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CRS Report for Congress

Digital Television: An Overview

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Digital Television: An Overview

Summary

Digital television (DTV) is a new television service representing the most significant development in television technology since the advent of color television. DTV can provide sharper pictures, a wider screen, CD-quality sound, better color rendition, multiple video programming or a single program of high definition television (HDTV), and other new services currently being developed. The nationwide deployment of digital television is a complex and multifaceted enterprise. A successful deployment requires the development by content providers of compelling digital programming; the delivery of digital signals to consumers by broadcast television stations, as well as cable and satellite television systems; and the widespread purchase and adoption by consumers of digital television equipment.

The Telecommunications Act of 1996 (P.L. 104-104) provided that initial eligibility for any DTV licenses issued by the Federal Communications Commission (FCC) should be limited to existing broadcasters. Because DTV signals cannot be received through the existing analog television broadcasting system, the FCC decided to phase in DTV over a period of years, so that consumers would not have to immediately purchase new digital television sets or converters. Thus, broadcasters were given new spectrum for digital signals, while retaining their existing spectrum for analog transmission so that they can simultaneously transmit analog and digital signals to their broadcasting market areas.

Congress and the FCC set a target date of December 31, 2006 for broadcasters to cease broadcasting their analog signals and return their existing analog television spectrum to be auctioned for commercial services (such as broadband) or used for public safety communications. However, the Balanced Budget Act of 1997 (P.L. 105-33) allowed a station to delay the return of its analog spectrum if 15% or more of the television households in its market did not subscribe to a multi-channel digital service and did not have digital television sets or converters. However, given the slower-than-expected pace at which digital televisions have been introduced into American homes, and given the impetus to reclaim analog spectrum for commercial uses and public safety, the 109th Congress enacted the Deficit Reduction Act of 2005 (P.L. 109-171), which established a "date certain" digital transition deadline of February 17, 2009.

A key issue in the Congressional debate over the digital transition continues to be addressing the millions of American over-the-air households whose existing analog televisions will require converter boxes in order to receive digital signals when the analog signal is turned off. P.L. 109-171 allocates up to $1.5 billion for a digital-to-analog converter box subsidy program to be administered by the Department of Commerce. The 110th Congress is expected to closely oversee the converter box program. Possible issues include whether the $1.5 billion allocated to the program is sufficient to meet the needs of all requesting households, whether consumer education efforts among government and private stakeholders is adequate, and whether the program is sufficiently targeted to vulnerable populations.

This report will be updated as events warrant.

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The Deficit Reduction Act of 2005 (P.L. 109-171) was signed by the President on February 8, 2006. P.L. 109-171 sets the digital transition deadline for full power television stations at February 17, 2009, and provides for a digital-to-analog converter box subsidy program to be administered by the National Telecommunications and Information Administration (NTIA) of the Department of Commerce. The act initially allocates $990 million for the converter box program, and may subsequently allocate an additional $510 million (totaling $1.5 billion) if NTIA notifies Congress that additional funding is needed.

On March 12, 2007, NTIA released its final rule implementing the converter box program. The final rule states that starting on January 1, 2008, for the initial $990 million program (the "Initial Period"), up to two $40 coupons will be available to any and all requesting U.S. households to be used towards the purchase of up to two digital-to-analog converter boxes. In the event that NTIA determines that the additional $510 million is needed, only exclusively over-the-air households will be eligible for coupons.

What Is Digital Television?

Digital television (DTV) is a new television service representing the most significant development in television technology since the advent of color television. DTV can provide sharper pictures, a wider screen, CD-quality sound, better color rendition, multiple video programming or a single program of high definition television (HDTV), and other new services currently being developed. DTV can be HDTV, or the simultaneous transmission of multiple programs of standard definition television (SDTV), which is a lesser quality picture than HDTV but significantly better than today's television.

The rationale often cited for the digital transition is that aside from offering superior broadcast quality to consumers, DTV will allow over-the-air broadcasters to offer the same kinds of digitally-based services (such as pay-per-view) currently offered by cable and satellite television providers. Additionally, it is argued that digital television uses the radiofrequency spectrum more efficiently than traditional analog television, thereby conserving a scarce resource (bandwidth) that can be used for other wireless applications.

There are three major components of DTV service that must be present in order for consumers to enjoy a fully realized "high definition" television viewing experience. *First*, digital programming must be available. Digital programming is

content produced with digital cameras and other digital production equipment. Such equipment is distinct from what is currently used to produce conventional analog programming. *Second*, digital programming must be delivered to the consumer via a digital signal. Digital signals can be broadcast over the airwaves (requiring new transmission towers or DTV antennas on existing towers), transmitted by cable or satellite television technology, or delivered by a prerecorded source such as a digital video disc (DVD). And *third*, consumers must have a digital television product capable of receiving the digital signal and displaying digital programming on their television screens. To receive digital broadcast signals, consumers can buy digital monitors accompanied with a set-top converter box (a digital tuner),[1] or alternatively, an integrated digital television with digital tuning capability already built in.

Role of Congress and the FCC

Congress and the Federal Communications Commission (FCC) have played major roles in the development of DTV. Starting in 1987, the FCC launched a decade-long series of proceedings exploring the potential and feasibility of a transition from conventional analog televisions to advanced television systems. While the original term used to describe the new television system was high definition television (HDTV), the FCC used a broader term — advanced television (ATV) — referring to any television technology that provides improved audio and video quality. After it became clear that ATV would be using digital signal transmission, the FCC began (in 1995) to use the term DTV (synonymous with ATV) to describe the new service more accurately.

In December 1996, after lengthy debate between television manufacturers, broadcasters, and computer firms, the FCC adopted a standard for DTV signal transmission based on recommendations of the Advanced Television System Committee (ATSC).[2] The ATSC standard allows for 18 different video formats, of which four have subsequently been adopted for commercial use.[3]

Meanwhile, the Telecommunications Act of 1996 (P.L. 104-104) provided that initial eligibility for any DTV licenses issued by the FCC should be limited to existing broadcasters. Broadcasters would be issued DTV licenses while at the same time retaining their existing analog licenses during the transition from analog to

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[1] Set-top converter boxes can also be used to enable conventional analog televisions to receive digital signals over the air. However, analog televisions hooked up to digital tuners cannot display high definition pictures.

[2] *FCC Fourth Report and Order In the Matter of Advanced Television Systems and Their Impact on Existing Television Service*, MM Docket No. 87-268, FCC 96-493, released December 27, 1996.

[3] Four video formats are being used commercially by U.S. television producers and manufacturers. These four formats are described by the number of lines they produce per each picture frame, and whether they use interlaced (i) or progressive (p) scanning techniques. These are: 480i and 480p (suitable for SDTV broadcasts), and 720p and 1080i (HDTV). The progressive scan video format is more compatible with PC displays, while the interlaced scan is more compatible with analog television receivers.

digital television. The act provided that broadcasters must eventually return either their existing analog channel or the new digital channel. Also in the 104th Congress, a major debate took place over whether to direct the FCC to conduct auctions for the spectrum allocated for DTV. The FCC estimated the commercial value of the DTV spectrum to be between $11 billion to $70 billion. No legislation was enacted, however, and the FCC did not obtain the authority to auction the DTV licenses.

In 1997, the FCC adopted rules[4] to implement the Telecommunications Act, and granted DTV licenses to some 1600 full power incumbent television broadcasters.[5] The DTV licenses consist of 6 megahertz (MHZ) of unused spectrum within the VHF and UHF frequency bands. Because DTV signals cannot be received through the existing analog television broadcasting system (known as NTSC[6]) the FCC decided to phase in DTV over a period of years, so that consumers would not have to immediately purchase new digital television sets or converters. Thus, broadcasters were given 6 MHZ of new spectrum for digital signals, while retaining their existing 6 MHZ for analog transmission so that they can simultaneously transmit NTSC and DTV signals to their broadcasting market areas.[7] The simultaneous broadcasting ("simulcasting") of the same programs in both digital and analog modes was intended to allow viewers who have not yet purchased DTV sets or converters to continue to receive television programming during the transition to DTV.

The ruling required television stations receiving the DTV licenses to build their DTV facilities according to a schedule determined by the size of their markets. The FCC has granted extensions to licensees unable to meet the schedule due to unforeseeable or uncontrollable circumstances, such as an inability to secure tower locations for new antennas.

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[4] *FCC Fifth Report and Order In the Matter of Advanced Television Systems and Their Impact on Existing Television Service*, MM Docket No. 87-268, FCC 97-116, released April 21, 1997.

[5] A provision in the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (P.L. 107-188, H.R. 3448, H.Rept. 107-481) addresses the digital conversion of full power television stations that received their analog licenses *after* the FCC allocated digital spectrum to existing analog stations in 1997. Section 531 requires the FCC to allot a digital channel to any requesting full-power television station that had an application pending for an analog television station construction permit as of October 24, 1991, and which had its application granted after April 3, 1997. Any station receiving digital spectrum under this provision is required to complete construction of its digital facility within 18 months, without the possibility of an extension. Stations are also prohibited from operating an analog signal on its designated digital channel. The bill's conference report states that this provision will allow recent broadcast licensees to foster a digital audience during the transition period to digital television without having to terminate analog service, and that without this change, those stations would be denied the flexibility to operate an analog and a digital facility simultaneously in the near term, especially in major markets.

[6] The National Television Systems Committee (NTSC) was the industry group that developed the currently used U.S. television standards.

[7] Using digital technology, the DTV frequencies can be placed in the vacant portion of the same spectrum band currently allocated for analog (NTSC) television without interfering with analog television broadcasts.

The FCC set a target date of 2006 for broadcasters to cease broadcasting the analog signal and return their existing analog television spectrum licenses to be auctioned for other commercial purposes. During the 105th Congress, the Balanced Budget Act of 1997 (P.L. 105-33) made the 2006 reversion date statutory, providing that a "broadcast license that authorizes analog television service may not be renewed to authorize such service for a period that extends beyond December 31, 2006." However, the act required the FCC to grant extensions for reclaiming the analog television licenses in the year 2006 from stations in television markets where any one of the following three conditions exist:

- if one or more of the television stations affiliated with the four national networks are not broadcasting a digital television signal;
- if digital-to-analog converter technology is not generally available in the market of the licensee; or
- if at least 15% of the television households in the market served by the station do not subscribe to a digital "multi-channel video programming distributor" (including cable or satellite services) and do not have digital TV sets or converters.

In the 109th Congress, the 2006 deadline for the digital transition was extended. The Deficit Reduction Act of 2005 (P.L. 109-171), signed by the President on February 8, 2006, sets a "hard" digital transition deadline of February 17, 2009. Meanwhile, since the beginning of the digital transition, the FCC has continued to monitor the status of the DTV conversion of both commercial and noncommercial broadcast stations.[8] On August 6, 2007, the FCC released the final assignment of digital television channels — to be used post DTV transition — for over 1,800 stations.[9]

Status of the DTV Buildout

The nationwide buildout of digital television is a complex and multifaceted enterprise. A successful buildout requires: the development by content providers of compelling digital programming; the delivery of digital signals to consumers by broadcast television stations, as well as cable and satellite television systems; and the widespread purchase and adoption by consumers of digital television equipment.

Creation of Digital Programming

Digital programming is created with digital cameras and other digital production equipment. Digital content tends to favor more "visual" types of programming —

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[8] For a comprehensive listing of FCC regulatory activities with respect to the digital transition, see [http://www.fcc.gov/dtv/].

[9] FCC, *Press Release*, "FCC Announced Final Assignment of Digital Television Channels," August 6, 2007.

such as sports events or movies — which take full advantage of the high-definition viewing experience. The amount of available digital programming is gradually becoming widespread among broadcast and cable networks. Two factors have generally inhibited content providers from accelerating the production of digital programming. First, because relatively few households have had digital televisions, networks have had a diminished incentive to invest the money to produce digital content. Second, content providers (e.g. networks and movie studios) have been reluctant to provide digital programming until a digital copyright standard is in place.

Delivery of Digital Signals

Currently, there are three ways digital programming is being delivered to consumers. Digital signals are: (1) broadcast over the airwaves; (2) transmitted over channels provided by satellite television systems; and (3) provided via digital cable service in a growing number of markets.

Broadcasting. According to the National Association of Broadcasters (NAB), as of August 7, 2007, there were 1,625 stations (both commercial and public) broadcasting digital signals in 211 markets.[10] This represents about 95% of the nation's approximately 1,700 full-power television stations. The 211 markets currently receiving digital transmissions cover over 99% of U.S. TV households. Television stations must construct new facilities and purchase new equipment in order to transmit digital signals. According to NAB, costs range from $8-$10 million to fully convert a station to digital operation.[11] NAB has estimated that the total cost of the transition for broadcasters is $10 to $16 billion.[12]

As of June 12, 2007, the FCC has granted a construction permit or license to 1,702 stations, about 99% of the total number of DTV allotments.[13] Approximately three-quarters of the 1,240 full-power commercial stations did not meet the May 1, 2002 conversion deadline. A total of 843 commercial stations requested from the FCC an extension of the May 2002 deadline in order to complete construction of their DTV facilities. So far, 772 have been granted and 71 have been admonished. Of those stations granted extensions, 602 filed requests for second extensions. Of this number, 535 extension requests have been granted, 67 have been dismissed, and the rest remain pending. A third extension was requested by 141 stations; 104

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[10] For latest statistics, see [http://www.nab.org/AM/ASPCode/DTVStations/DTVStations.asp]

[11] Testimony of Ben Tucker, Chairman of NAB Television Board, in: U.S. Congress, House, "Digital Television: A Private Sector Perspective on the Transition," Hearing Before the Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, March 15, 2001, 107th Cong., 1st sess., p. 72.

[12] Testimony of Edward O. Fritts, NAB President and Chief Executive Officer, before the House Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, June 2, 2004. Some critics dispute the validity of these cost estimates. See Snider, J.H., *Speak Softly and Carry A Big Stick: How Local TV Broadcasters Exert Political Power*, iUniverse, Inc., New York, pp. 331-345.

[13] See [http://www.fcc.gov/mb/video/files/dtvsum.html].

extensions were granted, action was deferred for 30 satellite stations, and 7 stations were admonished. Meanwhile, 214 noncommercial educational stations requested extension of the May 1, 2003 buildout deadline. The FCC has granted all of those extension requests; 134 stations filed for second extensions with 129 granted.[14]

Satellite. Satellite television is currently provided to over 22 million American households. Two major companies offer direct broadcast satellite (DBS) television service in the United States: Echostar's DISH Network and Hughes' DirecTV. Satellite TV customers need added equipment (a slightly bigger satellite dish and either a set-top box or built-in satellite HDTV reception capability) in order to receive high-definition programming on their digital televisions.

Cable. Initially, cable companies had been reluctant to carry channels of digital and high definition programming (thereby displacing some existing channel offerings) until more consumers had the digital television equipment necessary to view digital programming.[15] The reluctance of cable companies to carry digital programming has changed, however, as cable providers in most markets have begun to carry digital or high-definition channels. According to the National Cable & Telecommunications Association (NCTA), as of June 2006, consumers in 203 (out of 210) local TV markets can now receive a package of HDTV services from their cable operator. Cable systems providing HDTV pass 97 million U.S. television households (out of a total 110 million) and reach all 100 of the biggest TV markets.[16]

Consumer Purchase of DTV Products

DTV products are now available from multiple manufacturers offering varying features and technical characteristics. Over the past several years, prices for DTV monitors and receivers have dropped markedly. As the market for DTVs expands, prices are expected to decrease further.

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[14] Ibid.

[15] Many cable (and both DBS commercial services) are "digital." However, "digital cable"generally refers to technology which converts analog programming to a digital signal which is transmitted to the consumer and then converted back to analog form for television viewing. "Digital cable" allows cable companies to provide more channels, as well as high speed (broadband) Internet service. However, the "digital" signals transmitted over cable systems use different digital standards than the DTV standard used by broadcasters and current DTV sets; therefore current digital cable services currently cannot be directly received by DTV sets.

[16] National Cable & Telecommunications Association, "Digital Transition Statistics," available at [http://www.ncta.com/IssueBrief.aspx?contentId=2688&view=4].

According to the Consumer Electronics Association (CEA), approximately 36% of U.S. households are expected to have HDTVs by the end of 2007.[17] The average retail price of DTVs is expected to be $819 in 2007, a $224 drop from 2006.[18]

Policy Issues Surrounding the Digital Transition

The goal of the FCC and Congress is to complete the transition to DTV as quickly as possible, so that NTSC (analog) spectrum can be reclaimed and reallocated for other purposes. Some of the NTSC spectrum will be auctioned for commercial wireless services, and some of it will be used for new public safety services (the FCC has already designated some of the analog TV spectrum for public safety use).

The key issue for Congress and the FCC has been: what steps, if any, should be taken by government to further facilitate a timely, efficient, and equitable transition to digital television? To address this question, Congress and the FCC have confronted a highly complex policy landscape, involving different industries, technologies, and interests, including content providers, commercial and noncommercial television broadcasters, cable and satellite television providers, consumer electronics manufacturers and retailers, and consumers.

The following sections in this report — on activities and issues in the 108th, 109th, and 110th Congresses — discuss issues that have been primary considerations in the Congressional debate on the digital television transition. Additionally, **Appendix A** provides background information on a complex array of policy issues related to the digital television transition. These include digital "must carry," mandating digital tuners, copyright protection technology, cable/DTV interoperability, digital conversion of public broadcasting stations, digital conversion of low power television stations, public interest obligations of DTV broadcasters, and others.

Activities in the 108th Congress

A number of bills were introduced into the 108th Congress, relating in some way to digital television. Some urged Congress to require broadcasters to return the analog spectrum on "a date certain." Under this approach, spectrum would be freed up for other uses. Among legislation in the 108th Congress, the HERO Act (H.R. 1425 and within 9/11 Commission omnibus bills H.R. 5024, H.R. 5040, and S. 2774)

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[17] Consumer Electronics Association, "CEA Helps Consumers Shift To Digital Television," Press Release, December 4, 2006, available at [http://www.ce.org/Press/CurrentNews/press_release_detail.asp?id=11192].

[18] Consumer Electronics Association, "30 Percent of U.S. Households Own an HDTV, CEA Research Finds," Press Release, June 26, 2007, available at [http://www.ce.org/Press/CurrentNews/press_release_detail.asp?id=11309].

would have prohibited any delay in reassigning the 24 MHZ for public safety purposes, and required those frequencies to be operational by January 1, 2007.

During March and April 2004, another digital transition proposal was informally circulated by the Media Bureau of the FCC.[19] Under this proposal, the transition deadline would be moved from 2006 to 2009. Cable and satellite providers would be required to carry a broadcaster's digital signal only, but could — if the broadcaster so chooses — down-convert the digital signal to an analog signal that cable or satellite customers could watch on their analog televisions. Under this scenario, according to the Media Bureau proposal, cable and satellite TV households watching down-converted digital signals on their analog sets would be counted toward the 85% statutory threshold required in order for broadcasters to return to the government their valuable analog spectrum, which can then be auctioned and/or assigned for other purposes.

The commercial broadcasting industry expressed strong opposition to the Media Bureau's proposal.[20] According to the commercial broadcasters, the proposal would discourage the development of digital television services (such as HDTV and multicasting) and remove the incentive for consumers to purchase DTVs. Additionally, they argue, if analog spectrum is reclaimed under the Media Bureau proposal, TV households that are exclusively "over-the-air" — many of whom are economically disadvantaged — would lose their television service altogether unless they purchased DTVs, converter boxes, or cable or satellite television subscriptions. In response to these criticisms, Kenneth Ferree, former head of the Media Bureau, argues that the development of digital services will not be adversely impacted because market forces will ensure that popular stations will likely be carried by cable and satellite TV providers in both digital and analog form by 2009. Additionally, suggests Ferree, economically disadvantaged over-the-air households could receive federal subsidies (derived from reclaimed spectrum auction proceeds, for example) for purchasing converter boxes, thereby ensuring that these households will continue to receive television service.[21]

During the summer of 2004, Congress held three hearings on the digital television transition. On June 2, 2004, the House Energy and Commerce Committee, Subcommittee on Telecommunications and the Internet, held a hearing on the Ferree proposal — "Advancing the DTV Transition: An Examination of the FCC Media Bureau Proposal." A June 9, 2004 hearing held by the Senate Committee on Commerce, Science and Transportation — entitled, "Completing the Digital Television Transition," — also examined the Ferree proposal and other digital transition issues including the possibility of consumer subsidies for converter boxes.

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[19] The Media Bureau's digital transition proposal has not yet been released as a formal document.

[20] Written Ex Parte Submission in MB Docket Nos. 03-15 & 98-120, April 15, 2004, Available at [http://www.nab.org/AM/AMTemplate.cfm?template=/CM/ContentDisplay.cfm&ContentID=3772].

[21] Boliek, Brooks, "Feds: No analog TV by '09," *Hollywood Reporter*, April 15, 2004.

Finally, the House Subcommittee on Telecommunications and the Internet held another hearing on July 21, 2004, looking specifically at lessons learned from Berlin, Germany, which successfully underwent a transition to digital television in 2003. The hearing, entitled, "The Digital Television Transition: What We Can Learn from Berlin," featured the release of a General Accountability Office (GAO) report entitled, *German DTV Transition Differs From U.S. Transition in Many Respects, but Certain Key Challenges Are Similar*. The GAO identified three elements responsible for Berlin's successful digital transition: implementing extensive consumer education, providing subsidies to low-income households for converter boxes, and setting a near-term, widely recognized shut-off date for analog TV service.[22]

On July 22, 2004, the National Commission on Terrorist Attacks Upon the United States (the 9/11 Commission) released its final report. The Commission recommended that Congress support legislation "which provides for the expedited and increased assignment of radio spectrum for public safety purposes." In response to this recommendation, on September 21, 2004, Senator John McCain introduced S. 2820, the SAVE LIVES Act. S. 2820 would change the digital transition deadline from December 31, 2006 to December 31, 2008. Spectrum for public safety would be freed for use by first responders, and other spectrum would be available for commercial uses. Proceeds from the auctioning of commercial spectrum would be credited to a Digital Transition Consumer Assistance Fund. The Fund would be used to establish a $1 billion digital transition program, administered by the Secretary of Commerce, which would subsidize consumers who continue to rely exclusively on over-the-air broadcasts with analog televisions. The program would give priority to low-income households, and would provide assistance for purchasing digital-to-analog converter boxes or other technologies which would allow consumers to continue receiving television signals.

S. 2820 also required labeling of analog televisions (with the label stating it is unable to receive digital signals without a converter box), directs the Department of Commerce (in consultation with the FCC) to submit a report to Congress recommending a consumer education program on the digital transition, and requires the FCC to issue final decisions on its proceedings regarding DTV must-carry and public interest obligations.

During the September 22, 2004 markup of S. 2820 in the Senate Committee on Commerce, Science and Transportation, an amendment was offered by Senator Conrad Burns which sets a digital transition deadline (December 31, 2007) *only* for spectrum that has been designated for public safety, and provides that the FCC may waive the deadline in a given market "to the extent necessary to avoid consumer disruption while ensuring the ability of relevant public safety entities to use such frequencies." The Burns amendment was subsequently adopted by the Committee.

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[22] See U.S. General Accountability Office, *German DTV Transition Differs From U.S. Transition in Many Respects, but Certain Key Challenges Are Similar*, GAO-04-926T, July 21, 2004. 22 p.

On September 29, 2004, Senator McCain offered a modified version of S. 2820 as an amendment to the National Intelligence Reform Act of 2004 (S. 2845). As in Committee, Senator Burns offered a modifying amendment to the McCain amendment. At the request of Senator McCain, the Senate approved by unanimous consent the McCain amendment as modified by the Burns amendment. The final version adopted into S. 2845 sets the digital transition deadline of December 31, 2007 only for spectrum that has been designated for public safety. Language regarding the FCC's authority to waive the deadline to avoid consumer disruption was modified to read: "only if all relevant public safety entities are able to use such frequencies free of interference by December 31, 2007, or are otherwise able to resolve interference issues with relevant broadcast licensee by mutual agreement."[23] The Senate passed S. 2845 on October 6, 2004. Other provisions of S. 2820 relevant to digital television are retained within the Senate-passed version of S. 2845. However, the sections regarding the Digital Transition Consumer Assistance fund and the $1 billion in consumer digital transition subsidies are moot, because the legislation limits the digital transition deadline only to public safety spectrum and does not authorize auctions of commercial spectrum currently used for analog television broadcasts. Also, labeling requirements would only go into effect if the FCC acts to set a hard deadline for the return of analog spectrum.

The House-passed version of S. 2845 (passed on October 16, 2004) contained a nonbinding provision (Section 5011) expressing the "sense of the Congress" that the 85% penetration test should be eliminated and that broadcasters should be required to cease analog transmissions by December 31, 2006 in order that analog spectrum can be returned for public safety and commercial uses. The conference report version of S. 2845 contained a digital television provision similar to the House language. Section 7501 states that it is the sense of Congress that "Congress must act to pass legislation in the first session of the 109th Congress that establishes a comprehensive approach to the timely return of analog broadcast spectrum as early as December 31, 2006" and that any delay in the adoption of such legislation will "delay the ability of public safety entities to begin planning to use this needed spectrum." The Intelligence Reform and Terrorism Prevention Act of 2004 (P.L. 108-458) was signed into law on December 17, 2004.

Activities and Issues in the 109th Congress

During the first session of the 109th Congress, lawmakers debated when and how a "hard date" for the DTV transition might be implemented, thereby freeing reclaimed analog spectrum. Policy questions included should the then-existing statutory digital transition deadline of December 31, 2006, be implemented by modifying or removing the 85% digital penetration threshold requirement, or would a later and redefined transition deadline be more appropriate? Should the reclaiming of analog spectrum for public safety uses be singularly designated, or should it be included as part of a comprehensive approach to returning all of the analog spectrum?

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[23] For more information on this issue, see CRS Report RL32408, *Spectrum Policy: Public Safety and Wireless Communications Interference*, by Linda K. Moore.

Appendix B in this report provides a listing of DTV-related legislation introduced into the 109th Congress.

Aside from ensuring that consumers enjoy the benefits of digital television, reclaiming the analog spectrum is a prime motivation in the desire of Congress and the FCC to complete the digital transition as soon as possible. A portion of reclaimed analog spectrum will be allocated for first responder communications, while the rest will be auctioned to the private sector for development and use of innovative telecommunications technologies such as wireless broadband.

Budgetary considerations are also an important factor. Auctioning the analog spectrum could raise revenues in the billions of dollars. Estimates of possible auction revenues vary, from $10 billion[24] to $28 billion[25] to $50 billion.[26] All or part of these auction proceeds could be used to reduce the federal budget deficit.[27]

A key issue in the debate was addressing the millions of American over-the-air households whose existing analog televisions will require converter boxes in order to receive digital signals when the analog signal is turned off. According to the National Association of Broadcasters, there are currently 280.5 million analog televisions in United States. Of these, 73 million rely on over-the-air broadcasting.[28]

Many policymakers asked whether should some form of financial assistance (subsidies or tax credits, for example) should be provided by the federal government to enable over-the-air households to purchase converter boxes or digital televisions. Should such assistance be provided to low-income households exclusively or to all households? Should subsidies, if warranted, be financed by proceeds garnered by auctioning the analog spectrum? And finally, how much funding would a subsidy program require, and how much revenue is likely to be raised by auctioning the commercial portion of the reclaimed analog spectrum?

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[24] Congressional Budget Office Cost Estimate, Digital Transition and Public Safety Act of 2005, October 24, 2005. CBO estimates revenue of $12.5 billion from auction of spectrum vacated by analog broadcasters over the period 2006-2010. However, CBO estimates that offering this new spectrum for auction will lower anticipated receipts by $2.5 billion for other spectrum already authorized for auction under current law. Thus, auctioning spectrum released by the digital transition would increase net spectrum auction receipts by $10 billion.

[25] The Brattle Group, "700 MHZ Band Spectrum Auction Could Yield $28 B, Analysis Says," Press Release, May 18, 2005.

[26] Snider, J.H. and Michael Calabrese, New America Foundation, *Speeding the DTV Transition*, Spectrum Series Issue Brief #15, May 2004, p. 3.

[27] For more information on this issue, see CRS Report RS22306, *Spectrum Auctions and Deficit Reduction: FY2006 Budget Reconciliation*, by Linda K. Moore.

[28] Comments of the National Association of Broadcasters and the Association for Maximum Service Television, Inc. before the Federal Communications Commission, *In the Matter of Over-The-Air Broadcast Television Viewers*, MB Docket No. 04-210, August 11, 2004.

At the request of the House Committee on Energy and Commerce, the Government Accountability Office (GAO) conducted a television characteristics survey involving 2,471 randomly selected American households. Based on the survey, GAO found that 19% or 21 million households rely exclusively on over-the-air television; 57% or 64 million households rely on cable; and 19% or 22 million have a subscription to DBS (satellite) television. Additionally, GAO found that low-income, non-White, and Hispanic households are more likely to rely on over-the-air television broadcasting.[29]

GAO estimated that if a subsidy were needed only for over-the-air households, the cost could range from about $460 million to $2 billion, depending on the cost of the set-top box (from $50 to $100 per box) and whether subsidy recipients are limited to low-income households. Under this scenario, GAO is assuming that cable and satellite providers would convert broadcasters' digital signals to analog at the "head-end," such that cable and satellite TV consumers with analog sets would be able to receive the signal without a converter box.

Under a different scenario, GAO assumed that cable and satellite providers would deliver high-definition signals to the home, thereby requiring consumers with analog sets to purchase converter boxes. GAO estimated that if subsidies were available to cable and satellite subscribers as well as to over-the-air households, the cost would range from $1.8 billion to over $10 billion, again depending on the cost of the converter box and the use of means testing. The GAO estimate assumes a subsidy for one converter box per household — it should be noted that the vast majority of television households have more than one over-the-air analog television. Each analog television set would need its own converter box to be able to receive a digital signal.

The GAO cost estimates also do not include the cost of implementing a subsidy program, nor do they take into account what form a subsidy might take, be it a voucher, tax credit, rebate, government supplied equipment, or other means. On May 26, 2005, GAO testified before the House Energy and Commerce Committee on the administrative challenges that could arise in implementing a subsidy for DTV equipment.[30]

Other organizations have offered differing estimates of the impact of the digital transition. The Consumer Electronics Association (CEA) has estimated that 11.5% of all television sets in the U.S. are used to view over-the-air programming, and that

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[29] See U.S. Government Accountability Office, Testimony before the Subcommittee on Telecommunications and the Internet, Committee on Energy and Commerce, House of Representatives, *Digital Broadcast Television Transition: Estimated Cost of Supporting Set-Top Boxes to Help Advance the DTV Transition*, February 17, 2005. Available at [http://www.gao.gov/new.items/d05258t.pdf].

[30] See U.S. Government Accountability Office, Testimony before the Subcommittee on Telecommunications and the Internet, Committee on Energy and Commerce, House of Representatives, *Digital Broadcast Television Transition: Several Challenges Could Arise in Administering a Subsidy Program for DTV Equipment*, May 26, 2005. Available at [http://www.gao.gov/new.items/d05623t.pdf].

12% of the 110 million U.S. TV households currently do not receive broadcast signals through cable or satellite. CEA projects — assuming a December 31, 2008 analog cut-off date — that only 6.8% of TV households would lose their primary video signal by that future date.[31]

On the other hand, in June 2005 the Consumers Union and the Consumer Federation of America issued a joint study[32] estimating that approximately 16 million households would lose all TV reception when analog signals are cut off. Based on an estimate of a $50 price to purchase a converter box, the report concluded that "the direct government-imposed costs on consumers to preserve the usefulness of [analog television sets] would be $3.5 billion or more."

Meanwhile, the FCC has estimated that 15% of TV households are exclusively over-the-air.[33]

House Activities

On February 17, 2005, the House Energy and Commerce Committee, Subcommittee on Telecommunications and the Internet, held the first of a series of hearings on the digital transition. At the February 17th hearing, entitled, "The Role of Technology in Achieving a Hard Deadline for the DTV Transition," witnesses discussed the need for a hard deadline and the possible costs of subsidizing over-the-air analog viewers. Other issues discussed at the February 17th hearing included whether labels warning of a possible analog signal shut-off should be required on new analog televisions purchased by consumers. Another key issue discussed was whether digital signals should be converted at the cable and satellite providers' head-end, or — alternatively — at the subscriber's home.

A second hearing, entitled, "Preparing Consumers for the End of the Digital Transition," was held by the House Subcommittee on Telecommunications and the Internet on March 10, 2005. Witnesses spoke to the importance of educating retailers and consumers about the digital transition, and argued that raising public awareness is difficult without a certain transition deadline.

On May 26, 2005, the House Energy and Commerce Committee held a hearing on staff draft DTV legislation. Committee Chairman Joe Barton cited the importance of meeting budget reconciliation targets as a key factor in the Committee's movement of legislation to hasten the DTV transition and raise revenues from auctioning the analog spectrum. While most (but not all) Committee Members and witnesses

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[31] Statement of Gary Shapiro, President and CEO, Consumer Electronics Association, before the House Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, May 26, 2005. Available at [http://energycommerce.house.gov/reparchives/108/Hearings/05262005hearing1533/Shapiro.pdf].

[32] *Estimating Consumer Costs of a Federally-Mandated Digital TV Transition*, Consumers Union and Consumer Federation of America, June 29, 2005 at [http://www.hearusnow.org/fileadmin/sitecontent/DTV_Survey_Report-Final_6-29-05.pdf].

[33] FCC, *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, Report FCC 05-13, MB Docket No. 04-227, released February 4, 2005.

agreed with the setting of a hard 2008/2009 deadline for the digital transition, there was disagreement over the need for — as well as the size, scope, and mechanics of — a subsidy program for digital-to-analog converter boxes funded with a portion of analog spectrum auction proceeds.

Digital Television Transition Act of 2005. On October 27, 2005, the House Energy and Commerce Committee approved the Digital Television Transition Act of 2005 as part of its submission to the House FY2006 budget reconciliation bill. The legislation sets a "hard" DTV transition deadline of December 31, 2008. CBO estimated $10 billion in net receipts from auctioning vacated spectrum currently being used by broadcasters.[34] The legislation would allocate a portion of auction proceeds as follows: $990 million for a digital-to-analog converter box program, $500 million for public safety interoperable communications grants, $30 million for a New York City 9/11 digital transition fund, and $3 million to assist digital conversion of low-power television stations. Remaining auction proceeds would be transferred to the Treasury for budget deficit reduction. The Digital Television Transition Act of 2005 does not contain language addressing the multicast must-carry issue, nor does it address other DTV issues such as the broadcast flag or DTV public interest obligations.

On November 3, 2005, the House Budget Committee reported the Deficit Reduction Act of 2005. Subtitle D (sections 3401-3413) is the Digital Television Transition Act of 2005. On November 18, 2005, the House passed the Deficit Reduction Act of 2005 (H.R. 4241). The following is a summary of major provisions.

DTV Transition Deadline. The legislation would shift the deadline for the DTV transition from December 31, 2006 to December 31, 2008. As of January 1, 2009, analog spectrum in the range of channels 52 through 69 would be recovered, and analog television service that is broadcast over the air would cease. The December 31, 2008 deadline would be a hard deadline — the legislation repeals the provision in current law allowing broadcasters to retain their analog spectrum indefinitely if 15% or more of television households are unable to receive digital signals. The legislation also directs the FCC to release final digital channel assignments to all full-power broadcast television stations by December 31, 2006, and to issue six month status reports on coordinating digital allotments with Canada and Mexico.

Auction of Recovered Spectrum. The legislation directs the FCC to conduct auctions for the licenses of recovered analog spectrum reclaimed from analog television service. Auctions will commence no later than January 7, 2008, and the FCC shall deposit auction proceeds no later than June 30, 2008. Recovered analog spectrum is defined as between channels 52 and 69 inclusive (698 through 806 MHZ). This auction authority does not apply to analog spectrum to be made available for public safety services, nor does it apply to spectrum auctioned prior to the date of enactment of the legislation.

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[34] Congressional Budget Office Cost Estimate, Reconciliation Recommendations of the House Committee on Energy and Commerce, October 31, 2005, p. 12.

Digital-to-Analog Converter Box Program. The legislation directs that $990 million from auction proceeds be placed in a "Digital Television Conversion Fund." This Fund will be used by the National Telecommunications and Information Administration (NTIA) of the Department of Commerce to establish a digital-to-analog converter box program. Under this program, U.S. households may request up to two coupons worth $40 each to be applied toward the purchase of digital-to-analog converter boxes. Coupons may be requested between January 1, 2008 and January 31, 2009. Retailers participating in the program would be required to undergo a certification process in order to be reimbursed by the Department of Commerce.

Other Expenditures of Auction Receipts. The legislation directs that $500 million be deposited in a "Public Safety Interoperable Communications Fund," which would be used by NTIA to establish a grant program to assist public safety agencies in the acquisition of, deployment of, or training for use of interoperable communications systems. The legislation directs that $30 million be deposited in a "NYC 9/11 Digital Transition Fund," which will reimburse New York City television broadcasters for costs incurred in the design and deployment of a temporary DTV broadcast system which will provide DTV service until a permanent facility is constructed. Finally, the legislation directs $3 million into a "Low-Power Digital-to-Analog Conversion Fund" which will be used to compensate low power television stations (including Class A, translator, or booster television stations) for the cost of a digital-to-analog conversion device.

Consumer Education. The legislation would require manufacturers to put warning labels on analog televisions that inform consumers that such televisions will not be able to receive broadcast programming after the digital transition unless connected to a digital tuner, a digital-to-analog converter box, or cable, satellite or other multichannel video services. Similar warnings are required to be posted in stores by retailers, and run as public service announcements by broadcasters and cable and satellite providers. Finally, the FCC and the NTIA are required to engage in a public outreach program to educate consumers about the deadline for termination of analog television broadcasting and the options consumers have after such termination to continue to receive broadcast programming.

Preserving and Expediting Tuner Mandates. The legislation would move up the deadline by which all televisions with screens of 13 to 24 inches must contain built-in digital tuners. The FCC's current deadline is July 1, 2007; the draft legislation would set an earlier deadline of March 1, 2007. Additionally, the draft legislation prohibits the FCC from further revising its existing schedule for mandatory DTV reception capability.

Digital-to-Analog Conversion and "Must Carry". The legislation requires cable operators (with capacities over 550 MHZ) and satellite television providers to offer to their customers broadcaster signals in both digital and analog formats for five years after the transition. The legislation, which allows cable and satellite providers to convert broadcaster signals at the "head-end," would permit these providers to convert digital broadcasts to a standard definition format (which occupies less bandwidth than a high definition signal) if they so choose.

Senate Activities

On July 12, 2005, the Senate Commerce, Science and Transportation Committee held a hearing on the DTV transition. While consensus emerged on the need for a "hard" deadline for digital conversion, there was considerable disagreement among witnesses over the issue of cable and satellite carriage of multicast broadcast programming and whether Congress should mandate which local broadcast stations might receive "dual carriage" (both digital and analog signals) by cable providers.

S. 1932: Digital Transition and Public Safety Act of 2005. On October 20, 2005, the Senate Commerce, Science and Transportation Committee approved DTV legislative language intended for the Senate's budget reconciliation bill. Entitled the Digital Transition and Public Safety Act of 2005, the legislation would set a "hard" deadline of April 7, 2009 for the digital conversion.

The legislation extends the FCC's auction authority to September 30, 2009, and directs the FCC to commence auctions of the licenses for recovered analog spectrum on January 28, 2008. Auction proceeds would be deposited into a "Digital Transition and Public Safety Fund." The Secretary of Commerce is directed to transfer $5 billion from the Fund to the general fund of the Treasury on October 2, 2009. Remaining money in the Fund would be distributed by the Department of Commerce for a number of purposes, including $3 billion for a program to assist consumers in the purchase of converter boxes, $200 million for a program to assist the digital conversion of low-power and translator television stations, $1.25 billion for a program to facilitate emergency communications, $250 million for a program to implement the ENHANCE 911 Act of 2004, $200 million for a program to provide assistance to coastal States and Indian tribes affected by hurricanes and other natural disasters, and $15 million to be made available under certain conditions to the Department of Transportation's essential air service program.

Because the legislation was designed specifically for the budget reconciliation process, no specifics are included on how the converter box subsidy program would be framed or administered. The legislation also does not contain language on the issues of cable carriage of multicasted digital signals and downconverted analog signals. It is anticipated that a separate DTV bill (not attached to the budget reconciliation) may be introduced in the future to address those and other issues not directly related to the budget reconciliation process.

On October 26, 2005, the Senate Budget Committee reported S. 1932, the Deficit Reduction Omnibus Reconciliation Act of 2005. Title III of S. 1932 is the Digital Transition and Public Safety Act of 2005 as approved by the Senate Commerce, Science and Transportation Committee.

During Senate consideration of S. 1932 on November 2, 2005, amendments were introduced by Senator Ensign to reduce funding for converter boxes from $3 billion to $1 billion, and by Senator McCain to move forward the transition deadline from April 7, 2009 to April 7, 2008. The Ensign amendment was withdrawn and the McCain amendment was defeated. The Senate passed S. 1932 on November 4, 2005.

Conference Report on S. 1932

The budget reconciliation conference report on S. 1932 (H.Rept. 109-362) was approved by the House on December 19, 2005, and approved by the Senate on December 21, 2005. However, because the Senate removed three provisions from the conference report (provisions not related to digital television), S. 1932 was returned to the House for final approval. On February 1, 2006, the House again approved S. 1932, thereby clearing the measure for the President's signature.

P.L. 109-171: Deficit Reduction Act of 2005

On February 8, 2006, the President signed S. 1932 into law (P.L. 109-171). Title III (the Digital Television Transition and Public Safety Act of 2005) sets the digital transition deadline at February 17, 2009, and allocates up to $1.5 billion for a digital-to-analog converter box program. The act directs that after the digital transition deadline of February 17, 2009, full-power television stations will cease analog broadcasts and operate only on channels 2 through 51. Beginning on January 28, 2008, and ending on June 30, 2008, the FCC (with auction authority extended to 2011) will auction recovered analog spectrum between channels 52 and 69 (except for channels 63, 64, 68, and 69 which are already designated for public safety). Auction proceeds — most recently estimated at $12.5 billion by the Congressional Budget Office[35] — will be deposited in a fund in the U.S. Treasury called the Digital Television Transition and Public Safety Fund.

On September 30, 2009, $7.363 billion will be transferred from the Digital Television Transition and Public Safety Fund to the general fund of the Treasury. Of the funds remaining, $990 million will be made available to the National Telecommunications and Information Administration (NTIA) to administer a digital-to-analog converter box program. The $990 million includes up to $100 million for administrative costs, including up to $5 million for consumer education. Between January 1, 2008, and March 31, 2009, the program will supply up to two coupons per requesting household worth $40 each towards the purchase of converter boxes (which are expected to cost $50 to $60 each). The act defines "converter box" to mean a stand-alone device used solely for digital-to-analog conversion. The program may receive additional funding bringing the total up to $1.5 billion (including up to $160 million for administrative costs) if NTIA notifies Congress that additional funding is needed.

Other designated uses of auction proceeds are as follows:

- not to exceed $1 billion through FY2010 to establish a grant program to assist public safety agencies in the acquisition of, deployment of, or training for use of interoperable communications systems.

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[35] Congressional Budget Office, Cost Estimate for H.R. 2863, DOD Appropriations Act, 2006, December 20, 2005, p. 3, available at [http://www.cbo.gov/ftpdocs/69xx/doc6990/hr2863.pdf].

- not to exceed $30 million for FY2007- FY2008 to reimburse New York City television broadcasters for costs incurred in the design and deployment of a temporary DTV broadcast system, which will provide DTV service until a permanent facility is constructed.

- not to exceed $10 million during FY2008-FY2009 to compensate low-power television stations (including Class A, translator, or booster television stations) for the cost of a digital-to-analog conversion device in order to convert the digital signals received from their corresponding full-power television stations and provide analog signals to their customers.

- not to exceed $65 million during FY2009 to reimburse low-power television stations for equipment to upgrade stations from analog to digital in rural communities.

- not to exceed $156 million during FY2007-FY2012 for a national alert and tsunami warning program.

- not to exceed $43.5 million to implement the ENHANCE 911 Act of 2004.

- not to exceed $30 million for the essential air service program administered by the Department of Transportation.

The act provides for additional supplemental license fees to be assessed by the FCC in the aggregate amount of $10 million during FY2006. Additionally, the conferees instruct the FCC to issue a report and order on the digital television table of channel allotments, and to coordinate those allotments with Canada and Mexico to resolve any international interference issues.

Activities and Issues in the Second Session

The Conference Agreement for P.L. 109-171 did not retain the provisions in the House bill on "digital-to-analog conversion and must carry" (the "downconversion" issue, which addresses cable and satellite provision of broadcast signals to analog televisions), nor were the House provisions on a comprehensive consumer outreach program retained. Also, like the previous House and Senate versions, P.L. 109-171does not contain language addressing the multicast must-carry issue or other DTV issues such as the broadcast flag or DTV public interest obligations.

On May 1, 2006, Senator Stevens introduced S. 2686, the "Communications, Consumer's Choice, and Broadband Deployment Act of 2006." Title VII of S. 2686 ("Digital Television") contains a number of provisions related to the digital television transition. On June 28, 2006, the Senate Committee on Commerce, Science and Transportation completed its markup of the communications reform bill, H.R. 5252. Title VII of the Senate Commerce Committee version of H.R. 5252 similarly contains a number of provisions related to the digital television transition, as follows:

- mandates consumer education requirements for manufacturers, retailers, broadcasters, and the FCC (Sec. 701a);
- establishes a DTV Working Group on consumer education, outreach, and technical assistance (Sec. 701b);
- requires all television sets imported or shipped in interstate commerce for sale or resale to the public after March 1, 2007 to be capable of receiving digital signals (Sec. 701c);
- requires the Department of Commerce, in consultation with the Department of Energy, to set energy standards for digital-to-analog converter boxes (Sec. 701c);
- requires large cable operators to provide to their customers their local broadcasters' digital signals in both digital and "downconverted" analog formats through February 17, 2014 (Sec. 701d);
- affirms the authority of the FCC to implement a digital stream requirement for the blind (Sec. 702);
- requires the FCC to submit a semi-annual report on international coordination with Canada and Mexico of the DTV table of allotments (Sec. 703);
- permits Spanish-language analog television stations broadcasting within 50 miles of the U.S.-Mexican border to continue analog operation (between channels 2 and 51, and subject to certain conditions) until February 17, 2011 (Sec. 704);
- gives the FCC statutory authority to proceed with its broadcast flag rule, with certain limitations (Sec.452).

H.R. 5252 was reported on September 29, 2006 (S.Rept. 109-355). The bill was placed on the Senate Legislative Calendar, but was ultimately not considered by the full Senate.

Issues in the 110th Congress

As provided in the Deficit Reduction Act of 2005 (P.L. 109-171), most over-the-air analog television sets in American households will stop functioning after February 17, 2009, unless they are attached to a digital-to-analog converter box. P.L. 109-171 directed the National Telecommunications and Information Administration (NTIA) to administer a converter box subsidy program which will provide to requesting households up to two $40 coupons which can be used to defray the cost of converter boxes. Up to $1.5 billion, derived from spectrum auction proceeds, will be allocated.

A primary concern of the 110th Congress will likely be minimizing the effect of the digital transition on consumers. Accordingly, the scope, effectiveness, focus, and comprehensiveness of the NTIA's converter box program is likely to receive heightened scrutiny. A related issue — of great concern to Congress — is the adequacy of consumer education efforts by NTIA, the FCC, and the private sector. Other DTV issues — some of which were considered by the 109th Congress, but remain unresolved — include digital multicast must-carry, downconversion, and the

broadcast flag. Additionally, there remain issues related to the auctioning and use of spectrum made available by the digital transition.[36]

NTIA Implementation of Converter Box Program

On July 25, 2006 the National Telecommunications and Information Administration (NTIA) released a Request for Comment and Notice of Proposed Rulemaking (NPRM) to implement and administer a coupon program for digital-to-analog converter boxes. In the NPRM, NTIA proposed that up to two $40 coupons will be available to households with analog televisions that exclusively rely on over-the-air broadcast signals. Cable or satellite television households would not be eligible, even if they also happened to contain over-the-air analog televisions not connected to cable or satellite systems. NTIA proposed that applying households would self-certify that they only receive over-the-air signals using an analog television. NTIA also asked for comments on whether economic need should determine whether a household is eligible for the program, and if so, how economic need should be determined (i.e. "means testing").[37]

In the NPRM, NTIA also asked for comments on consumer education. Given that the Deficit Reduction Act allocates no more than $5 million for consumer education concerning the digital transition and the converter box program, NTIA noted that considering "the costs of media production and paid advertising time, the $5,000,000 limit necessitates that NTIA carefully leverage the program's consumer education spending by collaborating with and complementing the consumer education efforts of broadcasters, equipment manufacturers, retailers, consumer groups and others with a stake in a successful and timely transition to digital television broadcasting."[38] Acknowledging the difficulty in reaching households most likely to rely solely on over-the-air television, NTIA asked for ideas and comments on how best to reach those households.

On November 16, 2006, Representative John Dingell and nineteen other Democrats on the House Committee on Energy and Commerce sent a letter to NTIA expressing concerns regarding the converter box program. Specifically, the letter urged NTIA not to restrict eligibility for converter box coupons to exclusively over-the-air households, and instead to make coupons available also to any cable or satellite television households which may contain an over-the-air analog television. The letter also opposed "means testing," arguing that determining economic eligibility imposes too many administrative burdens on consumers; urged performance standards for converter boxes which would ensure picture and audio quality and the ability of converter boxes to be updated, modified or repaired; and

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[36] For information on spectrum issues related to the digital transition, see CRS Report RS22218, *Spectrum Use and the Transition to Digital TV*, by Linda K. Moore.

[37] National Telecommunications and Information Administration, "Implementation and Administration of a Coupon Program for Digital-to-Analog Converter Boxes," Notice of proposed rulemaking and request for comment, *Federal Register*, Vol. 71, no. 142, July 25, 2006, p. 42067-42074.

[38] Ibid., p. 42071.

stated that $5 million for consumer education was inadequate, urging NTIA to target especially lower income households and other vulnerable groups.[39]

On March 12, 2007, NTIA released its final rule implementing the converter box program.[40] The Deficit Reduction Act of 2005 (P.L. 109-171) initially allocates $990 million for the converter box program, and may subsequently allocate an additional $510 million (totaling $1.5 billion) if NTIA notifies Congress that additional funding is needed. The final rule states that starting on January 1, 2008, for the initial $990 million program (the "Initial Period"), up to two $40 coupons will be available to any and all requesting U.S. households to be used towards the purchase of up to two digital-to-analog converter boxes. In the event that NTIA determines that the additional $510 million is needed, only exclusively over-the-air households will be eligible for coupons during this "Contingent Period.".

Households will be required to self-certify that they are exclusively over-the-air and do not subscribe to cable, satellite, or other pay television services. Cable and satellite households that contain extra over-the-air televisions **will** be eligible for coupons during the "Initial Period" of the program (the first $990 million), but **will not** be eligible for coupons if there is a second phase or "Contingent Period" of the program (the additional $510 million).

The rule also sets forth procedures and requirements for manufacturers and retailers who wish to participate in the converter box program. Manufacturers must submit test results and sample converter boxes to NTIA for approval. Approved devices must meet prescribed technical specifications that are intended to ensure an affordable state-of-the-art converter box. Additional permitted features include a smart antenna interface connector and program guide. Features that would disqualify a converter box from being covered by the coupon program include video recording, playback capability, or other capabilities which allow more than simply converting a digital over-the-air signal.[41]

Meanwhile, retailers must receive a certification from NTIA in order to participate in the converter box coupon program. Certified retailers must agree to have systems in place capable of processing coupons electronically for redemption and payment, track every transaction and provide reports to NTIA, train employees on the purpose and operation of the coupon program with NTIA-provided training materials, use commercially reasonable methods to order and manage inventory, and assist NTIA in minimizing incidents of waste, fraud, and abuse, including reporting

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[39] *Communications Daily*, "Don't Confine DTV Coupons to Over-the-Air Households, Democrats Urge NTIA," November 17, 2006.

[40] U.S. Department of Commerce, National Telecommunications and Information Administration, ""Rules to Implement and Administer a Coupon Program for Digital-to-Analog Converter Boxes," 47 CFR 301, *Federal Register*, Vol. 72, No. 51, March 15, 2007, pp. 12097-12121.

[41] National Telecommunications and Information Administration, *DTV Converter Box Program Information Sheet for Manufacturers*, March 2007, available at [http://www.ntia.doc.gov/otiahome/dtv/DTVmanufacturers.pdf].

suspicious patterns of customer behavior. Retailers are not responsible for verifying household eligibility.[42]

The 110th Congress is expected to closely oversee the converter box program. Possible issues include whether the $1.5 billion allocated to the program is sufficient to meet the needs of all requesting households, whether consumer education efforts among government and private stakeholders are adequate, and whether the program is sufficiently targeted to populations — including low income, minorities, elderly, disabled, and other vulnerable groups — who may be most in need of converter box coupons. The NTIA's converter box final rule, which designates all households eligible for initial funding and limits contingent funding only to over-the-air households, has drawn support from many industry stakeholder groups and criticism from some consumer interest groups for being potentially confusing and for partially excluding participation of cable and satellite households.

Meanwhile, the President's FY2008 budget request recommended $426 million from the Digital Television Transition and Public Safety Fund for the converter box program in FY2008.

Consumer Education

With the February 17, 2009 deadline for the digital transition approaching, and with the implementation of the converter box program in January 2008, Congressional concern is focusing on the adequacy of efforts to inform the public of the digital transition. A primary goal is preventing analog over-the-air households from losing television service in the event that these households do not purchase a converter box or take other measures to ensure the ability to receive digital broadcasts after February 17, 2009.

A survey conducted by the National Association of Broadcasters (NAB) found that 56% of over-the-air viewers have never seen, heard, or read anything about the digital transition, that only 10% were able to guess the right year when analog broadcasts will cease, and that only 1 to 3% knew that the transition would be complete by February 2009.[43] NAB estimates that there are 69 million analog television sets that will be potentially impacted by the digital transition, consisting of 19.6 million households (17% of all households) relying exclusively on over-the-air analog television sets and 34.5 million cable and satellite households which continue to receive some over-the-air programming on analog sets.[44]

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[42] National Telecommunications and Information Administration, *DTV Converter Box Program Information Sheet for Retailers*, March 2007, available at [http://www.ntia.doc.gov/otiahome/dtv/DTVretailers.pdf].

[43] Testimony of K. James Yager on behalf of the National Association of Broadcasters and the Association for Maximum Service Television, hearing before the House Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, March 28, 2007, p. 14. Available at [http://energycommerce.house.gov/cmte_mtgs/110-ti-hrg.032807.Yager-testimony.pdf].

[44] Ibid., p. 11.

Of particular concern to many policymakers are low-income, elderly, disabled, and minority populations which tend to rely more on over-the-air broadcasts. A survey commissioned by the Association of Public Television Stations (APTS) indicates that Americans aged 65 and older are consistently more likely to receive television signals via an over-the-air antenna than are Americans under 65. The survey found that during the first quarter of 2007, 24% of households with Americans 65 and older received their TV programming over-the-air, while only 19% of younger households were over-the-air. The study also found that of Americans aged 65 and older who rely solely on over-the-air connections to television programming, only 17% own a digital TV.[45]

Similarly, a 2005 GAO survey found that over-the-air households are more likely to have lower incomes than cable or satellite households. Specifically, GAO found that approximately 48% of exclusive over-the-air viewers have household incomes less than $30,000, versus 6% with household incomes over $100,000. GAO also found that non-white and Hispanic households are more likely to rely on over-the-air television, with over 23% of non-white households relying on over-the-air television compared to less than 16% of white households, and about 28% of Hispanic households relying on over-the-air television compared to about 17% of non-Hispanic households.[46]

Reflecting Congressional concern over DTV public education efforts, the House Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, held a hearing, "The Status of the Digital Television Transition," on March 28, 2007, and the Senate Committee on Commerce, Science and Transportation held a hearing entitled, "Preparing Consumers for the Digital Television Transition," on July 26, 2007. At both hearings, Members expressed concerns that federal and private sector efforts to educate the public about the DTV transition may be inadequate, that DTV education programs at the FCC and NTIA are underfunded, and that the FCC is not exercising sufficient overall leadership of the DTV transition.

Currently, NTIA is statutorily funded (per P.L. 109-171, the Deficit Reduction Act of 2005) at up to $5 million for DTV consumer education. The Administration has requested $1.5 million for the FCC in FY2008 for DTV consumer education; the FY2008 House Financial Services and General Government Appropriations bill (H.R. 2829; H.Rept. 110-207) would provide $2 million. Both NTIA[47] and the FCC[48]

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[45] Association of Public Television Stations, "APTS Study Shows Older Americans Less Prepared for the Digital TV Transition," Press Release, July 24, 2007.

[46] U.S. Government Accountability Office, Testimony before the Subcommittee on Telecommunications and the Internet, Committee on Energy and Commerce, House of Representatives, *Digital Broadcast Television Transition: Estimated Cost of Supporting Set-Top Boxes to Help Advance the DTV Transition*, February 17, 2005, p. 7-8.

[47] For information on NTIA DTV consumer education efforts, see Testimony of John Kneuer, Assistant Secretary for Communications and Information, National Telecommunications and Information Administration, hearings held by the Senate Committee on Commerce, Science and Transportation, "Preparing Consumers for the (continued...)

are pursuing a strategy of leveraging their resources for consumer education by partnering with private sector DTV education efforts, including through the DTV Transition Coalition, a broad-based coalition of business, trade, and industry groups as well as grass roots and membership organizations.[49]

On July 30, 2007, in response to criticisms and suggestions on DTV consumer education raised by a May 24, 2007 letter[50] from the House Energy and Commerce Committee, the FCC released a Notice of Proposed Rule Making on a DTV Consumer Education Initiative.[51] The NPRM requests public comments on a number of proposals to raise awareness among the public of the DTV transition, including broadcaster public service announcements, broadcaster consumer education reporting, multichannel video programming distributor (MVPD) customer bill notices, consumer electronics manufacturer notices, consumer electronics retailer training, and education reporting, and other proposals.

Digital Multicasts and Downconversion

Digital multicasting refers to the ability of broadcasters to divide their 6 MHZ of digital spectrum into separate and discrete streams of content. Thus, for example, a broadcaster could transmit alternate channels of programming — such as weather, news, or foreign language, for example — in addition to its primary digital video broadcast. On February 10, 2005, the FCC affirmed its prior decision that cable operators are not required to carry more than a single digital programming stream from any particular broadcaster. At issue is whether "must carry" requirements should be expanded such that cable operators would be required to carry any or all additional multicasted channels transmitted by commercial broadcasters. Commercial broadcasters argue that their incentive to develop additional digital programming streams is diminished if they have no guarantee that cable systems will carry that programming. Cable providers counter that their decision whether or not to carry additional programming streams from a broadcaster should be dictated by the market, rather than mandated.

In the 109th Congress, H.R. 5252, as reported by the Senate Committee on Commerce, Science and Transportation, did not explicitly address multicast must-

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[47] (...continued)
Digital Television Transition," July 26, 2007. Available at [http://commerce.senate.gov/public/_files/JohnMRKneuerTestimonyv2.pdf].

[48] Testimony of Catherine Seidel, Chief, Consumer and Governmental Affairs Bureau, Federal Communications Commission, hearings held by the Senate Committee on Commerce, Science and Transportation, "Preparing Consumers for the Digital Television Transition," July 26, 2007. Available at [http://commerce.senate.gov/public/_files/WrittenStatementofCathySeidel7262007Hearing.pdf].

[49] For more information on the DTV Transition Coalition, including a membership list, see [http://www.dtvtransition.org].

[50] Available at [energycommerce.house.gov/Press_110/FCC.052407.Martin.ltr.DTV.pdf].

[51] FCC, *Notice of Proposed Rulemaking, In the Matter of DTV Consumer Education Initiative*, MB Docket No. 07-148, FCC 07-128, 22 p.

carry, and to date, no multicast must-carry legislation has been introduced. However, FCC Chairman Kevin Martin has publicly stated his support for requiring multicast must-carry, and suggested the possibility of reconsidering the FCC's 2005 decision (which was issued under the previous FCC Chairman, Michael Powell).[52] Two of the FCC Commissioners who voted against multicast must-carry, Michael Copps and Jonathan Adelstein, stated that they may be willing to reexamine the issue if public interest obligations of broadcasting multicast signals are also addressed.[53] An attempt to require multicast must-carry at the FCC's June 2006 meeting was withdrawn by Chairman Martin when it became clear that the order lacked votes necessary for passage.[54]

A related issue is the extent to which cable providers may be permitted or required to carry downconverted analog signals after the digital transition takes place. Many cable households will likely continue to use analog televisions which cannot receive a digital signal. Cable companies might offer or lease converter boxes to these customers, or customers may be required to purchase their own converter box. As an alternative, it is possible that cable providers might seek authority from Congress to "downconvert" the digital signal of selected local broadcast stations to analog format. To serve customers with digital televisions, cable providers would continue to provide digital signals as well (in other words, "dual carriage"). Under this scenario, a key issue is whether (and if so, how) Congress should mandate which local broadcast stations would receive the benefit of "dual carriage" to cable customers.

In the 109th Congress, H.R. 5252, as reported by the Senate Committee on Commerce, Science and Transportation, contained language that would require satellite carriers and cable operators with capacities of greater than 550 megahertz to offer, through February 17, 2014, must-carry locally broadcast digital signals in formats viewable on both analog and digital televisions. Cable operators with capacities of 550 megahertz or less would be required only to offer those signals in analog format through February 17, 2014, while maintaining the option of offering digital signals as well. Cable operators and satellite carriers would have the option of providing standard definition digital signals in lieu of high definition signals, and would be allowed to perform conversions at any location, from the cable head-end or local receive facility, to the customer premises.

The provision in H.R. 5252 allowing cable operators and satellite carriers to provide digital signals in a standard definition format was opposed by broadcasters and the consumer electronics industry. They argued that permitting conversions of broadcasters' signals to a standard definition format removes the incentive for consumers to purchase high definition television sets, while also giving cable and satellite providers the opportunity to offer their own programming in a higher quality

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[52] "Martin Backs Broadcasters on Multicast Must-Carry at NAB," *Communications Daily*, April 26, 2006.

[53] "Adelstein, Copps Say Multicast Must-Carry Can be Rethought,"*Communications Daily*, April 27, 2006.

[54] "McDowell Rejection Jilts Multicast Must-Carry," *Communications Daily*, June 20, 2006.

format (i.e. high definition) than what they might offer for broadcasters' digital programming. Cable companies asserted that the legislation provides a seamless digital transition for the majority of consumers who have not yet purchased high definition sets.[55]

On April 25, 2007, the FCC adopted a Second Further Notice of Proposed Rulemaking (NPRM)[56] asking for comment on proposals to ensure all cable subscribers, including those with analog TV sets, can view must-carry television stations on cable systems after the transition to digital television occurs on February 17, 2009. In the NPRM, the FCC pointed out that about 50% of all cable subscribers (approximately 32 million households) are analog cable subscribers. Additionally, many digital cable subscribers have one or more television sets that only receive analog cable service.[57]

By statute, cable operators must ensure that all subscribers are able to view all must-carry local broadcast stations. In the NPRM, the FCC proposes that cable operators must either: (1) carry the signals of all must-carry stations in an analog format to all analog cable subscribers, or (2) for all-digital systems, carry those signals only in digital format, provided all subscribers have the necessary equipment to view the broadcast. The FCC also reaffirmed that cable systems must carry high definition broadcast signals in HD format, and asked for comment on whether the Commission should move from a subjective to an objective measure of what constitutes "material degradation."[58]

"Broadcast Flag" and the "Analog Hole"

Many content providers (e.g., movie studios and broadcast networks) may be reluctant to provide high quality digital content to households until they are assured that technologies are in place to prevent consumers from making unauthorized copies and Internet transmissions of copyrighted digital content. Two of these technologies currently under consideration are the "broadcast flag"[59] and technology to "plug" what is commonly referred to as the "analog hole." The "broadcast flag" applies only to content that is broadcast over-the-air. The "analog hole"problem applies to all digital content, whether it is transmitted over-the-air, by cable, or by satellite. For further explanations of these technologies, see the section, "Copyright Protection Technologies" in **Appendix A** of this report.

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[55] "Networks Object to 'Down Conversion' of TV Signals," *Technology Daily*, August 15, 2006.

[56] FCC, *Second Further Notice of Proposed Rulemaking, In the Matter of: Carriage of Digital Television Broadcast Signals: Amendment to Part 76 of the Commission's Rules*, CS Docket No. 98-120, FCC 07-71, 26 p.

[57] FCC, *News Release*, "FCC Seeks Comment to Ensure All Cable Customers Receive Programming After the Digital Television Transition," April 25, 2007.

[58] Ibid.

[59] For more information on the broadcast flag, see CRS Report RL33797, *Copyright Protection of Digital Television: The 'Broadcast Video Flag'*, by Brian T. Yeh.

On November 4, 2003, the FCC adopted a rule which gives broadcasters the option of inserting a "broadcast flag" into their over-the-air broadcast transmissions. By July 1, 2005, all consumer electronics devices capable of receiving an over-the-air DTV signal would have been required to be manufactured to incorporate content protection technologies that would limit the redistribution of digital television content when the broadcast flag is recognized. However, on May 6, 2005, the U.S. Circuit Court of Appeals for the District of Columbia struck down the FCC's broadcast flag rules. The Court ruled that the FCC has no authority to regulate consumers' use of televisions and other devices which receive broadcast transmissions. With the FCC's broadcast flag rule negated by the Court, Congressional policymakers are considering whether to introduce legislation mandating a broadcast flag.

In the 109th Congress, discussion draft legislation released by the House Committee on the Judiciary, Subcommittee on Courts, the Internet and Intellectual Property, the Broadcast Flag Authorization Act, would give the FCC authority to proceed with the broadcast flag rule. On November 3, 2005, the Committee heard witnesses in support and opposition to the draft legislation. On January 24, 2006, broadcast flag draft legislation (which would also give the FCC authority to proceed with the broadcast flag rule) was discussed at a hearing held by the Senate Committee on Commerce, Science and Transportation. Another hearing addressing the broadcast flag issue was held by the House Committee on Energy and Commerce on June 27, 2006.

H.R. 5252, as reported by the Senate Commerce, Science and Transportation Committee, would give the FCC statutory authority to proceed with its broadcast flag rule. The legislation provided that within 30 days after enactment, the FCC shall initiate a further proceeding for the approval of digital output protection technologies and recording methods for use in distance learning activities. The FCC's authority is not limited with respect to approving technologies that allow for the redistribution of digital broadcast content within the home or similar environment. Finally, a broadcast flag could not be used to restrict the distribution of news and public affairs programming of which the primary commercial value depends on "timeliness." The FCC would allow broadcasters to determine whether that "timeliness" criteria is met. Such determination by broadcasters would be subject to FCC review under certain conditions.

Meanwhile, on November 3, 2005, the House Committee on the Judiciary heard witnesses in support and opposition to draft legislation that would require consumer electronics devices (such as digital video recorders) to incorporate technology designed to prevent unauthorized copying and distribution of digital content obtained through the analog hole. The draft legislation was the basis for the Digital Transition Content Security Act of 2005 (H.R. 4569), introduced by House Judiciary Committee Chairman James Sensenbrenner and Ranking Member John Conyers on December 16, 2005.

Appendix A. Background on Selected Policy Issues

Digital "Must Carry"

Under the "must carry" provisions of the Cable Television Consumer Protection and Competition Act of 1992, cable TV providers are required to transmit local analog programs to their customers. This decision was based on the reasoning that since cable TV has a predominant position in the market, "without mandatory carriage provisions, the economic viability of local broadcast television and its ability to produce quality local programming would be jeopardized."[60]

The commercial broadcasters (primarily the smaller networks and independent stations, represented by the Association of Local Television Stations, but also the National Association of Broadcasters) believe that the same principles and conclusions of the 1992 Act should apply to DTV services, leading to mandatory carriage of the DTV programming by cable operators. Broadcasters argue that because most Americans receive their TV via cable, the carriage of DTV programming by cable providers is essential for consumers to purchase DTV receivers.

The cable companies (led by the National Cable Television Association, NCTA) oppose any "must carry" requirements for cable operator carriage of DTV programming, arguing that it would be an unlawful taking of their property, and that they should be able to decide what content they provide on their own networks. NCTA points out that, unlike the commercial broadcasters who were given free spectrum licenses for DTV, cable operators must build their own infrastructure to be able to transmit DTV signals. Cable operators say they will carry commercial broadcasters' DTV programming as soon as consumer demand warrants it. Cable television services provide a finite number of channels to consumers, and any mandate to provide DTV programming would require cable companies to remove other non-broadcast channels. Many cable operators are investing in the upgrades needed to provide DTV, although the video transmission standards adopted by cable operators may not be the same as those used by the broadcasters. This could mean that different home equipment may be necessary for cable services than for over-the-air TV reception. In addition, HDTV programming will require cable operators to build a more robust transmission (i.e., greater bandwidth) capability than is required by SDTV, and some cable operators may want to offer SDTV but not HDTV services. The cable industry also contends that mandating carriage of all DTV broadcast transmissions will financially devastate many smaller cable operators.

Responding to the debate between the broadcast and cable industries over whether cable TV providers should be required to transmit DTV programming, in

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[60] Ibid., p. 5. Satellite television is also subject to must carry requirements. See CRS Report RS20425, *Satellite Television: Historical Information on SHVIA and LOCAL*, by Marcia S. Smith.

July 1998 the FCC initiated a proceeding on the matter.[61] On January 22, 2001, the FCC announced its adoption of rules for cable carriage of digital TV signals. Most notably, the FCC ruling did **not** require cable systems to simultaneously carry both the analog and digital signals ("dual carriage") of local TV stations. The FCC tentatively concluded that "such a requirement appears to burden cable operators' First Amendment interests more than is necessary to further a substantial governmental interest."[62] While not approving a dual carriage mandate, the FCC did rule that a digital-only TV station, whether commercial or non-commercial, can immediately assert its right to carriage on a local cable system. Additionally, a TV station that returns its analog spectrum and converts to digital operations must be carried by local cable systems. Cable systems must carry "primary video," defined as a "single programming stream and other program-related content."

The FCC continued to examine the must-carry issue through 2004. Of particular interest was how must-carry rules would ultimately apply to "digital multicasting," which refers to the ability of broadcasters to divide their 6 MHZ of digital spectrum into separate and discrete streams of content. At issue is whether cable operators should be required to carry any or all additional multicasted channels transmitted by commercial broadcasters as part of their 6 MHZ digital allotment.

On January 31, 2005, the National Cable Television Association (NCTA) and the Association of Public Television Stations (APTS) announced an agreement under which cable companies would provide dual-carriage (both analog and digital) of at least one public television station in a market during the transition, as well as carrying up to four multicasts of public stations after the transition. Under the agreement, APTS will no longer lobby the FCC or Congress for government must-carry mandates.

On February 10, 2005, the FCC affirmed its prior decision that cable operators are not required to carry more than a single digital programming stream from any particular broadcaster. The FCC also affirmed the previous tentative conclusion not to impose a dual carriage requirement on cable operators.

Mandating Digital Tuners

After the digital transition, existing analog television sets will not be able to receive digital signals unless they are attached to a converter box. However, it is possible to manufacture analog televisions with a digital tuning capability already built in. Such televisions would not require a separate converter box in order to receive over-the-air broadcasted digital signals. On August 8, 2002, the FCC adopted a phase-in plan requiring most new television sets to contain digital tuners by 2007. Specifically, the FCC's Second Report and Order and Second Memorandum Opinion and Order (FCC 02-230) requires all television sets with screen sizes of at least 13 inches, and all television receiving equipment (such as video cassette recorders and

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[61] *FCC Notice of Proposed Rule Making on Carriage of Transmissions of Digital Television Broadcast Stations*, CS Docket No. 98-120, released July 10, 1998.

[62] See [http://www.fcc.gov/Bureaus/Cable/News_Releases/2001/nrcb0103.html].

DVD players/recorders to include DTV reception capability according to the following schedule:

> **Receivers with screen sizes 36 inches and above** — 50% of a responsible party's units must include DTV tuners effective July 1, 2004; 100% of such units must include DTV tuners effective July 1, 2005.
> **Receivers with screen sizes 25 to 35 inches** — 50% of a responsible party's units must include DTV tuners effective July 1, 2005; 100% of such units must include DTV tuners effective July 1, 2006.
> **Receivers with screen sizes 13 to 24 inches** — 100% of all such units must include DTV tuners effective July 1, 2007.
> **TV Interface Devices** VCRs and DVD players/recorders, etc. that receive broadcast television signals — 100% of all such units must include DTV tuners effective July 1, 2007.

The FCC's phase-in plan was opposed by the Consumer Electronics Association (CEA), consumer groups, and antitax groups. The CEA, citing the "scant percentage of households relying on over-the-air television reception" argued that the mandate is a "multi-billion dollar TV tax on American consumers," and called instead for an FCC mandate on cable-DTV compatibility standards.[63] This position was countered by the National Association of Broadcasters, who argued that the mandate is necessary to hasten the DTV transition and ensure the survival of free over-the-air broadcasting, which NAB says is currently received by roughly one third of all TV sets in use.[64]

Subsequently, the agreement between the consumer electronics and cable industries on a cable-DTV interoperability standard dampened CEA's opposition to the digital tuner mandate, because the circuitry enabling "plug and play" compatibility between digital televisions and cable systems could be modified to receive digital over-the-air signals at an incremental cost.[65] However, in November 2004, the CEA, along with the Consumer Electronics Retailers Coalition (CERC), petitioned the FCC to eliminate the deadline of July 1, 2005 for digital tuners in 50% of televisions in the 25 to 36 inch (mid-sized) screen size range. Alternatively, CEA and CERC proposed that the digital tuner deadline for all (100%) of televisions in that size range be moved up from July 1 to March 1, 2006. On February 14, 2005, the FCC announced a Notice of Proposed Rulemaking to consider whether to adjust the schedule by which televisions with screen sizes of 25 to 36 inches are required to contain digital tuners.

On June 9, 2005, the FCC denied the CEA and CERC petition to eliminate the deadline of July 1, 2005 for 50% of televisions in the 25 to 36 inch screen size range to have digital tuners. At the same time, the FCC did agree to move up the digital

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[63] Consumer Electronics Association, *Americans Should Not Be Forced to Buy DTV Over-the-Air Tuners Says CEA*, Press release, August 8, 2002, available at [http://www.ce.org/Press/CurrentNews/press_release_detail.asp?id=10012].

[64] National Association of Broadcasters, *Fact Vs. Myth: The DTV Tuner Integration Debate*, available at [http://www.dtvprofessional.com/2002/08_aug/editorials/nab_dvttuners.htm].

[65] Clark, Drew, "Electronics Group Shows Flexibility on Digital TV Issue," *National Journal's Technology Daily*, January 27, 2003.

tuner deadline for mid-size televisions from July 1 to March 1, 2006. The FCC also proposed to move up the date by which all televisions with screen sizes over 13 inches must have digital tuners, from July 1, 2007 to December 31, 2006; and asked for comments on whether digital tuner requirements should be extended to televisions with screen sizes smaller than 13 inches.

On November 3, 2005, the FCC announced its decision to require **all** sets shipped in interstate commerce or imported into the United States (including sets with screen sizes smaller than 13 inches) to contain digital tuners by March 1, 2007.[66] While newly manufactured or imported sets must have a digital tuner, retailers are permitted to sell analog-only television sets from existing inventory. On April 25, 2007, the FCC adopted a rule[67] requiring retailers to put a label on all analog-only televisions which informs the consumer that the television will require a converter box after February 17, 2009. The FCC is monitoring compliance with the labeling rule, and has levied over $3 million in fines, in the aggregate, against retailers who fail to display required labels.[68]

Copyright Protection Technology

Many content providers (e.g., movie studios and broadcast networks) are reluctant to provide high quality digital content to DTV owners until they are assured that interoperability standards and technology licensing agreements are in place to prevent consumers from making unauthorized copies and Internet transmissions of digital content. In 1998, five consumer electronics manufacturing companies — Hitachi, Intel, Matsushita, Sony, and Toshiba — formed an entity called the Digital Transmission Licensing Administrator (DTLA, also known as "5C") to license a jointly developed Digital Transmission Content Protection (DTCP) technology. DTCP is designed to protect audiovisual and audio content against unauthorized interception or retransmission in the digital home environment.

On July 17, 2001, two major studios — Warner Bros. and Sony Pictures Entertainment — announced a licensing agreement to adopt DTCP. The agreement is designed to permit the studios to protect prerecorded media, pay-per-view, and video-on-demand transmissions against unauthorized copying, and to protect all content against unauthorized Internet retransmission, while assuring consumers'

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[66] FCC News Release, "FCC Modifies Digital Tuner Requirements to Advance Digital Transition," November 3, 2005, available at [http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-262013A1.pdf].

[67] *FCC Second Report and Order, In the Matter of Second Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, MB Docket No. 03-15, FCC 07-69, 30 p.

[68] Testimony of Catherine Seidel, Chief, Consumer and Governmental Affairs Bureau, Federal Communications Commission, hearings held by the Senate Committee on Commerce, Science and Transportation, "Preparing Consumers for the Digital Television Transition," July 26, 2007.

ability to continue customary home recording of broadcast and subscription programming.[69]

Broadcast Flag.[70] While DTCP protects content delivered to the home via cable or satellite, the technology does not protect over-the-air broadcast content. Other major studios have been reluctant to sign licensing agreements with DTLA until broadcast content can also be protected. Additionally, broadcast networks (ABC, CBS, and Fox) have opposed the 5C standard, arguing that the technology's inability to encrypt over-the -air broadcasts will cause high quality content to migrate toward cable and satellite exclusively. A week after the 5C agreement with Sony Pictures and Warner Bros. was announced, the five other major studios (Disney, Paramount, Fox, Universal, and MGM) submitted a proposal to DTLA which would require digital broadcast content to be encrypted with a "broadcast flag" preventing Internet distribution or retransmission of digital content broadcast over-the-air. On June 3, 2002, a group of engineers from the motion picture and technology industries[71] released a detailed "broadcast flag" proposal. While the proposal is strongly supported by the content industry, the technology industry remains divided, with some companies supporting and others opposing this particular proposal. Some consumer groups have also expressed opposition.

Those supporting a broadcast flag (such as the Motion Picture Association of America and other content providers) argue that the protections against piracy offered by a broadcast flag are crucial to ensure that content providers make high-value programming available over the digital airwaves. Supporters also argue that a broadcast flag will not prevent consumers from making physical copies of DTV programs, or from distributing such copies within a person's home digital network. Opponents of a broadcast flag (many consumer electronics and high tech companies, as well as consumer groups) assert that because electronic devices will have to be meet certain specifications in order to process the broadcast flag, the innovation and functionality of consumer electronics equipment will be adversely affected. Additionally, they argue, because the broadcast flag would effectively ban any retransmission not approved by content providers, legitimate consumer rights (e.g. "Fair Use") would be compromised.

On August 9, 2002, the FCC issued a notice of proposed rulemaking (FCC 02-231, MB Docket 02-230) in the matter of digital broadcast copy protection. Noting that the lack of digital broadcast copy protection is a significant impediment to the DTV transition, the FCC solicited public comment on whether the FCC can and should mandate the use of a copy protection mechanism for digital broadcast television. The comment period closed on February 18, 2003; over 6000 comments were received, most from individual citizens.

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[69] DTLA Press Release, "DTLA, Sony Pictures Entertainment and Warner Bros. Announce First Studio Licenses for Digital Home Network Technology," July 17, 2001, see [http://www.dtcp.com/data/press/DTCP_PRESS_010717.pdf].

[70] For more information on the broadcast flag, see CRS Report RL33797, *Copyright Protection of Digital Television: The 'Broadcast Video Flag'*, by Brian T. Yeh.

[71] The Broadcast Protection Discussion Group (BPDG), a subgroup of the Copy Protection Technical Working Group (CPTWG).

On November 4, 2003, the FCC adopted a rule which gives broadcasters the option of inserting a "broadcast flag" into their over-the-air broadcast transmissions. By July 1, 2005, all consumer electronics devices capable of receiving an over-the-air DTV signal would have been required to be manufactured to incorporate content protection technologies that will limit the redistribution of digital television content when the broadcast flag is recognized. Before DTV devices can be manufactured, however, content protection technologies must be approved. The FCC set forth an "interim procedure" whereby parties would certify that their content protection technology meets FCC criteria. After a period of public comment, the FCC would determine whether or not to approve that particular technology. The FCC issued a *Further Notice of Proposed Rulemaking* in order to formulate a permanent approval procedure for content protection technology.[72] On August 4, 2004, the FCC adopted a Report and Order approving thirteen digital output protection technologies and recording methods.[73]

On February 22, 2005, the U.S. Circuit Court of Appeals for the District of Columbia heard an appeal filed in March 2004 by library and consumer groups objecting to the FCC rule mandating that copy protection technology be included in digital televisions and related electronics by July 1, 2005. On May 6, 2005, the Court struck down the FCC's broadcast flag rules. The Court ruled that the FCC has no authority to regulate consumers' use of televisions and other devices which receive broadcast transmissions. With the FCC's broadcast flag rule negated by the Court, the 109th Congress considered legislation mandating a broadcast flag.

In the 109th Congress, H.R. 5252, as reported by the Senate Commerce, Science and Transportation Committee, would have given the FCC statutory authority to proceed with its broadcast flag rule. The legislation provided that within 30 days after enactment, the FCC shall initiate a further proceeding for the approval of digital output protection technologies and recording methods for use in distance learning activities. The FCC's authority is not limited with respect to approving technologies that allow for the redistribution of digital broadcast content within the home or similar environment. Finally, a broadcast flag could not be used to restrict the distribution of news and public affairs programming of which the primary commercial value depends on "timeliness." The FCC would allow broadcasters to determine whether that "timeliness" criteria is met. Such determination by broadcasters would be subject to FCC review under certain conditions. H.R. 5252 was not enacted by the 109th Congress.

Analog Hole. Another copyright protection issue of concern to content providers is what is commonly referred to as the "analog hole." In the foreseeable future, many consumers will continue to use analog televisions. In order to display the content carried by digital signals, analog televisions will be equipped with a digital tuner (a set-top box) which converts the signal from digital to analog. At this

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[72] *FCC Report and Order and Further Notice of Proposed Rulemaking in the Matter of Digital Broadcast Content Protection*, MB Docket No. 02-230, FCC 03-273, released November 4, 2003.

[73] *FCC Order in the Matter of Digital Output Protection Technology and Recording Method Certifications*, FCC 04-193, released August 12, 2004.

point, the digital signal, even if content protected, is converted into an unprotected analog form which could then be easily converted into a similarly unprotected digital form subject to the unauthorized copying and Internet transmission the content providers are seeking to prevent.

During the 109th Congress, discussion draft legislation released by the House Committee on the Judiciary, Subcommittee on Courts, the Internet and Intellectual Property, the Analog Content Protection Act, would require devices (such as digital video recorders or PC-based tuners) to recognize an analog rights signaling mechanism called "CGMS-A plus Veil" (Analog Copy Generation Management System coupled with the Veil Technologies Rights Assertion Mark). On November 3, 2005, the Committee heard witnesses in support and opposition to the draft legislation.[74] The draft legislation was the basis for the Digital Transition Content Security Act of 2005 (H.R. 4569), introduced by House Judiciary Committee Chairman James Sensenbrenner and Ranking Member John Conyers on December 16, 2005.

Cable/DTV Interoperability Standards

Interoperability standards between digital televisions and cable systems are necessary in order for consumers to be able to watch digital programming over their cable systems. Traditionally, interoperability has been achieved via the proprietary set-top box leased to the subscriber by the local cable company. Given the absence of a national interoperability standard, consumers had been unable to purchase DTV products from consumer electronics stores which can be directly connected to cable systems without the use of a set-top box. Two separate entities — the consumer electronics industry (including manufacturers and retailers) and the cable system operators — have embarked on an often contentious process of determining the specific technical details of how DTV devices might achieve nation-wide compatibility and interoperability with cable systems.

Section 304 of the Telecommunications Act of 1996 directed the FCC to adopt regulations to assure the commercial consumer availability of "navigation devices" (i.e. set-top boxes, remote control units) without jeopardizing the rights of a cable provider to protect its signal from theft. Currently, proprietary set-top boxes are "integrated" with two overall functions: security and navigation (i.e. allowing the subscriber to flip from channel to channel). A 1998 order adopted by the FCC (FCC 98-116) required the cable operators to separate the security functions from non-security functions and to make available (by July 1, 2000) modular security components to the consumer electronics industry.[75] Allowing time for transition, the FCC order permitted cable operators to continue to provide integrated set-top boxes

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[74] See [http://judiciary.house.gov/Oversight.aspx?ID=202].

[75] Also referred to as a Point of Deployment or "POD" module, this would consist of a smart card (subsequently referred to as a "CABLEcard") that could be inserted into the consumer electronics device to provide the security required by the cable operator. A "national security interface" is required to ensure that POD modules from all the different local cable operators would satisfactorily operate in every device. To manufacture a "POD reliant" device, the manufacturer must sign a POD-Host Interface License Agreement ("PHILA").

through January 1, 2005. After that date, the sale or lease of new integrated boxes would be prohibited. This deadline was subsequently extended to July 1, 2006, and again extended to July 1, 2007.

On February 22, 2000, the Consumer Electronics Association (CEA) and the National Cable Television Association (NCTA) announced a voluntary agreement on a set of technical requirements that permit the direct connection of digital television receivers to cable television systems. In January 2002, CableLabs (a research organization of the cable industry) published specifications for the OpenCable Applications Platform (OCAP), which would serve as a uniform interoperability cable/DTV standard. However, consumer electronics manufacturers and retailers and the cable industry continued to disagree over the pace and specific technical details (including copy protection requirements) of how interoperability should be implemented.

On December 19, 2002, the cable and consumer electronics industries announced they had reached an agreement on a cable compatibility standard for an integrated, unidirectional digital cable television receiver. The two industry groups filed a Memorandum of Understanding (MOU) with the FCC, outlining the agreement. According to the MOU, the industries will continue to negotiate a "bidirectional" standard that would enable consumers to receive advanced services (such as video on demand) without the need for an external navigation device. On January 7, 2003, the FCC issued a Further Notice of Proposed Rulemaking (FCC 03-3) seeking comment on the MOU and proposing FCC rules necessary to implement the industry agreement. Opposition to the agreement's "encoding rules" was expressed by several organizations, including the Motion Picture Association of America, makers of personal video recording technology (TiVo), and consumer groups.

On September 10, 2003, the FCC adopted a Second Report and Order which adopted, with certain modifications, the MOU agreement between the cable and consumer electronics industries. The new rules allowed for the manufacture of "plug and play" television sets that would receive one-way digital signals (from the cable company to the consumer) without the need for a set-top box. However, consumers would have to obtain from their cable operator a security card (a "POD" or "CableCARD") that must be inserted into the TV set. A set-top box would still be required for two-way services such as video on demand or pay-per-view. Finally, the Order initiated a subsequent proposed rulemaking (Second Further Notice of Proposed Rulemaking) to examine remaining issues.[76]

Under the current FCC rule, after July 1, 2007, the security of the unidirectional digital signal must be protected by a CableCARD (supplied by the cable provider) which can be inserted into the "plug and play" television set, and allow consumers to view scrambled programming. New set-top boxes provided by cable operators to their customers can no longer be "integrated," that is, they must operate in conjunction with a CableCARD. In its ruling setting the July 1, 2007 deadline for

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[76] FCC Press Release, *FCC Eases Digital Transition for Consumers*, September 10, 2003, available at [http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-238850A1.pdf].

integrated set-top boxes, the FCC stated that it would entertain requests for waivers of the prohibition. As the July 1, 2007 deadline approached, many cable providers sought waivers from the FCC, urging that the July 1, 2007 deadline be extended by two years. Cable providers argued that imposing the ban would raise the costs to consumers of leasing the new CableCARD enabled boxes (without adding any new functionality) and divert industry resources from developing low-cost digital set-top boxes needed for the digital transition. Cable companies also argued that next-generation network architect security ("downloadable security") will likely be available in 2008 or 2009, rendering CableCARD technology obsolete. The consumer electronics industry, on the other hand, argued that if the July 1, 2007 deadline was extended, the value of CableCARD technology to consumers would be further diminished, thereby making it more likely that consumers would not purchase "plug and play" digital sets with integrated tuners, and continue to opt for sets which rely on the set-top boxes supplied by cable providers. Ultimately, the FCC granted some waivers for small cable operators experiencing difficulty obtaining new equipment, as well as for operators pledging an all-digital conversion by February 17, 2009.[77] Large cable operators — such as Comcast and Time Warner — have not been granted waivers, and must comply with the July 1, 2007 deadline.

Meanwhile, because CableCARDs do not provide signal security for two-way bidirectional signals (used for pay-per-view or video-on-demand, for example), the cable and consumer electronics industry continue to negotiate on a standard for bidirectional navigation devices. On June 29, 2007, the FCC released a Third Further Notice of Proposed Rulemaking seeking comment on industry-proposed standards to ensure bidirectional compatibility of cable television systems and consumer electronics equipment. The FCC is also seeking comment on whether such a proposed rule should apply to other non-cable providers such as direct broadcast satellite (DBS) or Internet protocol (IP)-based video services.

Digital Conversion of Public Broadcasting Stations

The FCC set a deadline of May 1, 2003 for public television stations to convert to digital. Unlike commercial broadcasters, public television broadcasters were not opposed to an early deadline for returning analog spectrum, provided that a mechanism was put in place which would ensure that converter boxes are made available to exclusively over-the-air households. Public broadcasting stations view digital television as an opportunity to enhance and expand services to their local communities. For example, public television stations are using multicast channels to provide programming streams dedicated to formal and children's education, workforce development, public affairs and local issues, and addressing underserved communities. Stations are also conducting pilot programs, whereby datacasts are used to establish Homeland Security public safety networks, including public alert systems and closed networks used by public safety and emergency management agencies.

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[77] FCC Press Release, *Media Bureau Acts on Requests for Waiver of Rules on Integrated Set-Top Boxes*, June 29, 2007. Available at [http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-274776A1.pdf]

According to the Corporation for Public Broadcasting (CPB), as of January 2007, 340 public television stations (out of a total of 349) were on the air with a digital signal. Stations are currently at different stages of the digital transition, some with high definition production capacity and/or multicasting, while others struggle to maintain a single digital broadcast service that meets FCC requirements. CPB estimates that public television stations need $400 million to fully complete the digital transition.[78] Raising money for the digital conversion is a challenge for many public television stations, especially those in small markets. In 1997, the Corporation for Public Broadcasting and other public television stakeholders estimated the cost of digital conversion for public television stations at $1.7 billion.[79] In 2002, GAO reported that digital conversion would cost each station approximately $3 million.[80]

Public broadcasters have sought a substantial federal contribution for digital conversion. There are three federal programs which provide funding to public television stations for digital conversion. Those programs are: 1) the Public Telecommunications Facilities Program (PTFP), a grant program administered by the National Telecommunications and Information Administration (NTIA) at the Department of Commerce; 2) the Digital Distribution Fund at the CPB, and 3) the Public Television Station Digital Transition Grant Program at the Rural Utilities Service (RUS), U.S. Department of Agriculture. **Table 1** shows funding histories for each of these programs.

PTFP funding is used to help public television stations pay for the new equipment and physical infrastructure required for digital conversion (e.g. transmitters, translators, and production equipment). The PTFP, which has provided matching grants for public broadcasting equipment for over 40 years, began to fund digital conversion in FY1998. For FY2008, as in previous years, the Administration has requested no funding for PTFP in FY2008. On June 29, 2007, the Senate Appropriations Committee approved a bill (S. 1745;S.Rept. 110-124) providing $20 million to PTFP in FY2008. On July 12, 2007, the House Appropriations Committee approved a bill (H.R. 3093; H.Rept. 110-240) providing $21.728 million. The House passed H.R. 3093 on July 26, 2007.

The Digital Distribution Fund at the Corporation for Public Broadcasting (CPB) provides matching grants to public television stations for the purchase of digital transmission equipment. The Administration has requested $30.6 million for CPB's digital conversion program in FY2008. As in previous Administration budget proposals, the $30.6 million would be taken from advance appropriations previously enacted. On June 7, 2007, the House Appropriations Subcommittee on Labor-HHS-Education approved $29.7 million in "new money" for digital conversion (H.R. 3043; H.Rept. 110-231). The House passed H.R. 3043 on July 19, 2007. On June

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[78] Corporation for Public Broadcasting, *Appropriation Request and Justification FY2008 and FY2010*, February 2007, p. 11-13. Available at [http://www.cpb.org/aboutcpb/financials/appropriation/justification_08-10.pdf]

[79] U.S. Government Accountability Office, *Issues Related to Federal Funding for Public Television by the Corporation for Public Broadcasting*, GAO-04-284, April 2004, p. 51.

[80] U.S. Government Accountability Office, *Many Broadcasters Will Not Meet May 2002 Digital Deadline*, GAO-02-466, April 23, 2002, p. 16.

20, 2007, the Senate Appropriations Committee approved a bill (S. 1710; S.Rept. 110-107) that would also provide $29.7 million.

Table 1. Federal Funding for Digital Conversion of Public Television Stations
($millions)

	PTFP (announced grant funding awarded for digital conversion)	CPB (appropriated funding for digital conversion)	RUS (appropriated funding for digital conversion)
FY1998	12.5	—	—
FY1999	15.7	—	—
FY2000	18.0	—	—
FY2001	35.0	20.0	—
FY2002	36.0	25.0	—
FY2003	25.0	48.7	—
FY2004	9.8	50.0	14.0
FY2005	11.7	39.7	10.0
FY2006	12.3	30.0	5.0
FY2007	not yet announced	30.0	5.0
FY2008 (request)	0	30.6	0

The Public Television Station Digital Transition Grant Program at the Rural Utilities Service (RUS) provides funding to public televison stations serving rural areas for the purchase or lease of digital broadcasting equipment. The Administration requested no funding for the RUS digital conversion program in FY2008. On July 19, 2007, the Senate Appropriations Committee approved a bill (S. 1859; S. Rept. 110-134) providing $10 million for public broadcasting digital conversion in rural areas. The Committee noted that FY2008 is the last appropriation that can effectively make funding available before the transition deadline and that "future funding is not anticipated." The House Agriculture Appropriations Act (H.R. 3161; H.Rept. 110-258), approved by the House Appropriations Committee on July 19, 2007, includes no funding for digital conversion. The House passed H.R. 3161 on August 2, 2007. Meanwhile, the Farm, Nutrition, and Bioenergy Act of 2007 (H.R. 2419), passed by the House on July 27, 2007, contains a provision (section 6028, "Assistance for Rural Public Television Stations") which gives the Secretary of Agriculture the authority to provide grants to "noncommercial education television broadcast stations that serve rural areas for the purposes of developing digital facilities, equipment, and infrastructure to enhance digital services to rural areas."

Satellite Television and "Digital White Areas"

Under current law, satellite television providers are permitted to provide distant network signals (from "out of market" network affiliates) only to subscribers living in "white areas" — meaning they receive inadequate analog television broadcast signals from their local broadcasters. Legislation was introduced into the 108th Congress (H.R. 4501/H.R. 4518/S. 2644) which would explore the possibility of creating "digital white areas" such that some subscribers may be eligible for distant network digital signals via their satellite dish if they cannot receive local digital TV signals. In November 2004, Congress passed the Satellite Home Viewer Extension and Reauthorization Act (SHVERA) as part of the FY2005 Consolidated Appropriations Act (P.L. 108-447). SHVERA provides limited authority for satellite companies to offer "distant digital signals" if certain conditions are met. For more information on this issue, see CRS Report RS21990, *Satellite Television and "Digital White Areas": Provisions of the 2004 Satellite Home Viewer Extension and Reauthorization Act*.

Low Power TV

Low Power Television (LPTV) was created by the FCC in 1982 to serve rural areas and individual communities within larger urban areas. LPTV stations may not exceed 3 kilowatts for VHF channels or 150 kilowatts for UHF channels, and must not cause interference in the reception of full service television stations. Concerns have arisen that many LPTV stations will lose their licenses in the transition to DTV. While the FCC's February 1998 modification to its table of allotments for DTV licensees did provide for some LPTV licensees to be relocated to new frequencies, many would still lose their licenses under FCC digital transition plans.

To provide some relief for LPTV licensees, the Community Broadcasters Protection Act of 1999 was enacted as part of the Intellectual Property and Communications Omnibus Reform Act of 1999 (P.L. 106-113). This law established a "class A" status to qualifying LPTV licensees, giving them a measure of protection from full-power TV stations in the transition to DTV. The act directs that class A licensees be accorded primary status as television broadcasters, prescribes the criteria LPTV stations must meet to be eligible for class A status, and outlines the interference protection class A stations must provide to other television stations. To implement the act, in April 2000, the FCC established rules for class A LPTV licensees, to facilitate the acquisition of capital for LPTV stations to continue to provide free, over-the-air programming to their communities.[81]

In accordance with the 1992 Cable Act (47 USC 534), cable television providers are required to transmit to their audiences the locally-generated programming of all full-power TV broadcasters that request carriage, a provision known as "must-carry." Under the 1992 act, some LPTV stations are entitled to "must-carry"status if they

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[81] *FCC Report and Order in the Matter of Establishment of Class A Television Service*, MM Docket No. 00-10, FCC 00-115, released April 4, 2000.

meet certain criteria.[82] The FCC's April 2000 ruling did not address the question of whether class A licensees should be entitled to the "must-carry" provision, as are full-power broadcast TV stations. A petition filed with the FCC argued that class A licenses should be granted the same "must-carry" status as full-power broadcasters. The FCC subsequently ruled that class A stations do not have the same must carry rights as full service television stations.[83]

On August 6, 2003 the FCC adopted a Notice of Proposed Rulemaking[84] to seek comment on rules for digital low power television and digital television translator stations. On September 9, 2004, the FCC adopted rules to allow for the digital conversion of LPTV and translator stations. While requiring the conversion to digital operation, the FCC did not set a digital transition deadline for LPTV and translator stations. The final transition date — on which analog operations will cease — will be considered in the FCC's Third DTV periodic review proceeding.[85]

The Conference Report accompanying the Deficit Reduction Act of 2005 (P.L. 109-171; H.Rept. 109-362) clarified that "only full-power stations, not low-power stations must cease analog broadcasting by February 18, 2009." Low-power stations may continue analog broadcasts after that date, subject to future decisions by the FCC on how to complete the digital transition for low-power stations. The conference report stated that low-power stations (other than Class A stations) may continue broadcasting above channel 51 subject to FCC decisions "so long as those stations' use of those channels is secondary to the use of those channels by the auction winners and public safety officials."

P.L. 109-171 also provides funding not to exceed $10 million during FY2008-2009 (starting October 1, 2007) to compensate low-power television stations (including Class A, translator, or booster television stations) for the cost of a digital-to-analog conversion device in order to convert the digital signals received from their corresponding full-power television stations and provide analog signals to their customers. In no case shall the compensation for a single digital-to-analog converter device exceed $1000.

Additionally, funding not to exceed $65 million during FY2009 (starting October 1, 2008) will be available to reimburse low-power television stations for

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[82] Those criteria (47 USC 534) include (among other requirements) that the community of license of the LPTV station has a population not exceeding 35,000, that there is no full-power TV station licensed to any community within the county or other political subdivision (of a state) served by the cable system, and that the LPTV station provides the only news coverage in its community of license.

[83] *FCC Memorandum Opinion and Order on Reconsideration in the Matter of Establishment of Class A Television Service,* MM Docket No. 00-10, FCC 01-123, released April 13, 2001.

[84] *FCC Notice of Proposed Rulemaking in the Matter of 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,* MB Docket No. 03-185, FCC 03-198, released August 29, 2003.

[85] For further information, see [http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-251978A1.pdf].

equipment to upgrade stations from analog to digital in rural communities. Both grant programs will be administered by the National Telecommunications and Information Administration of the Department of Commerce.[86]

Fees for Ancillary or Supplemental Services

The Telecommunications Act (P.L. 104-104) states that if a DTV licensee offers ancillary or supplemental services for which they receive a subscription fee or other compensation, the FCC "shall establish a program to assess and collect from the licensee...an annual fee or other schedule or method of payment..." The act further states that the collection of fees "shall be designed (I) to recover for the public a portion of the value of the public spectrum resource made available for such commercial use, and (ii) to avoid unjust enrichment through the method employed to permit such uses of that resource."[87] Congress is overseeing the FCC's actions regarding implementation of this law. Public interest groups have also maintained pressure on the FCC to establish a fee program, arguing that commercial broadcasters should compensate the American people for the use of the DTV spectrum, and that fees should be required out of fairness to those who paid for spectrum at FCC auctions (such as licensees for personal communications services).

In November 1998, the FCC adopted rules to require broadcasters to pay 5% of their gross revenues from ancillary or supplementary uses of DTV spectrum for which they charge subscription fees or other specified compensation.[88] These include subscription video, software distribution, data transmissions, teletext, interactive materials, aural messages, paging services, and audio signals. Home shopping channels and "infomercials" are not subject to fees because the FCC did not consider them new services. The FCC has initiated a separate proceeding to determine how much non-commercial stations can use the DTV spectrum for revenue-generating services, and whether they should have to pay spectrum fees. Some consumer groups say that the FCC's spectrum fees are not heavy enough on commercial broadcasters, arguing that most revenue will come from home shopping and infomercials. They also warn that public broadcasters should not be over-regulated, arguing that too heavy a burden placed on public broadcasters could impair their long-term viability.

On October 11, 2002, the FCC ruled that noncommercial stations are required to use their entire digital capacity primarily for nonprofit, noncommercial, educational broadcast services. However, the FCC also ruled that the statutory prohibition against advertising on noncommercial broadcasts does not apply to any ancillary or supplementary services presented on an excess DTV channels that does

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[86] For more information on these grant programs, see the NTIA website at [http://www.ntia.doc.gov/otiahome/dtv/LPTVDigital_070622_files/frame.htm].

[87] The Budget Resolution of 1997 (H.Con.Res.84) included a provision requiring broadcasters to pay a spectrum usage fee of $2 billion over five years. Broadcasters strongly opposed that provision, however, and it was not included in the Budget Act of 1997.

[88] *FCC Report and Order on Fees for Ancillary or Supplementary Use of Digital Television Spectrum*, MM Docket No. 97-247, released November 19, 1998.

not constitute broadcasting. The FCC further ruled that public stations must pay a fee of five percent of gross revenues generated by ancillary or supplementary services provided on their DTV service.[89]

Public Interest Obligations of DTV Broadcasters

In March 1997, President Clinton established an Advisory Committee on Public Interest Obligations of DTV Broadcasters, to make recommendations on how DTV licensees should compensate the public for their licenses. Committee members were selected from government, the broadcasting industry, academia, and consumer interest organizations. After a series of public meetings in 1997 and 1998, the Committee submitted a set of recommendations to Vice President Gore in December 1998. The recommendations consist of mostly voluntary actions by broadcasters, including providing five minutes per night of air time for candidate-centered discourse in the 30 days prior to an election. Some panel members wanted to recommend mandating the free air time as well as other Committee proposals. The White House referred the report to the FCC, which on December 15, 1999, opened a Notice of Inquiry (NOI) proceeding to solicit public comment on public interest obligations of TV broadcasters as they transition to DTV (MM Docket No. 99-360).

After reviewing public comment, the FCC, in September 2000, issued the *DTV Public Interest Form* Notice of Proposed Rulemaking (NPRM) which sought to require television broadcasters (both digital and analog) to disclose on a quarterly standardized form how they are serving the public interest. Also in September 2000, the FCC issued the *Children's DTV Public Interest* NPRM (MM Docket No. 00-167), which focused on the obligation of broadcasters to provide educational and informational programming for children, and the requirement that licensees limit advertising in children's programs. The FCC has not yet issued any decisions in those proceedings. Given the significant amount of time that has passed, the Second Periodic Review of FCC rules and policies affecting DTV conversion, issued on January 27, 2003, has asked for further comment on the public interest obligation issue.[90] On August 4, 2004, the FCC adopted a Report and Order (FCC-04-192) which implements several steps identified in the Second Periodic Review. However, no action was taken regarding public interest obligations.

On September 9, 2004, the FCC adopted a Report and Order[91] addressing children's programming obligations for digital television broadcasters. The FCC issued guidelines on the obligation to provide educational programming for children and the requirement that children are protected from excessive and inappropriate commercial messages. Specifically, the Order increases the required amount of core

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[89] *FCC Report and Order in the Matter of Ancillary or Supplementary Use of Digital Television Capacity by Noncommercial Licensees*, MM Docket No. 98-203, FCC 01-306, released October 17, 2001.

[90] NPRM, *Second Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, pp. 39-42.

[91] *Report and Order and Further Notice of Proposed Rulemaking in the Matter of Children's Television Obligations of Digital Television Broadcasters*, MM Docket No. 00-167, FCC 04-221, released November 23, 2004, 54 p.

educational programming proportionally to the amount of increased free video programming offered by the broadcaster on multicast channels. Regarding commercial limitations, the Order concludes that commercial limits apply to all digital programming directed at children 12 and under, whether the programming is provided on a free or pay multicast channel.[92]

Two bills introduced into the 109th Congress — but not enacted — addressed the issue of public interest obligations of DTV broadcasters. H.R. 2359, introduced on May 12, 2005, by Representative Watson, sought to establish minimum public interest requirements for multicast digital television channels. S. 616, introduced on May 12, 2005 by Senator Rockefeller, sought to require broadcasters providing digital television multicasts to increase educational and informational programming for children.

Hearings held in the 110th Congress have addressed the issue of public interest obligations of DTV broadcasters. On February 1, 2007, the Senate Committee on Commerce, Science and Transportation held a hearing on the communications marketplace at which all five FCC Commissioners testified. In response to questions on public interest obligations of broadcasters, two opposing views emerged. According to Commissioner Michael Copps:

> [W]e have to really get serious about determining what those public interest obligations are going to be. We're going into the Digital Age now. We're giving the right to use that spectrum to broadcast six — or, if you have a duopoly, 12 — program streams in the community. And we've done well on the mechanics of that, but the big question is, what do the American people have a right to expect from them? Can't they get more community affairs, local affairs and the things you're talking about?
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> . . . We ought to complete the proceedings that have already been begun. We've had, since 1999, pending a proceeding on the public interest obligations of DTV broadcasters. And we've done the children's programming out of that, but all the other things are lying fallow, so we really need to tee that up and get done with that. So, I absolutely share your sense of urgency. There's no higher priority, I think, that the commission has.[93]

On the other hand, FCC Chairman Kevin Martin expressed reservations on placing certain obligations on broadcasters:

> Well, you know, I guess I would say I'm hesitant to actually put specific requirements on the type of programming that they've got to put on. There have been a lot of proposals that have been put forth — for example, that we should be requiring individual broadcasters to put free air time — a specific amount of free air time available to political candidates. And there've been those who have come forward with this repeatedly in the context of the digital transition, saying

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[92] For more information see [http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-251972A1.pdf].

[93] Federal News Service Inc., transcript of hearing of the Senate Commerce, Science and Transportation Committee, "The Communications Marketplace: A View from the FCC," February 1, 2007.

> we should make digital television broadcasters provide free air time to political candidates. And I'm hesitant about saying that we're going to require broadcasters to provide that kind of free air time.[94]

Similarly, in response to questions from the House Energy and Commerce Committee, both Commissioners Copps and Adelstein called on the FCC to move forward on the DTV public interest obligation proceedings.[95] However, at the FCC oversight hearings held by the House Energy and Commerce Committee on March 14, 2007, FCC Chairman Martin maintained that many of the rules that were part of that proceeding (such as children's programming) have already been addressed by the FCC. Chairman Martin stated that the "one issue that's remaining is whether we're going to require minimum quantities of certain kinds of broadcasting. I'm not convinced that that's necessary."[96]

Tower Siting

One obstacle to the broadcasters' ability to offer DTV services has been the opposition from state and local communities over the building of new signal transmission towers.[97] In most cases, DTV antennas can be built on top of existing towers used for analog TV broadcasting. If new towers are required, however, they must be constructed before the stations can transmit DTV signals. In August 1997, the FCC released an NPRM (FCC 97-182) to consider the preemption of state and local zoning restrictions on the siting, placement, and construction of DTV broadcasting facilities. In its January 18, 2001 Report and Order, the FCC concluded that "while some stations are facing problems with tower availability and/or local zoning issues, such problems do not seem to be widespread at this time."[98]

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[94] Ibid.

[95] Responses of FCC Commissioners Jonathan Adelstein and Michael Copps to questions from the House Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, February 7, 2007. Available at [http://energycommerce.house.gov/Press_110/110-resp.FCC.020707.Adelstein.pdf] and [http://energycommerce.house.gov/Press_110/110-resp.FCC.020707.Copps.pdf].

[96] Federal News Service Inc., transcript of hearing of the Subcommittee on Telecommunications and the Internet of the House Energy and Commerce Committee, "Oversight of the Federal Communications Commission," March 14, 2007.

[97] For more information on DTV tower siting, see [http://www.fcc.gov/mb/policy/dtv/].

[98] *FCC Report and Order and Further Notice of Proposed Rulemaking In the Matter of Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, MM Docket No. 00-39, FCC 01-24, p. 37.

Appendix B. Legislation in the 109th Congress Related to Digital Television

H.R. 1646 (Harmon). Homeland Emergency Operations Response Act. Prohibits any delay in reassigning 24 MHZ in the upper 700 MHZ band (currently occupied by television broadcasters) for public safety purposes, and requires those frequencies to be operational by January 1, 2007. Introduced April 14, 2005; referred to Committee on Energy & Commerce.

H.R. 2354 (Sensenbrenner). TV Consumer Choice Act. Prohibits the FCC from requiring digital tuners in television receivers. Introduced May 12, 2005; referred to Committee on Energy and Commerce.

H.R. 2359 (Watson). Digital Television Accountability and Governance Enhancement Act of 2005 (DTV-AGE Act). Establishes minimum public interest requirements for multicast digital television channels. Introduced May 12, 2005; referred to Committee on Energy and Commerce.

H.R. 2512 (Regula). Digital Opportunity Investment Trust Act. Establishes a Digital Opportunity Investment Trust fund, part of which would provide Public Television Digital Educational grants to noncommercial educational television stations. Introduced May 19, 2005; referred to Committee on Energy and Commerce and to Committee on Education and the Workforce.

H.R. 3032 (Gene Green). TV Truth Act of 2005. Requires manufacturers and retailers to provide disclosure to consumers that analog televisions will no longer receive broadcast transmissions after the public broadcast spectrum changes to digital. Introduced June 22, 2005; referred to Committee on Energy and Commerce.

H.R. 4569 (Sensenbrenner). Digital Transition Content Security Act of 2005. Requires certain analog conversion devices to preserve digital content security measures. Introduced December 16, 2005; referred to Committee on Judiciary.

H.R. 5252 (Barton). Communications Act of 2006. Senate Commerce Committee version contains a number of provisions related to the digital television transition, including mandating DTV consumer education, requiring large cable operators to provide to their customers their local broadcasters' digital signals in both digital and "downconverted" analog formats through February 14, 2014, and giving the FCC statutory authority to proceed with its broadcast flag rule, with certain limitations. Introduced May 1, 2006; passed by House June 8, 2006. Reported by Senate Committee on Commerce, Science and Transportation, September 29, 2006 (S.Rept. 109-355) and placed on the Senate Legislative Calendar.

H.R. 5264 (Engel). Digital Television Consumer Education Act. Directs manufacturers, retailers, and broadcasters to implement consumer education measures regarding the digital transition. Establishes a DTV Transition Federal Advisory Committee to lead the effort to educate the public about the digital television transition. Introduced May 2, 2006; referred to Committee on Energy and Commerce.

S. 616 (Rockefeller). Indecent and Gratuitous and Excessively Violent Programming and Control Act of 2005. Requires broadcasters providing digital television multicasts to increase educational and informational programming for children. Introduced March 14, 2005; referred to Committee on Commerce, Science, and Transportation.

S. 1023 (Dodd). Digital Opportunity Investment Trust Act. Establishes a Digital Opportunity Investment Trust fund, part of which would provide Public Television Digital Educational grants to noncommercial educational television stations. Introduced May 12, 2005; referred to Committee on Health, Education, Labor, and Pensions.

S. 1268 (McCain). Spectrum Availability for Emergency Response and Law Enforcement to Improve Vital Emergency Services Act (SAVE LIVES Act). Designates digital transition date as December 31, 2008, and authorize $468 million — drawn from spectrum auction proceeds — to supply digital-to-analog converter boxes to over-the-air households with incomes not exceeding 200% of the poverty level. Introduced June 20, 2005; referred to Committee on Commerce, Science and Transportation.

S. 1600 (Snowe). Digital Translator and Low Power Television Transition Act. Amends the Communications Act of 1934 to ensure full access to digital television in areas served by low-power television. Introduced July 29, 2005; referred to Committee on Commerce, Science and Transportation.

S. 1932 (Gregg). Deficit Reduction Omnibus Reconciliation Act of 2005. Title III is the Digital Transition and Public Safety Act of 2005, which sets a digital transition deadline of February 17, 2009, and allocates up to $1.5 billion for a program to assist consumers in the purchase of converter boxes. Passed Senate, November 3, 2005. House agreed to conference report (H.Rept. 109-362), December 19, 2005. Senate agreed to conference report with amendments, December 21, 2005. House agreed to amended conference report, February 1, 2006. **P.L. 109-171** signed by President, February 8, 2006.

S. 2686 (Stevens). Communications, Consumer's Choice, and Broadband Deployment Act of 2006. Contains a number of provisions related to the digital television transition, including mandating DTV consumer education, requiring large cable operators to provide to their customers their local broadcasters' digital signals in both digital and "downconverted" analog formats through February 14, 2014, and giving the FCC statutory authority to proceed with its broadcast flag rule, with certain limitations. Introduced May 1, 2006; referred to Committee on Commerce, Science and Transportation. See **H.R. 5252** for further action.

Appendix C. Legislation in the 110th Congress Related to Digital Television

H.R. 608 (Barton). Digital Television Consumer Education Act of 2007. Requires the FCC to create a DTV public education program, to convene a DTV Advisory Group to coordinate consumer outreach, and to report to Congress every six months on the progress of consumer education efforts. Requires NTIA to report to Congress every 90 days on the progress of the converter box coupon program. Requires retailers, cable and satellite operators, and broadcasters to take various measures to inform the public about the digital transition. Introduced January 22, 2007; referred to Committee on Energy and Commerce.

H.R. 2566 (Engel). National Digital Television Consumer Education Act. Requires TV retailers and distributors to place signs next to all analog TV displays with an advisory that a set-top box is necessary after February 17, 2009, to continue using the TV. Also requires broadcasters to air Public Service Announcements for more than a year before the transition to inform the public about the change and the set-top box subsidy program. Introduced June 5, 2007; referred to Committee on Energy and Commerce.

H.R. 2917 (Butterfield). Transition Education Accountability Report Act of 2007. Requires the FCC to submit a report to Congress describing the measures taken by the FCC, NTIA, and other federal agencies to inform the public of the transition to digital television. Introduced June 28, 2007; referred to Committee on Energy and Commerce.