television is more often the result of a preference than an inability to afford services.”⁵⁸ In fact one study from 1989 established that most non-subscribers were former subscribers, suggesting that consumer satisfaction with a cable operator’s service and offerings plays an important role in determining cable subscribership, and that the motivation to subscribe initially comes from a desire to obtain the unique video programming supplied by cable operators.⁵⁹

Nor does the age of a viewer determine with any certainty the likelihood of reliance on over-the-air reception. As the evidence above demonstrates, older Americans aged 55 and above are slightly less likely to demonstrate reliance, a fact confirmed in a

⁵⁷ Robert Kieschnick and B.D. McCullough, *Why Do People Not Subscribe to Cable Television? A Review of the Evidence* (1998), available at: www.tprc.org/abstracts98/kieschnick.pdf.

⁵⁸ Kieschnick and McCullough, p. 4. The authors of the study also reported that at the time, “70% of the households not subscribing to cable television services [were] above the poverty line.” *Id.* at 5. This result may also be consistent with previous studies of the purchasing behaviors of indigent households, where it was determined that such households frequently purchase cable television subscriptions before purchasing basic telephone service. *See* Kieschnick and McCullough, p. 5, n. 10, citing Milton Mueller and Jorge R. Schement, *Universal Service from the Bottom Up: A Profile of Telecommunications Access in Camden, New Jersey*, Report, Rutgers University School of Communication, Information and Library Studies (1995).

⁵⁹ Kieschnick and McCullough, p. 7.

recent telephone survey of 1024 individuals conducted by Magid Media Futures. In this survey, of those individuals aged 25 and older without any multichannel television service, only 30% were 55 years or older (the percentage was lower (18%) in an on-line survey that slightly favored younger adults). By way of contrast, 25% fell within the 35-44 age group, and 26% fell within the 25-34 age group.⁶⁰

In addition, while according to the Nielsen data above, African American households are slightly more likely to rely on over-the-air reception, other studies have indicated that African Americans and Hispanics constitute a larger proportion of cable subscribers than non-subscribers.⁶¹

3. *Reliance on Over-the-Air Reception for Additional Television Sets*

Numerous television households that do subscribe to a multichannel television service possess additional televisions that are not connected to either cable or satellite. In this regard, it has been estimated that there are 34.5 million such sets.⁶² Cessation of service to these television sets could be politically problematic from a consumer point of view, although from a legal point of view, the Communications Act does not account for additional, unconnected television sets. In fact, by statute, the cessation of analog over-the-air service may continue even if additional television sets in a household are not connected to a multichannel television service (See Appendix A).⁶³

4. *Analog Cable Subscribers*

In addition, the cessation of analog over-the-air television service also has the potential to affect analog cable subscribers. Cable systems typically retransmit the programming of local television stations from an off-air broadcast signal collected at the cable system's headend, although in some circumstances where it is not possible to deliver a good quality signal over the air to the headend, a broadcaster may employ fiber, microwave or other means. If the analog broadcast service were to cease, cable systems

⁶⁰ Ages 45-54 represented 18% of respondents; ages 35-44 represented 25%; and ages 25-34 represented 26%. The following were the percentages in the on-line survey: ages 55+, 18%; ages 45-54, 21%; ages 35-44, 25%; ages 25-34, 25%; and ages 21-24, 11%. Age and Income of Non-Multichannel Households, Frank N. Magid Associates, Inc (January, 2004).

⁶¹ Kieschnick and McCullough, p. 8. See also *Id.* at p. 26, citing Alan B. Albarran and Don Umphrey, *Marketing Cable and Pay Cable Services: Impact of Ethnicity, Viewing Motivations, and Program Types*, *Journal of Media Economics*, 7:3, pp. 47-58 (1994).

⁶² Comment of the National Association of Broadcasters, *In the Matter of Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, CS Docket 01-129 (Aug. 3, 2001). See also *Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, Second Report and Order and Second Memorandum Opinion and Order, FCC 02-230, 17 FCC Rcd 15978, ¶ 33 (Aug. 9 2002).

⁶³ 47 U.S.C. § 309(j)(14)(B)(iii).

would have to either down-convert a digital signal for analog customers or encourage analog customers to upgrade to a digital subscription at additional cost.

5. *Satellite Subscribers*

Lastly, the cessation of analog over-the-air television service will also affect satellite television subscribers as well. Pursuant to the Satellite Home Viewer Improvement Act of 1999 (SHVIA), satellite television providers like EchoStar and DirecTV retransmit the analog broadcast signal of local television stations via satellite back into those stations' local markets. If a satellite program provider retransmits one local broadcast station, it must rebroadcast all local broadcast stations in a market.⁶⁴ Like cable, local stations typically deliver their signal over the air to a local receive site (or via other means if a good quality signal cannot be delivered via off-air reception). There is currently no provision under SHVIA for mandatory carriage of digital broadcast signals.⁶⁵ Consequentially if analog service in a market ceased, satellite subscribers would lose access to local signals unless those signals were delivered via non-broadcast technology.

B. Universal Service: Potential Solutions

Because the cessation of analog broadcast television could likely lead to the disenfranchisement of these four groups of consumers, it is important to consider a targeted, effective and cost-efficient means for preserving access to over-the-air digital broadcast signals. In lieu of such a targeted remedy, American consumers would have to rely on the availability of integrated digital television sets with ATSC tuners to receive digital broadcast signals. Such sets are still quite expensive with little evidence that there will be significant decreases in cost in the near future. In addition there is much consumer confusion regarding the range of digital television products and little demonstrated interest in purchase. Detailed findings regarding the cost, consumer understanding, and consumer acceptance of digital equipment – particularly integrated digital television sets—can be found at Part IV of this report.

Without a doubt, under current circumstances to rely on the widespread availability and consumer acceptance of integrated DTV television sets would be folly. Therefore, to supplement the market for integrated digital television sets equipped with ATSC receivers, and to address the four constituencies that may be harmed by the cessation of analog broadcast service, policy makers concerned about preserving universal service may want to consider a range of potential solutions. These include:

- ***Subscription Subsidies or Tax Credits.*** A limited income-triggered subsidy for digital cable or satellite subscription, either in the form of direct payments

⁶⁴ 47 U.S.C. § 338(a)(1).

⁶⁵ “By directing the FCC to promulgate these must-carry rules, the conferees do not take any position regarding the application of must-carry rules to carriage of digital television signals by either cable or satellite systems.” Joint Explanatory Statement of the Committee of Conference on H.R. 106-1554, 145 Cong. Rec. at H11792, H11795 (Daily ed. Nov. 9, 1999).

or a tax incentive, coupled with full, mandatory carriage of digital television broadcast signals on these services (or a tuner requirement for cable and satellite set-top boxes).

- ***Over-the-Air Set-Top Box Subsidies or Tax Credits.*** A similar income-triggered subsidy program for the one-time purchase of digital over-the-air set-top boxes, coupled with full, mandatory carriage of digital television broadcast signals on cable and satellite (or a tuner requirement for cable and satellite set-top boxes).
- ***Analog “Fade to Black.”*** A gradual cessation of analog service, whereby (a) analog service would be shut off on a rolling geographic or market basis, coupled with (b) a decrease in analog power levels over time as digital broadcasters increase to full power.
- ***Publicity.*** Adequate and continuing publicity through a wide range of media concerning the schedule for the cessation of analog broadcast service and options for continuing to receive broadcast television.
- ***United States Freeview.*** The creation of a cooperative marketing effort to package free digital over-the-air services in a way parallel to the Freeview service that was introduced in the United Kingdom.

Each of these elements will be discussed in turn. An effective means of ensuring universal service would likely involve the one-time subsidy for over-the-air set-top box purchase, coupled with an analog “fade to black,” adequate and continuing publicity, and possibly the creation of a Freeview-like service in the United States. Subsidies for the purchase of cable or satellite subscriptions, while having the advantage of avoiding reliance on over-the-air reception, would, however, involve prohibitively high recurring costs.

1. Subsidies or Tax Credits to Encourage Digital Cable or Satellite Subscription

One possible means to ensure universal access would be to create subsidies or tax credits for qualified individuals to purchase a subscription to digital cable or satellite services. One of the signal advantages of this approach would be to ensure universal service without relying on the effectiveness of direct over-the-air reception. While it is true that only 20% of all TV Households (or 30% of all cable subscribers) subscribe to digital cable (for comparisons with satellite subscription, which carries analog local channels only, see Appendix B),⁶⁶ a subsidy and/or tax credit targeted to households that fall below a specified income may increase this number. On one hand, it may be more

⁶⁶ See National Cable and Telecommunications Association, www.ncta.com.

effective to use direct subsidies for poorer households, as tax credits typically do not motivate the behavior of households that pay little in the way of taxes. On the other hand, tax credits may be a more economical means of motivating behavior with fewer budgetary and political implications than a direct subsidy.

Nevertheless, the cost of a continuing subsidy (either through direct payment or tax credits) would be both prohibitively high and recurring. Assuming a basic average digital cable subscription rate of \$660 per year (\$55 per month⁶⁷ x 12), and a 50% subsidy targeted only to households below \$25,000 per year in income (30,261,220 households according to the 2000 Census), the cost would be a staggering \$9,986,202,600 each year. A more conservative 25% subsidy would still cost \$4,993,101,300 per year. One would project similar costs for a digital satellite subsidy if local digital carriage were available.

Even if this approach were economically feasible, it would also require full mandatory carriage on both cable and satellite systems, something that would likely require legislative changes that would be strenuously opposed by the affected industries. Moreover, with regard to satellite carriage of digital signals, it is unclear at this time whether satellite systems have the technical capability to carry all local digital signals, although presumably if terrestrial analog service were turned off and replaced with digital signals, the burden on satellite capacity would be less than with analog, due to the inherent efficiencies of digital signals and compression technology.

Moreover, in lieu of mandatory digital carriage (which may be politically problematic) a technological solution that might reduce the burden on cable and satellite capacity could be a requirement that all cable and satellite set-top boxes be equipped with ATSC tuners and A/B switches that would enable consumers to switch back and forth seamlessly between proprietary and free, over-the-air signals. This technology is reportedly deployed in some DirecTV set-top boxes⁶⁸ (Samsung sells a set-top box with a DTV over-the-air receiver for \$500) and Time Warner cable boxes. A requirement to include such technology in set-top boxes would also likely require additional legislation. Moreover, it should be noted that consistent over-the-air DTV reception frequently requires something more than a normal indoor antenna, and may require the installation

⁶⁷ This figure was derived from the cost of basic digital cable subscription on a typical Cox system in Fairfax County, VA. The average cost for basic analog cable subscription was \$36.47 in 2002. "Issues Related to Competition and Subscriber Rates in the Cable Television Industry," United States General Accounting Office, GAO-04-8, p. 20 (October 2003).

⁶⁸ In its merger review, DirecTV and Newscorp reported that they were "exploring the potential of incorporating digital terrestrial television tuners into DirecTV set-top boxes." In the Matter of General Motors Corporation and Hughes Electronics Corporation, Transferors and the News Corporation Limited, Transferee, for Authority to Transfer Control, FCC 03-330, ¶ 324 (rel. January 14, 2003). DirecTV and Newscorp also claimed that "[b]y mounting a small antenna for receiving broadcast signals at the same point where the satellite dish is located, most subscribers would be able to receive digital television broadcast signals from their local stations over-the-air." Id. at n. 883 In addition, they further claim that "these digital signals can be seamlessly processed by the set-top-box with the DirecTV satellite signal in a manner that will be transparent to the viewer." Id. at ¶ 324. However, the FCC specifically found that the applicants' claims had not been demonstrated with sufficient credibility. Id. at 328.

or replacement of an outdoor directional antenna, making an integrated set-top box solution potentially difficult.

- **Summary of Advantages and Disadvantages**
 - Advantages
 - Addresses needs of the disadvantaged and ensures universal service.
 - Does not rely on direct over-the-air reception.
 - Disadvantages
 - Cost of subsidy or tax credit is high and recurs on a yearly basis.
 - Requires additional legislation
 - Either full digital carriage on cable and satellite, or
 - Mandatory VSB over-the-air tuners in cable and satellite set-top boxes (which may require installation or replacement of an outdoor directional antenna).

2. *Subsidies or Tax Credits for the Purchase of Over-the-Air Set-Top Boxes*

A second, and more likely, means to ensure universal service would be to create subsidies or tax incentives for the purchase of at least one over-the-air DTV conversion box in each qualified household. As discussed above, this model was followed in Berlin, where the regional government offered a 25% subsidy for the purchase of over-the-air set-top boxes that could convert digital signals to analog.

Thomas Hazlett estimates that the cost to implement a similar program in the United States would amount to a one-time cost of \$50 million.⁶⁹ However, at current costs at approximately \$400 per unit,⁷⁰ and assuming a 50% subsidy targeted at households below \$25,000 per year in income, the one-time cost would be substantially more than that: \$6,052,244,000. Under a more conservative 25% subsidy, the one-time cost would drop to \$3,026,122,000. In addition, the above costs assume the purchase of one set-top box per household. If the subsidy program were to extend to the purchase of multiple set-top boxes in each qualified household, in order to accommodate additional

⁶⁹ Thomas Hazlett, "Finally, Something Good on German TV: Berlin has digital television. Why can't the U.S. follow?" (Oct. 7, 2003), available at: <http://slate.msn.com/id/2089424/>. Thomas W. Hazlett is a Senior Fellow at the Manhattan Institute for Policy Research and a Columnist for the Financial Times' New Economy Policy Forum @ FT.com. He is currently a Senior Research Associate at the Columbia Institute for Tele-Information and a Fellow of the AEI-Brookings Joint Center for Regulatory Studies. <http://www.manhattan-institute.org/html/hazlett.htm>.

⁷⁰ Samsung sells two models of digital over-the-air set-top boxes retailing for \$450 and \$400, while Motorola sells a model retailing for \$300 (prices quoted from Circuit City).

sets that rely on over-the-air reception, the aggregate cost would be higher. On the other hand, with mass production in a market the size of the United States, the cost of set-top boxes could drop considerably. For instance, in Britain, over-the-air set-top boxes, sold to receive the Freeview service, currently retail between £80-100 (equivalent to \$136-170). It is anticipated that with mass production, the cost could drop to £ 20 (\$34) in Britain.⁷¹ Assuming a conservative estimate of \$50 per unit in the United States within the context of mass production and a Freeview-type service, the one-time cost of a 50% subsidy would drop to \$756,530,500 and a 25% subsidy would cost \$378,265,250.

Unlike the cable/satellite subscription subsidy program, a subsidy for the purchase of set-top boxes would involve a substantially cheaper one-time investment, rather than a recurring cost. In addition, no legislation would be needed to require DTV carriage on cable and satellite or mandatory VSB tuners in cable and satellite set-top boxes.

This approach also possesses some disadvantages, however. First, the cost analysis above relies on the assumption of converting at least one television per qualified household and does not address additional television sets that rely on over-the-air reception, although this may be less of an issue for disadvantaged households. Second, at the lower end, over-the-air set-top boxes transmit only standard definition programming and do not currently have the capability to convert and display high-definition programming (even if it did have the ability to convert HD, display would be problematic on an analog set). Most importantly, however, this approach relies on the effectiveness of over-the-air reception on consumer premises. In many cases, adequate DTV reception requires something more than the usual indoor rabbit ears consumers are familiar with, and in many instances may require the installation or upgrade of directional rooftop antennas, either at the consumer's home or, on the roof of a multiple dwelling unit for apartment dwellers. This last issue will be discussed in more depth at Part III of this paper.

- **Summary of Advantages and Disadvantages**

- Advantages

- Addresses needs of the disadvantaged and ensures universal service.
 - No legislation would be needed to require DTV carriage on cable and satellite or mandatory VSB tuners in cable and satellite set-top boxes.
 - Requires only a one-time investment.

- Disadvantages

- While lower than direct subsidies for cable and satellite subscription, cost is still high.
 - At lower end, over-the-air set-top boxes transmit only standard definition programming, not high definition programming.

⁷¹ Stephen Dowling, "Freeview marks its first year," BBC News, (Oct. 30, 2003), available at: http://news.bbc.co.uk/go/pr/fr/-/1/hi/entertainment/tv_and_radio/3197802.stm.

- Relies on the effectiveness of over-the-air reception, which may require the installation of new directional rooftop antennas in most cases.

3. *Analog “Fade to Black”*

Another means of making the transition to digital-only broadcasting smoother would be to phase in the cessation of analog service through a variety of means: a “fade to black” approach, rather than a “snap to black.”

One possible means would be to mandate a rolling market-by-market turn-off, beginning with either the highest ranked DMAs, those DMAs with the lowest over-the-air reliance, the most urban DMAs, or some other objective measure. In this regard, the United Kingdom has explicitly considered employing a similar approach by studying a geographic rolling shut-down of analog service. As its Independent Television Commission has observed:

“One means by which DTT coverage could be increased prior to nationwide switchover, enabling the process to start earlier, would be to implement switchover in a rolling region-by-region manner rather than as a nationwide “big bang.” With a rolling switchover process, as switchover were implemented in each region, the power of DTT transmissions within that region could be significantly increased, especially for any multiplexes for which analogue conversions were undertaken.”⁷²

This approach has been thought to have a number of advantages from a social standpoint.

“In addition to potential coverage and reception benefits, a rolling switchover process seems likely to have substantial practical advantages. It would enable the considerable deployment of technical resources necessary to implement switchover to be broken down into manageable chunks and for the switchover process to be continually improved, building upon the experience gained in those regions which underwent switchover earlier. It should also enable the broadcasters to focus their investment on improving DTT coverage where it was needed most and, as a rolling process got underway, credibility could be built amongst consumers nationwide as they were persuaded that switchover was “for real”, building momentum and, perhaps, encouraging some consumers to “future-proof” their next TV set.”⁷³

⁷² Independent Television Commission and the BBC, “A Report on Progress Towards Digital Switchover,” pp. 11-12 (April 2003), available at: http://www.digitaltelevision.gov.uk/pdfs/ITC_BBC_switchover_report.pdf.

⁷³ *Id.* at 12.

A second and not inconsistent alternative would be to require that analog stations gradually reduce power over time while DTV stations would be required to increase to full power. To a certain extent, this was the approach applied in Berlin, which as discussed above, required that its public service broadcasters relocate to lower power channels pending the transition. However, relocation is not necessary in the United States, as stations could simply reduce their analog output power over time according to an established schedule. As a result, more and more over-the-air households would either lose analog service, or experience a degradation in picture quality, but on a gradual basis rather than on a single date. This approach would also have the advantage of giving consumers time to adjust to the cessation of analog service over time and to plan accordingly. It would also open up spectrum for new non-broadcast technologies to use, as the gaps between broadcast service areas gradually increase.

4. *Public Outreach*

In order to make the transition to digital-only broadcasting as socially acceptable as possible, the government, with close coordination of the private sector could also implement a comprehensive public outreach and education effort. One model for this comes from Berlin, which, as discussed above, involved a public-private partnership including: (a) broadcast spots, running bar information and local news and current affairs coverage by broadcasters; (b) a letter sent to every home with details concerning the analog shut-off; (c) leaflets, brochures and newsletters distributed through local retailers; (d) close communication with local associations; (e) a telephone hotline; and (f) an Internet website. Extensive use of the print press, radio and other advertising methods (e.g. bus signs, billboards) could also likely be helpful to ensure adequate notice to the populace concerning the cessation of analog service.

5. *United States Freeview*

An additional means of making the transition to digital over-the-air service easier for non-cable and non-satellite households would be the creation of a cooperative marketing effort to package a free digital over-the-air service, like the Freeview service in the United Kingdom. Although an early return of analog spectrum could be accomplished without establishing a United States Freeview service, it could present a marketplace incentive to get over-the-air set-top boxes (or boxes with VSB tuners) into the hands of consumers with a minimum of government intervention. It could also revitalize the over-the-air service by providing more channels than are available currently over-the-air through an inexpensive and consumer friendly technology. In addition, if successful, it could also evolve into a competitive multichannel video service of its own, thus providing competition to cable and satellite and reducing broadcasters' reliance on cable and satellite for the distribution of their signals. Public television, consumer electronics manufacturers, commercial broadcasters and others are exploring the possibility of establishing such a service within the unique parameters of the United States market.

III. HOW RELIABLE IS THE ATSC STANDARD FOR OVER-THE-AIR DIGITAL RECEPTION?

As discussed above, it is critically important to the preservation of universal service, and to consumer and political expectations, that upon the cessation of analog service, digital signals should be reliably received in urban and rural environments. How reliable, therefore is the ATSC standard for over-the-air digital reception?

A recent report by the Association of Maximum Service Television (MSTV) indicates that current over-the-air digital reception is extensive and reliable. As of October, 2003, MSTV found the following:

- 73.3% of U.S. television households were in markets where there were at least six over-the-air DTV facilities.
- 92.7% of the replication area populations of DTV stations on the air were being served by existing facilities.
- At current power levels over 70 million U.S. DTV households were reached by six or more over-the-air DTV signals, 49 million U.S. TV households were reached by nine or more over-the-air DTV signals, and 30 million U.S. TV households were reached by 12 or more over-the-air digital signals.
- The most popular television stations had operational DTV facilities that served most, if not all, of their replication areas. The weighted average audience market share for those stations was 81.6% of all viewing to local broadcast stations.⁷⁴

However, as Doug Lung has pointed out, this most recent report, like all others, is based on projected coverage from computer model predictions and does not take into consideration actual reception by receivers in the field: the accuracy of the coverage conclusions is therefore based on the accuracy of the underlying assumptions inherent in the predictive computer model used, including assumptions about receiver performance.

“My main concern [is] that the [MSTV] study was based on the FCC noise-limited threshold and OET-69 Longley-Rice coverage, not the 7-dB higher FCC “city grade” signal level or the even higher signal levels many studies have found are necessary for practical DTV reception, particularly when indoor antennas are used. ... [M]any, if not all, of the DTV receivers currently being sold do not meet the parameters used in the planning factors that are the basis of FCC coverage predictions. It is also well-known that Longley-Rice, as used on OET-69, over-predicts signal levels

⁷⁴ Mark R. Fratrick, “Reaching the Audience: An Analysis of Digital Broadcast Power and Coverage,” Prepared for the Association of Maximum Service Television, Inc (BIA Financial Network, October 17, 2003).

over most unobstructed paths. None of this invalidates the premise of the study, which compares current coverage to the coverage the FCC calculated in the DTV allocation table. With the possible exception of the use of the DTV “City Grade” signal level, there is no other widely accepted method for determining DTV coverage. While current DTV receiver performance can be estimated, the wide variations in performance make it difficult to specify what new planning factors should be used. Should the best DTV receivers be used, since they represent what most consumers will be buying, or should older receivers be included because they represent the installed base?”⁷⁵

Putting this general issue aside, a number of commentators have also noted the difficulty with which digital signals are received in multipath and mobile environments. Whether this arises from deficiencies in current receiver design on one hand, or whether it is attributable to an alleged deficiency in the ATSC standard itself on the other hand, is a matter of considerable debate. To partially address this issue, however, ATSC has developed a newly revised digital broadcast standard called E-VSB, which it intends on putting to a membership vote in the Spring of 2004.⁷⁶ E-VSB alters, but doesn't replace, VSB by slowing the data rate to 14-15 Mbps so the signal-to-noise ratio (S/N) decreases to the 9.5-11 dB range from 15 dB. This is designed to ensure a more robust transport stream to enhance reception in circumstances where there is multipath interference (e.g. urban areas). In June of 2003, the National Association of Broadcasters board approved of a resolution supporting the introduction of E-VSB.⁷⁷

An additional issue that impacts reception concerns antennas. The computer models typically used to predict DTV reception assume the use of a rooftop antenna. In addition, anecdotal evidence in urban areas indicates that a simple “rabbit-ear” type of antenna is insufficient to enable consistent digital reception. To receive off-air digital signals, consumers with DTV tuner-equipped electronics (either a set-top box or integrated receiver) will have to either install or upgrade rooftop antennas.⁷⁸ In addition, there is some evidence that such antennas must have directional capability in order to receive all the available digital stations. For instance, in many communities, the public television transmitter is not collocated with other broadcasters on antenna farms. Thus, if the consumer antenna is oriented to receive commercial broadcast signals, it may not adequately receive the public broadcast signals emanating from a different geographic location. To accommodate this problem, rooftop antennas must have the capability to be rotated and adjusted from a remote location in the consumer dwelling.

⁷⁵ Doug Lung's RF Report, TVTechnology.com (November 3, 2003), available at: <http://www.tvtechnology.com/features/On-RF/index.shtml>.

⁷⁶ “New Technologies,” Communications Daily, (Nov. 18, 2003).

⁷⁷ “Broadcast,” Communications Daily (June 13, 2003).

⁷⁸ It appears this is not unique to the ATSC standard. In Britain, which uses a different digital standard, its Freeview service requires connection to a rooftop antenna as well. Independent Television Commission and the BBC, “A Report on Progress Towards Digital Switchover,” pp. 10, 22-23 (April 2003), available at: http://www.digitaltelevision.gov.uk/pdfs/ITC_BBC_switchover_report.pdf.

A further issue arises in the context of multiple dwelling units, such as apartment buildings or condominiums. If a rooftop antenna is required for adequate digital reception, building owners of rental properties will be required to upgrade or replace existing antennas for their multiple tenants. In the context of condominiums or homeowners associations, where the responsibility for antenna is on the individual owner, condominium or homeowners association rules may interfere with the placement of off-air antennas. Through its Over the Air Reception Device Rule (OTARD) the FCC does purport to preempt unreasonable local rules from interfering with the ability of consumers to install equipment necessary to receive television signals. However, condominium and homeowners associations may (and still do) impose a number of “aesthetic” restrictions that may make installation uncomfortably difficult or expensive, if not unduly so.⁷⁹

⁷⁹ For a fact sheet on the OTARD Rules, see <http://wireless.fcc.gov/siting/otard.html>. See also 47 C.F.R. §1.4000. The rule prohibits restrictions that impair the installation, maintenance or use of antennas used to receive video programming. The rule applies to video antennas including direct-to-home satellite dishes that are less than one meter (39.37") in diameter (or of any size in Alaska), TV antennas, and wireless cable antennas. The rule prohibits most restrictions that: (1) unreasonably delay or prevent installation, maintenance or use; (2) unreasonably increase the cost of installation, maintenance or use; or (3) preclude reception of an acceptable quality signal. Effective January 22, 1999, the Commission amended the rule so that it also applies to rental property where the renter has an exclusive use area, such as a balcony or patio. On October 25, 2000, the Commission further amended the rule so that it also will apply to customer-end antennas that receive and transmit fixed wireless signals.

IV. WHAT ARE THE COSTS FOR CONSUMERS TO PURCHASE DIGITAL EQUIPMENT AND RECEIVE DIGITAL SIGNALS?

An essential component of any adequate analysis of the success of digital-only broadcasting is to understand the costs for consumers to purchase equipment capable of receiving and displaying digital signals. Necessary equipment may include any of the following: (a) integrated digital television sets with ATSC receivers; (b) over-the-air DTV conversion set-top boxes; (c) computer PC video cards; (d) DTV capable antennas.

A. *Integrated Digital Television Sets with ATSC Receivers*

To encourage the availability of integrated receivers and the reception of broadcast digital signals, the FCC has mandated that a phased-in schedule for the inclusion of ATSC receivers in every television set by July 1, 2006.⁸⁰ However, at present, integrated television sets with ATSC tuners are quite expensive. Presently, integrated television sets with ATSC tuners cost between \$1850 for a 47" rear projection set to \$3300 for a 65" rear projection, although Zenith now offers a flat screen 32" product for \$1200—the lowest cost among integrated receivers. In estimating the effect of its tuner order on the cost of analog sets, the FCC concluded that in 2002, the additional cost would be \$200 per television⁸¹ but that the additional cost would drop to between \$50-70 towards 2006.⁸² Moreover, recent technological developments announced by Intel may indicate further decreases in prices for such sets.⁸³

Nevertheless, the FCC's ruling does not account for the problem of existing (legacy) analog television sets that do not have DTV reception capability, nor does it address the sale of HDTV monitors that lack any off-air tuner and that are exempt from its tuner requirement. In this regard, the FCC observed that in August of 2002, sales of integrated sets with ATSC tuners had reached only 70,295 nationwide (128,845 DTV set-

⁸⁰ Under the phase-in schedule: (1) 50% of TVs 36" and larger must include tuners by July 1, 2004, and 100% of them by July 1, 2005. (2) 50% of TVs 25" to 35" must have tuners by July 1, 2005, 100% of them by July 1, 2006. (3) 100% of TVs 13"-24" must include tuners by July 1, 2007. (4) 100% of TV interface devices such as VCRs and DVD players/recorders must include DTV tuners by July 1, 2007. Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television, Second Report and Order and Second Memorandum Opinion and Order, FCC 02-230, 17 FCC Rcd 15978, ¶ 40 (Aug. 9 2002), *aff'd* Consumer Electronics Association v. FCC, 347 F.3d 291 (D.C. Cir. 2003).

⁸¹ Id. at ¶ 39.

⁸² Recognizing the widely differing estimates, the FCC cited estimates by Motorola that the additional cost would be \$50 per set by 2006, estimates by Thompson that the additional cost per set would be \$75 by 2007-2008 and a study by ADL that that the additional cost would be \$16 by 2006. Id. at ¶ 42.

⁸³ John Markoff, "New Intel Chip for Digital TV Could Remake the Market," *New York Times* (Dec. 16, 2003).

top boxes had also been sold), as compared to the 1.3 million digital monitors sold.⁸⁴ The FCC further observed that the number of households reporting the ability to receive DTV signals over-the-air was only .2% of the total number of U.S. TV Households, implying that a significant number of integrated sets had been purchased by stores and remained there (or had found their way to non-residential use).⁸⁵

Moreover, current evidence indicates that prices will have to fall quite dramatically to gain consumer acceptance. In a recent survey of 1017 adults conducted by Pulse and CTAM, only 10% said they would very likely purchase a DTV television set within the next three years if the price were approximately \$1800, while more significantly, only 45% were very likely to purchase if the product dropped to \$300 with a full 23% said they were not at all likely to purchase a DTV set even at that price.⁸⁶

A separate study concluded that while barriers to consumers purchasing high definition TVs (HDTV) may be falling, many would-be buyers still remain confused about the product. The survey of 1556 individuals by Dove Consulting⁸⁷ said 30% of non-HDTV owners indicated they were willing to pay up to \$700 for an HDTV, with 20% willing to pay \$1,000. However, 47% of consumers surveyed didn't know whether programming was available in their area. In addition, the study found that the variety of HDTV equipment remained confusing to consumers, as 23% were unsure whether they had an HD-capable set, even though definitions and descriptions of equipment were provided. Overall, 17% of consumers reported having a good understanding of the equipment, while nearly 40% lacked knowledge or understanding. Moreover a separate study by Magid Associates indicates similar conclusions: a mere 14% of 1258 respondents were familiar with HDTV, while 40% said they were only somewhat familiar.⁸⁸

⁸⁴ Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television, Second Report and Order and Second Memorandum Opinion and Order, FCC 02-230, 17 FCC Rcd 15978, ¶ 34 (Aug. 9 2002). In its most recent video competition report the FCC noted that as of the second quarter of 2003, only about 700,000 of HDTV-capable sets "with a built-in tuner or add-on decoder box required for receiving and HDTV broadcast" had been sold. Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, FCC 04-5, ¶103 (rel. January 28, 2004).

⁸⁵ Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television, Second Report and Order and Second Memorandum Opinion and Order, FCC 02-230, 17 FCC Rcd 15978, ¶ 35 (Aug. 9 2002).

⁸⁶ "HDTV—At What Price," Pulse/ Cable & Telecommunications Association for Marketing, pp. 6-7.

⁸⁷ See Dove Consulting, "Barriers to Purchase HDTV Are Falling, But Consumers Remain Confused About the Product, Dove Study Finds," (Nov. 28, 2003), available at: www.doveconsulting.com/PR-2003-11-28HDTV.htm. See also Communications Daily (Dec. 1, 2003).

⁸⁸ "I Want my HDTV??? Consumer Perspectives on High Definition Television 2003," Frank N. Magid Associates, Iowa DTV Symposium, 2003.

B. Over-the-Air DTV Conversion Set-Top Boxes

A cheaper alternative to digital reception can be accomplished through the installation of over-the-air DTV conversion set-top boxes by consumers. As indicated above, current retail prices for such equipment in the United States, manufactured by Samsung and Motorola, range from \$300 to \$700. In Britain, inexpensive set-top boxes, marketed in conjunction with the Freeview service, retail from £80-100 (equivalent to \$136-170).⁸⁹ It is anticipated that with mass production, the cost could drop to £20 (\$34) in Britain.⁹⁰ With mass production for the larger U.S. market, it is likely that the cost of set-top boxes would drop substantially.

C. Computer PC Cards

An additional means of receiving digital television signals may be through a consumer's computer by employing a PC card connected to an antenna. At present, there are a few models of DTV PC-tuner cards available for purchase by the public. For instance, Hauppauge has two models of digital PC cards, one that is fully HD compatible for \$299 and one that receives DTV but not HD for \$199.⁹¹

D. Antenna Equipment

Use of any of the above equipment to receive digital off-air signals may require the installation or upgrade of an exterior roof-top antenna at additional cost. As indicated above, in order to receive all off-air DTV signals, the antenna may need to have directional capability that can be modified from within the home. Depending on the local needs, the cost of the equipment can vary and may require professional installation. The approximate cost of a typical roof-top "HDTV compatible" antenna is between \$50-100, depending on the type and size purchased; a rotator device can cost \$70; and there may be additional costs associated with mounting hardware, wires, splitters and amplifiers.⁹²

⁸⁹ "Freeview reaches first birthday," BBC News (Oct. 30, 2003); Matt Wells, "Digital TV at turning point as converts top 50%," The Guardian (Dec. 17, 2003).

⁹⁰ Stephen Dowling, "Freeview marks its first year," BBC News, (Oct. 30, 2003), available at: http://news.bbc.co.uk/go/pr/fr/-/1/hi/entertainment/tv_and_radio/3197802.stm.

⁹¹ www.hauppauge.com. B2C2 also makes a digital PC card for either DVB or ATSC. See www.b2c2.com/products/pc-products.html.

⁹² Costs of equipment are from www.radioshack.com, as of January 8, 2004.

V. WHAT PARTNERSHIPS DOES PUBLIC TELEVISION NEED IN ORDER TO SUCCESSFULLY RETURN ANALOG SPECTRUM EARLY?

While many public television stations are ready and willing to turn in their analog spectrum, provided that universal service requirements can be met in some manner, it is unlikely that a unilateral return of spectrum would be successful. In this regard, public television stations would need to enter into a number of partnerships to make early return of analog spectrum a success.

For instance, without the participation of **commercial broadcasters** with their higher viewership and extensive reach, it would be difficult to effectively spread the message concerning any potential broad-based analog shut-off and the means for maintaining service. In addition, if a Freeview-like service were to be established, commercial broadcaster participation would be essential for consumer acceptance.

A number of **equipment manufacturers**, such as Samsung and Dielectric, have voiced an interest in digital-only broadcasting. These companies would be instrumental in the development, manufacturing and mass distribution of products to enable digital reception over the air, e.g. through integrated television sets with ATSC receivers, digital set-top boxes, and antennas, among others.

In addition, just as the Berlin regional government reached out to **consumer and other affinity groups**, public television must also engage consumer groups (such as the Consumer Federation of America and Consumers Union) and affinity groups (such as the American Association of Retired People) in a process of exploring how to inform their constituency and to accommodate their interests in ensuring a smooth consumer-friendly transition to digital broadcasting.

A number of other companies in industries that would like to use the out-of-core DTV channels in the 700 MHz band would also be instrumental partners in accomplishing a rapid and successful return of analog spectrum. Once an early return of analog spectrum is accomplished, more television channels can be moved into the core of channels 2 through 51 and out of the 700 MHz band. In this regard, public television should work with **representatives of the 3G industry** (fixed and mobile telephony and data companies) **and public safety community** to facilitate financing and publicity.

Another potentially valuable partner would be companies in the **personal computer industry**, such as Dell, Gateway and Microsoft, who are seeking to enter the television market.

Lastly, it would be helpful to work closely with a number of **influential think tanks**, such as the New America Foundation, The American Enterprise Institute, the Manhattan Institute and the Cato Institute, among others, all of whom have voiced an

interest in making reforms to spectrum policy and have advocated for the rapid return of analog broadcast spectrum.

VI. WHAT REGULATORY AND LEGISLATIVE STRATEGIES ARE NECESSARY TO ACHIEVE EARLY RETURN OF ANALOG SPECTRUM?

To achieve the goal of digital-only broadcasting, it is important to consider what regulatory and legislative strategies public television stations would need to pursue. First, as discussed above, legislative changes may need to be sought to amend the Communications Act to delete the 85% market-by-market extension, create a hard date for analog cessation, and create a phased-in approach. Second, some form of subsidy would have to be created, funding in part by federal appropriations, to ensure that the economically disadvantaged have access to digital signals. Public television stations would also need to seek full and complete carriage of their digital signals on cable and satellite, or as an alternative, mandated ATSC tuners in all digital cable and satellite set-top boxes.

A. Changes to the Communications Act: Deletion of the Market-by-Market Extension Provision

As discussed above, a public television station may, without additional legislation, voluntarily return its analog spectrum, pursuant to the FCC's current band-clearing policies that require the station to demonstrate that the cessation of analog service would be in the public interest, including a demonstration that there would not be a loss of the sole noncommercial educational television service to a community on a reserved channel. Alternatively, it may be necessary to seek an amendment to the Communications Act to create a hard date by which analog spectrum should be returned for all broadcasters by deleting the 85% market-by-market extension and replacing it a new date coupled with a phased-in approach (either a rolling geographic shut-off and/or a schedule of power decreases) to effectuate a "fade to black."

B. Partial Subsidies for the Economically Disadvantaged to Access Digital Signals

As discussed above, to ensure that the economically disadvantaged will continue to have access to over-the-air services, it will be necessary to create a federally funded partial subsidy for either digital cable/satellite subscriptions or the purchase of over-the-air set-top converter boxes.

C. Digital Cable Carriage

Currently, broadcast television stations are not guaranteed full and complete carriage of their digital signals on cable, even if they are a digital-only station. The FCC's current rule states that if a television licensee with dual analog-digital channels returns one of its channels to the FCC prior to the end of the DTV transition, the digital channel remaining will be guaranteed cable carriage under FCC rules. However, carriage is

limited to the broadcaster's "primary video" stream if it is transmitting multiple programming streams simultaneously (i.e. multicasting).⁹³ A number of petitions for reconsideration have been filed at the FCC concerning this issue, and the FCC may be poised to resolve it in the Spring of 2004. Public television stations should continue to pursue a regulatory reconsideration of this ruling. Public television stations should also pursue legislative changes to clarify that the words "primary video" at Section 614 and 615 of the Communications act does not act to interfere with the mandatory carriage of all freely available multicast programming streams in the digital environment. Without such a change, digital-only broadcast stations face the likelihood that even if their digital signals are carried on cable, substantial portions of the programming in which they invest their resources will still be unavailable to the public which they serve.

D. Digital Satellite Carriage

The Satellite Home Viewer Improvement Act (SHVIA) requires satellite carriers to carry all local broadcast television stations in markets where they carry at least one local broadcast television station.⁹⁴ However, SHVIA is limited to analog carriage, as there is no provision under SHVIA for the carriage of local digital television broadcast signals. Indeed, the legislative history indicates that Congress did not take any position regarding mandatory carriage of digital signals by satellite carriers.⁹⁵ As part of its cable digital must-carry proceeding, the FCC is currently considering whether it should apply digital cable carriage rules to satellite carriers.⁹⁶ However, it seems unlikely that, in the absence of any stronger signals from Congress, the FCC will act to mandate digital carriage on satellite. Mandatory digital carriage would most likely be accomplished (if at all) through additional legislation in conjunction with the reauthorization of SHVIA's distant signal license, which expires by the end of 2004 and which will be addressed by Congress this year.

⁹³ Carriage of Digital Television Broadcast Signals; Amendments to Part 76 of the Commission's Rules; Implementation of the Satellite Home Viewer Improvement Act of 1999; Local Broadcast Signal Carriage Issues; Application of Network Non-Duplication Syndicated Exclusivity and Sports Blackout Rules to Satellite Retransmission of Broadcast Signals, First Report and Order and Further Notice of Proposed Rulemaking, 16 FCC Rcd 2598, ¶ 57 (rel. January 23, 2001).

⁹⁴ 47 U.S.C. §338(a)(1).

⁹⁵ "By directing the FCC to promulgate these must-carry rules, the conferees do not take any position regarding the application of must-carry rules to carriage of digital television signals by either cable or satellite systems." Joint Explanatory Statement of the Committee of Conference on H.R. 106-1554, 145 Cong. Rec. at H11792, H11795 (Daily ed. Nov. 9, 1999).

⁹⁶ Carriage of Digital Television Broadcast Signals; Amendments to Part 76 of the Commission's Rules; Implementation of the Satellite Home Viewer Improvement Act of 1999; Local Broadcast Signal Carriage Issues; Application of Network Non-Duplication Syndicated Exclusivity and Sports Blackout Rules to Satellite Retransmission of Broadcast Signals, First Report and Order and Further Notice of Proposed Rulemaking, 16 FCC Rcd 2598, ¶ 136 (rel. January 23, 2001).

E. ATSC Tuners in Digital Cable and Satellite Set-Top Boxes

As an alternative to pursuing legislative changes to mandate digital carriage on either cable or satellite, or as an interim step, it may be possible to request legislation to mandate ATSC tuners in all digital cable and satellite set-top boxes. This would enable cable and satellite subscribers to switch back and forth between subscription services and free off-air services without constraining the capacity of cable or satellite systems. This approach would have the advantage of freeing up cable and satellite capacity while maintaining consumer access to free off-air signals, and it would impose little or no burden on satellite carriers themselves, as some industry leaders – notably DIRECTV, EchoStar and Cablevision’s Voom satellite service—are already providing this technology to their HD customers. On the other hand, it may pose some navigation issues for those consumers who are less technologically adept than their peers and may require modifications to interfaces with additional equipment, such as VCR and PVR recording devices.

VII. IS THE EUROPEAN EXPERIENCE APPLICABLE TO THE UNITED STATES?

As discussed above, the Berlin regional government and Great Britain have already done a great deal of work to understand the consequences of, and to manage, the cessation of analog television service. In addition, the Commission of European Communities has recently asked European Union member states to report by the end of 2003 on their plans for analog switch-off. As part of this directive, it has set forth a number of suggested elements that may be part of member plans. First, it has suggested that market forces and informed consumer demand must drive the process, emphasizing that it should be a “market-led process, not a simple infrastructure change with no added value for citizens.”⁹⁷ Second, it has suggested that plans should be “transparent, justified, proportionate, and timely.”⁹⁸ Third, it has suggested that plans should be non-discriminatory, technologically neutral and that analog switch-off should only occur when digital broadcasting has achieved almost universal penetration in order to minimize social cost.⁹⁹ Lastly, the Commission has stated that policy intervention to support the cessation of analog television service should occur solely on the national level with the EU possessing only an advisory and coordinating function.¹⁰⁰ In particular, it is not envisioned that the EU would propose a common analog switch-off date, but rather that this would occur at a time of each nation’s choosing.¹⁰¹

It is likely that the U.S. would benefit from an analysis of each EU member state’s plans once these are published. However, it is important to consider whether and to what extent the European experience is applicable at all to the United States.

- For instance, in light of the fact that the EU has adopted a different digital standard than the US, are coverage patterns and over-the-air receivability different?
- Second, DTV in Europe is primarily driven by an improved standard definition service rather than high definition or datacasting.
- Third, the equivalent to public television has a higher profile and a better funding base in EU nations than in the United States.

⁹⁷ Commission of the European Communities, Communications from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, on the transition from analogue to digital broadcasting (from digital “switchover” to analog “switch-off”), SEC(2003)992, p. 4 (Sept. 17, 2003).

⁹⁸ Id.

⁹⁹ Id.

¹⁰⁰ Id.

¹⁰¹ Id.

- Fourth, the European populace may be more economically homogenous than in the U.S.
- Fifth, the European populace may be more geographically concentrated than in the U.S.
- Sixth, there are fewer analog over-the-air viewing choices in EU nations as compared to the U.S. and possibly a higher reliance on cable and satellite reception.
- Seventh, EU citizens are more accustomed to their governments being economically interventionist than the U.S. citizens.

Addressing all these apparent differences in detail is beyond the scope of this paper and would involve a degree of comparative research that would be difficult to conduct at this time. Nevertheless, a number of preliminary tentative observations can be made.

- The fact that Europe has adopted a different digital standard with possibly different coverage characteristics may be irrelevant, as the final determinant of adequate reception may be the design and performance of the receiver, not what is transmitted from the broadcast tower. Nevertheless, this issue does require careful consideration.
- Second, it is also difficult to understand the relevance of the fact that the European DTV market is more driven by standard-definition fare than by high-definition programming. What matters is the distribution of quality content that the consumer craves, not the nature of the cravings. On the other hand, if an over-the-air solution to digital distribution involves devices that are able to decode and display only standard-definition programming, and this is not what the American consumer wants, then it is likely that it will not meet with consumer acceptance, and the transition to digital-only broadcasting may be flawed.
- Third, while it may be true that the European equivalent to public television possesses a higher profile and is better funded by national governments than American public television stations, the relevance of this comparison becomes less compelling if American public television stations were to engage in partnerships with their commercial brethren, equipment manufacturers and other strategic partners to bring about digital-only broadcasting.
- Fourth, it is unclear whether the European population is more economically homogeneous than in the U.S., but even if this were the case, it is unclear why this would be a relevant comparison, except if it were to disproportionately affect the ability of the U.S. government (or

American public-private partnerships) to craft an effective subsidy for the purchase of digital equipment by disadvantaged households.

- Fifth, it is unclear whether the European population is more concentrated than the U.S. population, but even if it were true, the relevance of this comparison is questionable, unless it speaks to the greater difficulty of distributing digital signals in the U.S. to its numerous rural and remote areas.
- Sixth, while it may be claimed that there are fewer analog over-the-air viewing choices in Europe than in the U.S., and a likely higher reliance on cable and/or satellite reception, it is unclear whether this may be relevant if an effective off-air strategy can be crafted in the U.S. Interestingly, in Great Britain, the rate of cable subscription is *lower* than in the U.S. (50% in Britain as compared to an average of 67% in the U.S.)¹⁰²
- Lastly, while it may be true that EU citizens are more accustomed to their governments being economically interventionist than Americans, Americans have accepted a vast array of government-sponsored and regulated initiatives themselves when it is in their interest to do so. In fact, a market-sensitive approach to managing the transition to digital-only broadcasting would be optimal in both the U.S. and Europe, hence the European Commission's admonition that any analog shut-off scheme should be a "market-led process, not a simple infrastructure change with no added value for citizens."¹⁰³

¹⁰² "The cable networks currently reach around 50 per cent of UK households of which 50 per cent have currently been upgraded to digital operation." Independent Television Commission and the BBC, "A Report on Progress Towards Digital Switchover," p. 9 (April 2003), available at: http://www.digitaltelevision.gov.uk/pdfs/ITC_BBC_switchover_report.pdf.

¹⁰³ Commission of the European Communities, Communications from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, on the transition from analogue to digital broadcasting (from digital "switchover" to analog "switch-off"), SEC(2003)992, p. 4 (Sept. 17, 2003).

VIII. DIGITAL-ONLY BROADCASTING: A POSSIBLE ACTION PLAN

Based on the foregoing considerations, the following is a condensed possible action plan for implementing digital-only broadcasting.

- Voluntary Cessation of Analog Service
 - Consider advantages and disadvantages of current FCC band-clearing policy.
- Mandatory Cessation of Analog Services
 - Legislation:
 - Amend Communications Act:
 - Established a new hard date (later than 2006?)
 - Delete the 85% percent market-by-market extension
 - Establish a phased in approach, either or both of the following:
 - Rolling shut-off based on DMA, OTA reliance, or some other objective measure
 - Gradual decrease in analog power according to an established schedule, i.e. “fade to black”
 - Create a 50% or 25% federally funded subsidy (or tax credit) to ensure that the economically disadvantaged can access digital signals.
 - Mandate full cable and satellite carriage of digital signals post-transition
 - Alternative: mandate ATSC tuners in all digital cable and satellite set-top boxes.
- Communications
 - Implement a comprehensive and complete publicity campaign regarding the timing of analog cessation and means of continuing to receive signals, modeled on success of Berlin approach.
- Partnerships
 - Forge strategic partnerships with:
 - commercial broadcasters,
 - equipment manufacturers,
 - consumer and other affinity groups,
 - representatives of the 3G industry (fixed and mobile telephony and data companies) and public safety community,
 - personal computer industry, such as Dell, Gateway and Microsoft, and
 - influential think tanks, such as the New America Foundation, The American Enterprise Institute, the Manhattan Institute and the Cato Institute.
- United States Freeview
 - Create conditions for market forces to encourage consumer adoption of digital over-the-air services by creating a U.S. equivalent to Britain’s Freeview.

APPENDIX A

47 U.S.C. § 309(j)(14)

(14) Auction of recaptured broadcast television spectrum.

(A) Limitations on terms of terrestrial television broadcast licenses. A television broadcast license that authorizes analog television service may not be renewed to authorize such service for a period that extends beyond December 31, 2006.

(B) Extension. The Commission shall extend the date described in subparagraph (A) for any station that requests such extension in any television market if the Commission finds that--

(i) one or more of the stations in such market that are licensed to or affiliated with one of the four largest national television networks are not broadcasting a digital television service signal, and the Commission finds that each such station has exercised due diligence and satisfies the conditions for an extension of the Commission's applicable construction deadlines for digital television service in that market;

(ii) digital-to-analog converter technology is not generally available in such market; or

(iii) in any market in which an extension is not available under clause (i) or (ii), 15 percent or more of the television households in such market--

(I) do not subscribe to a multichannel video programming distributor (as defined in section 602 [[47 USCS § 522](#)]) that carries one of the digital television service programming channels of each of the television stations broadcasting such a channel in such market; and

(II) do not have either--

(a) at least one television receiver capable of receiving the digital television service signals of the television stations licensed in such market; or

(b) at least one television receiver of analog television service signals equipped with digital-to-analog converter technology capable of receiving the digital television service signals of the television stations licensed in such market.

APPENDIX B

Digital Cable Subscription Rates and Analog DBS Subscription Rates

Total TV Households

106,641,910 (April, 2003)

Source: National Cable and Telecommunications Association, www.ncta.com.

Cable Figures

Total Cable Subscription (basic tier)

72,111,560 (July, 2003); 67.6% of all TV Households

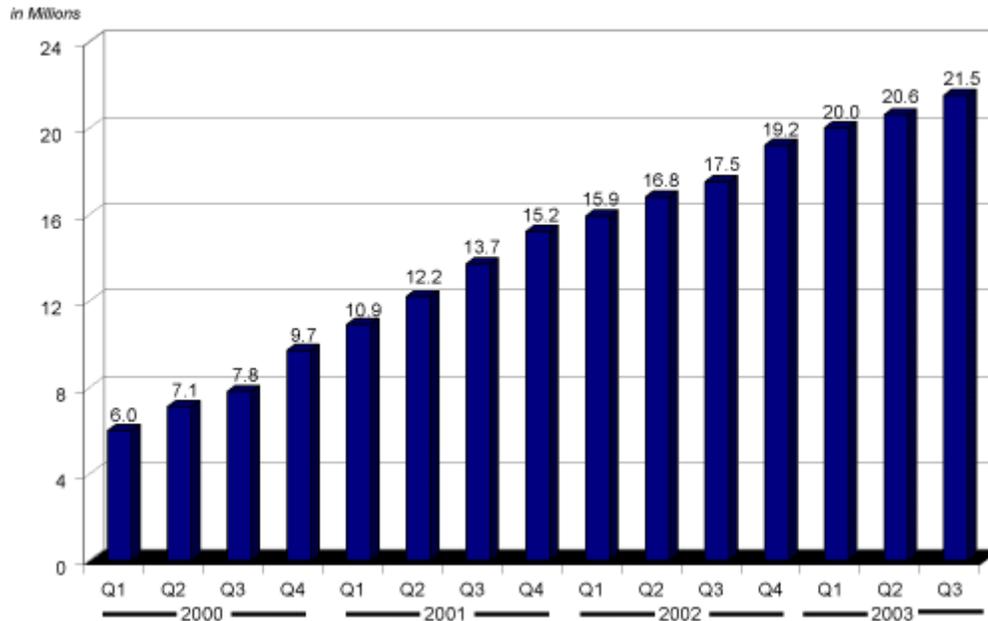
Source: National Cable and Telecommunications Association, www.ncta.com.

Digital Cable Subscription

21,500,000 (Sept., 30, 2003); 20.2% of all TV Households or 30% of all cable subscribers.

Source: National Cable and Telecommunications Association, www.ncta.com.

Digital Cable Customers: 2000-2003



Non-Cable Figures

Total Subscribers to Non-Cable MVPD's.

23,660,000 (June, 2003)

Source: National Cable and Telecommunications Association, www.ncta.com.

Satellite Figures

DBS Subscription

21,541,000 (December, 2003)(excluding C-Band); 20.2% of all TV Households.

National Number Estimates

Month	% Pen	USPS HHs	Total DTH	C-Band	DIRECTV	EchoStar
December-02	16.40%	121,680,332	19,951,089	590,089	11,181,000	8,180,000
March-03	16.81%	121,865,991	20,484,058	534,058	11,420,000	8,530,000
June-03	17.11%	121,943,488	20,859,800	499,800	11,560,000	8,800,000
September-03	17.51%	122,232,484	21,400,869	465,769	11,850,000	9,085,100
December-03	17.91%	122,663,335	21,969,362	428,362	12,150,000	9,441,000

Source: www.skyreport.com.

DBS Local-into-Local Subscription Rates

Total: 54% of all DBS subscribers

DIRECTV: 75% of all residential customers

EchoStar: Figures not available

Dominion: Figures not available

Voom: Figures not available

Source: Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, FCC 04-5 (rel. January 28, 2004).

APPENDIX C

Over the Air Reception Statistics from Highest Percentage of Over-the-Air Reliance to Lowest

Nov-03

DMA		Over the Air				
DMA Rank	Name	TV HH	HH	Raw OTA Rank	%	OTA% Rank
	Harlingen-Wslco-					
97	Brnsvl-McA	297,390	120,146	41	40.4	1
203	Fairbanks	31,840	10,826	174	34.0	2
123	Boise	222,490	72,309	68	32.5	3
100	El Paso (Las Cruces)	283,870	89,987	54	31.7	4
57	Fresno-Visalia	521,160	153,742	28	29.5	5
36	Salt Lake City	786,030	229,521	18	29.2	6
155	Anchorage	135,950	37,658	111	27.7	7
14	Minneapolis-St. Paul	1,635,650	451,439	6	27.6	8
7	Dallas-Ft. Worth	2,255,970	615,880	4	27.3	9
11	Houston	1,848,770	495,470	5	26.8	10
191	Laredo	60,210	15,895	163	26.4	11
33	Milwaukee	871,490	228,330	19	26.2	12
136	Duluth-Superior	172,360	44,124	96	25.6	13
105	Ft. Wayne	268,610	67,690	72	25.2	14
68	Green Bay-Appleton	426,820	106,278	43	24.9	15
78	Springfield, MO	389,150	96,898	47	24.9	16
87	South Bend-Elkhart	330,200	80,239	62	24.3	17
21	St. Louis	1,202,170	290,925	11	24.2	18
85	Madison	355,010	85,557	56	24.1	19
	Albuquerque-Santa					
49	Fe	633,500	152,040	30	24.0	20
147	Lubbock	152,090	35,893	114	23.6	21
153	Bangor	139,550	31,957	124	22.9	22
24	Portland, OR	1,073,210	244,692	16	22.8	23
134	Wausau-Rhineland	178,910	40,255	106	22.5	24
172	Yuma-El Centro	99,290	22,340	149	22.5	25
73	Des Moines-Ames	404,580	90,626	51	22.4	26
169	Missoula	100,180	22,440	147	22.4	27
	Phoenix (Prescott),					
15	AZ	1,561,760	348,272	7	22.3	28
146	Joplin-Pittsburg	153,130	33,995	117	22.2	29
164	Idaho Falls-Pocatello	109,820	24,160	142	22.0	30
192	Twin Falls	58,840	12,945	164	22.0	31

71	Tucson (Sierra Vista)	413,460	90,134	53	21.8	32
	Grand Rapids-					
38	Kalmzoo-B.Crk	724,290	151,377	31	20.9	33
3	Chicago	3,399,460	707,088	3	20.8	34
2	Los Angeles	5,402,260	1,118,268	1	20.7	35
80	Spokane	381,820	79,037	64	20.7	36
	Yakima-Pasco-					
127	RchInd-Knnwck	200,950	41,396	103	20.6	37
120	Eugene	226,870	46,055	92	20.3	38
32	Cincinnati	872,330	175,338	26	20.1	39
	Columbia-Jefferson					
139	City	166,500	33,467	120	20.1	40
60	Tulsa	505,000	101,000	45	20.0	41
126	La Crosse-Eau Claire	207,370	41,474	102	20.0	42
207	Helena	24,910	4,957	201	19.9	43
	Sacramnto-Stktn-					
19	Modesto	1,278,430	250,572	15	19.6	44
112	Traverse City-Cadillac	248,930	48,043	90	19.3	45
	Grand Junction-					
190	Montrose	62,380	12,039	172	19.3	46
	Davenport-R.Island-					
94	Moline	308,460	58,916	79	19.1	47
132	Chico-Redding	185,920	35,139	116	18.9	48
69	Toledo	425,770	80,045	63	18.8	49
118	Fargo-Valley City	232,850	43,776	99	18.8	50
170	Billings	99,470	18,700	155	18.8	51
45	Oklahoma City	647,390	121,062	40	18.7	52
50	Louisville	624,470	116,776	42	18.7	53
37	San Antonio	736,240	136,941	35	18.6	54
144	Sioux City	157,970	29,382	128	18.6	55
43	Memphis	662,280	121,860	39	18.4	56
84	Columbia, SC	363,750	66,566	73	18.3	57
199	Bend, OR	50,980	9,329	182	18.3	58
18	Denver	1,399,100	254,636	13	18.2	59
25	Indianapolis	1,038,370	187,945	25	18.1	60
23	Baltimore	1,083,030	193,862	23	17.9	61
54	Austin	577,740	102,838	44	17.8	62
	Quincy-Hannibal-					
166	Keokuk	106,110	18,888	154	17.8	63
194	Butte-Bozeman, MT	57,310	10,201	179	17.8	64
	Cedar Rapids-Wtrlo-					
88	IWC&Dub	328,060	58,067	80	17.7	65
	Colorado Springs-					
93	Pueblo	309,960	54,553	84	17.6	66
10	Detroit	1,923,230	334,642	8	17.4	67
31	Kansas City	875,090	152,266	29	17.4	68

75	Rochester, NY	395,350	68,791	71	17.4	69
110	Lansing	252,040	43,855	98	17.4	70
56	Little Rock-Pine Bluff	524,090	89,619	55	17.1	71
184	Meridian	71,090	12,156	169	17.1	72
188	Great Falls	64,000	10,816	175	16.9	73
	Raleigh-Durham					
29	(Fayetteville)	947,750	159,222	27	16.8	74
34	Columbus, OH	854,040	143,479	32	16.8	75
	Paducah-Cape					
76	Girard-Harsbg	391,080	65,310	75	16.7	76
133	Rockford	178,930	29,881	126	16.7	77
141	Erie	159,140	26,576	136	16.7	78
104	Charleston, SC	269,880	44,800	94	16.6	79
	Rochestr-Mason City-					
152	Austin	141,300	23,456	145	16.6	80
	Cleveland-Akron					
16	(Canton)	1,542,970	254,590	14	16.5	81
113	Sioux Falls(Mitchell)	247,210	40,790	105	16.5	82
168	Hattiesburg-Laurel	101,810	16,799	161	16.5	83
	Flint-Saginaw-Bay					
64	City	473,910	77,247	65	16.3	84
114	Augusta	244,490	39,852	109	16.3	85
	Minot-Bismarck-					
159	Dickinson	132,070	21,395	151	16.2	86
58	Richmond-Petersburg	512,310	81,970	58	16.0	87
81	Shreveport	379,880	60,401	76	15.9	88
130	Bakersfield	189,650	29,965	125	15.8	89
59	Dayton	511,770	80,348	60	15.7	90
99	Evansville	284,000	44,588	95	15.7	91
148	Terre Haute	146,260	22,963	146	15.7	92
	Burlington-					
89	Plattsburgh	323,070	50,399	87	15.6	93
181	Bowling Green	80,200	12,511	166	15.6	94
	Wichita-Hutchinson					
67	Plus	447,710	68,947	70	15.4	95
129	Amarillo	191,330	29,465	127	15.4	96
137	Topeka	171,660	26,436	137	15.4	97
163	Abilene-Sweetwater	115,410	17,773	159	15.4	98
30	Nashville	904,380	138,370	33	15.3	99
51	Las Vegas	601,700	92,060	49	15.3	100
135	Monroe-El Dorado	174,000	26,622	135	15.3	101
	Greenvll-Spart-					
35	Ashevl-And	806,930	122,653	38	15.2	102
117	Peoria-Bloomington	241,200	36,662	112	15.2	103
198	Mankato	51,460	7,770	193	15.1	104
193	Eureka	57,520	8,628	189	15.0	105

17	Miami-Ft. Lauderdale Columbus-Tupelo-	1,510,740	225,100	20	14.9	106
131	West Point Greenville-N.Bern-	187,780	27,979	130	14.9	107
103	Washngtn Sherman, TX-Ada,	270,560	40,043	108	14.8	108
161	OK Medford-Klamath	122,000	18,056	157	14.8	109
140	Falls	160,910	23,654	143	14.7	110
42	New Orleans	665,190	96,453	48	14.5	111
197	Ottumwa-Kirksville	51,470	7,463	194	14.5	112
101	Youngstown	279,260	40,213	107	14.4	113
12	Seattle-Tacoma	1,685,480	241,024	17	14.3	114
77	Omaha	389,270	55,666	83	14.3	115
200	Casper-Riverton	50,720	7,202	196	14.2	116
90	Jackson, MS Lincoln & Hstngs-	322,480	45,470	93	14.1	117
102	Krny Plus Greensboro-H.Point-	274,480	38,702	110	14.1	118
46	W.Salem	645,430	90,360	52	14.0	119
74	Portland-Auburn	398,500	55,790	82	14.0	120
92	Waco-Temple-Bryan	310,280	43,439	100	14.0	121
28	Charlotte	986,830	137,169	34	13.9	122
116	Reno	242,080	33,407	121	13.8	123
201	St. Joseph Jacksonville,	50,400	6,955	197	13.8	124
52	Brunswick	598,070	81,936	59	13.7	125
86	Chattanooga	349,260	47,499	91	13.6	126
66	Roanoke-Lynchburg San Francisco-Oak-	450,090	60,312	77	13.4	127
5	San Jose Washington, DC	2,440,920	324,642	9	13.3	128
8	(Hagrstwn) Birmingham (Ann and	2,224,070	293,577	10	13.2	129
40	Tusc)	697,570	91,382	50	13.1	130
79	Syracuse Champaign&Sprngfld-	384,290	49,958	88	13.0	131
82	Decatur Wichita Falls &	378,560	49,213	89	13.0	132
143	Lawton Ft. Smith-Fay-	158,290	20,578	152	13.0	133
108	Sprngdl-Rgrs	259,680	33,499	119	12.9	134
128	Corpus Christi	194,040	25,031	139	12.9	135
158	Panama City	132,860	17,139	160	12.9	136
174	Rapid City	93,610	12,076	170	12.9	137
186	Charlottesville	69,670	8,987	184	12.9	138

107	Tyler- Longview(Lfkn&Ncgd)	260,080	32,770	122	12.6	139
109	Myrtle Beach- Florence	258,430	32,304	123	12.5	140
44	Buffalo	647,920	80,342	61	12.4	141
185	Lima	70,850	8,715	187	12.3	142
13	Tampa-St. Pete (Sarasota)	1,644,270	200,601	22	12.2	143
41	Norfolk-Portsmth- Newpt Nws	693,660	84,627	57	12.2	144
55	Albany-Schenectady- Troy	542,670	66,206	74	12.2	145
157	Odessa-Midland	133,170	16,247	162	12.2	146
180	Harrisonburg	85,850	10,474	177	12.2	147
83	Huntsville-Decatur (Flor)	364,340	44,085	97	12.1	148
121	Monterey-Salinas	226,380	27,392	131	12.1	149
209	North Platte	15,670	1,896	210	12.1	150
62	Mobile-Pensacola (Ft Walt)	497,570	59,708	78	12.0	151
122	Macon	225,190	27,023	132	12.0	152
47	Harrisburg-Lncstr- Leb-York	637,240	75,832	66	11.9	153
125	Columbus, GA	207,820	24,731	140	11.9	154
142	Wilmington	159,060	18,928	153	11.9	155
145	Albany, GA	156,610	18,637	156	11.9	156
189	Lafayette, IN	63,130	7,449	195	11.8	157
48	Providence-New Bedford	635,610	74,366	67	11.7	158
176	Alexandria, LA	92,440	10,815	176	11.7	159
61	Knoxville	499,040	57,889	81	11.6	160
183	Jackson, TN	75,280	8,657	188	11.5	161
177	Watertown	91,280	10,315	178	11.3	162
95	Baton Rouge	299,980	33,598	118	11.2	163
204	Victoria	30,830	3,453	205	11.2	164
91	Tri-Cities, TN-VA	322,130	35,756	115	11.1	165
115	Montgomery (Selma)	243,000	26,730	134	11.0	166
124	Lafayette, LA	215,830	23,525	144	10.9	167
162	Gainesville	117,310	12,787	165	10.9	168
22	Pittsburgh	1,175,410	126,944	36	10.8	169
65	Lexington	466,980	50,434	86	10.8	170
111	Tallahassee- Thomasville	250,300	26,782	133	10.7	171
208	Alpena	18,220	1,950	209	10.7	172
175	Lake Charles	93,030	9,768	181	10.5	173
138	Beaumont-Port Arthur	171,310	17,816	158	10.4	174

206	Juneau, AK	25,840	2,662	208	10.3	175
	Greenwood-					
182	Greenville	79,080	8,066	191	10.2	176
205	Presque Isle	29,930	3,053	206	10.2	177
171	Dothan	99,350	10,034	180	10.1	178
4	Philadelphia	2,874,330	287,433	12	10.0	179
179	Jonesboro	87,690	8,769	186	10.0	180
210	Glendive	49,680	4,968	200	10.0	181
1	New York	7,376,330	730,257	2	9.9	182
	Orlando-Daytona					
20	Bch-Melbrn	1,263,900	125,126	37	9.9	183
98	Savannah	288,830	28,594	129	9.9	184
26	San Diego	1,029,210	99,833	46	9.7	185
	SantaBarbra-SanMar-					
119	SanLuOb	230,400	22,349	148	9.7	186
178	Marquette	89,600	8,512	190	9.5	187
9	Atlanta	2,035,060	191,296	24	9.4	188
106	Springfield-Holyoke	260,880	24,262	141	9.3	189
156	Biloxi-Gulfport	133,530	12,285	167	9.2	190
	Wilkes Barre-					
53	Scranton	590,100	52,519	85	8.9	191
	Cheyenne, WY-					
196	Scottsbluff,	52,950	4,713	202	8.9	192
202	Zanesville	32,570	2,899	207	8.9	193
154	Binghamton	139,190	12,249	168	8.8	194
6	Boston (Manchester)	2,391,830	208,089	21	8.7	195
70	Ft. Myers-Naples	421,130	36,638	113	8.7	196
	Charleston-					
63	Huntington	495,190	42,586	101	8.6	197
167	Utica	105,300	8,845	185	8.4	198
149	Salisbury	145,280	12,058	171	8.3	199
	Wheeling-					
151	Steubenville	142,450	11,111	173	7.8	200
195	San Angelo	53,980	4,049	203	7.5	201
96	Johnstown-Altoona	297,460	21,715	150	7.3	202
	Hartford & New					
27	Haven	1,001,320	71,094	69	7.1	203
72	Honolulu	412,190	26,380	138	6.4	204
	Bluefield-Beckley-Oak					
150	Hill	144,210	9,229	183	6.4	205
160	Palm Springs	125,270	7,892	192	6.3	206
173	Elmira (Corning)	97,690	5,959	199	6.1	207
187	Parkersburg	64,560	3,938	204	6.1	208
165	Clarksburg-Weston	106,430	6,279	198	5.9	209
	West Palm Beach-Ft.					
39	Pierce	709,290	41,139	104	5.8	210

Total 108,454,860 17,462,735 16.1%

Source: Dennis Haarsager and Television Bureau of Advertising
(November, 2003)

APPENDIX B: DIGITAL TRANSLATORS

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

In the Matter of)
)
Amendment of Parts 73 and 74 of the)
Commission’s Rules to Establish Rules for) MB Docket No. 03-185
Digital Low Power Television, Television)
Translator, and Television Booster Stations and)
to Amend Rules for Digital Class A Television)
Stations)

**COMMENTS OF THE ASSOCIATION OF PUBLIC TELEVISION STATIONS
AND THE PUBLIC BROADCASTING SERVICE**

The Association of Public Television Stations (“APTS”) and the Public Broadcasting Service (“PBS”) (collectively, “Public Television”)¹ hereby submit comments in the above-captioned proceeding.

Public Television applauds the Commission’s recent adoption of a Notice of Proposed Rulemaking that seeks comment on how to upgrade the translator, low power and Class A service to digital operations² and looks forward to working with the Commission to resolve issues of critical importance to Public Television and rural Americans. In this regard, it is important that the Commission act swiftly to provide for

¹ APTS is a nonprofit organization whose members comprise the licensees of nearly all of the nation’s 357 CPB-qualified noncommercial educational television stations. APTS represents public television stations in legislative and policy matters before the Commission, Congress, and the Executive Branch and engages in planning and research activities on behalf of its members. PBS is a nonprofit membership organization of the licensees of the nation’s public television stations. PBS distributes national public television programming and provides other program-related services to the nation’s public television stations.

² Amendment of Parts 73 and 73 of the Commission’s Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations, Notice of Proposed Rulemaking, FCC 03-198, MB Docket No, 03-185 (rel Aug. 29, 2003) (“NPRM”).

the licensing of digital translator and on-channel repeaters so that rural America is not left behind in the digital revolution transforming this country's media landscape. The Commission's Notice of Proposed Rulemaking is a significant step in the right direction. In particular, Public Television believes that, with limited modifications, the proposed application processing procedures are both fair and reasonable. Further, the Commission should allow for technological flexibility and licensee autonomy to address local programming and technical needs. Lastly, the Commission should act to protect the integrity of the existing analog translator service, while maintaining its secondary status, by encouraging mutually acceptable technical solutions prior to any request that an analog translator cease operations due to a higher priority use.

I. Swift Commission Action will Ensure the Distribution of Digital Broadcast Television Services to Rural Americans

Through its system of full-power transmitters and over 700 translators, public television provides services to 99 percent of television households in furtherance of its statutory mandate to provide universal service.³ In multiple prior filings, Public Television presented the Commission with evidence that without rules to facilitate the conversion of translators to digital operation, millions of rural Americans will likely not receive critical educational and public safety services over digital broadcast technology.⁴

³ 47 U.S.C. §§ 396(a)(5), (7).

⁴ See Association of Public Television Stations, Public Broadcasting Service and Corporation for Public Broadcasting, Petition for Rulemaking, Enhancement of Broadband Access Through the Preservation of Public Television Translator Service and the Development of Digital Translators and Digital On-Channel Repeaters (May 29, 2002); Comments of the Association of Public Television Stations, the Corporation for Public Broadcasting and the Public Broadcasting Service, RM-10666 (May 16, 2003); and Reply Comments of the Association of Public Television Stations, the Corporation for Public Broadcasting and the Public Broadcasting Service, RM-10666 (June 16, 2003).

If the Commission were to decline to establish digital translator operational rules in this proceeding, as some may suggest, rural Americans would unnecessarily be disadvantaged in the digital transition that is currently transforming this nation's media landscape. For instance a study conducted by the Corporation for Public Broadcasting in 1998 concluded that over 12 million Americans are served by public television translators.⁵ Of these, over 2 million Americans receive no other public television service.⁶

Indeed, the importance of translators to the delivery of local service is dramatically illustrated when one examines typical cases in the western states. A review of the FCC database reveals, for example, that of the over 700 public television translators in service nationwide, over 70 are located in rural Utah, repeating the signals of KUED, KULC and KBYU to communities that are otherwise unable to receive these signals. Similarly, Idaho Public Television reports that it operates five transmitters and 34 translators covering 80 percent of the state's population,⁷ while the public television stations in New Mexico operate over 50 translators to deliver noncommercial educational services to residents throughout that state. Moreover, although national figures are unavailable, numerous small cable systems in rural areas rely on the reception of

⁵ See Reply Comments of the Association of America's Public Television Stations, and the Public Broadcasting Service, Rural and Small Market Access to Local Television Broadcast Signals, Department of Commerce, National Telecommunications and Information Administration, Docket No. 000208032-0031-01 (May 15, 2000), citing Jerry Ostertag, *Analysis of Impact of Elimination of Translators*, Corporation for Public Broadcasting, September 18, 1998.

⁶ The Department of Commerce's National Telecommunications and Information Administration has informed us that it is conducting a study of the coverage of public television stations nationwide, including both full-power and translator coverage, a project that is expected to be completed by the Summer of 2004.

⁷ Reply Comments of Idaho Public Television, Rural and Small Market Access to Local Television Signals, National Telecommunications and Information Agency, Docket No. 000208032-0032-01, (May 15, 2000), p. 1.

television translator signals at their headends to provide service to their customers.⁸

Providing for the licensing of digital translators and on-channel repeaters would therefore ensure distribution of digital signals both to rural citizens who rely on over-the-air reception and to rural cable subscribers as well.

As the above figures make clear, it is vitally important that as the Commission guides the conversion of the analog broadcast infrastructure to digital, rural Americans not be ignored. As Public Television previously demonstrated, digital translators and on-channel repeaters are both a technically feasible and a spectrum efficient means of accomplishing this goal.⁹ To ensure the universal and fair distribution of digital services, the Commission should act swiftly to allow for the licensing of digital translators and on-channel repeaters.

II. With Limited Modifications, the Commission's Proposed Application Processing Policy is Both Fair and Reasonable

The Commission seeks comment on the process for accepting applications by LPTV and TV translators to operate digital facilities.¹⁰ The Commission proposes accepting applications from LPTV and TV translators that would like to make a “hot-

⁸ For instance, it has been reported that in Utah, “Cable companies use the translators to provide the Salt Lake City television stations to rural viewers. Therefore, if a translator goes off the air, the cable company can’t provide the station carried by the translator to its viewers.” Bill McClure, “Free Rural Television May Soon Be A Thing of the Past,” the Richfield Reaper (April 5, 2000), p. 1-A. “This system [of translators] not only fills the free airwaves, but also feeds local broadcasts to the cable systems, such as Peak Cablevision.” Martin Renzhofer, “Rural Utah May Lose Free Television Feed,” The Salt Lake Tribune (March 15, 2000),p. D1.

⁹ Association of Public Television Stations, Public Broadcasting Service and Corporation for Public Broadcasting, Petition for Rulemaking, Enhancement of Broadband Access Through the Preservation of Public Television Translator Service and the Development of Digital Translators and Digital On-Channel Repeaters , p. 13, *et. seq.* (May 29, 2002).

¹⁰ NPRM, ¶ 92 *et. seq.*

switch” to digital on their current analog channels as minor facilities changes, provided (a) there would be no channel change (except to accommodate displacement) and (b) the protected digital signal contour of the proposed facility would overlap some portion of the protected contour of the analog authorization.¹¹ These applications will be accepted on a first-come, first-served basis.¹² Applications received on the same day that have interference conflicts with other applications will be considered mutually exclusive and will be resolved through auctions (a procedure about which Public Television continues to have concerns for public television applicants).¹³ Applications by stations seeking replacement channels due to displacement would be accorded higher priority than new facilities applications or modified facilities applications.¹⁴

For stations that wish to apply for additional channels on which to operate a digital LPTV or TV translator station, the Commission proposes announcing a digital-only filing window without geographic limitations but limiting eligibility to existing translator, LPTV and Class A licensees.¹⁵ The Commission suggests that mutually exclusive applications should be resolved through auctions (again, a concern for Public Television) but seeks comment on whether the applications for digital channels are exempt from auctions pursuant to Section 309(j)(2)(B) of the Communications Act.¹⁶ If such applications are exempt, the Commission seeks comment on a method to decide

¹¹ NPRM ¶ 92.

¹² Id.

¹³ Id.

¹⁴ Id.

¹⁵ NPRM ¶ 93 et. seq.

¹⁶ NPRM ¶ 94.

among mutually exclusive LPTV and TV translator digital applications.¹⁷ After the initial window has closed, the Commission has proposed accepting applications by LPTV and TV translator stations for additional digital channels through “rolling one-day filing windows” without any applicant eligibility restrictions.¹⁸

Public Television understands the difficulty of managing the process for accepting and awarding thousands of low power and TV translator digital applications in a way that maximizes the public interest while preserving limited Commission resources. Public Television therefore supports the Commission’s proposed application processing procedures, with some minor requested alterations, as a reasonable and fair means to efficiently award such licenses in an expeditious manner. Public Television requests some additional and limited modifications to restrict spectrum speculation and to ensure that non-profits and small communities have access to these valuable digital services.

First, in order to limit spectrum speculation, the Commission should impose some reasonable geographic restrictions on the application process. In this regard, the Commission rightly points out that in the last LPTV and TV translator window, approximately 4700 applications were filed with approximately 3700 of these applications being mutually exclusive.¹⁹ One reason why there were so many mutual exclusivities was that, although the Commission had restricted applications within 75 miles of major cities, it accepted applications without any further geographic limitations. This resulted in chains of mutual exclusivity that reached across several state borders. To

¹⁷ NPRM ¶ 95.

¹⁸ NPRM ¶ 98.

¹⁹ NPRM, n. 169.

avoid this, the Commission should divide the application process for new digital channels into regional windows.

Second, the Commission could reduce the incidences of mutual exclusivities and discourage spectrum speculation by also limiting the number of applications for each filing window.²⁰ However, in so doing, the Commission should be aware that many state licensees of integrated and centrally programmed public television systems will need to apply for multiple TV translator stations within their state. The Commission should accommodate this need by limiting the number of *multi-state* applications for LPTV and TV translator stations by a single entity.

Third, Public Television notes its continuing objection to the use of auction procedures where applicants propose a noncommercial educational television service.²¹ The Commission has raised the question whether all LPTV and TV translator applications for additional digital channels are covered by the auction exemption provision at Section 309(j)(2)(B). That provision states that competitive bidding authority shall not apply to licenses or construction permits “for initial licenses or construction permits for digital television service given to existing terrestrial broadcast licensees to replace their analog television service licenses.”²² Public Television supports Commission forbearance from using its auction procedures in this case and supports the

²⁰ See NPRM ¶ 107.

²¹ See NPRM n. 156 and Reexamination of the Comparative Standards for Noncommercial Educational Applications, 18 FCC Rcd 6691 ¶¶ 15-18 (2003) (holding that the auction exemption extends only to LPTV and TV translator applications for which the proposed facilities would be owned and operated by municipalities that would transmit only educational programming). See also Comments of the Association of Public Television Stations, MM Docket 95-31 (May 15, 2002); Reply Comments of the Association of Public Television Stations, MM Docket 95-31 (June 17, 2002); and Ex Parte Supplemental Memorandum of the Association of Public Television Stations, MM Docket 95-31 (December 16, 2002).

²² 47 U.S.C. § 309(j)(2)(B). *But see* H.R. Conf. Rep. No. 217, 105th Cong., 1st Sess. 1997, at 573; 1997 U.S.C.A.N. 176, (“Any mutually exclusive applications received after June 30, 1997, shall be subject to

Commission's alternative approach, which would allow parties to resolve their mutual exclusivity through settlements and engineering solutions, subject to dismissal of all mutually exclusive applications if settlements are not made within a specified period of time.²³

On the whole, however, Public Television supports the Commission's proposed application processing policy as both a fair and reasonable approach to initiating a digital rural service, but requests the inclusion of the above three modifications to greatly improve the proposed process. Public Television requests inclusion of: (1) geographic restrictions through a regional approach, (2) limitations on the number of multi-state applications, and (3) forbearance from use of auctions for digital translator and LPTV applications.

III. The Commission Should Allow for Technological Flexibility and Licensee Autonomy to Address Local Programming and Technical Needs

In its NPRM, the Commission seeks comment on a comprehensive range of programming and technical issues related to the operation of digital translators and digital boosters. In general, Public Television believes that the Commission should allow licensees a degree of technological flexibility and autonomy to meet the programming and technical needs of their local communities.

Construction Period. The Commission has sought comment on the possibility of reducing the construction period for a digital LPTV or TV translator station from three

the Commission's rules regarding competitive bidding, including applications for secondary broadcast services such as low power television, television translators, and television booster stations.")

²³ NPRM, ¶ 95.

years to two years.²⁴ Public Television urges the Commission to retain the three year period. First, many public television stations will be seeking federal funding assistance for digital translator and/or booster construction either through the Department of Commerce's Public Telecommunications Facilities Program or the Department of Agriculture's Rural Utilities Service Public Television Station Digital Transition Grant Program. Frequently, the time that it takes from the filing of the grant application to an award is nearly a year, while a successful capital campaign to provide matching funds may take another year. In addition, many noncommercial educational translators are operated by university licensees, which must operate under the unique timing of their own budget cycles, while other sources of matching funding may depend on the budget cycles of the various states. It is important, therefore, that the construction period be long enough to accommodate these unique circumstances.

Available Channels. Public Television supports the Commission's proposal that digital translators and digital LPTV stations be allowed to use channels 2 through 59 inclusive (except channel 37) for either on-channel conversion or for new digital operations, and that translator and LPTV operations on these channels be required to operate on a non-interfering basis to primary users and to protect earlier-authorized secondary users.²⁵ The Commission also seeks comment on the possibility of allowing digital translator and LPTV stations to use channels 52 through 59 only if the applicant demonstrates that there are no in-core channels available.²⁶ In addition, the Commission seeks comment on a similar restriction for channels 60-69 with the additional proviso that

²⁴ NPRM, ¶ 116.

²⁵ NPRM, ¶ 28.

²⁶ NPRM, ¶ 29.

only channels not allocated to public safety should be used.²⁷ The use of out-of-core channels is especially important to public television stations. For instance, PBS estimates that more than one-third (35 percent) of public television translators operate on channels 52 and above, and approximately 25 percent of public television translators operate on channels 60-69.²⁸ While licensees would prefer to use channels in the digital core for obvious reasons, in some circumstances use of out-of-core channels is necessary. Public Television requests that in such circumstances the Commission allow licensees the flexibility to seek channel assignments that have the technical features needed to serve their communities, without the requirement of demonstrating that no in-core channels are available.

Ancillary and Supplementary Services. The Commission seeks comment on whether it should extend its current rules concerning the provision of “ancillary and supplementary services” by digital television broadcast licensees to licensees of digital translators.²⁹ The Commission has recognized the value of these services when it authorized full power noncommercial education digital television stations to provide non-broadcast ancillary and supplementary services to their communities provided that the entire DTV bit-stream is used “primarily” for a noncommercial, nonprofit, educational broadcast service.³⁰ For instance, some public television stations are planning to use their

²⁷ NPRM, ¶ 30.

²⁸ Comments of the Association of America’s Public Television Stations and the Public Broadcasting Service, MM Docket No. 87-268 (Nov. 22, 1996), p. 16.

²⁹ NPRM, ¶ 16.

³⁰ 47 C.F.R. § 621(i). See also Ancillary or Supplementary Use of Digital Television Capacity by Noncommercial Licensees, Report and Order, FCC 01-306, (rel. October 17, 2001) (“A&S NCE Order”). Thus, a “substantial majority” of a station’s entire digital capacity must be used for a noncommercial, nonprofit, educational purpose as measured on a weekly basis. A&S NCE Order, ¶¶ 15-16. On May 9, 2003, the U.S. Court of Appeals for the District of Columbia Circuit unanimously affirmed the FCC rules. The Court held that the Commission had reasonably interpreted federal law prohibiting the broadcast of

ancillary and supplementary transmission to enhance the delivery of broadband services to their communities. Ancillary and supplementary transmissions may also be used to disseminate financial stock exchange information, Congressional voting information, Statehouse voting records, election returns and weather updates to targeted subscribers. In addition, ancillary and supplementary transmissions can also be used to enhance public safety. Still other public television stations plan to use ancillary and supplementary transmissions to enhance educational opportunity in their communities. For instance, some stations plan on offering subscription-based college courses, while others plan to transmit non-broadcast digital interactive content overnight to schools so that teachers can download it on demand during the school day. In light of the Commission's decision and the compelling nature of the public interest benefits such services provide, Public Television strongly supports the Commission's proposal and requests that public television digital translators be afforded the same degree of flexibility as their "parent" stations providing ancillary and supplementary services.

Regulatory Fees. The Commission seeks comment on whether LPTV and TV translators should be subject to the Commission's application and regulatory fees.³¹ Unlike commercial broadcasters, noncommercial educational television stations are exempt from paying annual regulatory fees, which, pursuant to federal law do not apply to governmental entities or nonprofits.³² In addition, public television stations are exempt from paying application fees that commercial broadcasters must pay for license

advertisements by public television stations and that the FCC's decision to allow public television stations to offer subscription services was neither arbitrary nor capricious in light of prior commission precedent, the high cost of digital technology and its greater flexibility. United Church of Christ v. FCC, 327 F.3d 1222 (D.C. Cir. 2003).

³¹ NPRM, ¶ 124.

³² See 47 C.F.R. § 1.1162(e) and 47 U.S.C. § 159(h)(1).

applications, renewals or construction permits.³³ The same application and regulatory fee exemptions should apply to noncommercial educational translators or boosters that repeat the main signal of a full-power exempt noncommercial educational station.

On-Channel Repeaters. The Commission also requests comment on the possibility of licensing “digital booster stations” that use the same input and output channels.³⁴ Public Television has previously presented the Commission with evidence that such digital booster stations are a technically feasible and spectrum efficient means of distributing a digital signal to remote areas within a station’s digital contour that are not ordinarily reached due to terrain or other factors.³⁵ Where boosters are designed to serve the same population as the main station with the same channel as the main station, Public Television suggests that the Commission grant the same degree of interference protection to the booster. The booster, in other words, should be considered merely an extension of the main signal through alternative technological means. Boosters may also be an effective means of providing service beyond a main station’s DTV contour. In such cases, the usual rules for interference protection that apply to a secondary service should apply.

Other Technical Issues. In addition, Public Television requests a limited number of policies concerning the technical operation of digital translators. First, to ensure that

³³ 47 C.F.R. § 1.1114(c)(full power stations) and 47 C.F.R. § 1.1114(e)(2) (noncommercial educational translators) (“An applicant for a translator or low power television station that proposes a noncommercial educational service will be entitled to a refund of fees paid for the filing of the application when, after grant, it provides proof that it has received funding for the construction of the station through the National Telecommunications and Information Administration (NTIA) or other showings as required by the Commission.”).

³⁴ NPRM, ¶ 118 et. seq.

³⁵ Association of Public Television Stations, Public Broadcasting Service and Corporation for Public Broadcasting, Petition for Rulemaking, Enhancement of Broadband Access Through the Preservation of Public Television Translator Service and the Development of Digital Translators and Digital On-Channel Repeaters, p. 13, et. seq. (May 29, 2002).

licensees have the technological flexibility to meet local needs, digital translators should be permitted to use the same input signal delivery techniques as they do presently, including but not limited to the signal of a full-power broadcast station, a booster, another translator or translator relay (digital or analog), a microwave relay link or a fiber optic circuit.³⁶

Second, the Commission seeks comment on whether digital translators should be authorized to use either a heterodyne frequency conversion mode, a regenerative digital mode or whether broadcasters should be able to choose their mode of transmission based on individual circumstances.³⁷ The Commission notes that while a heterodyne digital translator is less complex and therefore less costly, a regenerative digital translator is particularly useful for multi-hop translator networks.³⁸ While on one hand public television stations are sensitive to the issue of cost and prefer the most efficient and least costly equipment consistent with their universal distribution mission due to limitations on their financial resources, many public television stations in the West operate multi-hop translator networks to reach remote or difficult-to-access populations. Public Television therefore believes that it is most reasonable for the Commission to allow broadcasters to choose the mode of transmission based on the compelling nature of individual circumstances that a local broadcaster is best situated to assess.

Third, when predicting interference protection,³⁹ the Commission should, where possible, use the Longley-Rice method of predicting signal propagation. The Longley-

³⁶ See NPRM, ¶ 17.

³⁷ NPRM, ¶ 14.

³⁸ Id.

³⁹ See NPRM ¶ 41 et. seq.

Rice method takes detailed topographic terrain information into account and not only more accurately determines the expected coverage area but also provides a more accurate estimate of potential interference to, and from, translators. In addition, because the frequency offset rules were designed to address the reception of high-powered signals, digital TV translator stations should not be required to operate with a frequency offset where an NTSC signal is on the lower adjacent channel to the digital LPTV or translator in the same area.⁴⁰

Fourth, regarding the use of out-of-channel emission masks,⁴¹ Public Television notes that the nature of translators is to operate a relatively low power levels compared to full-power stations. Thus it would be reasonable to believe that less attenuation of out-of-band emissions would be acceptable for low power facilities if scaled according to power level. While a continuous scale may be too cumbersome to implement, it should not be difficult to establish multiple out-of-band emission masks for digital translator effective radiated power levels of, for example, 1-10 watts, 10-100 watts, 100-1,000 watts, and 1,000-10,000 watts, while employing the standard emission masks for power levels above 10,000 watts.

Fifth, in order to enhance flexibility and responsiveness to local circumstances, Public Television agrees with the Commission that local interference agreements freely entered into among digital LPTV and TV translator stations and other primary services should be allowed to supercede any interference protection standards adopted by the Commission.⁴² For the same reasons, the Commission should allow the use of co-located

⁴⁰ NPRM ¶ 57.

⁴¹ NPRM ¶ 64.

⁴² NPRM ¶ 50.

adjacent channels either on a waiver basis or pursuant to a written agreement among all affected parties.⁴³

Sixth, Public Television believes that because it is difficult to insert customized station identification into any configuration of a DTV translator, there should be no requirement for the translator to transmit a unique identification code.⁴⁴ Should there be a need to identify the digital translator, the output signal contains adequate information about the input signal station identification within the DTV signal itself on a continuous basis. Alternatively, however, if the Commission were to require a unique station for a digital translator, such a requirement should be limited only to those translators with an ERP of 10,000 watts or more in order to be sensitive to the costs that such a requirement would impose.

Lastly, because many translators are located at remote locations, such as mountain tops or terrain that is difficult to access (especially during winter), Public Television agrees that the Commission should apply its current analog rules to the digital translator service for unattended operation.⁴⁵

IV. The Commission Should Act to Protect the Integrity of the Analog Translator Service while Maintaining its Secondary Status

The Commission seeks comment on actions it might take to preserve the analog service provided by LPTV and TV translator stations.⁴⁶ Public Television requests that

⁴³ NPRM ¶ 54.

⁴⁴ NPRM ¶ 85, et. seq.

⁴⁵ NPRM, ¶ 84.

⁴⁶ NPRM, ¶ 105 et. seq.

the Commission act to protect the integrity of the existing analog translator service while maintaining its secondary status.

Because television translators are a secondary service, they must protect other stations, including both full-power and low-power Class A stations from interference.⁴⁷ Even if a translator station provides the only public television signal to a community, it must accommodate the needs of neighboring full-power stations and some low-power stations by seeking a replacement channel in increasingly congested spectrum or go off the air. In addition, the Commission has held that because a translator station operates as a secondary service it must vacate the spectrum at channels 60-69 at the end of the DTV transition in its market.⁴⁸ Although the Commission has recently ruled that a translator may continue to operate at channels 52-59 even after the end of the DTV transition in its market, the Commission has made it clear that a translator continues to be secondary to other services and that it must not cause actual interference to either DTV stations or licensees for new services.⁴⁹ Consequentially, when new services are introduced at channels 60-69 and later at 52-59, translators must re-engineer into channels 2-51 under the constant threat of eviction.

Recognizing the plight of these essential television translator services, the Commission has created some limited relief in its Sixth Report and Order in the

⁴⁷ See 47 C.F.R. § 74.703 et seq.

⁴⁸ Reallocation of Television Channels 60-69, the 746-806 MHz Band, ET Docket No. 97-157, Report and Order, ¶¶ 25, 29 (January 6, 1998); Reallocation of Television Channels 60-69, the 746-806 MHz Band, Memorandum Opinion and Order, FCC 98-261, ET Docket No. 97-157, ¶ 13 (rel. Oct. 9, 1998). See also <http://www.fcc.gov/oet/faqs/dtv-tvtx.html>.

⁴⁹ Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), Report & Order, FCC 01-364, ¶¶24-30. (rel. January 18, 2002). The Commission also allowed translator licensees to negotiate interference agreements with new service providers. *Id.* at ¶ 27.

Advanced Television proceeding.⁵⁰ For instance, the Commission allows a displaced translator station to apply on a first-come first-served basis for a suitable replacement channel in the same geographic area without being subject to competing applications and without having to wait for a filing window.⁵¹ The Commission has also relaxed certain technical requirements pertaining to interference standards and taboo restrictions.⁵²

While the Commission's displacement policies are helpful to a certain extent, in many situations, the engineering and planning required to successfully file displacement applications and construct in accordance with any resulting construction permit are too costly for noncommercial educational licensees and the rural communities they serve. Although Public Television emphasizes that it does not advocate any change to the secondary status accorded television translators, it submits that the Commission can do much more to encourage mutually acceptable technical solutions prior to any request that a translator cease operations due to a higher priority use.

In this regard, Public Television respectfully requests that the Commission should facilitate the relocation of analog translators to their communities by continuing to process displacement applications at any time and quickly. In addition to the displacement relief that the Commission already has in place, Public Television proposes that the Commission should encourage all new entrants to cooperate and work with existing analog translators to accommodate them, if possible, in finding technical

⁵⁰ See Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service, Sixth Report & Order, FCC 97-115, MM Docket No. 87-268, ¶ 141 et. seq. (April 21, 1997).

⁵¹ Id. at ¶144.

⁵² Id. at ¶145. See also NPRM, ¶ 105.

solutions prior to requesting that the translator cease operations.⁵³ Examples of such technical solutions include, but are not limited to, the use of directional antennas and limits on power and/or antenna height.⁵⁴ In this regard, significant technical advances have been made that will achieve major spectrum efficiencies to provide the spectrum needed for and during the transition to nationwide digital television.⁵⁵

⁵³ See Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service, Memorandum Opinion & Order on Reconsideration of the Sixth Report & Order, FCC 98-24, ¶ 107 (rel. Feb. 23, 1998).

⁵⁴ See Id. at ¶ 77.

⁵⁵ Examples of such technical advances include those in interference prediction, digital television allocation criteria (e.g., FCC OET Bulletin #69), favorable power ratios and interference protection, adjacent channel operation, directional transmitting antennas, and the potential relaxation of UHF "taboos" (as a result of recent tests of DTV and analog television receivers).

Conclusion

For the above reasons, Public Television urges the Commission to act swiftly to authorize the licensing and operation of digital translators and on-channel repeaters in rural areas and to protect the integrity of the existing analog service while maintaining its secondary status.

Respectfully submitted,

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<p>November 25, 2003</p>	

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

In the Matter of)
)
Amendment of Parts 73 and 74 of the)
Commission’s Rules to Establish Rules for) MB Docket No. 03-185
Digital Low Power Television, Television)
Translator, and Television Booster Stations and)
to Amend Rules for Digital Class A Television)
Stations)

**REPLY COMMENTS OF THE ASSOCIATION OF PUBLIC TELEVISION
STATIONS AND THE PUBLIC BROADCASTING SERVICE**

The Association of Public Television Stations (“APTS”) and the Public Broadcasting Service (“PBS”) (collectively, “Public Television”)¹⁵⁹ hereby submit reply comments in the above-captioned proceeding.

In our Comments, Public Television argued that it is important that the Commission act swiftly to provide for the licensing of digital translator and on-channel repeaters so that rural America is not left behind in the digital revolution transforming this country’s media landscape. The Commission’s comprehensive Notice of Proposed Rulemaking is a significant step in the right direction. Public Television continues to believe that, with limited modifications, the proposed application processing procedures are both fair and reasonable. Further, the Commission should allow for technological

¹⁵⁹ APTS is a nonprofit organization whose members comprise the licensees of nearly all of the nation’s 357 CPB-qualified noncommercial educational television stations. APTS represents public television stations in legislative and policy matters before the Commission, Congress, and the Executive Branch and engages in planning and research activities on behalf of its members. PBS is a nonprofit membership organization of the licensees of the nation’s public television stations. PBS distributes national public television programming and provides other program-related services to the nation’s public television stations.

flexibility and licensee autonomy to address local programming and technical needs.

Lastly, the Commission should act to protect the integrity of the existing analog translator service, while maintaining its secondary status, by encouraging mutually acceptable technical solutions prior to any request that an analog translator cease operations due to a higher priority use.

The Commission has received scores of comments from a diverse range of interested parties in this proceeding, including those from full-power commercial and noncommercial broadcasters, licensees of the rural translator service, proponents for low power television and Class A stations, new technology entrants in the lower 700 MHz band, representatives of the public safety community, communications engineers and the public. With a few exceptions, many of these parties support the expedited creation of new rules to authorize digital translators, low power, Class A and booster stations. However, a few segments of the communications industry oppose the introduction of these digital services for reasons that, while seemingly reasonable, are ultimately unfounded. In order to support the conversion of its entire infrastructure to digital, and to bring the power of digital noncommercial educational services to rural Americans, Public Television hereby responds to MSTV/NAB and the new licensees in the lower 700 MHz band, both of whom oppose elements of the Commission's proposed rules.

I. Concerns About Potential Interference and Difficulty with Repacking the Broadcast Television Spectrum Do Not Counsel Delay in the Creation of Rules for and Acceptance of Applications for Digital Translators and On-Channel Boosters

MSTV and NAB urge delaying the issuance of second channels to LPTV, television translator and Class A stations until the end of the DTV transition, citing apparent concerns regarding the possibility of interference to full-power broadcast television services and difficulty with the “repacking” of broadcast spectrum upon the completion of the transition if low power stations were to operate second channels.¹⁶⁰ Both of these concerns are unfounded but in any event may be addressed by focusing on upgrading the rural translator service first.

a. Federal Statute and Congressional Policy Mandate the Processing of Digital Translator Applications

As an initial matter, the Commission should be aware that while it weighs the advantages and disadvantages of authorizing a digital translator (or on-channel booster) service, Congress has directly spoken on the subject, requiring the Commission to accept applications for digital upgrades by translator stations. Federal statute states in relevant part:

“Issuance of licenses for advanced television services to television translator stations and qualifying low-power television stations - The Commission is not required to issue any additional license for advanced television services to ... any licensee of any television translator station, but shall accept a license application for such services proposing facilities

¹⁶⁰ Comments of the Association of Maximum Service Television and the National Association of Broadcasters, MB Docket 03-185 (Nov. 25, 2003).

that will not cause interference to the service area of any other broadcast facility applied for, protected, permitted, or authorized on the date of filing of the advanced television application. ... A licensee of a ... television translator station may, at the option of licensee, elect to convert to the provision of advanced television services on its analog channel, but shall not be required to convert to digital operation until the end of such transition period.”¹⁶¹

In this statute, Congress has stated that the Commission is not required to allocate and assign additional channels on a general basis to all translators for digital broadcast as it did for full-power television broadcast licensees. Rather, the Commission is directed to accept any individual application by television translator stations for either (1) a second channel on which to operate in digital or (2) an on-channel hot-switch at the end of the DTV transition.¹⁶² The language “at the option of the licensee” in the context of the latter makes it clear that the choice between an additional channel or an on-channel hot-switch is the licensee’s to make, not the Commission. Moreover, in the former case, the only contingency is that an application for a second channel not cause interference to any incumbent primary broadcast service. In the latter case, no additional interference requirements are imposed. Had Congress intended additional interference requirements to be imposed on on-channel conversion requests, it would have stated as much. Many of parties in this proceeding opposed to the introduction of a digital translator or booster service act as if the Commission has full discretion in this field but ignore the Congressional language that states otherwise.

¹⁶¹ 47 U.S.C. § 336(f)(4) (emphasis added). See also Conference Report, H. Rep. 106-464 p. 153 (Nov. 9, 1999).

¹⁶² The contrary argument, advanced by MSTV and NAB, that the statute authorizes the acceptance of second channel digital applications without requiring the grant of such applications is clearly erroneous. See Comments of the Association of Maximum Service Television and the National Association of Broadcasters, MB Docket 03-185, p. 10 (Nov. 25, 2003). Why would Congress require the Commission to process an application without authorizing it to grant it if the public interest requires it? Public Television submits that its reading of the first sentence – as not requiring the grant of second channels en masse, as was done with the full-power television broadcast service – is the more reasonable reading of the statute.

Moreover, Congress has made its commitment to the digital upgrade of rural translators even more apparent through its most recent appropriations. Pursuant to Congressional directive, the Department of Agriculture's Rural Utilities Service is poised to announce in the near future the award of approximately \$15 million in grants to fund equipment -- including digital translators -- designed to facilitate the delivery of digital television signals to rural areas.¹⁶³ Because the needs of rural America were greater than the available funding in fiscal year 2003, Congress has appropriated an additional \$14 million for fiscal year 2004 in the current omnibus appropriations bill "to convert analog to digital operation those noncommercial educational television broadcast stations that serve rural areas and are qualified for Community Service Grants by the Corporation for Public Broadcasting under section 396(k) of the Communications Act of 1934, including associated translators, repeaters, and studio-to-transmitter links."¹⁶⁴ Through its appropriation process, Congress has again spoken with remarkable clarity: the digital upgrade of translators serving rural America is a Congressional priority that brooks no delay, otherwise federal funds would have been encumbered in vain.

¹⁶³ See Department of Agriculture, Rural Utilities Service, Public Television Station Digital Transition Grant Program, Notice of Funds Availability, 68 Fed. Reg. 42680 (July 18, 2003); Sen. Rep. 107-223, p. 123 (Jul. 25, 2002) (appropriating \$15,000,000).

¹⁶⁴ See H. Rep. 108-401, pp. 23-24 (Nov. 25, 2003) (emphasis added).

(b) An On-Channel Flash-Cut is Not A Substitute for the Award of Second Channels for Digital Translator Broadcast Service

To be sure, neither MSTV/NAB nor any other full-power broadcaster, objects to applications for on-channel flash-cuts.¹⁶⁵ This approach, however, should in no way be considered an adequate substitute for a second-channel approach, for as noncommercial educational licensees Vermont Educational Television and KAET (Phoenix, AZ) have aptly noted in their comments filed in this proceeding, a flash-cut conversion ordinarily will occur only after the transition to digital is finished, otherwise rural Americans would be disenfranchised by the sudden cessation of analog service.¹⁶⁶ Thus, the option to either flash-cut on-channel or operate a second channel is critically important to maintaining quality service to rural America, a fact recognized by a number of full-power broadcasters who support the award of second digital channels under certain circumstances,¹⁶⁷ and by Congress in the explicit working of Section 336(f)(4), as discussed above.

¹⁶⁵ See Comments of the Association of Maximum Service Television and the National Association of Broadcasters, MB Docket 03-185, pp. 12-13 (Nov. 25, 2003); Comments of Cox Broadcasting, Inc and the Liberty Corporation, MB Docket 03-185, p. 1 (Nov. 25, 2003); and Comments of Paxson Communications Corp, MB Docket 03-185, p. 2 (Nov. 25, 2003).

¹⁶⁶ Comments of Vermont Educational Television, MB Docket 03-185, pp. 5-6 (Nov. 25, 2003); and Comments of KAET, MB Docket 03-185, p. 8 (Nov. 25, 2003).

¹⁶⁷ See, e.g., Comments of Fox Television Stations, Inc and Fox Broadcasting Company, MB Docket 03-185 (Nov. 25, 2003); Comments of Vermont Educational Television, MB Docket 03-185, pp. 5-6 (Nov. 25, 2003); and Comments of KAET, MB Docket 03-185, p. 8 (Nov. 25, 2003). See also Comments of the National Translator Association, MB Docket 03-185, p 29. (Nov. 25 2003).

(c) The Likelihood of Interference from Rural Digital Translator Operations is Low

While MSTV and NAB raise the reasonable concern that the proliferation of low power stations might cause additional interference to full-power broadcast operations (a concern Public Television shares), history and current technical experience demonstrate that there should be little concern. Indeed, the Commission has accurately remarked that “[a] hallmark of the low power television service in its 20-year history has been the few reported cases of interference caused by LPTV and TV translator stations.”¹⁶⁸ And real-world experiments with DTV translators by Kent Parsons in Utah suggest that the possibility of interference from translators in rural areas, even on adjacent channels, is negligible.¹⁶⁹ Indeed, the National Translator Association has presented additional evidence in its comments that “if an analog station is converted to digital at 25% average digital power (-6dB), there is no increase in predicted interference to any other station. That is, if all other stations are protected by the analog operation, they will continue to be protected. The protection actually increases except for the one case of co-channel with offset where it remains the same.”¹⁷⁰

MSTV and NAB also oppose the use of interference agreements among Class A, LPTV and TV translators vis a vis full-power stations.¹⁷¹ While MSTV and NAB

¹⁶⁸ Amendment of Parts 73 and 73 of the Commission’s Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations, Notice of Proposed Rulemaking, FCC 03-198, MB Docket No. 03-185, ¶ 36 (rel Aug. 29, 2003) (“NPRM”).

¹⁶⁹ See Comments of R. Kent Parsons, MB Docket No. 03-185, p. 10 (Nov. 24, 2003).

¹⁷⁰ Comments of the National Translator Association, MB Docket No. 03-185, p. 22 (Nov. 25, 2003).

¹⁷¹ Comments of the Association of Maximum Service Television and the National Association of Broadcasters, MB Docket 03-185, p. 18 (Nov. 25, 2003).

recognize that current policy is to allow private interference agreements,¹⁷² it objects that the digital context is different because DTV reception is less predictable and interference can result in a complete loss of reception.¹⁷³ While Public Television is sympathetic to this view and concurs with the need to preserve the integrity of full-power operations, it also believes that a number of interference disputes can be resolved through technical solutions between the parties, especially in rural areas.¹⁷⁴ In this regard, the Commission should encourage the resolution of these disputes through such means, including interference agreements, wherever possible.

(d) Digital Translators in Rural Areas Will Not Adversely Affect the “Repacking” Process

MSTV and NAB also raise concerns that the authorization of a second channel for translator, LPTV and Class A stations would adversely affect the repacking of television broadcast channels into the core of channels 2 through 51 required for a successful transition to digital television.¹⁷⁵ Public Television shares this concern, as numerous public television stations will need to migrate from out-of-core channels into the DTV core of channels 2 through 51. However, as MSTV/NAB and the Commission are well aware, translator and some low power stations are considered secondary services that must protect not only full-power operations but also Class A stations from interference.

¹⁷² *Id.* at 17; and NPRM ¶ 50.

¹⁷³ Comments of the Association of Maximum Service Television and the National Association of Broadcasters, MB Docket 03-185, p. 18 (Nov. 25, 2003).

¹⁷⁴ Comments of the Association of Public Television Stations and the Public Broadcasting Service MB Docket 03-185, p. 18 (Nov. 25, 2003).

¹⁷⁵ Comments of the Association of Maximum Service Television and the National Association of Broadcasters, MB Docket 03-185, pp. 4 et. seq. (Nov. 25, 2003). See also Comments of Paxson Communications, MB Docket 03-185, p. 7 (Nov. 25, 2003).

Translators that operate out-of-core (approximately one-third of the over 700 public television translators), will of course pose no problem for full-power stations seeking in-core channels. Some of the remaining translators that operate within the core will undoubtedly have to relocate if a full-power station identifies the channel as a useful for its final channel home. In this regard, given the secondary nature of television translators, the channel repacking process would be no more complicated by the addition of secondary services designed to serve rural Americans in a spectrum efficient manner. Although full-power stations may need to identify and coordinate with incumbent secondary services as the full-power stations migrate to the core, the same number of in-core channels will be available to full-power stations regardless of the existence of secondary television services.

Nevertheless, even given the concerns of possible interference and difficulty with repacking the television broadcast spectrum, the Commission may act to address rural access now – where interference and spectrum congestion is less of an issue – while perhaps deferring further consideration on urban allotments pending further study concerning the availability of spectrum and the possibility of interference in urban environments. In this regard, MSTV and NAB suggest that to alleviate the interference and repacking issue, the Commission may, on a case-by-case basis, accept applications for second channels with which to operate digital translators in “geographically isolated areas,” provided that the grant of such applications would not “limit channel choices or result in any additional interference to full service stations.”¹⁷⁶

¹⁷⁶ Comments of the Association of Maximum Service Television and the National Association of Broadcasters, MB Docket 03-185, p. 4, note 10 (Nov. 25, 2003). Abacus Television, an LPTV licensee, concurs, stating that the FCC should “focus on the spectrum environment in which they [translators]

Public Television concurs with this approach as an acceptable provisional alternative measure if the Commission declines to accept applications for a second channel by incumbent translators and LPTV on a general basis. As Public Television and some commercial broadcasters have observed, television translators are distinct from LPTV and Class A stations, largely because television translators are a predominantly rural service (in addition to the fact that translators do not originate programming).¹⁷⁷ If the Commission were to focus on accepting applications from rural translators for second channels, it may, as the National Translator Association suggested, restrict applications to those from communities with a maximum number of stations available over the air,¹⁷⁸ or it may as an alternative rely on the Rural Utilities Service definitions of “rurality” as a

predominantly operate and the public they predominantly serve,” i.e. rural areas and populations. Comments of Abacus Television, MB Docket 03-185, p. 2 (Nov. 25, 2003).

¹⁷⁷ See generally, Comments of the Association of Public Television Stations and the Public Broadcasting Service MB Docket 03-185 (Nov. 25, 2003). See also Comments of Fox Television Stations, Inc and Fox Broadcasting Company, MB Docket 03-185, p. 2 (Nov. 25, 2003).

¹⁷⁸ See National Translator Association, Petition for Rulemaking, p. 4 (Nov. 6, 2002), and Comments of the Association of Public Television Stations, the Corporation for Public Broadcasting and the Public Broadcasting Service, RM 10666, pp. 4 et. seq. (May 16, 2003) (seeking limited modifications to NTA rurality criteria).

guideline.¹⁷⁹

II. Concerns by Licensees in the 700 MHz Band Should Not Counsel Delay in Introducing Digital Services to Rural Americans

The Commission has also received a number of comments from companies licensed to operate in the lower 700 MHz band that oppose the introduction of new channels for television translator, low power and Class A operations in the band. These companies – predominantly representatives of the cell-phone industry— raise a number of objections including: (a) that introduction of secondary services in the 700 MHz band was somehow unexpected and unfair in light of the substantial amounts paid at auction for the spectrum; (b) that secondary services will create unwanted interference to new licensees in the 700 MHz band; and (c) that the introduction of secondary digital service in rural areas will not significantly advance the DTV transition. None of these concerns is warranted.

¹⁷⁹ The term “rural” has been subject to varying definitions, depending on the context. For instance, the U.S. Department of Commerce and U.S. Department of Agriculture have used the U.S. Census definition of the term when examining the deployment of advanced telecommunications services to rural areas. “Advanced Telecommunications in Rural America: The Challenge of Bringing Broadband Service to All Americans,” U.S. Department of Commerce, National Telecommunications and Information Administration, and U.S. Department of Agriculture, Rural Utilities Service (April, 2000) (“NTIA/RUS Report”), p. 4. Thus, in this context, “rural” means “towns of fewer than 2,500 inhabitants as well as areas outside of towns, including farmland, ranchland, and wilderness.” *Id.* (citing U.S. Census Bureau, Urban and Rural Definitions and Data at www.census.gov/population/censusdata/urdef.html). Because the Census definition can encompass both traditionally small and rural towns and outlying areas, as well as areas that are developing or urbanizing (e.g. new suburban developments), the Department of Commerce and Department of Agriculture have cautioned analysts on the use of the term and have focused primarily on rural areas outside of towns and suburbs. *Id.* at p. 5. Indeed, the Department of Agriculture’s Rural Utilities Service has recognized three levels of “rurality” for purposes of its distance learning and telemedicine program. An “exceptionally rural area” means any area that is not included within the boundaries of any incorporated or unincorporated city, village or borough having a population “in excess of 5,000 inhabitants.” A “rural area” means any such area with a population over 5,000 but not exceeding 10,000 inhabitants. A “mid-rural area” refers to an area having a population with a population over 10,000 and not exceeding 20,000 inhabitants. 7 C.F.R. § 1703.126(b)(2)(i).

(a) **Introduction of Secondary Services in the Lower 700 MHz Band Will Not Frustrate the Legitimate Expectations of Auction Winners**

Nearly all of the comments from 700 MHz licensees allege that it is unfair to authorize additional channels (or in some instances to authorize an on-channel flash-cut) in the 700 MHz band, because those successful licensees in the auction placed bids under the assumption that the band would be cleared of incumbents. These licensees variously claim that the introduction of secondary services was somehow unexpected, or even represented an actual reversal of Commission policy. These licensees also claim that the proposed policy is unfair in light of the substantial sums these licensees paid for spectrum in Actions 44 and 49.¹⁸⁰

In support of the claim that introduction of secondary services in the 700 MHz band was somehow unexpected, the 700 MHz licensees selectively quote from paragraph 28 of the Commission's order establishing service rules in the lower 700 MHz band,¹⁸¹ conveniently ignoring paragraph 27 where the Commission quite explicitly authorized LPTV and translator stations to continue operating in the band as a secondary service even after the DTV transition, provided that these stations did not cause actual interference to primary licensees in the band.¹⁸²

This policy was surely not unexpected. As early as March 28, 2001, the Commission announced its intentions to allow LPTV and TV translators stations to

¹⁸⁰ Some licensees even claim that the Commission's proposal policy would represent an intrusion on their property rights under the Fifth Amendment to the U.S. Constitution. See, e.g. Comments of Corr Wireless, MB Docket 03-185 (Nov. 25, 2003).

¹⁸¹ See, e.g. Comments of Qualcomm, Inc. MB Docket 03-185, pp 8-9 (Nov. 25, 2003); Comments of the Rural 700 MHz Band Licensees, MB Docket 03-185, pp.10-11 (Nov. 25, 2003).

¹⁸² Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), Report and Order, FCC 01-364, ¶ 27 (Jan. 18, 2002).

operate as a secondary service in the lower 700 MHz band after the DTV transition had been completed. It stated:

[W]e believe that low power television should be permitted to continue to operate on the 698-746 MHz band on a secondary basis. Accordingly, we propose that LPTV and TV translator stations not be permitted to cause harmful interference to stations of primary services, including new licensees in Channels 52-59, and cannot claim protection from harmful interference from stations of primary services, including new licensees in Channels 52-59. However, as set forth in the *DTV Sixth Report and Order*, we propose that LPTV and TV translator operations will not be required to alter or cease their operations until they actually cause interference to a DTV station or new service provider's operations in the 698-746 MHz band.¹⁸³

And in its final order, released in January of 2002, the Commission again made it clear that it was adopting its proposed policy to allow LPTV and TV translator stations to operate in the lower 700 MHz band after the DTV transition.¹⁸⁴ Five months later, Auction 49 was conducted between May 28 and June 13, while eight months after the final order was issued, Auction 44 was conducted between August 27 and September 18, 2002.

Thus, for over two years potential new licensees in the 700 MHz band were on notice that the spectrum for which they would bid at auction could likely be encumbered by secondary broadcast services. And in any event several months prior to bidding on the spectrum, these licensees knew with certainty that this was the Commission's policy. The fact that these licensees paid highly for access to this band is therefore irrelevant.

¹⁸³ In the Matter of Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), Notice of Proposed Rulemaking, FCC-01-91, GN Docket No. 01-74, 16 FCC Rcd 7278, ¶ 18 (March 28, 2001) (citations omitted).

¹⁸⁴ Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), Report and Order, FCC 01-364, ¶¶ 25, 27 (Jan. 18, 2002).

Any attempt by 700 MHz licensees to undo the Commission's decision should therefore be considered a late-filed petition for reconsideration and thus disregarded.¹⁸⁵

In addition, the structure of the Communications Act makes it clear that while band clearing of channels 60-69 is mandatory, no such statutory mandate exists for channels 52 through 59, a statutory difference recognized by the Commission in its lower 700 MHz service order.¹⁸⁶ Thus, as compared to the upper 700 MHz band, bidders for spectrum in the lower 700 MHz band could not reasonably expect that the band would be cleared of broadcast licensees.¹⁸⁷ Licensees in the lower 700 MHz band are simply trying to undo established Commission policy that was based on explicitly articulated Congressional priorities.

Nevertheless, the Commission should be aware that it is the preference of public television translator licensees to use in-core spectrum for translator operations. Out-of-core allotments above channel 51 will be considered only if core spectrum is unavailable

¹⁸⁵ For similar reasons, because the lower 700 MHz licensees acquired their licenses knowing full well that the band would be encumbered by secondary services during and after the DTV transition, no Fifth Amendment takings issues are implicated.

¹⁸⁶ See 47 U.S.C. § 337(e)(1) ("Any person who holds a television broadcast license to operate between 746 and 806 megahertz [television channels 60-69] may not operate at that frequency after the date on which the digital television service transition period terminates, as determined by the Commission."). In January of 2002, the Commission noted the key differences between the lower 700 MHz and upper 700 MHz band. It stated that, for instance, "there is no public safety allocation in the Lower 700 MHz Band, and there is a significantly greater degree of broadcast incumbency relative to the Upper 700 MHz Band. In addition, we note that Congress has directed the Commission to reclaim the Upper 700 MHz Band for public safety and commercial use under an accelerated time frame, but did not accord the same priority to recovery of the Lower 700 MHz Band." Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), Report and Order, FCC01-364, ¶ 184 (Jan. 18, 2002).

¹⁸⁷ In this regard, the Commission has also received comments from Motorola and the Association of Public-Safety Communications Officials-International opposing the use of the upper 700 MHz band by LPTV and television translator stations, comments with which Public Television concurs. Comments of Motorola, Inc. MB Docket 03-185, p. 1 (Nov. 25, 2003); Comments of the Association of Public-Safety Communications Officials- International, Inc., MB Docket 03-185, p. 2 (Nov. 25, 2003).

or unusable.¹⁸⁸ Thus, Public Television agrees that applicants for television translator service may reasonably be required to demonstrate the unavailability of in-core channels before applying for channels out-of-core.¹⁸⁹ However, the Commission should be aware that even in rural areas out-of-core channel use may, in certain circumstances, be necessary. In this regard, more than one-third (35 percent) of public television translators operate on channels 52 and above.¹⁹⁰

Further, to discourage spectrum speculation and spectrum squatting on in-core channels, and thus to reduce ultimately the need to use out-of-core channels, the Commission may require construction of facilities in accordance with any approved construction permit within a reasonable time.¹⁹¹

(b) Concerns about Interference Are Unfounded

A number of 700 MHz licensees also raise concerns that existing and new secondary services will create unwanted interference to their operations, or, alternatively, that where interference is resolvable through technical means, the process would be difficult and expensive.¹⁹² As discussed above, however, the Commission has already decided that television translator and LPTV service should be allowed in the lower 700

¹⁸⁸ The Commission should be aware, however, that because rural access to television signals is frequently provided through “daisy chains” of multiple transmitters, the need to use out-of-core spectrum for one link in the chain will necessarily affect service at other transmitter sites.

¹⁸⁹ NPRM, ¶ 29

¹⁹⁰ About 25 percent of public television translators operate on channels 60-69. Comments of the Association of America’s Public Television Stations and the Public Broadcasting Service, MM Docket No. 87-268 (Nov. 22, 1996), p. 16.

¹⁹¹ See NPRM, ¶ 116. Previously, Public Television suggested a three year maximum period for construction based on the uniqueness of federal, state and institutional funding cycles. See Comments of the Association of Public Television Stations and the Public Broadcasting Service, MB Docket 03-185, p. 9 (Nov. 25, 2003). Other licensees may be required to construct within a shorter period, e.g. two years.

¹⁹² See, e.g. Comments of Qualcomm, Inc. MB Docket 03-185, pp.12-13 (Nov. 25, 2003).

MHz band on a non-interfering secondary basis, and that interference agreements among 700 MHz licensees should be allowed.¹⁹³ Again, because this issue has been resolved with finality, any proposal to ban television translators and LPTV station from the lower 700 MHz band on the basis of potential interference issues should be considered a late petition for reconsideration of the 700 MHz service rules order and should be disregarded.

However, if the issue is not to ban television translator and LPTV stations from the band but how to manage interference issues, the Commission's NPRM does seek comment on how to extend its current rules concerning interference with Land Mobile Radio and other primary services to the context of digital LPTV and TV translators operations.¹⁹⁴ Public Television supports extension of the current rules in this context.

Public Television wishes to note, however, that the possibility of interference with mobile applications is significantly reduced in light of the new "smart" technologies that are capable of seeking out available spectrum on an opportunistic basis. In this regard, based on the work of its Spectrum Policy Task Force and its most recently announced Notice of Proposed Rulemaking on "smart" radios, as well as past work on "cognitive radios," the Commission is currently examining such technology as a means to enhance efficient spectrum use by multiple parties on a non-interfering basis.¹⁹⁵ In fact, the Commission has observed that this technology is already being deployed by commercial

¹⁹³ Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), Report and Order, FCC01-364, ¶ 27 (Jan. 18, 2002) ("[W]e will allow LPTV stations to operate until they cause actual interference to a DTV station or new licensee and will allow LPTV stations to negotiate interference agreements with new service providers.").

¹⁹⁴ NPRM, ¶ 59.

¹⁹⁵ See Federal Communications Commission, Spectrum Policy Task Force, Report, ET Docket No., 02-135, p. 14 (November 2002); "FCC Opens Proceeding on Smart Radios," News Release (Dec. 17, 2003);

mobile wireless services and wireless local area networks.¹⁹⁶ Qualcomm’s comparison between the average LPTV radiated power of 150 kilowatts and a typical handset’s power of 10 milliwatts is therefore misleading in two respects.¹⁹⁷ First, it does not account for the “smart” capabilities of many hand-sets. Second, it ignores the fact that radiated power for the average rural translator is much less than that for a typical LPTV operation: in many instances rural translators operate with just a few watts of radiated power.

Public Television is willing to work with representatives of the cell phone industry and other 700 MHz licensees to explore how interference can be reduced and/or managed through mutually acceptable technical solutions prior to any request by primary services to seek displacement. In addition, if the Commission were to focus on rural translators alone, as MSTV and NAB have suggested, the Public Television notes that the potential for interference to 700 MHz licensees would be further diminished.

(c) To Ensure a Fair and Equitable DTV Transition, the Commission Should Authorize Applications for Digital Rural Translators

Lastly, a number of 700 MHz licensees advance the “red herring” argument that digital TV translator and LPTV stations should not be allowed to operate in the band because it would not significantly advance the DTV transition.¹⁹⁸ Other 700 MHz

¹⁹⁶ “FCC Opens Proceeding on Smart Radios,” News Release (Dec. 17, 2003) (“Certain smart radio capabilities are employed to some extent today in applications such as commercial mobile wireless services and wireless local area networks (WLANs)”).

¹⁹⁷ See Comments of Qualcomm, Inc. MB Docket 03-185, p. 13 (Nov. 25, 2003).

¹⁹⁸ See Comments of Harbor Wireless, MB Docket 03-185 (Nov. 25, 2003); Comments of Qualcomm, p. 10, MB Docket 03-185 (Nov. 25, 2003); Comments of Cavalier Group, LLC, MB Docket 03-185 (Nov. 25, 2003).

licensees, however, disagree, concurring with the Commission that “[t]ranslators and LPTV stations will play a significant role in furthering the transition to digital television.”¹⁹⁹ Regardless, as Public Television has stated in the past, the fundamental issue at stake is one of fairness to rural Americans as the digital transition progresses. Public Television has a statutory mission to provide public telecommunications services to all Americans regardless of their socioeconomic status, their ethnic background or geographic location.²⁰⁰ Delivery of noncommercial educational services over translator stations is critical to fulfilling this statutory mission in rural areas and continues to be of critical importance in the digital era.

III. Other Issues

In addition to the above, Public Television would like to reply regarding a number of other issues raised in the comments filed, including the following: (a) the proposed application processing proposals; (b) transmission mode; (c) program/data origination; and (d) boosters.

(a) Proposed Application Processing Proposals

Of the comments supporting the creation of a digital translator and LPTV service, none oppose the Commission’s proposed application processing procedures, with many seeking only minor modifications.²⁰¹ In its Comments, Public Television voiced support

¹⁹⁹ Comments of Motorola, MB Docket 03-185, pp. 1-2 (Nov. 25, 2003).

²⁰⁰ 47 U.S.C. §§ 396(a)(5), (7).

²⁰¹ See Comments of Fox Television Stations, Inc and Fox Broadcasting Company, MB Docket 03-185, p. 5(Nov. 25, 2003) (supporting FCC proposed procedures); Comments of Cordillera Communications, MB Docket 03-185, p. 1-3 (Nov. 25, 2003) (supporting procedures limited to incumbents but opposing application for new service); Comments of the National Translator Association, MB Docket 03-185, p. 26

for the Commission's proposed application processing procedures but requested some minor alterations to restrict spectrum speculation and to ensure that non-profits and small communities have access to these valuable digital services. First, it asked that in order to limit spectrum speculation, the Commission should impose some reasonable geographic restrictions on the application process. Second it requested that the Commission should restrict spectrum speculation by limiting the number of *multi-state* applications for LPTV and TV translator stations by a single entity. Third, it reiterated its continuing objection to the use of auctions to resolve mutual exclusivities. Public Television requests adoption of the minor application processing modifications submitted in its comments to the Commission.

(b) Transmission Mode

Public Television has asked that the Commission allow rural translators to use either a heterodyne frequency conversion mode or a regenerative digital mode at the broadcaster's option. A number of other comments agree.²⁰²

(c) Program Origination and Data Services

Public Television has demonstrated that many public television stations are interested in using their digital spectrum to provide a wide range of ancillary and

(supporting procedures but advocating use of lotteries instead of auctions); Comments of Abacus Television, MB Docket 03-185, p. 21 (Nov. 25, 2003).

²⁰² See Comments of Wyoming Public Television, MB Docket 03-185, p. 2 (Nov. 25, 2003); Comments of Vermont Educational Television, MB Docket 03-185, p. 5 (Nov. 25, 2003); Comments of KAET, MB Docket 03-185, p. 10 (Nov. 25, 2003); Comments of the National Translator Association, MB Docket 03-185, pp. 5-6 (Nov. 25, 2003) (allow regenerative for translators 30 watts and above with heterodyne as fall-back in limited circumstances); Comments of the Elko Television District, MB Docket 03-185, p. 3 (Nov. 25, 2003). See also Comments of the Association of Federal Communications Consulting Engineers and Comments of Greg Best Consulting.

supplementary services to their communities²⁰³ and has specifically requested that the Commission authorize translators to offer such services.²⁰⁴ A few rural telephone companies that are also interested in rolling out data services oppose allowing data delivery by TV translators and LPTV stations for no reason other than it would compete with their own service.²⁰⁵ These concerns are unfounded.

While there may be some overlap, public television stations are primarily interested in providing data that serves their public service mission and will not be directly competing with local telcos for delivery of the same material. In this regard, two noncommercial educational licensees, Vermont Educational Television and KAET, propose that it would be helpful for the Commission to allow their translators not only to offer pass-through ancillary and supplementary services transmitted from the main station but to some extent to allow translators to offer unique program streams and/or ancillary services to address the local educational and public safety needs of remote communities.²⁰⁶

Public Television realizes that under current analog rules, a TV translator may originate local public service announcements or messages seeking or acknowledging financial support necessary for its continued operation, not to exceed 30 seconds per

²⁰³ For instance, some public television stations are planning to enhance the delivery of broadband services, as well as to disseminate financial stock exchange information, Congressional voting information, Statehouse voting records, election returns and weather updates to targeted subscribers. In addition, ancillary and supplementary transmissions can also be used to enhance public safety. Still other public television stations plan to use ancillary and supplementary transmissions to enhance educational opportunity in their communities by offering subscription-based college courses, while others plan to transmit non-broadcast digital interactive content overnight to schools so that teachers can download it on demand during the school day.

²⁰⁴ Comments of the Association of Public Television Stations and the Public Broadcasting Service MB Docket 03-185, pp. 10-11 (Nov. 25, 2003).

²⁰⁵ See Comments of Arctic Slope Telephone, et al, MB Docket 03-185, p. 7 (Nov. 25, 2003).

²⁰⁶ For examples, see Comments of Vermont Educational Television, MB Docket 03-185, pp. 1-5 (Nov. 25, 2003) and Comments of KAET, MB Docket 03-185, pp. 2-6 (Nov. 25, 2003).

hour, and that a TV translator may also originate emergency warnings deemed necessary to protect life and property.²⁰⁷ Public Television suggests that if it is not feasible to change the definition of a translator to accommodate expanded program and data origination, the Commission may do so on a case-by-case basis through waivers of its rules, conditioned on the consent of the main parent station.

MSTV and NAB also oppose any changes to the Commission's requirement regarding program or data origination for television translators²⁰⁸ but do not explain why they oppose modifications to the analog rule except to say that it would "alter the fundamental nature of the translator service."²⁰⁹ Public Television submits that if the rule were to remain unchanged but subject to individualized waivers, no change to the fundamental nature of the translator service as a whole would occur.

²⁰⁷ 47 C.F.R. § 74.731.

²⁰⁸ See Comments of the Association of Maximum Service Television and the National Association of Broadcasters, MB Docket 03-185, pp. 21-23 (Nov. 25, 2003).

²⁰⁹ *Id.* at 23. See also Comments of the National Translator Association, MB Docket 03-185, pp. 6-7 (Nov. 25, 2003) (asking to maintain status quo); and Comments of the Elko Television District, MB Docket 03-185, p. 3 (Nov. 25, 2003).

(d) Boosters

In its Comments, Public Television has supported the authorization of digital boosters (or on-channel repeaters) with interference protections that are the same as the main station provided that the booster serves the same population as the main channel on the main channel's allocation. A number of other comments agree that the Commission should go forward with authorizing digital boosters as a spectrum efficient means of delivering digital signals to hard-to-reach areas.²¹⁰ Only MSTV and NAB oppose the authorization of a class of digital booster stations, preferring that systems of boosters in networks of distributed transmission be authorized instead.²¹¹ Public Television is on record as supporting both approaches and disagrees that authorization of singleton boosters would unnecessarily "divert" the Commission's "attention" from other similar projects.²¹²

²¹⁰ See Comments of the National Association of Translators, MB Docket 03-185, p. 26 (Nov. 25, 2003); Comments of Television, MB Docket 03-185 (Nov. 25, 2003); Comments of Southern Oregon Public Television, Inc, MB Docket 03-185 (Nov. 25, 2003); Comments of R. Kent Parsons, MB Docket 03-185, p. 16 (Nov. 25, 2003); Comments of the Association of Federal Communications Consulting Engineers, MB Docket 03-185 (Nov. 25, 2003), Comments of Greg Best, MB Docket 03-185, p. 8 (Nov. 25, 2003).

²¹¹ Comments of the Association of Maximum Service Television and the National Association of Broadcasters, MB Docket 03-185, pp. 23-24 (Nov. 25, 2003).

²¹² Id. at 24.

Conclusion

For the reasons articulated above, Public Television urges the Commission to expedite the authorization of digital television translator and LPTV stations.

Respectfully submitted,

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