The Transition to Digital Television: Setting a Hard Date Benefits Society

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Abstract

In the near future Congress will consider legislation setting a final date for completing the transition to digital television. By setting a definite date, Congress will speed the delivery of important economic benefits that include: 1) improved television programming, 2) an expansion of wireless technologies for broadband access and mobile applications, 3) improved communication for public safety officials, and 4) significant federal revenues from spectrum auctions.

In addition to the hard date, at least two other matters are likely to be considered. The most important involves the best way to subsidize individuals with old televisions purchase the equipment they will need to receive digital signals after the transition. Congress may also consider changing the legal obligations on cable and satellite companies to carry broadcast signals over their networks..

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The Transition to Digital Television:

Setting a Hard Date Benefits Society

In the near future, Congress is likely to set a definite date for the transition from analog to digital television. This transition began in the late 1990s when Congress authorized the Federal Communications Commission (FCC) to temporarily give television broadcasters a free second block of spectrum so they could begin sending digital signals simultaneously with their analog signals. The upcoming legislation provides Congress with its best opportunity to reevaluate how to complete the transition. This paper examines: 1) the benefits of making the transition, 2) the issue of providing subsidies to viewers impacted by the transition, 3) whether legislation should also adjust the transmission requirements imposed on cable and satellite broadcasters, and 4) whether current law is likely to result in the best use of all spectrum available even after the transition.

Before they received the second block of spectrum frequency broadcasters promised to use it to deliver a range of valuable programming to viewers, including high definition television (HDTV). Now that they possess frequency for both analog and digital television, broadcasters complain that it is not profitable for them to produce additional digital programming when few homes have the equipment needed to view it. Yet viewers have little incentive to purchase new equipment until there is additional programming. And equipment manufacturers will not make sets that no one wants to buy. Congress should consider setting a firm deadline in order to create a certain timetable that all sides can plan for. After the deadline, broadcasters will be required to give spectrum back to the government and broadcast only a digital signal.

The Benefits of Converting to Digital Broadcasting

Any transition entails costs. Broadcasting a digital signal requires additional equipment. More importantly, digital signals cannot be viewed on traditional televisions. The FCC is already requiring television manufacturers to include digital tuners in new televisions and interface devices by July 1, 2007. However, older televisions will need an external converter in order to work. Subscribers to cable or satellite service are unlikely to have a problem because the conversion will be handled by their service provider. But viewers that want to continue receiving free over-the-air signals on their old analog television will need converters. Industry observers expect these converters to cost $50 each by the time viewers need them.

Given these costs, and the possibility that voters will be upset once they can no longer receive their traditional signals, it is legitimate to ask whether the transition is worthwhile. The answer is yes. Even if we were not already midway through the transition, the benefits of going digital far exceed the costs. Moreover, these benefits are spread widely throughout society so that few, if any groups, lose on a net basis. Finally, most of the benefits go directly to consumers in the form of better and more varied services at lower prices. Although the benefits going to consumers are the most difficult to quantify, they are by far the largest. The total benefits fall into four categories.

Digital Television Services

The first benefit is the improved programming that a digital signal allows. With digitization, the electrical pulses making up a transmission are translated into ones and zeros before being converted to radio waves. This allows more information to be included in a given amount of radio spectrum. It is not clear how broadcasters will use this capability, but it is certain that viewers will enjoy more choices and improved quality. One possibility is to use most of the original channel to broadcast HDTV, a dramatically sharper picture that requires special sets to take full advantage of. Another possibility is to transmit several channels using the same amount of spectrum previously needed for one analog station. With a converter, even analog televisions will be able to display these new channels. This expands the programming choices available to the viewer. With good over-the-air reception, each channel should also be noticeably clearer than the old analog signal, even on analog televisions. A third option involves using some of the spectrum to include data in the transmission. For example, viewers might be able to look up a batter's statistics while they are watching a baseball game. With appropriate equipment, they could also order special programming on demand. The exact mixture of services will depend on the balance between consumer demand and broadcasting costs. Even if some viewers have to purchase converters, the one-time cost of $50 is likely to be outweighed by the benefit of increased programming choice and better reception, which will last for the duration of their television.

Proceeds from the Sale of Spectrum

Once the transition is complete, broadcasters will return some of the spectrum on which they have been broadcasting analog signals for over 50 years. Under current plans, much of this spectrum will be auctioned to the private sector, producing revenues to the federal government. The exact amount of revenue will depend upon the amount of spectrum sold and the conditions of the sale. Current plans call for auctioning an additional 60 megahertz of spectrum. One paper estimated the proceeds from this sale at $17 billion to $21 billion.[1] An industry member estimated the proceeds could be as high as $30 billion.[2] Since spectrum is public property, it is fitting that the public be rewarded when it is sold or leased for private use.

Public Safety Spectrum

In 1996, five years to the day before the attacks on New York and Washington D.C., the Public Safety Wireless Advisory Committee reported that: "currently allocated Public Safety spectrum is insufficient to meet current voice and data needs, will not permit deployment of needed advanced data and video systems, does not provide adequate interoperability channels, and will not meet future needs under projected population growth and demographic changes."[3] The Committee recommended allocating approximately 25 additional megahertz to public safety within the next five years.[4] After the attacks the 9/11 Commission documented the problems that first responders from different agencies and jurisdictions had communicating with each other during their

[1] Coleman Bazelon, *Analysis of an Accelerated Digital Television Transition,* Analysis Group, Washington D.C. May 31, 2005, pp. 8-10.
[2] Testimony of Charles Townsend, President & CEO of Aloha Partners, *Hearings on the Digital Television Transition*, U.S. Senate Committee on Commerce, Science, and Transportation, July 12, 2005.
[3] Public Safety Wireless Advisory Committee, Final Report, September 11, 1996, Volume I, p. 19.
[4] *Id.* p. 3. The Committee found that as much as 70 megahertz might be needed over the next 15 years.

response. Its report recommended legislation expediting and increasing the assignment of spectrum for public safety purposes.[5]

Under current law, 24 megahertz of the returned spectrum will be devoted to public safety uses, but it will only be available after the conversion is completed. The increased spectrum will enable public safety officials to build common communication systems so that officials at the scene can exchange information and tap into existing databases in order to increase the efficiency of their response. The final capabilities of such a system are still in the planning stages and will require further government funding, but better communication systems should result in saved lives and reduced property damage.

The Use of Auctioned Spectrum

By far the largest economic gains will be associated with the use of the spectrum freed up by using digital signals. In addition to the 60 megahertz that will be auctioned, an additional 24 megahertz that is already in private hands will increase in value because it will no longer be encumbered by interference from the surrounding broadcast spectrum that will be returned. Again, since the spectrum is not yet usable, companies have had little incentive to invest in new products and services. But there are good reasons to think that the new uses of this spectrum will bring great benefits. Spectrum in the 700 megahertz band has several attractive properties. It can go through walls and other obstacles, making it easier for users to receive a distant signal in their homes. It can also carry much further, dramatically lowering the cost of providing wireless broadband to a given area.

Based on the rapid growth of telecommunications capability, it is likely that the uses will dramatically expand the choices available to consumers and lead to reductions in the price of services they already receive. One of the most important possibilities involves WiMax, the delivery of broadband internet service through radio spectrum. WiMax could become a viable alternative to DSL and cable, especially in rural areas where the cost of extending physical lines remains high. Another possibility is a dramatic increase in mobile IP-enabled technology like telephone and internet service.

Other spectrum could be reserved for unlicensed use. Unlicensed spectrum would not be auctioned for exclusive use by particular service providers, but would instead be made available for anyone to use with devices designed to operate on the unlicensed spectrum. Reserving spectrum for unlicensed use would thus reduce the auction revenues. Any auction of public spectrum raises important policy questions regarding how to maximize social value. Should the spectrum be leased or sold outright? Should it be licensed to one user in each geographic area or unlicensed for use by all? To what extent should unlicensed use be allowed? The desire to maximize auction proceeds should not stand in the way of maximizing the social welfare attached to the spectrum's eventual use. The total value of consumer benefit to be created from this spectrum is extremely speculative, but one estimate is between $200 billion and $432 billion.[6]

Since broadcasters currently occupy this second slice of spectrum, none of these benefits can be fully realized until the digital transition is complete. Although the transition has entailed additional costs for broadcasters, going digital gives them substantial new areas for revenue

[5] *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks Upon the United States*, p. 397.
[6] Coleman Bazelon, *Analysis of an Accelerated Digital Television Transition,* Analysis Group, Washington D.C. May 31, 2005, p. 10.

growth by adding additional channels and higher-valued services. Congress has already subsidized this transition by temporarily allowing broadcasters to use an additional slice of the public spectrum for free. In order for other parts of society to share in these benefits, the transition needs to be completed. This is best done by setting a definite date so that government, broadcasters, providers of cable and satellite service, equipment manufacturers, and consumers can all plan appropriately.

Should Congress Provide a Subsidy?

Many people have called for a subsidy to ensure that all individuals with analog televisions continue to receive an over-the-air signal after the conversion. In order to do this they will need to buy an external converter. Advocates of a subsidy favor using some of the proceeds from the sale of the public spectrum to purchase converters for at least some of the viewers affected.

One possible reason for providing a subsidy is that some consumers might not be able to afford the $50 per set that converters are expected to cost. It is difficult to say whether many homes truly cannot bear this relatively small one-time cost in order to convert at least one television in their household, especially when the benefits in terms of better reception and more channels are significant. A CBO study reported that 48 percent of households with incomes under $10,000 subscribe to cable television, which entails a monthly fee about equal to the cost of a converter.[7]

A second possible rationale is the fear that voters will be upset once they discover that their televisions no longer receive a free broadcast. Aside from the fact that $50 is less than the cost of a new pair of basketball shoes, there are reasons to think that this fear is overblown.

First, with a good public education campaign, viewers should have plenty of time to prepare for an event that is still over three years away. Many individuals may want to purchase a converter well before the date of final conversion, assuming they are readily available. In exchange, the viewer would usually get better over-the-air reception on existing channels and would also get additional channels that are now only broadcast with a digital signal. These viewers are unlikely to be either surprised or upset at the final conversion.

Second, it is probable that a great many of the analog sets now in existence are: 1) not being used, 2) used so seldom that the owner would not find it worthwhile to bother obtaining a converter, especially if a small co-payment was required, or 3) used for other purposes such as video games, DVDs, or viewing recorded programming, which would be unaffected by the end of analog broadcasts.

Third, there have been previous instances in which technology shifts have stranded owners of electronic equipment. In previous decades, owners of Beta video players and 8-track tape players discovered that they could no longer purchase content for their machines because manufacturers of content had switched to alternative formats. Over the past decade, owners of phonograph record and cassette collections have found it difficult to purchase the equipment needed to listen to them. In none of these cases was there public pressure for either the industry or Congress to preserve the worth of past purchases. Since individuals will have plenty of time to plan prior to the transition, the prospect of a strongly negative reaction seems remote. Although in this case

[7] *Completing the Transition to Digital Television*, Congressional Budget Office, Washington D.C., September 1999, p. 40.

the government is directly involved in speeding up the transition, its actions are clearly increasing social welfare.

In fact, most viewers are unlikely to notice a difference. A recent study estimated that by this year over 90 percent of households will subscribe to either cable or satellite service.[8] These service providers are likely to find it in their interest to ensure that subscribers with analog sets experience little or no inconvenience. These providers will probably handle the conversion themselves, either by converting the signal to analog at their main transmission site or by incorporating a conversion feature into the set-top box they already give customers.

Although subsidy programs are easy to imagine, they are very difficult and costly to implement. Any subsidy plan raises important equity issues. First, it discriminates against viewers who make the transition early. The FCC has already mandated a schedule for incorporating digital tuners into new televisions sold in the U.S. As of July 1, 2005, all televisions with screens larger than 36 inches and 50 percent of receivers with screen sizes between 25 and 35 inches that are offered for sale must have an internal tuner. This mandate will significantly increase the price of smaller screens when it is applied to them. Consumers who purchase these televisions will pay the higher price themselves. Thus, by the time of the final transition, many viewers will have already incurred the necessary costs. None of the subsidy proposals would reimburse them. Since most of these televisions will be linked to cable or television service, the cost of the internal converter will be wasted since the service provider will already have converted the digital signal. As a result, the majority of internal tuners that the FCC is requiring consumers to purchase will never be used. It is very possible that the cost to consumers of having to buy internal converters they will never use exceeds the benefits of the proposed subsidy to reimburse the minority of viewers who will need converters.

Second, between 80 and 90 percent of all viewers subscribe to cable or satellite service. One way or another, they will be able to receive an analog signal from their provider. Since they do not currently view over-the-air programming, most subsidy proposals would exclude them. This dramatically reduces the cost of any subsidy but it leaves the viewers captive to their current service. Whether service providers accomplish conversion at their central facilities or through proprietary set-top boxes, any viewer that cancels service would be unable to view over-the-air signals without an external converter.

Any subsidy should try to reach appropriately targeted beneficiaries in an efficient manner. When designing a program, Congress will have to face a number of choices. A first question is whether any subsidy should attempt to cover all televisions or only one per household. Paying to convert every analog television would be much more expensive. Even so, it would do nothing for individuals who had already decided to go ahead and purchase a digital converter or television (although no current subsidy proposal would compensate these early adapters). Second, the program would have a difficult time distinguishing televisions that were in use from those that are seldom, if ever, used. The resale value of many of these televisions is a fraction of the likely cost of the converter. Lastly, if the purpose is to maintain the over-the-air ability of every analog television, it is not clear why televisions that are currently hooked to cable or satellite should not qualify. But this would dramatically raise the cost of any program, with little corresponding benefit.

[8] Thomas W. Hazlett, *The U.S. Digital TV Transition: Time to Toss the Negroponte Switch.*, AEI-Brookings Joint Center for Regulatory Studies, Washington D.C., Working Paper 01-15, November 2001, p. 9.

A different approach would be to compensate over-the-air viewers for the cost of continuing to view television. Viewers may accomplish this goal in one of three ways; 1) purchasing a new television with a built-in digital receiver, 2) subscribing to a cable or satellite service, or 3) buying an external converter. One proposal would compensate all viewers, regardless of income, but only if they chose the third option. The problem is that for households who value TV highly, the first two options are likely to be the most popular.

Another proposal would aim subsidies only at those individuals who might have difficulty affording the cost of conversion. For low-income viewers the first two options discussed above are likely to be more costly, and therefore less preferred. Hence, it makes sense to aim a subsidy only at the cost of an external converter. However, many of these households already pay for cable or satellite. Under most proposals, they would not qualify for a subsidy, even on any televisions that are not connected to the service. This is true even though their willingness to pay a monthly fee indicates that they place the most value on television programming. Correspondingly, many of those that do receive the subsidy may place little value on it since they seldom watch television. Means-testing a subsidy would also dramatically increase the administrative cost of running the program.

Any subsidy scheme is likely to have a very high cost-to-benefit ratio. Attempting to limit the subsidy to over-the-air viewers who cannot afford a converter may not substantially improve this ratio because of the higher administrative costs involved. Yet programs that are more broadly targeted will almost surely end up purchasing converters for some televisions that are rarely, if ever, used. Difficult questions regarding the identification of viewers and the delivery of the subsidy also stand in the way of a successful policy.

The Transmission Issue

Some industries want Congress to use this legislation to revisit some of the requirements associated with program transmission. It should resist these efforts. According to many experts, Congress should not attempt to dictate the outcome of competition between different players in the programming and transmission industries. Nor should it interfere in the negotiations between program producers and transmission companies over content. To the extent that current law imposes requirements on one party or another, the FCC is in the best position to make adjustments as conditions change.

Most observers agree that viewers should ultimately decide what programming survives market competition. But this does not fully solve the issue. The cable, satellite, and broadcasting industries all have limited transmission capability. They therefore must make a preliminary decision about what shows to offer the viewer. Programmers fear that the transmission companies will use this power to prevent them from reaching viewers. The high probability that popular shows like *The Tonight Show* will reach viewers in both an analog and digital format might not extend to producers of new, more innovative programming, or of programming that only appeals to a small audience. But given the finite capacity of transmission capability, society must rely on continued competition between programming channels on the one hand and cable, satellite, and ultimately wireless and fiber on the other, to ensure that the industry continues to place a high priority on presenting viewers with high-quality programming.

Placing too much emphasis on traditional broadcasting could inhibit the development of next generation technology. Although free over-the-air television was the historic practice, viewers do

not have an absolute right to view content free from any source. For example, one of the most popular television series of recent years has been *The Sopranos*. In order to view episodes of this show, viewers must not only subscribe to a cable or satellite service that carries the producer of the show, Home Box Office, they must also pay a separate fee for premium service. No one would claim that the producers of the show have a duty to allow ABC to broadcast the show over the airways so that everyone can view it free. Nor would they claim that viewers in rural areas have a right to free transmission if cable or satellite is not available. What then, is different about the current ABC hit *Desperate Housewives* other than the fact that its producer is a traditional broadcaster? Yet current law values free access for one but not the other.

Similarly, if an independent producer, a cable company, and a television station all want to produce a digital weather station the government should hesitate before determining whether any one station is carried on any one transmission route. Yet broadcasters would have Congress mandate that if they use the extra spectrum made available by digitization to create a new weather channel, cable companies must carry it. This would effectively shut out the independent producer and dissuade the cable company from producing its own show.

There are a number of arguments against altering current FCC requirements. Under current must-carry requirements, cable companies will have to carry the main digital signal offered by local broadcasters. This signal might be in either standard or high-definition format. This requirement maintains cable viewers' traditional access to the main programming of each broadcaster in its original format. Although digitization allows broadcasters to transmit several channels in addition to its historic one on the spectrum formally reserved for the analog signal, there is no reason why Congress should favor these extra channels. If they offer good content, cable and satellite companies will pay to carry them. In addition, viewers with either digital televisions or converters can still receive them free over the air. Forcing cable companies to carry these extra channels would also defeat some of the purpose of the digital conversion by making it less likely that broadcasters will send a single high-definition signal rather than many signals of lesser quality.

At the same time, there is little reason to excuse cable companies from having to transmit digital signals intact. Cable companies would like to convert the digital signal into analog and then transmit it to their viewers, dramatically simplifying the problem of conversion. Although this would save cable customers from needing an external converter it would retard the move toward digital. Viewers might receive far less digital programming. This down-conversion would also remove the pressure to integrate converters into the set-top boxes that are part of the service viewers pay for. If cable companies find it easier to convert the signal at the head-end rather than in a set-top box, they should be allowed to, even though such a move would force their analog viewers to purchase an external converter if they ever wanted to receive over-the-air signals. But this ability should not excuse them from also having to carry the digital signal that current law requires. Again, a change from current requirements would partially defeat the purpose of conversion.

Is Congress Maximizing the Social Value of the Spectrum?

Even after the transition, a large amount of radio spectrum will remain reserved for over-the-air broadcasting, albeit for digital signals. It is not at all clear that this represents the best use for this spectrum. Legislation to mandate the transition would give Congress a chance to reconsider its earlier decision to give this spectrum to broadcasters. However, Congress has already gone quite

far down the current path and, with prompting by the FCC, broadcasters have made significant investments in digital transmission capability. Therefore, any decision to change the allocation of spectrum would require some form of compensation to broadcasters.

The transition to digital television brings enormous benefits including between $200 billion and $432 billion in consumer benefits. But one has to distinguish between the provision of digital programming on the one hand, and the use of spectrum for over-the-air broadcasting of television signals on the other. Put another way, given that most viewers subscribe to cable or satellite service, is the spectrum that will remain in broadcasters' hands more valuable if it is reserved for digital television or if it is opened up to the transmission of digital information of all kinds, especially when broadcasters use only a fraction of the spectrum available in any market in order to minimize interference? The delivery of digital television services such as HDTV requires changes in the way a program is recorded and in the equipment used to view it. But the digitized signals do not necessarily have to be delivered over-the-air. They may instead arrive by cable, satellite, wireless, fiber or even power lines. It is not at all clear that traditional over-the-air transmission is the optimal delivery method. Indeed, it is becoming increasingly clear that radio spectrum has much more valuable uses.

Television transmission has changed in two important ways over the past decades. When the federal government first gave significant amounts of radio frequency to television broadcasters, producers had no other viable means for reaching a large audience and the spectrum had few alternative uses. The growth of cable and then satellite television distribution gave programmers another route into the vast majority of homes. Indeed, many producers such as HBO now rely solely on subscription television to reach viewers. In the future wireless broadband, fiber, and power lines may offer additional transmission routes. At roughly the same time, advances in information and communications technology have created a growing demand for spectrum in order to provide consumers with products like mobile telephones, short messaging services, and broadband internet access over the air.

Given these changes, three things are increasingly clear. First, radio spectrum can be used for the delivery of a range of services that combine data, voice, and visual messages in a variety of forms, determined by what consumers find most valuable. Second, television programming is just one of many forms of digital data and, over the long-term, whether it reaches the household via radio waves, cable, satellite or some other means is best left to the market. Third, reserving significant amounts of radio spectrum solely for television transmission to reach a small minority of the total television audience makes little sense, especially when the market attaches a higher value to other uses.

Current policy continues to reflect a bias toward over-the-air broadcasting. Such a preference may reflect past necessity rather than future need. Put simply, should we care whether over-the-air transmission survives, especially since the proportion of people relying on it is likely to decline further in the future? There are several possible reasons, but few are compelling when measured against the enormous benefits that radio spectrum might have in other uses. First, broadcasters have an enormous financial stake in over-the-air broadcasting. Not only does it provide part of the audience for their programming, it also gives them access, through must-carry and all-or-none rules, to cable and satellite viewers, who constitute 80-90 percent of their audience. The loss of over-the-air transmission would relegate them to the status of content producers negotiating for access to viewers. But other industries have had to suffer losses as a result of social and technological changes. Given competition for viewer loyalty, there is little reason to think that good programming would be unable to reach homes. Alternatively, current stations could be allowed to retain their must-carry rights even if they cease broadcasting.

To the extent that compensation is warranted because Congress is inflicting the losses, broadcasters could be allowed to retain at least some of the spectrum with the understanding that they could sell if for whatever use the market values most highly. In fact Congress and the FCC can produce great social benefits even without taking spectrum away from broadcasters. Since broadcasters only use a minority of the available spectrum in any market, Congress can direct the FCC to complete its current rulemaking to allow unlicensed use of the unused spectrum, provided that these uses do not interfere with broadcasters' signals.

A second concern is that broadcasters fulfill important public safety needs, including local programming and emergency broadcasting. Technology is increasingly offering public officials other methods of communicating with the public. Cable and satellite companies already transmit the local stations. And even when cable service is unavailable, there is always radio for emergency signals. Many jurisdictions increasingly rely on email and text messaging to notify residents of an emergency. The point is that broadcast services are no longer as critical as they once were and their importance is likely to further diminish over time as new forms of wireless communication come onto the market. Cable and satellite providers are likely to offer substantial local programming, whether it is produced by traditional stations or others.

Finally, there is the fear of stranding people who are currently getting something for free. But are they? Most viewers pay for cable or satellite service. Even over-the-air viewers must first purchase a TV in order to see programming. Moreover, technology has stranded consumers before and the markets have accepted it. All viewers will increasingly have the option to purchase content through other channels. Where income is not an issue, the decision of whether to pay for television should be seen as a personal choice that does not involve public policy. In those cases where income does constrain the viewer's choice, the issue is really much broader. It involves access not just to television programming, but, increasingly, to the broad array of internet, telephone, entertainment, and data services that will be made available to customers. Congress is most likely to help these individuals by freeing up as much spectrum as possible for the delivery of these services, promoting vigorous competition to increase choice and reduce prices, and by supporting broad policies designed to increase the effective income of the working poor. If a telecommunications subsidy is needed, it should look toward providing access to the services of the future rather than preserving access to the technology of the past.

Conclusion

Converting to digital signals will produce enormous benefits for the United States because it frees up radio frequency that can now be put to more valuable uses. Some of the benefits of this transition will take the form of increased federal revenues, better public safety, and improved television reception for over-the-air viewers. Most benefits, however, will accrue to consumers in the form of new services such as high-definition television, interactive TV, and wireless broadband internet service and as lower prices on existing ones such as wireless phone service. In order to complete the transition to digital, Congress needs to set a hard date for the end of analog broadcasting.

This legislation may also lead Congress to address other issues. The most important is whether the government should subsidize the cost of ensuring that analog televisions can receive a digital signal. Only a small minority of viewers rely on over-the-air reception. Those that do not are likely to have their conversion issues handled for them by the cable or satellite provider, at least

for those televisions hooked up to the service. Any subsidy problem is likely to suffer from serious problems of efficiency and fairness. But political pressures may require Congress to include a subsidy program. If it does, the program should be broadly targeted and require a small co-payment to ensure that the government only pays for converters that are likely to be used.

There is much less need to change the current requirements governing the respective obligations between broadcasters and cable or satellite companies. These obligations are best left to the FCC, which reviews them regularly. Whatever the FCC decides, it will be in the interest of cable and satellite companies to ensure that their customers with analog televisions continue to receive a signal.

Finally, any legislation passed this year will leave open serious questions about the future of broadcast television and the optimal use of the radio spectrum still licensed to TV and radio broadcasters. With continued growth of cable, satellite and broadband service, fewer individuals will rely on over-the-air transmission to receive a signal. At the same time, technological advances will create other, more valuable uses for the spectrum. There is a growing consensus that Congress needs to revisit the broad structure of current telecommunications law in order to encourage the development of future technologies and maximize the value of the public spectrum.

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