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Report to the Ranking Minority Member, Subcommittee on Telecommunications and the Internet, Committee on Energy and Commerce, House of Representatives

April 2002

TELECOMMUNICATIONS

Many Broadcasters Will Not Meet May 2002 Digital Television Deadline

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Abbreviations

DBS	direct broadcast satellite
DMA	designated market area
DTV	digital television
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
HDTV	high definition television
PBS	Public Broadcasting Service

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United States General Accounting Office
Washington, D.C. 20548

April 23, 2002

The Honorable Edward J. Markey
Ranking Minority Member, Subcommittee on
Telecommunications and the Internet
Committee on Energy and Commerce
House of Representatives

Dear Mr. Markey:

The transition of broadcast television stations throughout the United States from analog to digital television (DTV) technologies is under way. DTV technologies enable broadcasters to offer their viewers clearer, sharper pictures and a wider range of broadcast services than are possible with traditional analog technologies. This transition to digital technologies was sought by many broadcasters and was mandated by Congress and the Federal Communications Commission (FCC). Pursuant to statute, FCC (which administers radiofrequency spectrum for nonfederal government use) is temporarily providing each broadcast station with additional spectrum on which to begin broadcasting a digital signal.[1] For several years, during which time it is envisioned that consumers will begin to purchase digital television sets and other equipment, broadcasters will transmit both digital and analog signals. At some point, the analog signals are to be discontinued, leaving television stations to continue broadcasting only in digital format. FCC established 2006 as the target date for ending analog transmissions and this was later codified by Congress.[2] Spectrum that broadcasters vacate is to be returned for other uses. Some of the returned spectrum has been reallocated for public safety uses and some for

[1]The radiofrequency spectrum is the part of the natural spectrum of electromagnetic radiation lying between the frequency limits of 9 kilohertz and 300 gigahertz. It is the medium that makes possible wireless communications, including cellular and paging services, radio and television broadcasting, radar, and satellite-based services.

[2]In April 1997, FCC established a 2006 target date for the cessation of analog service in its *Fifth Report and Order* (FCC 96-493). Congress later codified the date (while at the same time creating exceptions to the date) in the Balanced Budget Act of 1997.

commercial uses.[3] After September 11, 2001, reassigning the spectrum for wireless uses, such as public safety communications and mobile phones, has become a higher priority and greater emphasis has been placed on a timely completion of the DTV transition.

To move the transition along and more quickly reassign the spectrum, FCC established staggered deadlines by which broadcasters must build their DTV stations and begin broadcasting a digital signal. Generally, larger stations in major television markets were required to begin broadcasting a digital signal by May or November 1999, while all remaining full-power commercial stations were required to begin broadcasting a digital signal by May 1, 2002.[4] Additionally, all of the nation's public broadcast stations are to begin broadcasting a digital signal by May 1, 2003.

According to a commercial database that contains information on broadcasters, there are currently 1,240 full-power commercial television stations in the United States. As of April 12, 2002, according to FCC, 298 of these stations had begun broadcasting a DTV signal. Although some stations are on the air with a digital signal and others are close to launching their DTV stations, some stations are still investigating what funds and equipment they will require and have much work remaining before they can broadcast a digital signal. Concerns have been expressed by industry officials that many commercial stations will have difficulty building their DTV stations by the May 2002 deadline. Because of your interest in the DTV rollout and the ultimate reassignment of the broadcast radiofrequency spectrum for other uses, you asked us to provide you with information on the following: (1) broadcasters' progress in building DTV stations, as well as broadcasters' perceptions of consumer interest in DTV and broadcasters' plans for developing and marketing DTV content; (2) the experiences among broadcasters who have and have not completed the

[3]There are incumbent television stations (both analog and digital) operating in channels 52 to 69, the portion of the broadcast spectrum that is to be returned. These stations will have to move before the spectrum can become completely available to the new licensees. Pursuant to congressional direction, FCC has reallocated some of the spectrum from television channels 60 to 69 for public safety uses. FCC has established a voluntary relocation scheme for the stations operating in channels 59 to 69 and will examine voluntary relocation of stations operating in channels 52 to 58 on a case-by-case basis. Thus, according to FCC staff, public safety and commercial users may be able to begin using the spectrum before the completion of the DTV transition.

[4]There are also more than 2,300 licensed low-power television stations operating throughout the United States. These stations were not given additional radiofrequency spectrum and are under no mandate to transition to digital technologies.

building of their DTV stations, including any key problems that may have arisen; and (3) the extent to which there are concerns about meeting DTV deadlines among broadcasters who have not completed building DTV stations. This report provides information on these broadcaster-specific issues. Later in 2002, we plan to provide an additional report on other issues affecting the DTV transition, including digital content production, copyright protection, cable carriage of DTV channels, and consumer knowledge about DTV.

To respond to your request for information about the progress in building DTV stations, we conducted a survey of all full-power commercial and public broadcast television stations operating in the United States. We developed two versions of the survey: one was sent to stations that are already on the air in digital, and one was sent to stations that are not yet on the air in digital. The survey asked a variety of questions about the stations' transitions. The survey questions and detailed survey results for commercial stations are contained in appendixes IV and V, and the questions and results for public stations are contained in appendixes VI and VII. To supplement and better analyze the broadcasters' responses to our survey, we purchased a commercial database with information on broadcast stations, which included information such as annual revenues, market size, and parent company or ownership information. Throughout this report, percentages are rounded to the nearest whole number. A more detailed discussion of our overall scope and methodology is provided in appendix I. We conducted our review from May 2001 to April 2002 in accordance with generally accepted government auditing standards.

In total, we received 1,036 of 1,554 surveys (a response rate of 67 percent). We received 135 of 168 surveys (80 percent) from commercial stations that had gone on the air with a digital signal as of September 2001,[5] hereafter referred to as "current DTV stations."[6] We received 727 of 1,014 surveys (72 percent) from commercial stations that were still in the process of building their DTV stations as of September 2001, and that had not yet gone on the air with a digital signal, hereafter referred to as "transitioning

[5]Although the list of current DTV stations was created in September 2001, we sent a different survey to any station that indicated that we had misclassified its digital broadcasting status. As such, some of the stations that filled out the survey for digital stations began that service after September 2001.

[6]Many of the current DTV stations were larger stations in major television markets that had been given an earlier deadline by FCC to be on the air with a digital signal.

stations." We also received 174 of 372 surveys (47 percent) from public stations; 15 of these responses were from 37 public stations that were already on the air in digital as of September 2001 (41 percent).[7] Because all public stations are under a deadline to be on the air in May 2003—1 year later than most commercial stations—we report separately on our survey results for public stations in appendix III. This letter discusses only the survey results for commercial stations.

Lastly, we did not mail surveys to 8 New York City stations that had broadcast towers located atop the World Trade Center, and that were directly affected by the September 11, 2001, terrorist attacks. Instead, we directly spoke to a representative from each of those stations to gather information about how the events of September 11 affected their station operations generally and affected their DTV plans in particular. A discussion of the current situation of the New York stations is provided in appendix II.

Results in Brief

At the present time, at least 24 percent of all commercial television stations are broadcasting a digital signal. At least 113 of the 119 broadcast stations that were mandated to be broadcasting a digital signal by 1999 are doing so. In addition, at least 185 of the remaining 1,121 commercial television stations that are to be broadcasting in digital by May 1, 2002, are on the air with a digital signal. As for the progress of transitioning stations, we conducted interviews with representatives from a few transitioning stations and found them to be in various stages of building the DTV stations. Once on the air, 74 percent of current DTV stations reported providing some amount of high definition content—an average of 23 hours per week for those stations showing some high definition content. However, current DTV stations reported that they perceive little interest in DTV among consumers in their viewing areas at the present time.

Responses to our survey indicate that differences exist between the experiences of current DTV stations and transitioning stations. Compared with transitioning stations, current DTV stations (many of which had an earlier DTV deadline) were less likely to report having had as many problems in building their DTV stations. Transitioning stations (which are

[7]We conducted a nonresponse analysis and found no significant differences between respondents and nonrespondents. For more information on the nonresponse analysis, see appendix I.

more likely to be smaller stations in smaller television markets) reported experiencing a variety of problems related to getting their digital signals on the air by the May 2002 deadline. Transitioning stations reported funding to be one of the most prevalent problems in building their DTV stations. While 79 percent of current DTV stations reported relying in whole or in part on funding from a station owner or parent company, 62 percent of transitioning stations said they could rely on similar financing. Moreover, 43 percent of transitioning stations relied to some degree on debt financing, compared with only 16 percent of current DTV stations. Six percent of transitioning stations (many of which were small broadcasters) said that the station might have to be sold to fund the transition to digital.

Seventy-four percent of transitioning stations reported to us that the problems they are facing are so significant that their station may not be able to begin broadcasting a DTV signal by May 2002, as required.[8] These transitioning stations, when compared with other transitioning stations that said they would meet the deadline, were more likely to have annual revenues of less than $2 million and to be in the bottom 100 television markets.[9] Sixty-eight percent of transitioning stations said that, were FCC to extend its deadline for having the digital signal on the air, a realistic extension for them would be 1 year or more. Thirty-one percent of the transitioning stations that said they might miss their May 2002 deadline reported that, if the transition were driven by market forces such as competition, technology, and consumer demand (rather than a government mandate), they likely would not be on the air with a digital signal until after 2010. Another 4 percent of these stations reported that without a government mandate, they likely would never transition to digital.

We provided a draft of this report to FCC staff for their review and comment. FCC staff stated that they believe the costs of building DTV facilities and the anticipated construction dates reported to us may not reflect the current status in light of FCC rule modifications made in

[8]Later in this report we discuss the actual number of broadcasters' applications that were filed with FCC for extension of the May 2002 deadline.

[9]The market for a broadcast station is known as its designated market area (DMA). According to Nielson Media Research, DMAs are used to identify television stations whose broadcast signals reach a specific area and attract the most viewers. Nonoverlapping DMAs cover the entire continental United States, Hawaii, and parts of Alaska. There are currently 210 DMAs throughout the United States.

November 2001. In addition, FCC staff provided technical comments that were incorporated as appropriate.

Background

Free over-the-air television broadcasts have been available to Americans for more than 50 years. According to the National Association of Broadcasters, the average television market includes over-the-air signals from at least seven local broadcast stations.[10] Commercial stations may get their programming content through an affiliation with one of the top seven television networks (ABC, CBS, Fox, NBC, PAX, UPN, and WB) or they may be an independent broadcaster. Some commercial television stations are owned by large media companies or other corporations; others are owned by individuals or small companies. The United States also has 380 public television stations that receive funding from a variety of sources, including federal funding, state funding, commercial grants and donations, and private donations from individuals. Public stations tend to show more educational and arts programming, and many of these stations are affiliated with the Public Broadcasting Service (PBS). In addition to over-the-air availability, most broadcasters are carried on local cable television systems along with numerous cable programming channels. Also, satellite television providers now offer subscribers the signals of local broadcasters in approximately 40 television markets. In fact, according to FCC, more than 86 percent of television households nationwide now subscribe to some type of multichannel video programming service, such as a cable or satellite provider, rather than relying solely on over-the-air broadcast television.[11]

Since its inception, the broadcast television industry has relied on "analog" technologies to transmit over-the-air television signals. During the last few decades, however, media of all types have been transitioning to "digital" technologies. Because digital technologies can provide greater versatility and higher quality pictures and audio than traditional analog technologies, the broadcast television industry supported, and Congress and FCC mandated, a transition of broadcast television stations from analog to

[10]Consumers living in rural areas tend to receive over-the-air signals from fewer broadcasters than consumers living in urban areas. More independent stations are located near urban areas.

[11]*In the Matter of Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, CS Docket No. 01-129, *Eighth Annual Report*, FCC 01-389 (released Jan. 14, 2002) at paragraph 6.

digital technology.[12] This decision was based on the notion that a transition to digital television would bring the broadcast television industry into the 21st century with current and competitive technology,[13] and would help to preserve for consumers the benefits of a healthy free over-the-air television service in the future.

Traditional television broadcasting uses the radiofrequency spectrum to transmit analog signals—that is, signals in which motion pictures and sounds have been converted into a "wave form" electrical signal. Traditional analog signals fade with distance, so consumers living farther from a broadcast tower will experience pictures that are distorted or full of "snow." With digital technology, the analog wave form is converted into a stream of digits consisting of zeros and ones. Although digital signals also fade over distance, because each bit of information is either a zero or a one, the digital television set or receiver can adjust for minor weaknesses in the signal to recreate the zeros and ones originally transmitted. Pictures and sound thus remain perfect unless significant fading of the signal occurs, at which point the transmission cannot be corrected and there is no picture at all.[14]

[12]The decision to transition the broadcast television industry to digital technologies and the establishment of a process for doing so took many years.

[13]Cable television systems are also transitioning to digital, although they are under no government mandate to do so. Many cable operators have added "digital tiers" to their programming offerings. Direct broadcast satellite systems (such as DirecTV and EchoStar) have always transmitted their signals in digital. Both cable and satellite operators primarily use digital technology as a way of increasing the number of channels they can offer.

[14]This is known as "the cliff effect"—a viewer gets either a perfect picture or no picture at all.

Digital technology also makes it easier to offer high definition television (HDTV). With HDTV, roughly twice as many lines of resolution are transmitted, creating a television picture that is much sharper than traditional analog television pictures.[15] Another advantage of digital television is that "digital compression" technologies allow for more efficient use of the radiofrequency spectrum than analog technologies. Using digital compression, broadcasters will have the opportunity to use the 6 megahertz of spectrum required to broadcast one analog television show to transmit four or five different digital "standard definition" television shows simultaneously.[16] This process of using the digital spectrum to show multiple programs at once is known as multicasting. To enjoy HDTV broadcasts or to be able to see multicasts of digital signals, consumers must own a television monitor that is capable of displaying these features and a digital tuner that is capable of receiving the broadcasts.[17]

[15]Current analog television sets display about 480 lines of resolution. HDTV sets display up to 1,080 lines of resolution and are often "widescreen" format, similar to movie theater screens.

[16]The idea of broadcasters as "multichannel" operators could make broadcast television more competitive with cable and satellite television providers. A transition to digital technology also opens doors to future links between television sets and computers and the Internet, possibly making television viewing more of an interactive experience.

[17]It is likely that consumers who subscribe to a cable or satellite television provider will not need a separate over-the-air digital tuner because the cable or satellite set-top converter may perform that function. These equipment issues have not yet been settled, and we plan to address them further in our next DTV report. Regardless, even cable and satellite subscribers will require a DTV monitor to see HDTV programming.

The DTV transition involves a substantial overhaul and replacement of the stations' transmitting and studio equipment as well as the eventual replacement of consumers' analog television sets or the attachment of "digital converter boxes" to those analog sets. Thus, building DTV stations involves a large outlay of capital and effort by the broadcast television industry. Sometimes a new broadcast tower or significant modifications to an existing tower are required for the digital antennas. Broadcasters must purchase digital transmission equipment, obtain digital programming, and acquire equipment for converting analog programming to digital. One station representative with whom we spoke noted that broadcasters must then incur the costs of running two stations simultaneously during the transition period, even though viewership and advertising revenues are likely to remain roughly the same.[18]

To facilitate the transition, Congress and FCC temporarily provided each full-power television station (both commercial and public) with another 6 megahertz of radiofrequency spectrum so that they could begin broadcasting a digital signal. A transition period was established during which broadcasters would build their DTV stations and simultaneously transmit both analog and digital signals. In 1997, FCC established a timeline for this transition period. By May 1, 1999, the affiliate stations of the 4 largest networks (ABC, CBS, Fox, and NBC) in the top 10 television markets in the country were to have a digital signal on the air.[19] By November 1, 1999, the affiliates of the 4 largest networks in the top 11 to 30 television markets were to have a digital signal on the air.[20] By May 1, 2002, all full-power commercial television stations across America are to have a DTV signal on the air. By May 1, 2003, all public stations are to be broadcasting a DTV signal as well.

[18]With time, however, it is possible that broadcasters will realize opportunities for new businesses and new sources of revenues from DTV.

[19]According to FCC, 39 of those 40 stations met the deadline and 38 are broadcasting today in digital (36 with licensed facilities and 2 with special temporary authority). Two New York City stations met the 1999 deadline but lost their digital antennas in the terrorist attacks on September 11, 2001. They, along with 4 other New York stations broadcasting in digital before September 11, have not yet restored digital services. See appendix II for more information about these New York stations.

[20]Seventy-five of these 79 stations met this deadline (68 with licensed facilities and 7 with special temporary authority).

The few stations that missed the earlier 1999 deadlines were granted extensions by FCC. In March 2002, FCC closed an application period for stations that have May 2002 deadlines to file for extensions. FCC said it will not issue any type of blanket waiver of the deadline, but it would allow extensions on a case-by-case basis. According to FCC, it also has the authority to sanction stations that do not meet their deadlines. FCC said it is currently considering what those sanctions might be and under what circumstances the sanctions might be imposed.

The goal is for the transition period to end in December 2006. By that time, the analog signals presumably are to be shut off, and Americans are to be watching DTV broadcasts on either a DTV set or on an analog set with some form of a digital converter box. The government is supposed to "repack" the digital stations within channels 2 to 51.[21] The federal government has reallocated some of the spectrum in channels 52 to 69 for public safety needs and some for commercial uses (such as mobile phone services). The public safety spectrum is currently being licensed, and the spectrum set aside for commercial uses will be auctioned later this year.[22]

[21]The government plans to leave television broadcasters with less radiofrequency spectrum overall because of this repacking of the DTV stations within a smaller slice of spectrum than was used previously for analog television. DTV signals are less susceptible to interference, enabling less spectrum to be assigned as buffers between channels than was the case with analog signals.

[22]The Congressional Budget Office has raised concerns that early auction timing could devalue the spectrum because bidders would have to wait years before being able to use the spectrum. The administration's latest budget plan calls for moving auctions to 2004 and 2006 and would give FCC the authority to charge lease fees to broadcasters who remain on the spectrum beginning in 2007.

However, Congress created exceptions to the 2006 date. In the Balanced Budget Act of 1997, Congress stated that no analog television station license was to be extended beyond December 31, 2006, except in cases where (1) one or more of the top four network affiliates in a market is not yet on the air in digital, (2) digital converter technology is not generally available in the market, or (3) 15 percent or more of the households in the market cannot receive DTV signals. The last exception—often referred to as "the 85 percent rule"—has the potential to significantly delay the cutoff of analog signals and the turnback of some spectrum beyond 2006. This is because the 85 percent rule might rely on consumer adoption of DTV equipment, which is currently market-driven (i.e., based on consumer demand, rather than on a government mandate) and does not appear at the present time to be progressing at a rate that will reach 85 percent in the next 4 years.[23]

Almost One-Quarter of Commercial Stations Are Broadcasting a Digital Signal, Although Many Stations Perceive Little Consumer Demand

In this section, we address several issues related to the progress of broadcasters to date in getting digital signals on the air. In particular, we discuss (1) the status of broadcasters in building the DTV stations; (2) the amount of digital, high definition, or multicast programming that stations are showing or planning to show; and (3) the stations' perceptions of consumer interest in DTV and how broadcasters are promoting or planning to promote DTV to consumers.

Broadcasters Are in Various Stages of Building DTV Stations

As of April 12, 2002, 24 percent of commercial television stations (298 of 1,240) had completed construction of DTV stations and were broadcasting a digital signal. Most Americans now have available to them an over-the-air signal from at least 1 DTV station, and many Americans living in larger television markets have several DTV signals available to them. Only 119 of the 298 current DTV stations were mandated to be broadcasting a digital

[23]FCC has asked for comments on transition issues, including under what circumstances and statutory interpretations will the statutory criteria for the auction of recaptured broadcast television spectrum be satisfied. *In the Matter of Carriage of Digital Television Broadcast Signals*, CS Docket No. 98-120, *First Report and Order and Further Notice of Proposed Rule Rulemaking*, FCC 01-22 (released Jan. 23, 2001) at paragraphs 117 and 118.

signal before May 2002.[24] Thus, some stations have elected to build their DTV stations and begin broadcasting a digital signal before they were required to do so. As for the progress of transitioning stations, we conducted interviews with representatives from a few transitioning stations and found them to be in various stages of building their DTV facilities. For example, one station had just begun planning for the construction of its DTV station and was currently analyzing its tower and equipment requirements, while another station was almost ready to start broadcasting a digital signal, several months before the deadline.

Transitioning Stations Have Plans for Less High Definition Content than Current DTV Stations

Once on the air with a digital signal, broadcasters have been given some flexibility in determining how to structure their DTV services. A station can simply duplicate the programming shown on its analog channel by "converting" it to digital, or it can provide programming actually filmed in digital, which can include HDTV. A station also can choose to multicast or to take advantage of the ability of DTV to transmit text or data, such as stock quotes or electronic newspapers. There are concerns that if broadcast stations use their digital channel largely to duplicate the programming from their analog channel, consumers would have little incentive to purchase digital televisions sets and cable systems would have little incentive to carry broadcasters' DTV channels. This lack of DTV adoption could delay the goal of having broadcasters vacate the spectrum in channels 52 to 69 by the end of 2006 to make the spectrum fully available for public safety and other uses.

We asked current DTV stations what services they were offering over their digital spectrum, and they responded as follows:

- Seventy-four percent of current DTV stations are providing some amount of HDTV content on their digital broadcast channel. These stations reported an average of 23 hours of HDTV content per week.

[24]This number is 119 instead of 120 because 1 of the top network affiliates in San Diego, Calif., is a Mexican station.

- Affiliates of CBS—one of the biggest supporters of HDTV—reported providing more HDTV programming than affiliates of other networks. CBS affiliates of current DTV stations reported an average of 33 hours per week of HDTV programming.[25]

- Affiliates of the smaller television networks (PAX, UPN, and WB) reported broadcasting no HDTV.

- Twenty-eight percent of current DTV stations said they are producing some of their own content in digital format, either in standard definition digital or high definition.

In addition to offering high definition content, 22 percent of current DTV stations said that some of their programming included the multicasting of two or more programs simultaneously over their digital channel. We contacted a number of these stations to learn precisely what they were doing with their multicasting. We were told by several stations that they are providing a second 24-hour local weather channel or showing a local weather radar picture. Another station told us that they broadcast live feeds from several traffic cameras throughout the state to give current traffic and weather information.

Our survey showed that within the first year of broadcasting in digital, commercial transitioning stations plan to do the following:

- Forty-three percent plan to show nothing more than content that has been converted from analog to digital.

- Thirty-four percent plan to provide some HDTV content.

- Eight percent plan to do some multicasting.

Our finding that transitioning stations expect to show less digital content than current DTV stations are showing is likely because many of the current DTV stations are affiliates of the top four networks and are in major television markets. By contrast, transitioning DTV stations are more likely than current DTV stations to be unaffiliated with the top four networks or to be in smaller television markets. Unaffiliated stations have less access

[25]CBS provides nearly its entire prime-time schedule, as well as its major sporting events and a daytime soap opera, in HDTV.

to the increasing amount of HDTV or other digital content that is provided by the major networks. Smaller stations sometimes rely more on syndicated shows—such as game shows, talk shows, or reruns of popular network programming—that are less likely to have been filmed in digital or high definition. Smaller stations also have fewer resources to buy the equipment necessary to film and produce their own digital content. In fact, only 10 percent of transitioning stations with annual revenues less than $2 million said that they expect to produce any digital content of their own within their first year of digital broadcasting.

Many Current DTV Stations Perceive Little Consumer Interest in DTV

We asked current DTV stations to describe the overall interest level in digital broadcasts by the consumers in their markets. According to these stations, few consumers have a high interest in DTV. Seven percent of the stations said that consumers in their markets had no interest in DTV, and another 56 percent of the stations described overall consumer interest in their digital broadcasts as "low." Stations that reported providing more high definition content did not report higher consumer interest than current DTV stations as a whole.

Despite broadcasters' perceptions of low consumer demand for digital and high definition television, only some of the current DTV stations reported undertaking promotion activities that have significant cost in order to promote or market their digital broadcasts. The two most prominent ways stations chose to promote their DTV channel—methods that do not involve great expense—were through a digital or high definition identifier running at the beginning of the program (52 percent) and by making information about digital programming available on the stations' Web sites (50 percent). In addition to these methods, current DTV stations reported the following:

- Thirteen percent said they use advertising spots or promotions for specific shows available in high definition, and 22 percent said they advertise their DTV channel.
- Twelve percent said that their DTV channel is mentioned in the local television listings.
- Twenty-three percent said they do not promote their DTV channel.

Compared with current DTV stations, only 6 percent of transitioning stations reported that they do not plan to promote their DTV channel. Thirty-five percent of transitioning stations said they plan to use

advertising spots or promotions regarding their digital channel, 16 percent plan to advertise their high definition programming, and 33 percent said they plan to have their DTV channel mentioned in the local television listings. Transitioning stations answered our survey based on future plans and may or may not promote their DTV channels to the level they indicated on our survey.

The Building of DTV Stations Is Proceeding, but Problems Have Arisen for Many Broadcasters

In this section, we address several issues related to the experiences of broadcasters to date in building their DTV stations. In particular, we discuss (1) the financial costs associated with building the DTV stations, (2) the problems stations reported experiencing (or the problems they expect to experience) in building the DTV stations, and (3) the various government reviews that are involved in building the DTV stations.

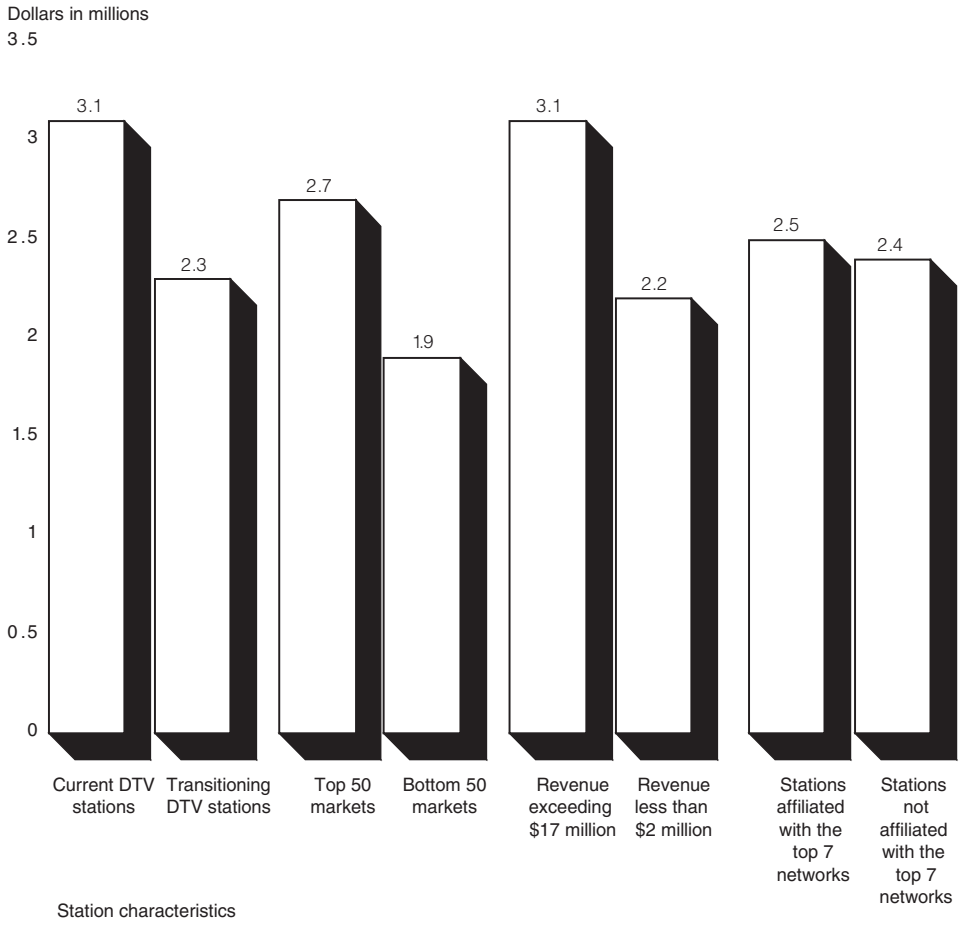
Stations Report High Costs and Funding Problems Associated with the DTV Transition

Broadcasters must make large capital investments to begin broadcasting in digital, and many of the stations we surveyed reported problems in raising the necessary capital. We asked stations to report or estimate the approximate total cost they incurred or expect to incur in complying with the initial requirements for digital transmission—including expenses for a new tower or construction on an existing tower, transmission line, antenna, digital transmiters and encoders, consultants, licensing, and other capital expenditures.[26] Our comparisons of reported costs by station types showed that the average reported costs per station among different types of stations were not dramatically different. Figure 1 shows that current DTV stations and larger stations on average reported somewhat higher costs than transitioning stations and smaller stations. For example, current DTV stations reported an average cost of $3.1 million per station to comply with the initial requirements for digital transmission, while transitioning stations reported an average of $2.3 million per station.[27]

[26]We asked that broadcasters not include program production or acquisition costs in these estimates.

[27]In addition to the overall cost of complying with the initial requirements for digital transmission, we also asked broadcasters about one particular cost of operating the DTV station: the increased energy cost associated with transmitting a digital signal. During the transition period, stations will bear the energy costs of transmitting two television signals. Current DTV stations reported spending about $6,300 per month in increased energy costs, and transitioning stations reported expecting to spend about $6,100 per month in increased energy costs.

Figure 1: Average Costs of Building DTV for Different Types of Stations



Source: GAO survey of broadcast stations (Oct. 2001 – Mar. 2002).

Some of the lower cost reported by transitioning stations may be due to recent rule changes by FCC that were designed to reduce the amount stations must spend to meet the initial requirements for digital transmission. For example, FCC's new rules allow stations to build less than maximum broadcast facilities.[28] FCC staff said they believe that the costs of meeting the requirements for building DTV stations are significantly lower than the costs reported in our survey. The amounts reported to us may be due in part to stations' reporting their actual costs of construction, even where construction exceeded FCC's minimum requirements. At a recent meeting of the National Association of Broadcasters, one broadcaster said he was able to go on the air for approximately $125,000 and that most of the equipment he was using could be upgraded to higher power. However, another speaker stated that for some stations, FCC's minimum requirements are not a long-term solution, particularly for stations that plan to show HDTV, and that upgrading the equipment at a later date could be problematic. Thus, some stations prefer to spend the money initially to build their DTV stations to exceed FCC's minimum requirements for broadcasting a digital signal.

Although there were no dramatic differences in the overall costs of building DTV facilities among various types of stations, our analysis of the reported overall expenditures as a percentage of station annual revenue did show considerable differences among various types of stations. For example, among current DTV stations the overall expenditures averaged 11 percent of annual revenues, while for transitioning stations the overall expenditures averaged 63 percent of annual revenues. For stations with annual revenues below $2 million (based on all stations), the overall expenditures averaged 242 percent of annual revenues. Thus, the overall cost of building the DTV stations appears to be more burdensome for some broadcasters than for others.

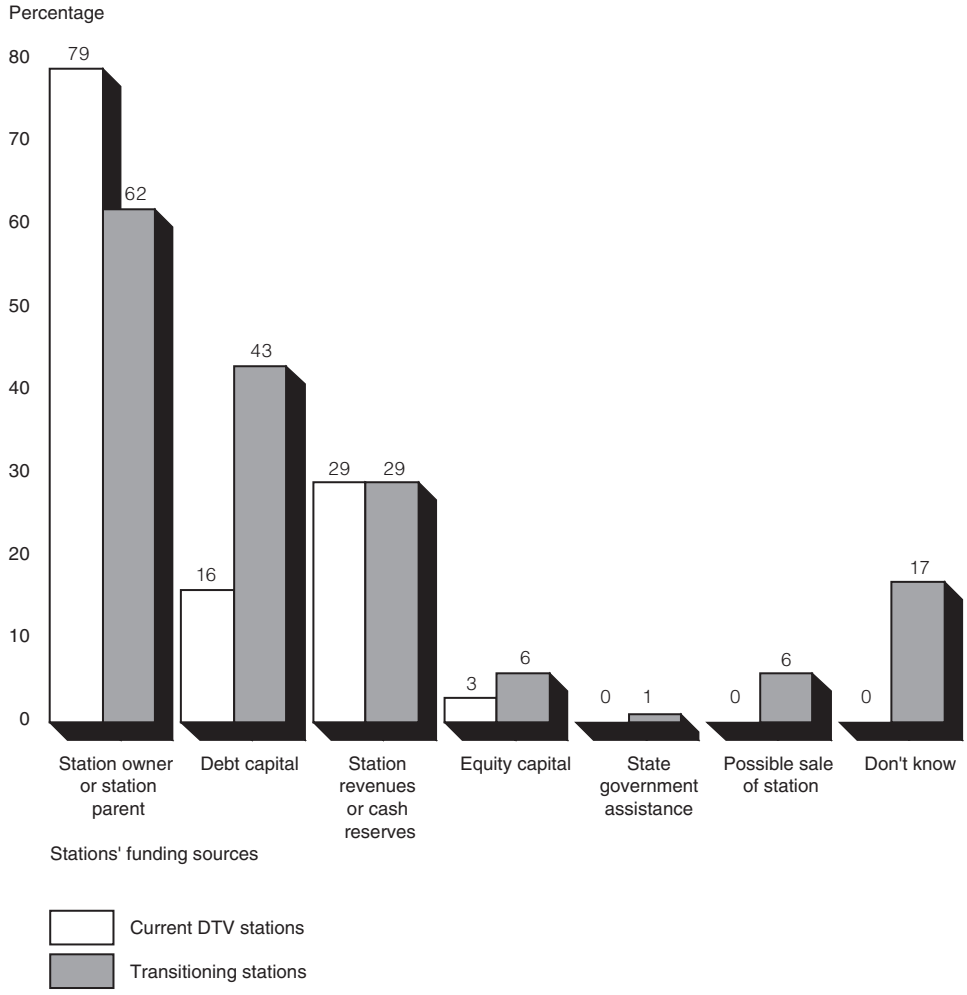
Given the significant costs reported for getting a DTV signal on the air, it is not surprising that survey respondents cited funding as one of the most common problems they had experienced or expected to experience. Although the overall costs of building the DTV stations reported by

[28]Stations can build a facility to serve only their community of license—a smaller geographic area than their entire viewing region—without losing interference protection that would prevent them from later increasing their signal strength to cover their larger allocated service area. See *In the Matter of Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, MM Docket No. 00-39, *Memorandum Opinion and Order on Reconsideration*, FCC 01-330 (released Nov. 15, 2001).

broadcasters were fairly similar, the annual revenues of stations and the funding sources available to stations differed. Thus, the problem of obtaining funding did not appear to affect all stations equally. While 14 percent of the current DTV stations said they had experienced problems in the area of funding, 55 percent of transitioning stations reported funding as a problem. This difference raises concerns about the ability of some transitioning stations to pay for construction of their DTV stations and meet the May 1, 2002, deadline for broadcasting in digital.

We asked stations what sources of funding they used or expected to use to pay for the building of their DTV stations. Almost half of all commercial stations that responded reported multiple sources of funding. As shown in figure 2, the most commonly cited source of funding for both current DTV stations and transitioning stations was funding from the station owner or parent company. Over 79 percent of current DTV stations had relied, in whole or in part, on their owner or parent company to provide money for their DTV construction. For transitioning stations, 62 percent reported obtaining some amount of funding from the station owner or parent company. This difference may be explained, in part, because stations with earlier DTV deadlines were more likely to have a large corporate parent, whereas transitioning stations are somewhat less likely to be owned by a large parent company.

Figure 2: Stations' Funding Sources for Building DTV Stations



Note 1: For transitioning stations, answers included both actual and expected funding sources.

Note 2: Current DTV stations were not given the options of "don't know" and "possible sale of station."

Source: GAO survey of broadcast stations (Oct. 2001 – Mar. 2002).

Regarding funding sources, survey respondents also reported the following:

- Transitioning stations were more than twice as likely to rely on debt financing than current DTV stations.[29] Forty-three percent of transitioning stations reported that they had borrowed or planned to borrow money to fund the construction of their DTV stations, while 16 percent of current DTV stations said they had relied on debt capital.

- Six percent of the transitioning stations said they were considering sale of the station as a way to fund the DTV transition. We met with a representative of one TV station who said that sale of the station to a larger ownership group might be the only way for the station to fund its transition to DTV. Concerns about a reduction in the number of small, independent broadcasters serving local communities could arise should such sales actually take place.

- Seventeen percent of transitioning stations reported that they did not know how they would completely fund the construction of the DTV station. This uncertainty raises concerns about whether these stations will be able to broadcast a digital signal on time, given that our survey was conducted only 7 months before the May 2002 deadline.

We also asked stations to select the *primary* funding source from the funding sources that they reported using. Both current DTV stations and transitioning stations most often named funding from the station owner or parent company as their primary funding source. However, 72 percent of current DTV stations said funding from the station owner or parent was their primary source, while 45 percent of transitioning stations listed a station owner or parent as the primary source.[30] Eleven percent of transitioning stations reported that they did not know what would be their primary funding source.

Some industry executives noted that there are ways to mitigate the initial costs of the DTV transition. We asked about some of these methods in our survey, and the responses showed the following:

[29]One industry representative with whom we spoke noted that obtaining a loan is difficult in this situation because broadcasters cannot show the lender a likelihood of increased future earnings or revenue from the DTV station.

[30]See appendix III for a discussion of public stations' funding sources, which include federal and state funding.

- Some stations reported sharing a broadcast tower with other stations, which can be less expensive than having an individual, private tower. However, we found no relationship between reported shared tower use and reported lower average overall cost for construction of the DTV station.

- We were told by industry executives that a temporary or "side-mount" antenna can be less expensive to mount on the broadcast tower and can be used to delay the construction of a new tower. Twenty-seven percent of current DTV stations reported having an antenna in a temporary location; 26 percent of transitioning stations said that they plan to temporarily install an antenna.

- FCC currently allows a broadcaster to transmit a DTV signal at less than full power.[31] For the broadcaster, this can save money on equipment purchases and energy bills. However, broadcasting at less than full power can reduce the effective market coverage and mean that fewer consumers can receive the over-the-air digital signal. Forty-five percent of current DTV stations reported that they are operating at less than full power and full market coverage, and 50 percent of transitioning stations told us they plan to operate at less than full power when they begin broadcasting in digital.

[31]FCC allows transmission of a DTV signal at less than full power provided that the broadcaster covers its community of license with an adequate signal.

Many Stations Are Experiencing Problems Getting Physical Facilities in Place

One of the key physical facilities that broadcasters must have in place is the broadcast tower, which supports the digital antenna. We were told by industry executives that some broadcasters can mount the digital antenna on their current analog tower. However, other broadcasters need to increase the height of or reinforce their current tower, while still others must construct an entirely new broadcast tower on which to install their digital antenna. We asked stations what changes they required or expected to require from their existing analog towers. There was great variance among the stations in the need for tower work. While 18 percent of current DTV stations and 20 percent of transitioning stations reported being able to use their current tower without modification, 21 percent of current DTV stations and 25 percent of transitioning stations reported that they needed to build an entirely new tower.[32]

Once a station determines its tower needs, it can run into various problems related to constructing the broadcast towers and other facilities needed for DTV transmission. One of the most commonly cited problems among all stations, for example, was weather. Frozen ground, wind, and snow can cause complications in tower work, particularly in the northern states during the winter months, and can lead to delays in DTV construction schedules. Of the stations answering our survey, 41 percent of current DTV stations and 57 percent of transitioning stations cited the weather as a problem that had arisen or that was expected to arise. We spoke with representatives of three tower crew companies who told us that certain types of weather require tower work to be delayed. The tower crew company representatives noted that wind is a particular problem in tower work because the wind patterns above 1,000 feet can be significantly stronger than at ground level, making the work too difficult and dangerous to attempt. We also asked one of the tower crew representatives if the May deadline—following winter—created more problems with regard to weather. The tower crew representative told us that a fall or winter deadline may have been better because May through October were the best months for tower work and tower construction.

Another concern noted by many broadcasters—again related to tower work—was "manpower availability." The digital transition has caused many stations to be requiring tower work within a short time period.

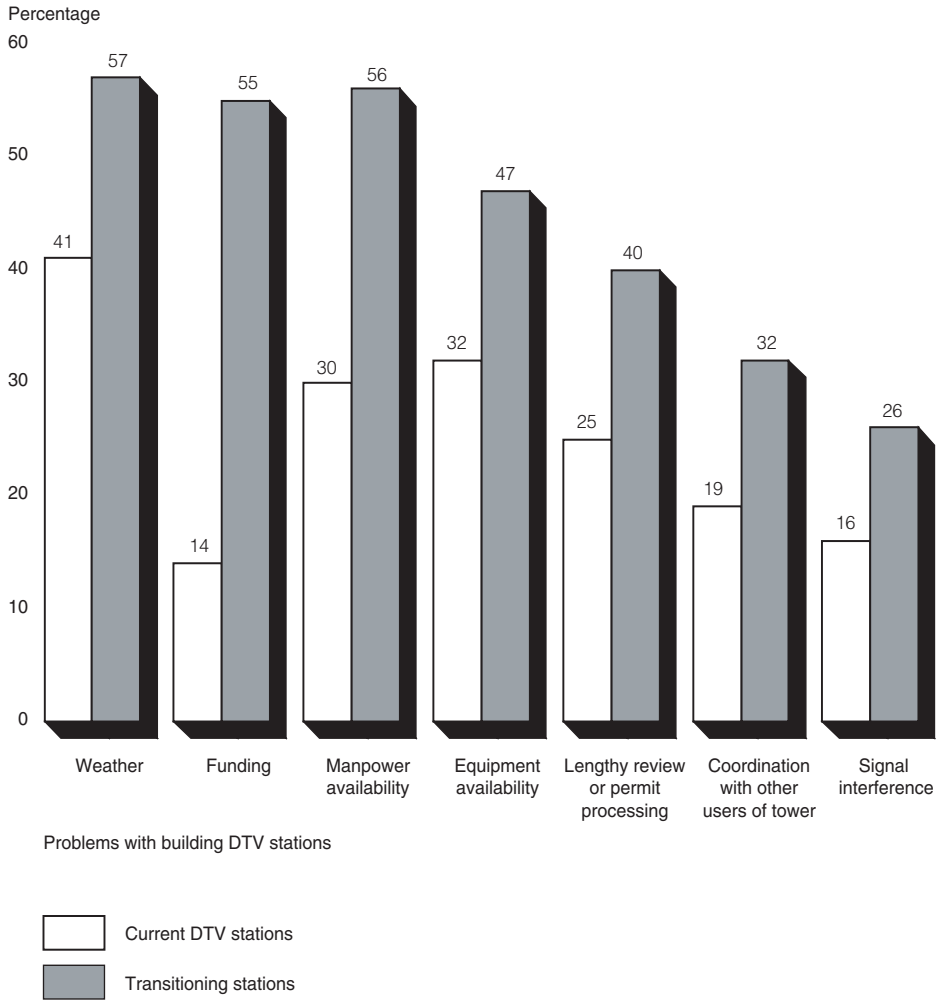
[32]In addition, 13 percent of current DTV stations and 6 percent of transitioning stations reported a need to change the height of their existing towers.

Broadcasters said that there are a limited number of tower crews in the United States that are qualified to do the type of work involved in constructing or reinforcing broadcast television towers and mounting broadcast antennas. According to our survey, 30 percent of current DTV stations and 56 percent of transitioning stations cited manpower availability as a problem area or expected problem area. Despite these views by broadcasters, we were told by representatives of the three tower crew companies that, although they are currently busy and have a significant amount of tower worked scheduled for the next few months, they do not feel overwhelmed by work related to the installation of digital antennas and are generally able to provide the services requested by broadcast stations.

Broadcasters reported various other problems with building DTV stations, as shown in figure 3.[33]

[33]Our survey found that "signal interference" was a problem area for 26 percent of transitioning stations and 16 percent of current DTV stations. We note, however, that a large number of stations reported signal interference to be a problem because they said they had to do lengthy and expensive signal interference analysis for FCC before they were allowed to maximize their signal. They did not experience *actual* signal interference. According to FCC, few stations have experienced more signal interference than was planned for in FCC's DTV channel allotment table.

Figure 3: Percentage of Stations Reporting Problems with Building DTV Stations



Note 1: For transitioning stations, problems include those already experienced and those expected.

Note 2: "Lengthy review or permit processing" can include reviews or permit processing by any federal, state, or local government entity.

Source: GAO survey of broadcast stations (Oct. 2001 – Mar. 2002).

Various Governmental Reviews Are Involved in the DTV Transition

We also examined whether any governmental reviews were necessary during the DTV transition process and, if so, whether such reviews had been the cause of any delays for the stations. Generally, these issues fell under the licensing or review authority of various government entities.

Specifically, we asked stations if issues had arisen or were expected to arise regarding the following: (1) review, permitting, or processing by FCC; (2) review or permitting by local authorities; (3) environmental review by state or local authorities; (4) review by the Federal Aviation Administration (FAA); (5) review by the Bureau of Land Management; (6) review by the National Park Service; and (7) coordination with Canadian or Mexican governments. We also asked stations whether the review took longer or was taking longer than they anticipated and whether lengthy reviews or permit processing was considered a problem area.

In general, the stations responded as follows:

- Some stations reported needing multiple reviews by various governmental agencies. For example, 15 percent of current DTV stations and 30 percent of transitioning stations told us they required reviews by three or more government entities.

- Stations located near a border with another country may require a review by Canadian and Mexican governments for coordination. Of the stations that reported they required such a review, 50 percent of current DTV stations and 73 percent of transitioning stations said the process of getting necessary approvals from Canadian or Mexican authorities had taken longer than they expected. Of the transitioning stations needing Canadian or Mexican review, 65 percent reported they had yet to resolve the international coordination issues.

- Review by FAA—which often must approve changes to the height of an existing tower or the construction of a new tower, in coordination with FCC—was noted by 19 percent of current DTV stations. Of those, 32 percent said the issue took longer than expected. For transitioning stations, 25 percent reported having or expecting to have an FAA review.

Many Transitioning Stations Reported That Problems Might Keep Them from Meeting FCC Deadlines

In this section, we address several issues related to the progress of transitioning stations in meeting the May 2002 deadline to be on the air with a digital signal. In particular, we discuss (1) the number of transitioning stations that reported they have had problems or expect problems that might keep them from meeting the deadline; (2) the lengths of extensions to the deadline that stations reported would be realistic for their situations; and (3) the dates when stations reported they would have built DTV stations if the transition were based on market forces rather than government mandate.

Almost Three-Quarters of Transitioning Stations Reported They May Not Meet the May 2002 Deadline

Seventy-four percent of transitioning stations told us that they had problems or expected problems that might keep them from meeting the May 1, 2002, deadline for having a digital signal on the air. In particular:

- Eighty-five percent of transitioning stations with annual revenues of less than $2 million reported that they had problems that might keep them from meeting the May 2002 deadline.
- Eighty-four percent of transitioning stations outside of the largest 100 television markets reported that they had problems that might keep them from meeting the May 2002 deadline.
- Stations that said they might not meet the deadline reported higher incidences of all types of problems. Funding was the most common problem, cited by 66 percent of stations that might not meet the deadline (funding problems were noted by 26 percent of stations that do not expect problems with meeting the deadline). In addition, of the stations that may not meet the deadline, 64 percent reported problems with manpower availability, 55 reported problems with equipment availability, 59 percent reported weather-related problems, and 45 percent reported lengthy permit or review problems. In contrast, of the transitioning stations that do not expect problems with meeting the deadline, 34 percent reported problems with manpower availability, 24 percent reported problems with equipment availability, 49 percent reported weather-related problems, and 26 percent reported lengthy permit or review problems.
- Station network affiliation and size of the station owner (based on how many broadcast stations the owner held) had little relationship to whether a station expected problems with meeting the deadline.

As FCC Begins Granting Extensions, Half of Transitioning Stations Reported They Could Use an Extension of 2 Years or More

In March 2002, FCC closed an application period for stations with a May 2002 deadline to apply for extensions of time to construct their digital stations. FCC is handling the stations' applications on a case-by-case basis. FCC allowed stations that applied for an extension to note technical, legal, financial, or other reasons (e.g., natural disaster) for the extension request. Applicants had to show support for the reasons given and mention steps taken to solve or mitigate the problems. In our survey of broadcasters, we asked whether stations should be required to show a "good faith effort" in meeting the deadline before being granted an extension. Seventy percent

of current DTV stations and 52 percent of transitioning stations thought that a station should be required to show a good faith effort.

As of April 3, 2002, FCC had received applications for extension from 810 commercial stations and had granted 476 of these stations a 6-month extension. FCC granted extensions for more than 200 of these stations on the basis of technical problems alone (e.g., equipment delays). Over 180 stations were given extensions that were based on some combination of technical, legal, financial, or other reasons. No stations were granted extensions that were based solely on financial reasons. The 334 stations not initially granted an extension were sent Letters of Inquiry by FCC in order to obtain more specific information. FCC staff said that many of the letters sought more financial and technical information with respect to finalizing DTV construction plans and that most of the letters gave stations 15 days to respond.

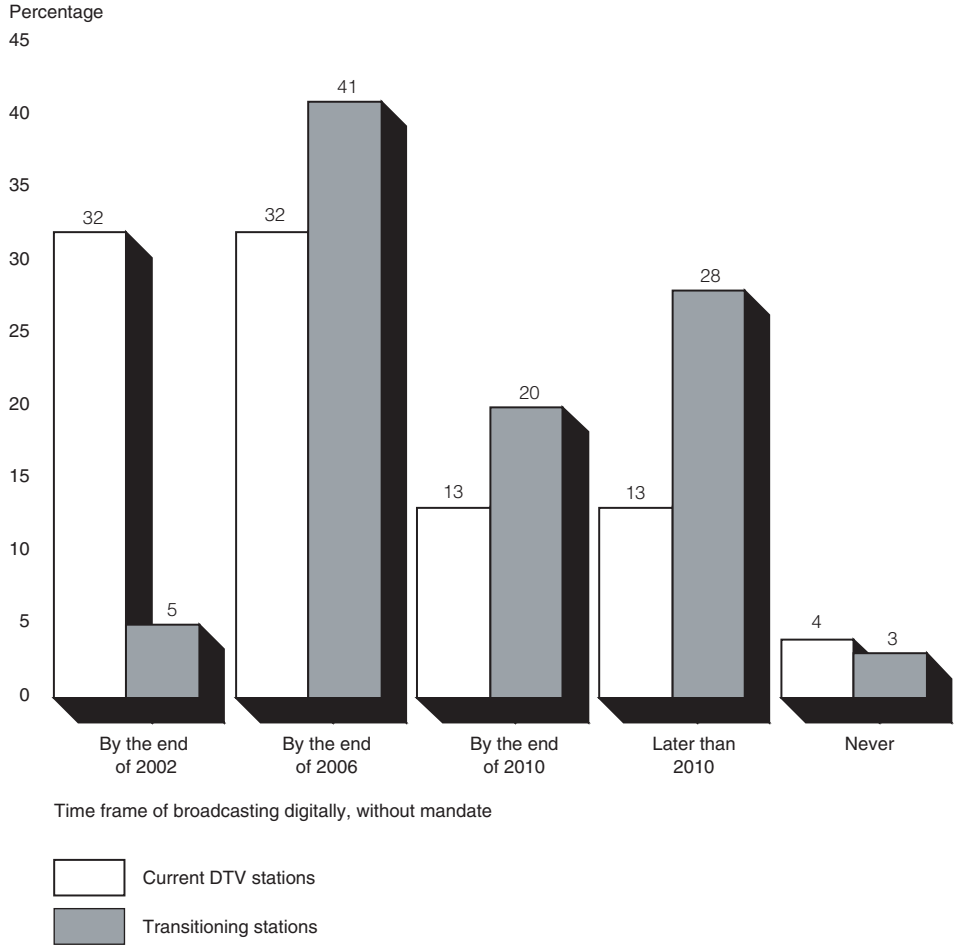
In our survey of broadcasters, we asked transitioning stations to estimate a "realistic extension" if FCC were to extend its deadline for them to be on the air with a digital signal. In general, smaller stations were most likely to believe that an extension of more than 2 years was realistic for them. Of the transitioning stations that expected problems with meeting the May 2002 deadline, only 19 percent considered an extension of 6 months or less to be sufficient, while 54 percent said that an extension of 2 years or more was realistic for their situation. Under commission standards, FCC staff may grant up to two extensions, each not to exceed 6 months. Further requests by a station for an extension of its DTV deadline would have to be granted at the commission level. From the responses to our survey, it appears that the 6-month extensions that FCC has granted so far may be insufficient for many transitioning stations and that additional rounds of applications for extension appear likely.[34]

Few Transitioning Stations Would Broadcast Digitally This Year Without a Government Mandate

We asked broadcasters to estimate when they would likely have begun broadcasting a digital signal—assuming they had been given the spectrum but were not under any government deadline to transition to digital—on the basis of market forces such as competition, technology, and viewer demand. While many current DTV stations said they would have broadcast digitally by the end of 2002, most transitioning DTV stations reported they would have begun broadcasting digitally much later, as shown in figure 4. A small percentage of stations reported that without a government mandate, they never would have chosen to transition to digital technologies.

[34]FCC staff, however, said that they believe that many of these stations may be able to get on the air sooner than they indicated in response to our survey because of the commission's relaxed requirements for building DTV stations that were adopted in November 2001.

Figure 4: Stations' Reported Dates of Broadcasting Digitally If No Government Mandate Existed



Source: GAO survey of broadcast stations (Oct. 2001 – Mar. 2002).

Observations

The digital television transition timeline established by FCC included an ambitious construction schedule for DTV stations. The level of difficulty in readying digital broadcasting facilities that was reported to us by transitioning stations indicates that many stations will have problems meeting the timeline. But even after construction of all DTV stations, only part of the DTV transition will have been completed. Because of the 85 percent rule (i.e., the requirement that 85 percent of households in a

market be able to receive a digital signal before the analog signals are discontinued), much of the spectrum is likely to remain encumbered by analog broadcast stations until consumers adopt the necessary digital technologies. According to our survey, however, broadcasters currently perceive little consumer demand for digital and HDTV programming.

Nonetheless, it appears that the broadcasters will move forward—some more slowly than others—with building the DTV stations. Other market participants—cable and satellite companies, content providers, consumer electronics manufacturers, and others—also play important roles in influencing the speed of the DTV transition. FCC recently addressed the role of these other market participants as well as that of the broadcasters in a letter from Chairman Michael K. Powell to Senator Ernest F. Hollings and Representative W.J. "Billy" Tauzin. In the letter, Chairman Powell proposed voluntary industry actions to speed the DTV transition by calling for the provision of more HDTV or other value-added DTV programming, more cable carriage of DTV channels, the provision of cable set-top boxes that allow for the display of HDTV programming, and the inclusion of over-the-air DTV tuners into almost all new television receivers by the end of 2006. If embraced by the industry, these actions could help to keep the DTV transition on track since their combined effect would be to encourage consumers to adopt DTV technologies. We will examine these critical issues in our next report on the digital television transition, which we expect to issue in November 2002.

Agency Comments

We provided a draft of this report to FCC staff for their review and comment. FCC staff believes that its *Memorandum Opinion and Order on Reconsideration*, which was adopted on November 8, 2001, may have a substantial impact on certain survey responses made before that date. In the order, the commission modified its rules to permit stations to adopt a more graduated approach to providing DTV service, initially operating with lower powered—and therefore less expensive—DTV facilities, while retaining the right to expand their coverage area as the transition continues to progress. We added information related to FCC's order in this report. FCC staff also provided technical comments that were incorporated throughout this report as appropriate.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days after the

date of this letter. At that time, we will send copies to interested congressional committees; the chairman, FCC; and other interested parties. We will also make copies available to others upon request. If you have any questions about this report, please contact me at 202-512-2834 or guerrerop@gao.gov. Key contacts and major contributors to this report are listed in appendix VIII.

Sincerely yours,

Peter Guerrero
Director, Physical Infrastructure Issues

Scope and Methodology

To provide information on the progress in building digital television (DTV) stations and on broadcaster problems and concerns, we mailed surveys to all full-power, on-the-air commercial and public broadcasting stations. To develop our survey questions, we interviewed officials at the Federal Communications Commission (FCC) as well as officials of organizations representing industries affected by the transition to DTV. We also reviewed relevant documents, such as FCC orders and proposed rulemakings. We then conducted pretests with several individual broadcast stations to help further refine our questions, identify any unclear portions of the survey, and identify any potentially biased questions. These pretests were conducted in-person and by telephone with stations covering a number of different metropolitan areas. Two versions of our survey were developed, one for stations that had begun broadcasting a digital signal ("current DTV stations") and one for stations that had not begun broadcasting a digital signal ("transitioning stations"). The survey questions and detailed survey results for commercial stations are contained in appendixes IV and V, and the questions and results for public stations are contained in appendixes VI and VII.

To provide the population information, we acquired the MEDIA Access Pro database of BIA Financial Network, Inc., which is a private firm that specializes in broadcast industry data. This database provided us with the names, addresses, and other contact information of broadcast stations as well as information on such things as station size and ownership, station revenues, market size, and station operating status. We also used this database to determine which stations were commercial and which were public as well as which were broadcasting in digital and which were not. The digital broadcasting status listed in BIA's database was combined with information from the National Association of Broadcasters' Web site to determine which version of the survey to mail to each station. We mailed surveys to all full-power commercial and public television stations on the air at the end of September 2001. We sent a different survey to any station that indicated that we had misclassified its digital broadcasting status. As such, some of the stations that filled out the survey for digital stations began that service after September 2001. Our survey was not sent to low-power commercial broadcast stations because these stations have not been required by FCC to transition to digital technologies. In addition, the survey was not mailed to the eight stations in New York City whose broadcast towers atop the World Trade Center were destroyed in the September 11 terrorist attacks. Instead, we spoke directly to a representative of each of these stations to gather information about how the events of September 11 affected their operations generally and affected

their DTV plans in particular. A discussion of the situations of the stations in New York City is provided in appendix II. We also adjusted the survey population to exclude the few stations that (1) had recently gone off the air, (2) indicated that they were not assigned a digital channel, or (3) were broadcasting outside of the United States. The resulting population to which we sent surveys consisted of 1,182 full-power commercial television stations and 372 full-power public television stations on the air at the end of September 2001.

We first mailed our survey in early October 2001. However, on October 15, 2001, all incoming mail to our headquarters was halted due to the receipt of letters containing anthrax by several federal agencies in the Washington, D.C., area. We received no U.S. mail for more than 2 months. On December 27, 2001, we conducted a second mailing of the survey to all stations from which we had not received a survey response before October 15, 2001. This time, surveys were mailed from and returned to our Boston field office. The second mailing went only to commercial stations due to time constraints on the research phase created by the mail stoppage. For commercial stations that may have completed and returned the survey twice, only the original survey from the October mailing was analyzed. We made a third and last attempt to contact the commercial station nonrespondents in telephone reminder calls during the first 2 weeks of March. These telephone contacts resulted in an additional 237 questionnaires from late respondents (approximately 27 percent of all commercial responses).

Of the population of broadcast stations, we received 1,036 of 1,554 usable questionnaires, for an overall response rate of 67 percent. We received 135 of 168 surveys from commercial current DTV stations (80 percent response rate) and 15 of 37 surveys from public current DTV stations (41 percent response rate). We received 727 of 1,014 surveys from commercial transitioning stations (72 percent response rate) and 159 of 335 public transitioning stations (47 percent response rate).

We conducted two types of analyses of commercial stations to evaluate the possibility that the respondents might differ from nonrespondents. Although there is some evidence of differences, these are not sufficiently consistent nor large enough to provide a basis for adjusting our survey responses. The first type of analysis directly compared two measures of the size of the responding and nonresponding stations. The nonrespondents tended to be from larger markets and from larger ownership groups. For the transitioning stations, for example, 40 percent

of the nonrespondents and 31 percent of the respondents were from the top 50 markets. The second analysis compared the early responses (sent between October and February) with the later responses (sent in March). The evidence was mixed as to whether the earlier or later responding stations might have more difficulties in meeting the DTV station deadline. On the one hand, transitioning early respondents were less likely than transitioning late respondents to give the direct assessment that they might have problems in meeting the deadline (73 percent and 80 percent, respectively). On the other hand, early respondents were more likely than late respondents to report experiencing specific types of digital transition problems. For example, a funding problem was reported by 19 percent of digital early respondents versus 5 percent of digital late respondents, and 62 percent of transitioning early respondents versus 43 percent of transitioning late respondents. No definite pattern emerges from these findings, and it is unclear whether differences are due to actual differences in the station characteristics of early and later respondents or to the differing proximity to the deadline for broadcasting a digital signal.

Questionnaires were mailed to station managers but were completed by station managers, station engineers, or officials of the station owner or parent company. All returned questionnaires were reviewed, and we called respondents to obtain information where clarification was needed. All data were double keyed and verified during entry, and computer analyses were performed to identify any inconsistencies or other indications of errors. Because the questionnaires were mailed to all broadcast stations in the appropriate population, percentage estimates do not have sampling errors. Other potential sources of errors associated with the questionnaires, such as question misinterpretation and question nonresponse, may be present.

The World Trade Center Attacks Severely Disrupted Over-the-Air Broadcast Television Throughout New York City

This appendix focuses on the special circumstances of the broadcast television stations in New York City following the terrorist attacks of September 11, 2001. We did not mail our survey to the New York City stations, but instead conducted telephone interviews with the stations in December 2001 and January 2002. Since the attacks, the eight local broadcasters whose antennas and other equipment were located atop the twin towers of the World Trade Center have struggled to restore over-the-air service to their viewers. Of these eight stations, six said they had completed building their DTV stations by September 11 and were broadcasting digital signals. All six digital antennas were also lost in the collapse of the World Trade Center. All of the broadcasters with whom we spoke stated that restoration of their full-power analog signals was their highest priority.

Broadcasters Struggled to Restore Service in the Immediate Aftermath of the Trade Center Attacks

The destruction of the World Trade Center buildings on September 11, 2001, also destroyed the antennas, transmitters, and associated equipment of eight broadcast television stations. Lacking immediate backup transmission equipment or other immediate contingency plans, the stations ceased over-the-air broadcasts entirely on September 11. Several of the stations had direct fiber links to some or all of the cable systems on which their analog signal was carried; thus these stations were able to continue providing a signal to some portion of their cable viewers on September 11. In addition, several of the broadcasters were carried on the direct broadcast satellite (DBS) systems of DirecTV and EchoStar and, although in some cases the broadcast signals were momentarily disrupted, local broadcast channel service continued for satellite subscribers on September 11.

Within 10 days of September 11, most of the stations said they had resumed over-the-air broadcasting from a temporary tower in Alpine, N.J. However, the broadcasters considered the move to Alpine a short-term solution. Station executives with whom we spoke said that, although they were pleased that the site was immediately available, they were disappointed to discover that signal weakness from the site meant that only about 70 percent of their viewers could be reached. Some stations attempted to increase coverage by arranging for additional cable providers to carry their

signals via fiber links.[35] However, we were told that large numbers of viewers—particularly in Brooklyn and Queens—do not subscribe to cable service.

The Priority for Station Executives Was Full Restoration of Their Analog Signals

Station executives told us that fully restoring their over-the-air analog broadcasts was of the highest priority. It is the analog signal—not the digital signal—that the stations count on for their revenue stream. One executive estimated that his station's signal is still lost to over 3 million viewers since September 11. We were told that it will take up to 3 years to achieve full analog signal restoration because each station must repair transmission lines, install new antennas, acquire backup generators, and negotiate for temporary and permanent space on rooftops and towers.

An immediate need for the broadcasters was to negotiate the terms of placing antennas, transmitters, and other equipment atop the Empire State Building, which was the favored temporary location due to its more than 100-story height. By mid-October, nearly every local TV station had begun to broadcast from the roof of the Empire State Building. Although the Empire State Building seemed initially to be an effective substitute for the World Trade Center location, unanticipated constraints arose, including limited physical space, an aging infrastructure, and the lower height (as compared with the World Trade Center).

First, we were told that space on the Empire State Building's rooftop is severely limited. Many of New York City's radio stations have broadcast from the rooftop for decades, and, as the rooftop is currently configured, there is little room for the TV stations to install new broadcasting equipment. Second, the station representatives said that television broadcasting is limited by engineering constraints related to the Empire State Building's aging infrastructure. Unlike the World Trade Center buildings, the Empire State Building's infrastructure is more than 70 years old. While considered a safe building for workers, it is nonetheless a fragile physical plant on which to place the amount of broadcasting equipment required by eight television stations. The aging infrastructure also creates

[35]DirecTV and EchoStar, two DBS service providers, have allowed several cable systems in New York City to receive their satellite transmissions of the local stations and retransmit those signals on their cable systems. DirecTV told us they have provided their local signals to cable systems free of charge; EchoStar told us they have provided their local signals to public safety groups free of charge.

wiring and powering issues. One station representative said that it simply may not be possible to wire the Empire State Building to power the necessary antennas, transmitters, and associated equipment. Third, the broadcasters used antennas perched on a 343-foot tower rising from a 110-story base when they were using the World Trade Center. The Empire State Building offers either operation from a 200-foot tower atop the somewhat lower roofline or operation from the 81st floor. In either case, nearby Manhattan buildings—even the Empire State Building itself—cause interference with the stations' signals and prevent reception for some viewers. One executive we spoke with believed that the Empire State Building would serve more effectively as a backup transmission location. Another executive noted the importance of this backup role, since the events of September 11 so dramatically demonstrated the need for "transmission redundancy."

Broadcasting at less than their accustomed levels of power and sharing limited space at and near the Empire State Building's roof, stations have continued to experience difficulty in reaching their entire audience. The Alpine site also reduces stations' market coverage. Reaching Brooklyn and Queens has been particularly problematic because viewers in these boroughs must contend with signals that are weakened or blocked by a variety of Manhattan obstructions. One station executive told us that he is currently reaching only about 80 percent of his viewers citywide.

As They Seek Permanent Broadcasting Space, Stations Are Working to Address Financial Issues

Concomitant with securing temporary tower space at the Empire State Building is the stations' need to find a new permanent location for their antennas. Currently, industry stakeholders are negotiating to select a

location that is acceptable to all parties.[36] Station executives with whom we spoke said that their preference is Governor's Island, which is currently owned by the federal government and located in New York Harbor near lower Manhattan.[37] The station executives consider the island to be a nearly optimal location because it is unused, virtually vacant, and lacks private residents who might object to the construction of broadcast towers. In addition, use of the island would allow all stations to be located together, thus obviating the need for each station to secure its own space in Manhattan proper.

While station executives attempt to secure permanent broadcasting space, they must grapple with a range of budget and finance matters. We were told that, in particular, stations are dealing with (1) ensuring redundancy in equipment placement, which requires negotiating twice for building rent, consulting services, and other key purchases; (2) seeking reimbursement from insurers for losses directly attributable to the events of September 11; and (3) retaining high-quality programming so that affected viewers will return when the analog signal is fully restored.

Station executives with whom we spoke emphasized the need for "redundancy" of their broadcast signal as a precaution against future terrorist attacks, natural disasters, or other calamities. This redundancy requires stations to invest at least twice the amount that would be required simply to replace the equipment that was destroyed on September 11, contract twice for the services of design and engineering consultants, and seek permits and negotiate rent at two distinct locations. In addition, stations are currently negotiating with their insurance companies to determine precisely what is reimbursable in the wake of the September 11 events. One station executive told us that his "complex claim" could surpass $30 million. Although some of this amount represents lost

[36]In the wake of the World Trade Center attacks, the New York area television stations have begun to work as a private coalition to pursue common goals. According to one executive, the broadcasters have formed the Metropolitan Television Transmission Committee, which meets regularly "in a communal effort to restore adequate broadcast television coverage to the New York metropolitan area." The coalition's primary mission is to secure a single location for a broadcast tower that all member stations may share. During the rebuilding process, coalition members are developing consensus requests for presentation to landlords, creditors, regulators, and other interested outside parties. Ancillary goals include devising a workable temporary plan for sharing space on the Empire State Building's roof, negotiating jointly with the insurance industry, and exploring how best to reacquire digital broadcast technologies in the most efficient and cost-effective manner.

[37]The federal government plans to transfer Governor's Island to New York for a nominal fee.

hardware, he said, some of it represents a request for reimbursement of lost revenue. The amount of lost advertising revenue is difficult to estimate and insurers have argued that the events of September 11 are not the sole cause of lower advertising revenues.

Rebuilding the DTV Stations Is an Important Long-Term Goal

Six of the eight stations had completed building their DTV stations before September 11, 2001, and all six lost their digital antennas. The other two stations were in the process of building their DTV infrastructure. Station executives with whom we spoke said that restoring full traditional analog service was their immediate priority. However, one executive noted the importance of regaining digital broadcasting capabilities in the long term. Ultimately, he said, viewers will want high definition content and other digital services. Another station executive mentioned that reacquiring digital capability was essential to recoup earlier financial investments in digital technologies. The eight stations' reported costs-to-date on the digital transition ranged from $250,000 to $27 million.

The station executives reiterated their commitment to high definition content, although they acknowledged that the viewers of New York City had yet to express widespread interest in HDTV. However, the executives anticipated that this will change as equipment prices decline and as HDTV is more aggressively promoted in coming years. Before September 11, 2001, local stations were broadcasting sports (such as the games of the New York Mets), cultural programs (such as *Live from the Met*), children's shows, nature shows, and other special programming in high definition format. One station had plans for a high definition broadcast of the Tournament of Roses Parade on January 1, 2002. Stations with whom we spoke were unable to estimate precisely when they might have their digital signals back on the air, although one station was hoping to be broadcasting a limited digital signal by May 2002.

FCC Received High Marks from New York City Broadcasters in the Aftermath of September 11

We were told by the station executives that, in the wake of the World Trade Center attacks, FCC was cooperative, supportive, and accommodating—a full partner in helping to restore broadcast television service to the New York metropolitan area. Specifically, according to the station executives, FCC offered temporary licenses, facilitated stations' moves to Alpine and the Empire State Building, and issued necessary waivers. One station executive said that FCC acknowledged and approved requests "in minutes, rather than days or weeks," while another expressed appreciation that FCC

had granted it temporary permission to file requests electronically. This executive expressed satisfaction with the proactive nature of FCC's involvement, noting that an FCC official called him within a day of the World Trade Center attacks to ask how the agency might facilitate the rebuilding process. The executives felt that other federal, state, and local government agencies have been similarly cooperative, including the U.S. Department of Commerce, the Federal Emergency Management Agency, the Federal Aviation Administration, and the Port Authority of New York & New Jersey.

Public Broadcasting Stations Also Report Experiencing Problems in Their Transition to DTV

The federal mandate that all full-power broadcast television stations must transition to digital technologies also applies to the nation's 380 public television stations. FCC has ordered that these stations have a digital signal on the air by May 1, 2003. We mailed surveys to all full-power, on-the-air public stations. Public stations were sent the same survey as commercial stations. Just as with the commercial stations, they were sent one version of the survey if they were already broadcasting a digital signal ("current DTV stations") and another version of the survey if they had not begun broadcasting a digital signal ("transitioning stations"). We did one mailing to the public stations in early October 2001. For more information on our response rates, see appendix I. Our survey responses from public stations were often similar to the responses of commercial stations. In this appendix, we report mostly on areas where survey results differed from those of the commercial stations. See appendixes VI and VII for complete results from the public stations.

As of April 12, 2002, according to FCC, there were 60 public stations on the air with a digital signal. Costs reported for the digital transition were $3.0 million for public current DTV stations and $2.6 million expected for public transitioning stations. Again, the costs are not dramatically different (the costs for commercial stations having been $3.1 million for current DTV stations and $2.3 million for transitioning stations). One of the biggest differences between public and commercial stations was the reported funding sources for building the DTV station. Commercial stations often relied on funding from the corporate parent or owner. For public stations, the most reported funding sources were state government funding, station cash reserves, federal funding or grants from the National Telecommunications and Information Administration, and fund-raising or private grants. Both public current DTV stations and transitioning stations reported that they relied heavily on state government funding sources. Current DTV stations also reported relying heavily on station cash reserves.

The public stations that had already gone on the air with a digital signal—all of which chose to do so ahead of the schedule set by FCC—reported that they were often providing their viewers with high definition content. Eighty percent of public current DTV stations said they were offering some HDTV programming. Many had their digital signal on the air constantly; the stations averaged 50 hours per week of HDTV content and 66 hours per week of multicasting. Two-thirds of current DTV stations said they were producing some of their own content in digital. Of the transitioning stations, most had various plans for their digital channel, including 84 percent that said they planned some amount of HDTV and 73 percent that

said they planned some amount of multicasting. Fifty-three percent plan to produce their own content in digital.

As for problems that the public stations were experiencing or expecting, funding ranked as the most reported problem. Similar to the commercial stations, funding was said to be a problem by 76 percent of transitioning stations. Weather was reported as a problem by 57 percent of transitioning stations, and lengthy permit reviews were reported by 30 percent of transitioning stations.

Another difference from the commercial stations was the number of public transitioning stations that said they might not make the deadline for broadcasting a digital signal. While 74 percent of commercial stations said this, 45 percent of public stations said this. It is likely that the additional year given to public stations in the FCC's schedule partly explains the lower number of public stations that think they will fail to meet their deadline. There were also differences in the extensions that public stations felt they might need from FCC. Thirty-eight percent of public stations said they would need an extension of 2 years or more, compared with 54 percent of commercial stations that said this. Lastly, public stations were more optimistic about when they would have had a DTV signal on the air had they not been given a timeline. Fifty-two percent of public transitioning stations said they would have been on the air in digital by 2006 (compared with 46 percent of commercial transitioning stations).

Survey Results for Commercial Current DTV Stations

The following results are based on 135 survey responses from commercial current DTV stations. Surveys were sent to 168 commercial current DTV stations. The response rate was 80 percent.

Question 1: When did you begin transmitting a digital signal?

Stations provided the year and month.

Question 2: What is the approximate total cost you incurred to comply with the initial requirements for digital transmission? (E.g., $3.2 million. Include expenses such as new tower, work to existing tower, transmission line, antenna, digital transmitter, consultants, licensing, digital encoders, and other capital expenditures. Do not include program production or acquisition costs.)

Average answer: $3.1 million.

Note: 7 percent of respondents did not answer.

Question 3: To reduce costs, did you have any partnerships or arrangements with other stations to share tower expenses? (Check one.)

Answer	**Percent**
Yes	31.1
No	64.4
Not answered	4.4

Question 4: Which of the following were used to fund the construction of your digital station? (Check all that apply.)

Answer	Percent
Station revenues or cash reserves	28.9
Funding from station owner or parent	79.3
Raising equity capital (e.g., sale of shares)	3.0
Raising debt capital (e.g., borrowed from bank or other financier)	15.6
State government funding or assistance	0.0
Other	1.5
Not answered	4.4

Note: Percentages total more than 100 percent because respondents could select more than one answer.

Question 5: From the funding options you marked in question 4, please record the number of the option that was the primary funding mechanism used.

Answer	Percent
Station revenues or cash reserves	12.6
Funding from station owner or parent	71.9
Raising equity capital (e.g., sale of shares)	0.0
Raising debt capital (e.g., borrowed from bank or other financier)	9.6
State government funding or assistance	0.0
Other	0.7
Not answered	5.2

Question 6: What do you estimate to be your increased energy costs per month of running the digital channel, to the nearest thousand?

Average answer: $6,342 per month

Note: 8 percent of respondents did not answer.

Question 7: As you went through the process of building your digital station, did any of the following issues arise? (For each item, check yes or no in column 1. If yes, proceed to columns 2 and 3.)

Column 1 – Did issue arise?	**Answer**	**Percent**
Review, permitting, or processing by the FCC?	Yes	48.2
	No	51.1
	Not answered	0.7
Review or permitting by local authorities?	Yes	23.7
	No	74.8
	Not answered	1.5
Environmental review by state or local authorities?	Yes	11.9
	No	85.2
	Not answered	3.0
Review by the Federal Aviation Administration?	Yes	18.5
	No	80.0
	Not answered	1.5
Review by the Bureau of Land Management?	Yes	3.0
	No	94.1
	Not answered	3.0
Review by the National Park Service?	Yes	3.0
	No	94.8
	Not answered	2.2
Coordination with Canadian or Mexican governments?	Yes	13.3
	No	85.2
	Not answered	1.5

[Only answered by those who answered "yes" to column 1.] **Column 2 – Please estimate how many months the review took to complete.**	**Average Answer**	**Percent Not Answered**
Review, permitting, or processing by the FCC?	9 months	8
Review or permitting by local authorities?	9 months	3
Environmental review by state or local authorities?	14 months	0
Review by the Federal Aviation Administration?	8 months	4
Review by the Bureau of Land Management?	4 months	0
Review by the National Park Service?	6 months	25
Coordination with Canadian or Mexican governments?	6 months	17

[Only answered by those who answered "yes" to column 1.] **Column 3 – Was the number of months it took longer than you anticipated?**	**Answer**	**Percent**
Review, permitting, or processing by the FCC?	Yes	46.2
	No	46.2
	Not answered	7.7
Review or permitting by local authorities?	Yes	43.8
	No	46.9
	Not answered	9.4
Environmental review by state or local authorities?	Yes	56.3
	No	25.0
	Not answered	18.8
Review by the Federal Aviation Administration?	Yes	32.0
	No	56.0
	Not answered	12.0
Review by the Bureau of Land Management?	Yes	25.0
	No	75.0
	Not answered	0.0
Review by the National Park Service?	Yes	75.0
	No	25.0
	Not answered	0.0
Coordination with Canadian or Mexican governments?	Yes	50.0
	No	33.3
	Not answered	16.7

Question 8: For your digital signal, did you require any changes from your existing analog tower? (Check one.)

Answer	**Percent**
Yes, built a new tower for digital antenna	20.7
Yes, placed digital antenna on a different existing tower	9.6
Yes, changed the height of (and possibly reinforced) the current tower	12.6
Yes, only reinforced the current tower	38.5
No, used the current tower without modifications	17.8
Not answered	0.7

Question 9: Is your antenna for digital broadcasting in a temporary or permanent location? (Check one.)

Answer	Percent
Temporary	27.4
Permanent	71.9
Not answered	0.7

Question 10: What is the operating status of your digital signal at the present time? (Check one.)

Answer	Percent
Operating at full power and full coverage relative to digital license	54.1
Not operating at, but capable of, full power and full coverage relative to digital license	17.8
Not currently capable of full power and full coverage relative to digital license	26.7
Not answered	1.5

Question 11: How would you describe the overall interest level in digital broadcasts by consumers in your designated market area? (Check one.)

Answer	Percent
High interest	7.4
Moderate interest	29.6
Low interest	56.3
No interest	6.7
Not answered	0.0

Question 12: Which types of content are being shown on your digital channel? (Check all that apply.)

Answer	Percent
Upconverted content from the analog format	87.4
Standard definition digital content (network pass-through, station produced, or other)	27.4
High definition digital content (network pass-through, station produced, or other)	74.1
Multicasts of two or more programs	22.2
Datacasting	5.2
Other ancillary or supplementary services	3.7
Not answered	0.0

Note: Percentages total more than 100 percent because respondents could select more than one answer.

Question 13: On average, how many hours per week are you doing the following? (If none, enter zero.)

	Average Answer	Percent Not Answered
Hours per week broadcasting in digital (both standard and high definition)	154 hours	2
Hours per week broadcasting just high definition	20 hours	9
Hours per week multicasting	34 hours	8

Question 14: Are you producing any of your own content in digital (either standard or high definition)? (Check one.)

Answer	Percent
Yes	28.2
No	71.9
Not answered	0.0

Question 15: Do you run any of the following promotions about digital? (Check all that apply.)

Answer	Percent
Some type of DTV or HDTV identifier at the beginning of a digital program	51.9
Advertising spots for shows that refer to their availability in high definition	12.6
Advertising spots or promotions about our DTV channel	21.5
Mention of our DTV channel in the local TV listings	11.9
Mention of our DTV channel on our Web site	49.6
Other	7.4
No, we do not promote our DTV channel	23.0
Not answered	0.7

Note: Percentages total more than 100 percent because respondents could select more than one answer.

Question 16: For your analog signal, please estimate the number of cable carriage agreements you have that are retransmission consent and the number that are must carry, as well as the approximate percentage of households in your viewing area covered under each type of agreement.

Responses to this question were inconsistent. We will provide analyses of the answers in our next report on the DTV transition.

Question 17: Which one of the following best describes the current status of carriage of your digital signal on cable systems (as handled by you or your parent company)? (Check one.)

Answer	Percent
Have not tried to discuss carriage with cable operators (Go to question 19.)	16.3
Have tried to contact cable operators, but have not yet spoken to them about carriage (Go to question 19.)	0.7
Have had discussions with cable operators, but no carriage agreements exist (Go to question 19.)	44.4
Have some carriage agreements, but with contingencies for when carriage would take effect (Go to question 19.)	9.6
Have some carriage of our digital signal by cable operators (Continue with question 18.)	15.6
Not answered	13.3

Question 18: *[Only answered if they answered "have some carriage of our digital signal by cable operators" in question 17.]* Of the households that currently receive your analog channel via cable, approximately what percentage are also receiving your digital channel via cable?

Average answer: 38 percent

Note: 29 percent of respondents did not answer.

Question 19: Did you experience problems in any of the following areas? (Check one for each.)

	Answer	Percent
Manpower availability (e.g., tower crews)	Yes	29.6
	No	68.2
	Not answered	2.2
Equipment availability (e.g., antennas, encoders)	Yes	31.9
	No	65.9
	Not answered	2.2
Weather (e.g., tower work during the winter)	Yes	40.7
	No	57.8
	Not answered	1.5
Signal interference	Yes	15.6
	No	82.2
	Not answered	2.2
Funding	Yes	14.1
	No	82.2
	Not answered	3.7
Coordination with other users of tower	Yes	18.5
	No	80.7
	Not answered	0.7
Lengthy reviews or permit processing	Yes	25.2
	No	74.1
	Not answered	0.7
Other	Yes	3.0
	No	96.3
	Not answered	0.7

Question 20: Should stations be required to show a good faith effort to meet current deadlines before being granted any extension? (Check one.)

Answer	Percent
Yes	70.4
No	8.2
No opinion	16.3
Not answered	5.2

Question 21: Assuming you had the spectrum but were never under any government deadline to transition to digital, please roughly estimate when you think you would have begun broadcasting a digital signal based on market forces such as competition, technology, and viewer demand? (Check one.)

Answer	Percent
By the end of 2002	31.9
By the end of 2006	31.9
By the end of 2010	13.3
Later than 2010	12.6
Never	3.7
Not answered	6.7

Question 22: Have you experienced any other issues during your conversion to digital?

Answer	Percent
Provided comments	29.6
Did not provide comments	70.4

Survey Results for Commercial Transitioning Stations

The following results are based on 727 survey responses from commercial transitioning stations. Surveys were sent to 1,014 commercial transitioning stations. The response rate was 72 percent.

Question 1: What is your estimated total cost of complying with the initial requirements for digital transmission? (E.g., $3.2 million. Include expenses such as new tower, work to existing tower, transmission line, antenna, digital transmitter, consultants, licensing, digital encoders, and other capital expenditures. Do not include program production or acquisition costs.)

Average answer: $2.3 million

Note: 2 percent of respondents did not answer.

Question 2: To reduce costs, do you have any partnerships or arrangements with other stations to share tower expenses? (Check one.)

Answer	**Percent**
Yes	24.9
No	61.4
This option is being considered	12.2
Don't know	0.8
Not answered	0.7

Question 3: Which of the following do you expect you will use to fund the construction of your digital station? (Check all that apply.)

Answer	Percent
Station revenues or cash reserves	28.8
Funding from station owner or parent	62.3
Raising equity capital (e.g., sale of shares)	5.9
Raising debt capital (e.g., borrowed from bank or other financier)	42.9
State government funding or assistance	0.8
Possible sale of station	6.2
Don't know yet	16.5
Other	0.8
NTIA grant (PTFP) or other federal funding or assistance[a]	0.1
Capital campaign or corporate or private donations[a]	1.0
Not answered	1.2

Note: Percentages total more than 100 percent because respondents could select more than one answer.

[a] These answers were not printed on the survey instrument, but were coded from responses provided in the "other" answer.

Question 4: From the funding options you marked in question 3, please record the number of the option that you expect to be the primary funding mechanism used.

Answer	Percent
Station revenues or cash reserves	6.6
Funding from station owner or parent	44.7
Raising equity capital (e.g., sale of shares)	1.0
Raising debt capital (e.g., borrowed from bank or other financier)	29.3
State government funding or assistance	0.0
Possible sale of station	1.8
Don't know yet	11.3
Other	0.6
NTIA grant (PTFP) or other federal funding or assistance[a]	0.1
Capital campaign or corporate or private donations[a]	0.7
Not answered	4.0

[a] These answers were not printed on the survey instrument, but were coded from responses provided in the "other" answer in question 3.

Question 5: What do you estimate to be your increased energy costs per month of running the digital channel, to the nearest thousand?

Average answer: $6,100

Note: 4 percent of respondents did not answer.

Question 6: As you are going through the process of building your digital station, have any of the following issues arisen, or do you expect the issue to arise? (For each item, if you answer "has arisen" in column 1, proceed to columns 2 and 3.)

Column 1 – Has issue arisen or do you expect it to arise?	Answer	Percent
Review, permitting, or processing by the FCC?	Has arisen	55.7
	Expected	10.0
	No	33.3
	Not answered	1.0
Review or permitting by local authorities?	Has arisen	18.4
	Expected	14.9
	No	65.5
	Not answered	1.2
Environmental review by state or local authorities?	Has arisen	11.3
	Expected	13.8
	No	73.3
	Not answered	1.7
Review by the Federal Aviation Administration?	Has arisen	15.4
	Expected	9.8
	No	72.9
	Not answered	1.9
Review by the Bureau of Land Management?	Has arisen	2.9
	Expected	5.0
	No	89.9
	Not answered	2.2
Review by the National Park Service?	Has arisen	2.6
	Expected	3.0
	No	92.4
	Not answered	1.9
Coordination with Canadian or Mexican governments?	Has arisen	11.1
	Expected	3.9
	No	82.9
	Not answered	2.1

[Only answered by those who answered "has arisen" in column 1.] **Column 2 – Has the issue been resolved?**	**Answer**	**Percent**
Review, permitting, or processing by the FCC?	Yes	59.3
	No	39.8
	Not answered	1.0
Review or permitting by local authorities?	Yes	67.2
	No	30.6
	Not answered	2.2
Environmental review by state or local authorities?	Yes	72.0
	No	28.0
	Not answered	0.0
Review by the Federal Aviation Administration?	Yes	79.5
	No	18.8
	Not answered	1.8
Review by the Bureau of Land Management?	Yes	61.9
	No	33.3
	Not answered	4.8
Review by the National Park Service?	Yes	63.2
	No	26.3
	Not answered	10.5
Coordination with Canadian or Mexican governments?	Yes	33.3
	No	65.4
	Not answered	1.2

[Only answered by those who answered "has arisen" in column 1.] **Column 3 – Did the issue take or is it taking longer than you anticipated?**	**Answer**	**Percent**
Review, permitting, or processing by the FCC?	Yes	68.9
	No	22.2
	Not answered	8.9
Review or permitting by local authorities?	Yes	53.7
	No	33.6
	Not answered	12.7
Environmental review by state or local authorities?	Yes	45.1
	No	42.7
	Not answered	12.2
Review by the Federal Aviation Administration?	Yes	36.6
	No	49.1
	Not answered	14.3
Review by the Bureau of Land Management?	Yes	52.4
	No	19.1
	Not answered	28.6
Review by the National Park Service?	Yes	57.9
	No	15.8
	Not answered	26.3
Coordination with Canadian or Mexican governments?	Yes	72.8
	No	24.7
	Not answered	2.5

Question 7: For your digital signal, will you require any changes from your existing analog tower? (Check one.)

Answer	**Percent**
Yes, will need to build a new tower for digital antenna	24.6
Yes, will need to place digital antenna on a different existing tower	9.4
Yes, will need to change the height of (and possibly reinforced) the current tower	6.1
Yes, will need only to reinforce the current tower	30.4
No, will be able to use the current tower without modifications	19.9
Haven't decided or don't know yet	8.7
Not answered	1.0

Question 8: When you begin digital broadcasting, will your digital antenna be in a temporary or permanent location? (Check one.)

Answer	Percent
Temporary	25.7
Permanent	62.3
Don't know yet	11.6
Not answered	0.4

Question 9: What do you expect to be the operating status of your digital signal when you first begin digital broadcasting? (Check one.)

Answer	Percent
Operating at full power and full coverage relative to digital license	31.2
Not operating at, but capable of, full power and full coverage relative to digital license	22.3
Not capable of full power and full coverage relative to digital license	27.7
Don't know yet	18.6
Not answered	0.2

Question 10: Which types of content do you expect to show on your digital channel within the first year of being on the air? (Check all that apply.)

Answer	Percent
Upconverted content from the analog format	83.8
Standard definition digital content (network pass-through, station produced, or other)	28.1
High definition digital content (network pass-through, station produced, or other)	34.0
Multicasts of two or more programs	7.8
Datacasting	9.4
Other ancillary or supplementary services	2.3
Don't know yet	10.7
Not answered	0.6

Note: Percentages total more than 100 percent because respondents could select more than one answer.

Question 11: Within the first year of broadcasting in digital, do you expect to produce any of your own content in digital (either standard or high definition)? (Check one.)

Answer	Percent
Yes	9.2
No	79.2
Don't know yet	11.1
Not answered	0.4

Question 12: At this time, do you plan to run any of the following promotions about digital? (Check all that apply.)

Answer	Percent
Some type of DTV or HDTV identifier at the beginning of a digital program	34.4
Advertising spots for shows that refer to their availability in high definition	16.1
Advertising spots or promotions about our DTV channel	34.5
Mention of our DTV channel in the local TV listings	33.3
Mention of our DTV channel on our Web site	40.4
Other	0.7
No, we do not plan to promote our DTV channel	5.5
Don't know yet	42.6
Not answered	0.8

Note: Percentages total more than 100 percent because respondents could select more than one answer.

Question 13: For your analog signal, please estimate the number of cable carriage agreements you have that are retransmission consent and the number that are must carry, as well as the approximate percentage of households in your viewing area covered under each type of agreement.

Responses to this question were inconsistent. We will provide analyses of the answers in our next report on the DTV transition.

Question 14: Which one of the following best describes the status of future carriage of your digital signal on cable systems (as handled by you or your parent company)? (Check one.)

Answer	Percent
Have not tried to discuss carriage with cable operators	48.6
Have tried to contact cable operators, but have not yet spoken with them about carriage	4.3
Have had discussions with cable operators, but no carriage agreements exist	38.1
Have some carriage agreements, but with contingencies for when carriage would take effect	3.3
Have some carriage agreements for our digital signal that would take effect when we go on the air	1.7
Not answered	4.1

Question 15: Have you experienced or are you expecting to experience problems in any of the following areas? (Check one for each.)

	Answer	Percent
Manpower availability (e.g., tower crews)	Yes	56.3
	No	42.0
	Not answered	1.8
Equipment availability (e.g., antennas, encoders)	Yes	47.2
	No	50.5
	Not answered	2.3
Weather (e.g., tower work during the winter)	Yes	56.5
	No	41.3
	Not answered	2.2
Signal interference	Yes	25.6
	No	72.1
	Not answered	2.3
Funding	Yes	55.4
	No	41.4
	Not answered	3.2
Coordination with other users of tower	Yes	31.8
	No	66.4
	Not answered	1.8
Lengthy reviews or permit processing	Yes	40.3
	No	57.5
	Not answered	2.2
Other	Yes	10.6
	No	88.5
	Not answered	1.0

Question 16: Have you had any problems or do you expect any problems that might keep you from meeting the deadline (May 2002 for commercial stations; May 2003 for PBS stations) for your digital station to be on the air? (Check one.)

Answer	Percent
Yes	74.1
No	24.9
Not answered	1.0

Question 17: If the FCC were to extend the deadline for your station to broadcast in digital, what would be a realistic extension? (Check one.)

Answer	Percent
No extension is needed	13.9
Three months	2.3
Six months	14.3
One year	25.3
Two years	21.2
More than two years	22.4
Not answered	0.6

Question 18: Should stations be required to show a good faith effort to meet current deadlines before being granted any extension? (Check one.)

Answer	Percent
Yes	51.7
No	34.0
No opinion	13.5
Not answered	0.8

Question 19: Assuming you had the spectrum but were never under any government deadline to transition to digital, please roughly estimate when you think you would have begun broadcasting a digital signal based on market forces such as competition, technology, and viewer demand? (Check one.)

Answer	Percent
By the end of 2002	5.2
By the end of 2006	41.0
By the end of 2010	19.7
Later than 2010	28.2
Never	3.4
Not answered	2.5

Question 20: Are there any other issues that are affecting your conversion to digital?

Answer	Percent
Provided comments	37.3
Did not provide comments	62.7

Survey Results for Public Current DTV Stations

The following results are based on 15 survey responses from public current DTV stations. Surveys were sent to 37 public current DTV stations. The response rate was 41 percent.

Question 1: When did you begin transmitting a digital signal?

Stations provided the year and month.

Question 2: What is the approximate total cost you incurred to comply with the initial requirements for digital transmission? (E.g., $3.2 million. Include expenses such as new tower, work to existing tower, transmission line, antenna, digital transmitter, consultants, licensing, digital encoders, and other capital expenditures. Do not include program production or acquisition costs.)

Average answer: $3.0 million

Note: 0 percent of respondents did not answer.

Question 3: To reduce costs, did you have any partnerships or arrangements with other stations to share tower expenses? (Check one.)

Answer	**Percent**
Yes	40.0
No	60.0
Not answered	0.0

Question 4: Which of the following were used to fund the construction of your digital station? (Check all that apply.)

Answer	Percent
Station revenues or cash reserves	60.0
Funding from station owner or parent	20.0
Raising equity capital (e.g., sale of shares)	6.7
Raising debt capital (e.g., borrowed from bank or other financier)	6.7
State government funding or assistance	60.0
NTIA grant (PTFP) or other federal funding or assistance[a]	26.7
Capital campaign or corporate or private donations[a]	33.3
Other	0.0
Not answered	0.0

Note: Percentages total more than 100 percent because respondents could select more than one answer.

[a] These answers were not printed on the survey instrument, but were coded from responses provided in the "other" answer.

Question 5: From the funding options you marked in question 4, please record the number of the option that was the primary funding mechanism used.

Answer	Percent
Station revenues or cash reserves	26.7
Funding from station owner or parent	0.0
Raising equity capital (e.g., sale of shares)	0.0
Raising debt capital (e.g., borrowed from bank or other financier)	0.0
State government funding or assistance	46.7
NTIA grant (PTFP) or other federal funding or assistance[a]	0.0
Capital campaign or corporate or private donations[a]	13.3
Other	0.0
Not answered	13.3

[a] These answers were not printed on the survey instrument, but were coded from responses provided in the "other" answer in question 4.

Question 6: What do you estimate to be your increased energy costs per month of running the digital channel, to the nearest thousand?

Average answer: $2,729 per month

Note: 7 percent of respondents did not answer.

Question 7: As you went through the process of building your digital station, did any of the following issues arise? (For each item, check yes or no in column 1. If yes, proceed to columns 2 and 3.)

Column 1 – Did issue arise?	**Answer**	**Percent**
Review, permitting, or processing by the FCC?	Yes	40.0
	No	60.0
	Not answered	0.0
Review or permitting by local authorities?	Yes	26.7
	No	73.3
	Not answered	0.0
Environmental review by state or local authorities?	Yes	26.7
	No	73.3
	Not answered	0.0
Review by the Federal Aviation Administration?	Yes	13.3
	No	86.7
	Not answered	0.0
Review by the Bureau of Land Management?	Yes	0.0
	No	100.0
	Not answered	0.0
Review by the National Park Service?	Yes	0.0
	No	100.0
	Not answered	0.0
Coordination with Canadian or Mexican governments?	Yes	26.7
	No	66.7
	Not answered	6.7

[Only answered by those who answered "yes" to column 1.] **Column 2 – Please estimate how many months the review took to complete.**	**Average Answer**	**Percent Not Answered**
Review, permitting, or processing by the FCC?	8 months	17
Review or permitting by local authorities?	4 months	50
Environmental review by state or local authorities?	12 months	50
Review by the Federal Aviation Administration?	2 months	50
Review by the Bureau of Land Management?	N/A	N/A
Review by the National Park Service?	N/A	N/A
Coordination with Canadian or Mexican governments?	5 months	50

[Only answered by those who answered "yes" to column 1.] **Column 3 – Was the number of months it took longer than you anticipated?**	**Answer**	**Percent**
Review, permitting, or processing by the FCC?	Yes	50.0
	No	50.0
	Not answered	0.0
Review or permitting by local authorities?	Yes	75.0
	No	25.0
	Not answered	0.0
Environmental review by state or local authorities?	Yes	75.0
	No	25.0
	Not answered	0.0
Review by the Federal Aviation Administration?	Yes	0.0
	No	100.0
	Not answered	0.0
Review by the Bureau of Land Management?	Yes	
	No	N/A
	Not answered	
Review by the National Park Service?	Yes	
	No	N/A
	Not answered	
Coordination with Canadian or Mexican governments?	Yes	50.0
	No	50.0
	Not answered	0.0

Question 8: For your digital signal, did you require any changes from your existing analog tower? (Check one.)

Answer	**Percent**
Yes, built a new tower for digital antenna	20.0
Yes, placed digital antenna on a different existing tower	26.7
Yes, changed the height of (and possibly reinforced) the current tower	6.7
Yes, only reinforced the current tower	33.3
No, used the current tower without modifications	13.3
Not answered	0.0

Question 9: Is your antenna for digital broadcasting in a temporary or permanent location? (Check one.)

Answer	Percent
Temporary	33.3
Permanent	66.7
Not answered	0.0

Question 10: What is the operating status of your digital signal at the present time? (Check one.)

Answer	Percent
Operating at full power and full coverage relative to digital license	73.3
Not operating at, but capable of, full power and full coverage relative to digital license	0.0
Not currently capable of full power and full coverage relative to digital license	26.7
Not answered	0.0

Question 11: How would you describe the overall interest level in digital broadcasts by consumers in your designated market area? (Check one.)

Answer	Percent
High interest	0.0
Moderate interest	20.0
Low interest	80.0
No interest	0.0
Not answered	0.0

Question 12: Which types of content are being shown on your digital channel? (Check all that apply?

Answer	Percent
Upconverted content from the analog format	33.3
Standard definition digital content (network pass-through, station produced, or other)	80.0
High definition digital content (network pass-through, station produced, or other)	80.0
Multicasts of two or more programs	73.3
Datacasting	20.0
Other ancillary or supplementary services	0.0
Not answered	0.0

Note: Percentages total more than 100 percent because respondents could select more than one answer.

Question 13: On average, how many hours per week are you doing the following? (If none, enter zero.)

	Average Answer	Percent Not Answered
Hours per week broadcasting in digital (both standard and high definition)	129 hours	0
Hours per week broadcasting just high definition	50 hours	20
Hours per week multicasting	66 hours	13

Question 14: Are you producing any of your own content in digital (either standard or high definition)? (Check one.)

Answer	Percent
Yes	66.7
No	33.3
Not answered	0.0

Question 15: Do you run any of the following promotions about digital? (Check all that apply.)

Answer	Percent
Some type of DTV or HDTV identifier at the beginning of a digital program	46.7
Advertising spots for shows that refer to their availability in high definition	13.3
Advertising spots or promotions about our DTV channel	33.3
Mention of our DTV channel in the local TV listings	26.7
Mention of our DTV channel on our Web site	100.0
Other	6.7
No, we do not promote our DTV channel	0.0
Not answered	0.0

Note: Percentages total more than 100 percent because respondents could select more than one answer.

Question 16: For your analog signal, please estimate the number of cable carriage agreements you have that are retransmission consent and the number that are must carry, as well as the approximate percentage of households in your viewing area covered under each type of agreement.

Responses to this question were inconsistent. We will provide analyses of the answers in our next report on the DTV transition.

Question 17: Which one of the following best describes the current status of carriage of your digital signal on cable systems (as handled by you or your parent company)? (Check one.)

Answer	Percent
Have not tried to discuss carriage with cable operators (Go to question 19.)	0.0
Have tried to contact cable operators, but have not yet spoken to them about carriage (Go to question 19.)	0.0
Have had discussions with cable operators, but no carriage agreements exist (Go to question 19.)	53.3
Have some carriage agreements, but with contingencies for when carriage would take effect (Go to question 19.)	20.0
Have some carriage of our digital signal by cable operators (Continue with question 18.)	26.7
Not answered	0.0

Question 18: *[Only answered if they answered "have some carriage of our digital signal by cable operators" in question 17.]* Of the households that currently receive your analog channel via cable, approximately what percentage are also receiving your digital channel via cable?

Average answer: 18 percent

Note: 0 percent of respondents did not answer.

Question 19: Did you experience problems in any of the following areas? (Check one for each.)

	Answer	Percent
Manpower availability (e.g., tower crews)	Yes	33.3
	No	66.7
	Not answered	0.0
Equipment availability (e.g., antennas, encoders)	Yes	26.7
	No	73.3
	Not answered	0.0
Weather (e.g., tower work during the winter)	Yes	20.0
	No	80.0
	Not answered	0.0
Signal interference	Yes	13.3
	No	86.7
	Not answered	0.0
Funding	Yes	73.3
	No	26.7
	Not answered	0.0
Coordination with other users of tower	Yes	20.0
	No	80.0
	Not answered	0.0
Lengthy reviews or permit processing	Yes	26.7
	No	73.3
	Not answered	0.0
Other	Yes	0.0
	No	100.0
	Not answered	0.0

Question 20: Should stations be required to show a good faith effort to meet current deadlines before being granted any extension? (Check one.)

Answer	Percent
Yes	100.0
No	0.0
No opinion	0.0
Not answered	0.0

Question 21: Assuming you had the spectrum but were never under any government deadline to transition to digital, please roughly estimate when you think you would have begun broadcasting a digital signal based on market forces such as competition, technology, and viewer demand? (Check one.)

Answer	Percent
By the end of 2002	26.7
By the end of 2006	40.0
By the end of 2010	13.3
Later than 2010	20.0
Never	0.0
Not answered	0.0

Question 22: Have you experienced any other issues during your conversion to digital?

Answer	Percent
Provided comments	53.3
Did not provide comments	46.7

Survey Results for Public Transitioning Stations

The following results are based on 159 survey responses from public transitioning stations. Surveys were sent to 335 public transitioning stations. The response rate was 47 percent.

Question 1: What is your estimated total cost of complying with the initial requirements for digital transmission? (E.g., $3.2 million. Include expenses such as new tower, work to existing tower, transmission line, antenna, digital transmitter, consultants, licensing, digital encoders, and other capital expenditures. Do not include program production or acquisition costs.)

Average answer: $2.6 million

Note: 4 percent of respondents did not answer.

Question 2: To reduce costs, do you have any partnerships or arrangements with other stations to share tower expenses? (Check one.)

Answer	**Percent**
Yes	28.3
No	62.9
This option is being considered	8.2
Don't know	0.0
Not answered	0.6

Question 3: Which of the following do you expect you will use to fund the construction of your digital station? (Check all that apply.)

Answer	Percent
Station revenues or cash reserves	39.0
Funding from station owner or parent	11.3
Raising equity capital (e.g., sale of shares)	6.3
Raising debt capital (e.g., borrowed from bank or other financier)	17.6
State government funding or assistance	88.7
Possible sale of station	6.9
NTIA grant (PTFP) or other federal funding or assistance[a]	45.9
Capital campaign or corporate or private donations[a]	28.9
Don't know yet	6.9
Other	5.7
Not answered	0.0

Note: Percentages total more than 100 percent because respondents could select more than one answer.

[a] These answers were not printed on the survey instrument, but were coded from responses provided in the "other" answer.

Question 4: From the funding options you marked in question 3, please record the number of the option that you expect to be the primary funding mechanism used.

Answer	Percent
Station revenues or cash reserves	3.1
Funding from station owner or parent	3.1
Raising equity capital (e.g., sale of shares)	2.5
Raising debt capital (e.g., borrowed from bank or other financier)	5.0
State government funding or assistance	47.8
Possible sale of station	0.0
NTIA grant (PTFP) or other federal funding or assistance[a]	11.3
Capital campaign or corporate or private donations[a]	6.9
Don't know yet	2.5
Other	2.5
Not answered	15.1

[a] These answers were not printed on the survey instrument, but were coded from responses provided in the "other" answer in question 4.

Question 5: What do you estimate to be your increased energy costs per month of running the digital channel, to the nearest thousand?

Average answer: $3,897 per month

Note: 7 percent of respondents did not answer.

Question 6: As you are going through the process of building your digital station, have any of the following issues arisen, or do you expect the issue to arise? (For each item, if you answer "has arisen" in column 1, proceed to columns 2 and 3.)

Column 1 – Has issue arisen or do you expect it to arise?	Answer	Percent
Review, permitting, or processing by the FCC?	Has arisen	53.5
	Expected	6.3
	No	39.6
	Not answered	0.6
Review or permitting by local authorities?	Has arisen	22.6
	Expected	9.4
	No	67.3
	Not answered	0.6
Environmental review by state or local authorities?	Has arisen	12.6
	Expected	10.7
	No	75.5
	Not answered	1.3
Review by the Federal Aviation Administration?	Has arisen	25.2
	Expected	7.6
	No	66.7
	Not answered	0.6
Review by the Bureau of Land Management?	Has arisen	4.4
	Expected	3.1
	No	91.2
	Not answered	1.3
Review by the National Park Service?	Has arisen	3.1
	Expected	2.5
	No	93.1
	Not answered	1.3
Coordination with Canadian or Mexican governments?	Has arisen	18.2
	Expected	2.5
	No	78.6
	Not answered	0.6

[Only answered by those who answered "has arisen" in column 1.] **Column 2 – Has the issue been resolved?**	**Answer**	**Percent**
Review, permitting, or processing by the FCC?	Yes	68.2
	No	30.6
	Not answered	1.2
Review or permitting by local authorities?	Yes	63.9
	No	33.3
	Not answered	2.8
Environmental review by state or local authorities?	Yes	85.0
	No	10.0
	Not answered	5.0
Review by the Federal Aviation Administration?	Yes	70.0
	No	17.5
	Not answered	12.5
Review by the Bureau of Land Management?	Yes	42.9
	No	57.1
	Not answered	0.0
Review by the National Park Service?	Yes	60.0
	No	40.0
	Not answered	0.0
Coordination with Canadian or Mexican governments?	Yes	55.2
	No	44.8
	Not answered	0.0

[Only answered by those who answered "has arisen" in column 1.] **Column 3 – Did the issue take or is it taking longer than you anticipated?**	**Answer**	**Percent**
Review, permitting, or processing by the FCC?	Yes	61.2
	No	34.1
	Not answered	4.7
Review or permitting by local authorities?	Yes	58.3
	No	36.1
	Not answered	5.6
Environmental review by state or local authorities?	Yes	45.0
	No	50.0
	Not answered	5.0
Review by the Federal Aviation Administration?	Yes	55.0
	No	42.5
	Not answered	2.5
Review by the Bureau of Land Management?	Yes	42.9
	No	42.9
	Not answered	14.3
Review by the National Park Service?	Yes	20.0
	No	60.0
	Not answered	20.0
Coordination with Canadian or Mexican governments?	Yes	62.1
	No	37.9
	Not answered	0.0

Question 7: For your digital signal, will you require any changes from your existing analog tower? (Check one.)

Answer	**Percent**
Yes, will need to build a new tower for digital antenna	25.2
Yes, will need to place digital antenna on a different existing tower	8.2
Yes, will need to change the height of (and possibly reinforced) the current tower	5.0
Yes, will need only to reinforce the current tower	27.0
No, will be able to use the current tower without modifications	27.0
Haven't decided or don't know yet	5.0
Not answered	2.5

Question 8: When you begin digital broadcasting, will your digital antenna be in a temporary or permanent location? (Check one.)

Answer	Percent
Temporary	10.1
Permanent	85.5
Don't know yet	4.4
Not answered	0.0

Question 9: What do you expect to be the operating status of your digital signal when you first begin digital broadcasting? (Check one.)

Answer	Percent
Operating at full power and full coverage relative to digital license	54.7
Not operating at, but capable of, full power and full coverage relative to digital license	23.3
Not capable of full power and full coverage relative to digital license	10.1
Don't know yet	12.0
Not answered	0.0

Question 10: Which types of content do you expect to show on your digital channel within the first year of being on the air? (Check all that apply.)

Answer	Percent
Upconverted content from the analog format	60.4
Standard definition digital content (network pass-through, station produced, or other)	79.9
High definition digital content (network pass-through, station produced, or other)	83.7
Multicasts of two or more programs	73.0
Datacasting	50.9
Other ancillary or supplementary services	15.7
Don't know yet	2.5
Not answered	0.0

Note: Percentages total more than 100 percent because respondents could select more than one answer.

Question 11: Within the first year of broadcasting in digital, do you expect to produce any of your own content in digital (either standard or high definition)? (Check one.)

Answer	Percent
Yes	52.8
No	31.5
Don't know yet	15.7
Not answered	0.0

Question 12: At this time, do you plan to run any of the following promotions about digital? (Check all that apply.)

Answer	Percent
Some type of DTV or HDTV identifier at the beginning of a digital program	52.8
Advertising spots for shows that refer to their availability in high definition	32.1
Advertising spots or promotions about our DTV channel	56.6
Mention of our DTV channel in the local TV listings	53.5
Mention of our DTV channel on our Web site	70.4
Other	5.7
No, we do not plan to promote our DTV channel	0.0
Don't know yet	23.9
Not answered	0.0

Note: Percentages total more than 100 percent because respondents could select more than one answer.

Question 13: For your analog signal, please estimate the number of cable carriage agreements you have that are retransmission consent and the number that are must carry, as well as the approximate percentage of households in your viewing area covered under each type of agreement.

Responses to this question were inconsistent. We will provide analyses of the answers in our next report on the DTV transition.

Question 14: Which one of the following best describes the status of future carriage of your digital signal on cable systems (as handled by you or your parent company)? (Check one.)

Answer	Percent
Have not tried to discuss carriage with cable operators	35.9
Have tried to contact cable operators, but have not yet spoken with them about carriage	5.7
Have had discussions with cable operators, but no carriage agreements exist	37.7
Have some carriage agreements, but with contingencies for when carriage would take effect	11.3
Have some carriage agreements for our digital signal that would take effect when we go on the air	8.8
Not answered	0.6

Question 15: Have you experienced or are you expecting to experience problems in any of the following areas? (Check one for each.)

	Answer	Percent
Manpower availability (e.g., tower crews)	Yes	45.9
	No	54.1
	Not answered	0.0
Equipment availability (e.g., antennas, encoders)	Yes	37.1
	No	62.9
	Not answered	0.0
Weather (e.g., tower work during the winter)	Yes	56.6
	No	43.4
	Not answered	0.0
Signal interference	Yes	20.1
	No	77.4
	Not answered	2.5
Funding	Yes	76.1
	No	23.3
	Not answered	0.6
Coordination with other users of tower	Yes	23.3
	No	76.7
	Not answered	0.0
Lengthy reviews or permit processing	Yes	30.2
	No	68.6
	Not answered	1.3
Other	Yes	6.9
	No	93.1
	Not answered	0.0

Question 16: Have you had any problems or do you expect any problems that might keep you from meeting the deadline (May 2002 for commercial stations; May 2003 for PBS stations) for your digital station to be on the air? (Check one.)

Answer	Percent
Yes	44.7
No	55.4
Not answered	0.0

Question 17: If the FCC were to extend the deadline for your station to broadcast in digital, what would be a realistic extension? (Check one.)

Answer	Percent
No extension is needed	39.0
Three months	0.0
Six months	7.6
One year	15.1
Two years	25.8
More than two years	12.6
Not answered	0.0

Question 18: Should stations be required to show a good faith effort to meet current deadlines before being granted any extension? (Check one.)

Answer	Percent
Yes	74.2
No	15.1
No opinion	10.7
Not answered	0.0

Question 19: Assuming you had the spectrum but were never under any government deadline to transition to digital, please roughly estimate when you think you would have begun broadcasting a digital signal based on market forces such as competition, technology, and viewer demand? (Check one.)

Answer	Percent
By the end of 2002	1.9
By the end of 2006	50.3
By the end of 2010	22.0
Later than 2010	21.4
Never	3.1
Not answered	1.3

Question 20: Are there any other issues that are affecting your conversion to digital?

Answer	Percent
Provided comments	32.7
Did not provide comments	67.3

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