

**COMPLETING THE
DIGITAL TELEVISION TRANSITION**

HEARING
BEFORE THE
**COMMITTEE ON COMMERCE,
SCIENCE, AND TRANSPORTATION**
UNITED STATES SENATE
ONE HUNDRED EIGHTH CONGRESS
SECOND SESSION

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JUNE 9, 2004
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ONE HUNDRED EIGHTH CONGRESS

SECOND SESSION

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COMPLETING THE DIGITAL TELEVISION TRANSITION

WEDNESDAY, JUNE 9, 2004

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The Committee met, pursuant to notice, at 9:30 a.m., in SR-253, Russell Senate Office Building, Hon. John McCain, Chairman of the Committee, presiding.

OPENING STATEMENT OF HON. JOHN MCCAIN, U.S. SENATOR FROM ARIZONA

The CHAIRMAN. Good morning. Today the Committee examines various policy proposals designed to hasten the completion of the transition to digital television. The end of this transition will mark the beginning of a new age in wireless communications. The liberation of this spectrum will unleash a multitude of new commercial wireless services and new opportunities for enhancing public safety.

By facilitating more broadband deployment and competition, freeing the spectrum would enable us to rely more heavily on the market rather than the government to regulate telecommunications. Moreover transmissions at the spectrum's frequency range pass easily and could start the deployment of more affordable broadband in rural areas.

This point was underscored by former FCC Chairman Reed Hunt, who told the Committee earlier this year as we are now entering the decade of wireless broadband and called the broadcasters analog spectrum ideal for deploying these services. Mr. Hunt said "the transformation of the use of that spectrum means for the economy literally hundreds of billions of dollars of extra growth and hundreds of thousands, if not ultimately, millions of new jobs provided it were done quickly."

We must recognize, however, that there are still many households that rely on over-the-air television signals. Let me be clear that any proposal to accelerate the digital television transition is incomplete unless it ensures that consumers may continue to use their existing television sets to view over-the-air broadcast signals. We must not leave these consumers out in the digital cold.

The good news is that the benefits from more efficient use of this spectrum should dwarf the cost of ensuring that these consumers can continue to use their old televisions. The proceeds received from auctioning even a small portion of the spectrum should easily cover this cost.

In an April hearing, an entire panel of telecommunications experts from conservative to liberal agreed that such an approach makes perfect sense. Let's not forget another important beneficiary of liberation of this spectrum, public safety. The government has committed a significant portion of this spectrum to public safety organizations. We need this important asset to facilitate interoperable communications systems between Federal and state organizations, and between multiple jurisdictions.

It's clear to me that now is the time for Congress to act to expedite the completion of this transition, and it appears that I'm not alone. Last week, House Energy and Commerce Chairman Barton questioned why the transition should not be completed by 2006, in order to retrieve this valuable spectrum for other consumer and public safety uses. I look forward to working with Chairman Barton on this issue.

Finally, I note that I have repeatedly criticized the broadcasters during this transition for failing to meet their commitments to broadcast digital signals. Although many were inexcusably late in meeting their obligations, I recognized that the vast majority of broadcasters are now doing so. Commercial broadcasters are critical stakeholders who deserve a voice in this discussion, so we invited the National Association of Broadcasters and the networks to offer a broadcast executive to testify today. Unfortunately, they chose not to accept. I encourage them to participate in this process in the future.

I thank the witnesses for being here and before the panelists begin, I ask Senator Ensign if he has any opening remarks?

Senator ENSIGN. No.

The CHAIRMAN. We are pleased to have with us a Member of Congress, Congresswoman Harman, a Representative from California who has been heavily involved in this issue, particularly in the aspect of public safety. We welcome you. Thank you for taking the time to be over here today, Congresswoman Harman.

**STATEMENT OF HON. JANE HARMAN,
U.S. CONGRESSWOMAN FROM CALIFORNIA**

Ms. HARMAN. Thank you, Mr. Chairman, and thank you, former colleague, Senator Ensign and hello, Senator Lautenberg. It is a privilege to appear before your committee and it was a privilege to be one of 30,000 people in the audience at the University of Southern California a couple of weeks ago when you gave a commencement address on courage.

My son was one of the graduates in that audience, and I'm very proud of him. Voted entrepreneur of the year at the USC School of Business, but I'm going to exhibit some courage.

The CHAIRMAN. I'd like to congratulate your son for his graduation from an outstanding institution, which my wife graduated from as well.

Ms. HARMAN. That makes it even better. People testifying today will have different priorities and different reasons to support spectrum reclaim. I'd like to take a few minutes of the Committee's time to talk about the priorities of America's hometowns, and the critical importance of interoperable communications to their first responders, an issue that you and I have discussed before, Mr.

Chairman. And an issue that you just mentioned in your opening remarks in which you echoed the comments of House Commerce Committee Chairman Joe Barton about the need for a firm deadline, hopefully the deadline of 2006 which Congress promised in legislation in 1997.

Interoperability is more than a public safety issue. It's a national security issue. And to our first responders, it can be the issue of life or death. As I mentioned in 1997, Congress made a promise to the American people to allocate dedicated radio spectrum to first responders. Seven years later, we have not made good on our commitment.

Why have we broken our promise? Because a handful of broadcasters refuse to compromise on the issue. Thousands of lives are potentially at stake. We all know the tragic stories of firefighters who died in the World Trade Center on 9/11 because NYPD helicopters circling overhead could not radio them that the towers were glowing and beginning to collapse.

At the Pentagon on that same dark day, first responders from surrounding counties who converged on the scene were forced to use runners to convey messages as their communications equipment was not compatible and the same was true last year during California's devastating wildfires. Unbelievably, in such unimaginably critical and complex situations, our first responders were reduced to Roman era technology, runners, to do their jobs.

Because of broadcaster intransigence, some 5 percent of the TV stations operating in the U.S. are holding the rest of America hostage by refusing to move their channels off the spectrum promised to first responders.

Specifically, out of 1500 TV stations operating in this country today, 75 analog and digital stations operating on channels 62 through 65 and 67 through 69 are causing the blockage of much-needed spectrum for public safety purposes. An estimated 54 percent of the Nation's population lives in areas where public safety officials have no access, repeat, no access to the 700 megahertz spectrum.

Think of it this way. Imagine if terrorists flew into the Bank One Center in Phoenix tomorrow, and local firefighters could not communicate with their colleagues on the ground or flying overhead. What would we tell the families of those lost in such a tragedy? Would we talk about the technicalities of the spectrum and the loophole left open for the broadcasters in 1997?

As someone who has been a strong supporter of the broadcasters on many occasions in the past, I must respectfully say that on this issue, they are dead wrong. More than once, I have attempted to work out a compromise with them and all efforts have been fruitless. Instead of addressing this issue head on, we are allowing 5 percent of the TV stations to prevent over half the American people from receiving any benefits of improved public safety communications in the 700 megahertz band.

All of us, including the broadcasters, have mothers, fathers, sons, daughters and siblings living and working in areas where there is no spectrum access for emergency purposes. Mr. Chairman and the Committee, we owe it to the American people to do the right thing. The first responders are counting on us to keep our promise. That

is why it is imperative that Congress act quickly to enforce a hard and fast deadline for turning the spectrum over to first responders.

A deadline of December 31, 2006, without any loopholes is entirely appropriate, and I believe it is still feasible. Key elements for first responders to begin using this spectrum are in place. The spectrum is allocated. States have already received licenses to use the 700 megahertz band and local jurisdictions are engaged in regional planning to get a license.

However, the investment to use the spectrum by public safety agencies cannot commence unless there is a tangible date when the spectrum can be used. Essentially, the first responders are waiting on us, the Congress, to keep our promise. And I think they have waited long enough.

Legislation that I have introduced in the House with my colleague, Curt Weldon, called the Homeland Emergency Response Operations Act, HERO, H.R. 1425, would hold the FCC to a December 31, 2006 deadline and eliminate any linkage to digital TV rollout to that deadline.

The HERO Act is supported by absolutely everyone in the law enforcement and public safety business, including for example L.A. County Sheriff Lee Baca who I know, Mr. Chairman, is a good friend of yours and mine. It has been endorsed by the International Association of Chiefs of Police, the International Association of Fire Chiefs, the National Sheriff's Association, the National Association of Counties, the National Emergency Management Association, as well as the National Governors' Association and League of Cities. It has the Good Housekeeping Seal of Approval.

But even with such stellar support, the Act introduced by us 2 years ago has made no progress but for one hearing on the House side, and for this hearing today. Mr. Chairman and members, I ask you to join me in moving forward on this important issue in the name of the victims of 9/11 and for the protection of the survivors. Thank you very much.

The CHAIRMAN. Thank you, Congresswoman Harman. I have two quick questions for you. One, why do you feel that the broadcasters have been so intransigent on this issue? And number two is, as you know, I mentioned in my opening statement those people who still receive over-the-air television, one of the ideas that's been floated around is just purchase for them a set-top box.

Ms. HARMAN. Well, on the first point, I think the broadcasters have been intransigent because they somehow feel they deserve compensation if they are removed. I have checked on this, and I understand that the cost of their original licenses was zero. They have made millions and millions of dollars in profit on the use of those licenses.

And it would seem to me that as an obvious condition of a public license, they ought to put public safety first, it would protect their own families, as well as themselves. I just think they are being shortsighted.

On the second issue, the use of the set-top box, there is another set of folks who then get mad if we go there, but I am for whatever it takes to close this loophole absolutely as of December 31. And I really think that after all this country has been through, putting the country first is the least we can ask.

The CHAIRMAN. Well, I thank you for your outstanding work on this issue. I know that you have other obligations this morning and I thank you for being here and again congratulations on your son's successful graduation.

Ms. HARMAN. Thank you very much, Mr. Chairman.

The CHAIRMAN. Senator Lautenberg, would you like to make an opening comment?

**STATEMENT OF HON. FRANK R. LAUTENBERG,
U.S. SENATOR FROM NEW JERSEY**

Senator LAUTENBERG. Just to say I truly appreciate Congresswoman Harman's insights here. I think we have to get moving here. We have complaints, Mr. Chairman, within a couple of counties in New Jersey about the interference that's presented by the status quo. And we have to get on with it. And I thank you for a good job.

Ms. HARMAN. Thank you, Senator. It's good to have you back.

The CHAIRMAN. Senator Ensign?

Senator ENSIGN. No.

The CHAIRMAN. Our next panel is Mr. Kenneth Ferree, Chief, Media Bureau, Federal Communications Commission. Please come forward, sir. This whole panel is Mr. Ken Ferree, Chief, Media Bureau; Mr. John Lawson, President and Chief Executive Officer, the Association of Public Television Stations, Mr. Michael Calabrese, who is the Vice President and Director of Spectrum Policy Program, The New America Foundation; Mr. Patrick Gelsinger, Chief Technology Officer and Senior Vice President, Intel; and Dr. Thomas Hazlett—is that the proper pronunciation—Hazlett, The Manhattan Institute. He is a Senior Fellow for the Center for a Digital Economy.

Mr. Ferree, we begin with you. Thank you.

Senator LAUTENBERG. Mr. Chairman, one second. One is to compliment you for holding this hearing. It's very important to me. Please permit me to enter my statement in the record because I do have to go elsewhere.

The CHAIRMAN. Thank you very much, Senator Lautenberg. Without objection.

[The prepared statement of Senator Lautenberg follows:]

PREPARED STATEMENT OF HON. FRANK R. LAUTENBERG,
U.S. SENATOR FROM NEW JERSEY

Mr. Chairman:

Thank you for holding this hearing on the transition to household televisions that receive digital, as opposed to analog, signals.

Upon completing this "DTV" transition, consumers will enjoy a better television viewing experience.

DTV will provide viewers with sharper pictures, a wider screen, CD-quality sound, and better color rendition.

More important, the television will really become an *interactive* medium, filled with *new features and services*.

I would like to mention a few of these new services.

One such service that I frequently talk about is the opportunity DTV offers to enhance the education our children receive. In the not too distant future, school buses and buildings will become less important as "virtual classrooms" become the norm.

We will be able to target scarce educational resources to students who need specialized instruction in certain subject areas. Personalized tutoring will be available to children who need it—through interactive digital TVs.

I have to compliment the Nation's public television stations for providing a host of innovative educational and civic programming that enriches the communities they serve.

In my home state of New Jersey, WNJN—the New Jersey Network—is already using its digital signal to transmit job training data to a test site in Trenton.

“Workplace Essential Skills,” an historic partnership with the New Jersey Department of Labor, is helping the unemployed get the basic skills they need to compete for jobs.

New Jersey Network has also been involved with the State Office of Emergency Management to provide secure links between emergency authorities and nuclear power plant operators.

I commend public broadcast television stations for offering these valuable services as they make the transition from analog to digital signals.

So, the transition to digital TV is opening whole new realms of opportunities for enhancing education, job training, and public safety. Commercial broadcasters should learn from their public counterparts with regard to tapping into those realms.

Of course, the big challenge we will face will be to prevent a “digital divide” from developing between people who can afford DTVs and people who cannot. We cannot afford to leave anyone behind, especially our youth, as we begin to reap the benefits of the Digital Age.

Thank you Mr. Chairman. I look forward to hearing the testimony of our witnesses.

The CHAIRMAN. Mr. Ferree.

**STATEMENT OF KENNETH FERREE, CHIEF, MEDIA BUREAU,
FEDERAL COMMUNICATIONS COMMISSION**

Mr. FERREE. Thank you and good morning, Chairman McCain and members of the Committee. My name is Ken Ferree, and I'm Chief of The Media Bureau of the FCC. And I appreciate the opportunity to testify this morning.

Today our efforts have been focused on getting the transition off the ground. Those efforts are now proving successful and it's no longer a question of whether the transition will occur but when and how. It's time, therefore, to focus on making the digital switchover as smooth as possible for consumers. The Bureau has been working on a plan to that end. In developing this plan the Bureau had the following objectives.

First, bring the transition to a timely, predictable conclusion which will benefit consumers and others with a stake in the digital transition.

Second, to reclaim valuable spectrum. The spectrum that will be recovered will bring tremendous benefits to the public, vastly increasing the amount available for first responders. The remainder will be auctioned for use by advanced wireless services which not only will generate substantial auction revenues but will provide continuing benefits in terms of the economy and job creation.

Third, minimize disruption to consumers. Whenever the transition ends, consumers should not lose access to their favorite programming. Our goal was to ensure that converter equipment is available at a reasonable cost for analog over-the-air viewers.

Fourth, maintain consumer access to high definition television. Today, consumers have access to a growing level of compelling digital content, particularly HDTV. That access should be maintained and encouraged.

Fifth and finally, comply with constitutional and statutory requirements. Some broadcasters have suggested for instance that cable operators should be required to carry both the analog and the

digital signals of every broadcast station. The Commission has tentatively concluded that such mandatory dual carriage would be unconstitutional. Based on the record in this proceeding, I think this is correct. Dual carriage creates a greater burden than necessary.

The Bureau has devised a plan that meets these objectives, the details of the plan are set forth in my written testimony. Generally, the plan involves a switch in broadcasters must-carry rights from analog to digital in January 2009. Cable subscribers and satellite subscribers in local markets will therefore count toward the 85 percent trigger for the end of the transition. Combined with the households who have digital TV sets, we expect to reach the 85 percent threshold virtually nationwide at that time.

Let me briefly explain one of the policy cuts the Bureau made in developing the plan. When broadcasters must-carry rights switched to digital, the question becomes how should they be carried on cable systems. If a cable system is all digital so that all subscribers can watch a digital cable stream, the digital broadcast signal should also be passed through on digital. That's the easy case.

But what if cable systems in 2009, like cable systems today, have a mix of analog and digital cable subscribers? The options are either to require the cable system to deliver the signal digitally, in which case analog viewers would be deprived of that programming or require the cable operators to down convert the signals so that all consumers may continue to receive it.

The Bureau chose the latter course. Thus, the vast majority of consumers, including all cable subscribers and most or all satellite subscribers, will experience a seamless transition. They will be able to continue to watch the same programming they always have.

Now, there are two important points to be made about this requirement. First, broadcasters can, of course, continue to negotiate voluntary carriage of their digital signal. Approximately 400 broadcasters have already done so and more are gaining digital carriage every day.

Second, this is only a transitional requirement. Once a broadcaster has returned its analog license, it may decide whether it wants its digital signal down converted or passed through in digital by the cable operator. It's the broadcaster's choice at that point.

Finally, to begin to address legitimate concerns of the effect of the transitions on consumers who rely on over-the-air television, the Bureau has issued a notice on these consumers to make the transition as smooth as possible. Thank you for the opportunity to review our proposal. I look forward to the work.

[The prepared statement of Mr. Ferree follows:]

PREPARED STATEMENT OF W. KENNETH FERREE, CHIEF, MEDIA BUREAU,
FEDERAL COMMUNICATIONS COMMISSION

I. Introduction

It wasn't too long ago that using a phrase like "timely and successful" in connection with the DTV transition would have been considered a non sequitur. No longer. The DTV transition is beginning to gain momentum; we are witnessing one of the most dramatic marketplace shifts in recent memory.

There is plenty of credit to go around. Each of the affected industries -broadcasters, cable and satellite operators, content providers, consumer electronics manufacturers and retailers deserve some credit for bringing us to this juncture. They are the ones who developed the business plans, put the capital at risk, and are bringing the benefits of digital television to American consumers.

Government deserves some of the credit as well. Over the past few years, both Congress and the FCC, under Chairman Powell's leadership, have created a renewed sense of urgency regarding the DTV transition, doing whatever was needed to get the transition moving. Often informal tools were used, like the industry roundtable discussions convened by the House Energy and Commerce Committee that helped define and focus the issues, or the "Powell Plan" that resulted in voluntary industry commitments to advance the transition. When necessary, more formal regulatory tools were used, such as the DTV tuner mandate, rules for "plug and play" television sets, and the adoption of the "broadcast flag" system to protect digital broadcast content from widespread piracy over the Internet.

It goes without saying that our work is far from done. Indeed, we are in the midst of an incredibly busy period at the FCC on issues relating to digital television, and we hope to act on several major proceedings in the near future, including the procedures for final channel allotments and deadlines for broadcasters to operate at full power.

So why turn our attention to the end of the transition when we still have work in front of us? Because now is the time to start looking ahead and planning if we want the transition to end smoothly for the American public. Up to now, most of our efforts have been focused on getting the transition off the ground. But now that the wheels are finally lifting off the runway and the transition is pointed skyward, we can and should begin turning our attention to our destination, and how we will land this transition as quickly and as safely as possible.

Put differently, it is no longer a question of *whether* the transition will occur, but *when*—and how we can make the final digital switch-over as smooth as possible for consumers.

This emerging reality led Chairman Powell to direct the Media Bureau to develop a bold framework that would provide a soft landing and clear conclusion for the DTV transition. The framework is outlined below in some detail but, at this point, it is still a work-in-progress. No formal recommendations have been made to the full Commission, although we have discussed the framework with each of the Commissioners' offices, just as we have discussed it with Hill staff, industry, consumer groups, and others.

One of the most important and difficult issues remaining to be solved is how to address those consumers who rely on over-the-air analog television when the transition is complete. On May 27, 2004, the Media Bureau issued a Public Notice to help us learn more about these consumers and to explore potential options for helping them make the transition with as little disruption as possible.

II. The Media Bureau's Objectives

In developing our framework for completing the digital television transition, the Media Bureau had the following objectives:

Bring the transition to a timely and predictable conclusion

A timely and predictable end date would benefit all those with a stake in the transition to digital television, including the public, broadcasters, consumer electronics manufacturers and retailers, public safety officials, as well as advanced wireless service providers and their customers.¹ Consumers would have fair warning of when analog broadcast signals will be terminated and can begin preparing themselves. Broadcasters would know precisely how long they will be required to run side-by-side analog and digital facilities and can make budget and maintenance decisions accordingly. Consumer electronics manufacturers and retailers would know when they will no longer need to produce, market, and support analog equipment. Public safety officials and advanced wireless providers waiting for broadcasters to vacate the 700 MHz band would know with certainty when they will be able to begin operations.

Reclaim valuable spectrum

The spectrum that will be recovered at the end of the transition will bring tremendous benefits to consumers and the U.S. economy.² As an initial matter, 24

¹ By statute, all analog broadcast licenses terminate on December 31, 2006, unless the licensee requests and the Commission grants an extension based upon the criteria in Section 309G(14) of the Communications Act. 47 U.S.C. §309(j)(14)(A) and (B). In the absence of significant changes in circumstances, we do not think it likely that the standard set forth in Section 309(1)(14) will be met by that date and thus expect that the majority of stations will qualify for an extension of the initial deadline.

² Channels 52–69 (a total of 108 MHz in the 700 MHz band) will be reclaimed from the broadcasting service for use by public safety (24 MHz) and advanced wireless services (84 MHz). In

MHz of spectrum will be used to address the critical needs of first responders and other public safety needs. The remaining 84 MHz in the 700 MHz band already has been or will be auctioned for use by cutting-edge wireless services. This is “beachfront” spectrum, with propagation characteristics that make it ideal for providing wireless broadband access through foliage and building walls. Not only would the immediate revenues from an auction of this spectrum potentially be enormous (the value substantially increased by a date certain when the spectrum will become available) but, more importantly, the advanced services that will be introduced in this spectrum could provide continuing benefits many times greater in terms of the economy, jobs, and international competitiveness. The opportunity costs of keeping this spectrum “bottled up” by analog broadcasting grows higher and higher with each passing day.

Minimize disruption to consumers

Whenever the transition ends, consumers who rely on over-the-air television and do not yet have a DTV receiver will be faced with a choice: purchase a digital TV set, purchase a digital-to-analog converter, or subscribe to a multichannel video provider such as a cable or satellite operator. Our goal is to minimize the number of consumers forced to make that choice and to ensure that digital-to-analog converter equipment is affordable for the average consumer.

Maintain consumer access to HDTV and other digital services

Today consumers have access to a growing level of compelling digital content particularly high-definition (“HDTV”) content over the broadcast, cable and satellite television platforms. That access should be maintained and encouraged under any proposal to advance the DTV transition.

Comply with Constitutional and statutory requirements

Whatever solution is decided upon must be sustainable in court. Some broadcasters have suggested, for instance, that cable television operators should be required to carry both the analog and the digital signals of every broadcast station in the market (*i.e.*, “dual carriage”) until cable systems have converted to all digital transmission. In 2001, the Commission tentatively concluded that such a requirement would be an unconstitutional abridgement of cable operators’ First Amendment rights.³ Based on the evidence submitted in the must-carry docket, the Bureau is convinced that the Commission’s tentative conclusion was correct. In constitutional parlance, a dual carriage requirement clearly imposes a greater burden than necessary to further any discernible government interest at stake. Indeed, I am concerned that the imposition of a dual carriage requirement would, in the inevitable judicial review that would follow, place the whole must-carry regime at risk.

III. The Media Bureau’s Proposal

The current Media Bureau proposal has the following essential points:

1. On a fixed date no later than January 1, 2009, broadcasters’ must-carry rights on cable and satellite would switch from their analog signals to their digital signals.⁴

2. Cable operators would be required to make the digital must-carry signals available to all subscribers by either: (a) down-converting a single digital broadcast stream from digital to analog at the cable head-end so that all subscribers, including analog-only subscribers, can continue to view the programming; or (b) passing through the digital must-carry signals to subscribers’ homes, where the system has converted to “all digital” transmission and all subscribers have the ability to receive and display the digital signals (either on a digital set or down-converted by a set-top box for display on an analog set).

3. Similarly, satellite operators in local-into-local markets would be required either: (a) to carry one standard-definition digital programming stream from each broadcaster in the market (down-converted from HDTV to standard-definition, if necessary); or (b) to pass through the digital broadcast signals to subscribers’ homes, where all subscribers have the ability to receive and display the programming.

the core broadcast spectrum (channels 2–51), the channels currently devoted to analog broadcasting would be available for potential auction or use by new entrants or other broadcasters.

³See *First Report and Order*, 16 FCC Red 2598 (2001), PP 3, 112.

⁴Every three years, broadcasters elect whether they wish to invoke their statutory must-carry rights or negotiate for retransmission consent. The next election date is October 1, 2005 for carriage beginning January 1, 2006, then October 1, 2008 for carriage beginning January 1, 2009, and so on.

4. In addition to any digital streams that are down-converted to analog, broadcasters electing must-carry may negotiate for cable pass-through of their HDTV, multicasting, or other high-value digital programming. Broadcasters electing retransmission consent will continue to negotiate for cable carriage of their broadcast signals in digital and/or analog. As of March 2004, cable systems carried 382 local digital broadcast stations—239 of which are owned by commercial entities other than one of the top four broadcast networks—all pursuant to marketplace retransmission consent agreements.⁵ Nothing in this proposal would negatively affect the continued availability of this or additional HDTV programming to consumers.

5. The statutory 85 percent threshold⁶ for ending the transition could be met nationwide on January 1, 2009:

- All cable households (almost 70 percent of TV households nationwide) will count towards the 85 percent threshold in each market.
- All satellite households in local-into-local markets that receive the local broadcast package, and all satellite households with HDTV service,⁷ will count towards the 85 percent threshold in those markets.
- All households that purchased a new television set covered by the FCC's DTV tuner mandate will count towards the 85 percent threshold.⁸ It is possible that the DTV tuner mandate alone could result in the 85 percent threshold being met in some markets by this timeframe. Sole reliance on the tuner mandate, however, would result in a spotty transition with a lack of predictability and advance notice for consumers and the industries involved.
- All households that purchased a new "plug-and-play" DTV set, the first of which will be introduced this year, will count towards the 85 percent threshold.⁹

6. As soon as possible after January 1, 2009, the FCC will make the appropriate findings that the 85 percent threshold is met in the relevant markets and reclaim the analog broadcast spectrum. There may be anomalous markets in which the 85 percent threshold is not met immediately, but it is expected that the proposal effectively will result in a nationwide transition on January 1, 2009.¹⁰

7. By January 1, 2009, the number of households that potentially could lose television service with the end of analog broadcasting should be well under the statutory maximum of 15 percent in many markets.¹¹ Indeed, cable penetration alone exceeds 85 percent in several markets.¹² In addition, the FCC's digital tuner and "plug and play" mandates—together with the incentives provided by a hard transition date—will ensure that a substantial number of viewers that rely on over-the-air broadcasting will have purchased digital receivers in the preceding five years.¹³

8. The digital tuner and "plug and play" mandates will drive down the cost of digital-to analog converter equipment for those over-the-air viewers who have not in-

⁵The current 382 local digital broadcast stations being carried on cable represents a more than four-fold increase from January 2003, when 92 local digital broadcast stations were carried. In addition to local broadcast HDTV, cable systems also carry national HDTV cable programming services such as Discovery-HD, ESPN-HD, HBO-HD and Showtime-HD.

⁶One of the criteria in Section 309(j)(14)(B) is the 85/15 percent test. At its most fundamental, this test asks if at least 85 percent of TV households in the licensee's market can continue to receive television service when the over-the-air analog signals are turned off. If 15 percent or more of the TV households in the market would lose service, then a licensee's analog license may be extended beyond December 31, 2006. See 47 U.S.C. § 309G)(14)(B)(iii).

⁷All HDTV set-top boxes deployed by DirecTV and EchoStar contain an over-the-air DTV tuner.

⁸The phase-in schedule of the DTV tuner mandate is as follows: (1) receivers with screens 36 inches and above—50 percent must include DTV tuners as of July 1, 2004; 100 percent must include DTV tuners as of July 1, 2005; (2) receivers with screens 25–35 inches—50 percent must include DTV tuners as of July 1, 2005; 100 percent must include DTV tuners as of July 1, 2006; (3) receivers with screens 13–24 inches—100 percent must include DTV tuners as of July 1, 2007; and (4) TV Interface Devices—VCRs and DVD players/recorders, etc. that receive broadcast television signals—100 percent must include DTV tuners as of July 1, 2007.

⁹"Plug and play" sets enable cable subscribers to receive digital programming without the need for a separate set top box. Pursuant to the FCC rule, all "plug and play" sets must also include a digital over-the-air tuner.

¹⁰The Bureau has not yet conducted a detailed market-by-market analysis, but will do so as the process continues.

¹¹Approximately 15 percent of TV households do not subscribe to a pay television service and rely on over-the-air broadcasting.

¹²E.g., cable penetration is 91 percent in the Hartford/New Haven Designated Market Area (DMA), 91 percent in the Honolulu DMA, and 87 percent in the Palm Springs DMA.

¹³For instance, approximately 24.7 million analog-only sets were sold in 2003. That number could decline dramatically with a 2009 end date for analog broadcasting, even before the DTV tuner mandate becomes fully effective in 2007.

vested in digital equipment by 2009. The Bureau and Commission are prepared to provide assistance to Congress in determining whether and how to assist these viewers in obtaining digital-to-analog converter boxes. On May 27, 2004, the Media Bureau issued a Public Notice seeking comment on those consumers that rely on over-the-air broadcast television service and potential options for addressing those over-the-air viewers with analog-only sets when the transition is complete.¹⁴

9. When a broadcaster turns off its analog signal and is broadcasting only in digital (whether because the 85 percent threshold was met and the analog spectrum was reclaimed, or voluntarily prior to that date), the broadcaster may choose to have its digital signal passed through to subscribers' homes rather than being down-converted to analog at the cable head-end. Such a selection may be made at any time with notice to the cable operator and, in such circumstances, the cable operator would be required to notify subscribers that the digital signals are available if they obtain the necessary equipment from the cable operator or at retail. The cable operator would not be required to provide the equipment for subscribers to view the digital programming.

10. If true digital must-carry meant that broadcasters were entitled to carriage of all free broadcast streams, including free broadcast HDTV and/or "multicast" programming, it would give broadcasters additional incentive to return their analog licenses in a timely manner.¹⁵ This proposal combines moving more quickly and certainly to the end of the transition, which both hastens the broadcasters' spectrum return and provides them opportunities to offer more programming to viewers. Cable operators claim it is a burden to carry multiple broadcast streams, but the Bureau believes the net result will be less cable capacity required to be devoted to broadcasters' programming as the transition moves more rapidly to all digital cable systems. The digital carriage obligations for satellite operators will be determined in a proceeding at the FCC examining alleged capacity constraints and potential technological solutions. However, the issue of "multicasting" does raise some Constitutional issues, as well as potentially providing a disincentive for broadcasters to develop more HDTV programming. The Commission previously declined to provide multicasting carriage rights, but the issue is currently being reviewed on reconsideration.

IV. Benefits of Media Bureau Proposal

As a result of the Media Bureau's proposal, the public will reclaim, on January 1, 2009, a significant amount of spectrum throughout the country that will yield great benefits to our citizens, economy and the industries involved in the digital television transition. The public interest benefits include advances in homeland security, broadband deployment, economic growth and job creation and the consumer adoption of digital television. The result of the Media Bureau's construct is that these substantial public interest benefits will be realized at minimal cost to the public and the various industry segments driving the digital transition.

As the government reclaims broadcasters' analog spectrum and reclaims it for other uses on behalf of the public, consumers will reap the rewards in several areas of national importance, including:

- *Homeland Security*—the Media Bureau proposal will vastly increase the amount of spectrum available to public safety officials across the country. This additional spectrum will be especially useful in improving communications systems and the ability to deploy forces for first responders during national and local emergencies. The need for this spectrum is greatest in many of our Nation's major metropolitan areas currently suffering from spectrum shortages.
- *Broadband Deployment*—the proposal will free up spectrum that can be used for wireless broadband services. Chairman Powell has identified the deployment of broadband infrastructure as a central communications policy. In addition, there is strong bipartisan support in both the House and the Senate to make broadband deployment a national policy objective. This plan will further those national broadband ambitions.
- *Economic Growth and Job Creation*—the Media Bureau plan will spur the development and the deployment of broadband technology as well as other new and improved wireless communications services. In turn, this activity will help drive overall economic growth through productivity gains, increased investment and the creation of new businesses and jobs, particularly in the small business sector.

¹⁴ A copy of the Public Notice is attached.

¹⁵ The issue of "primary video" as one stream only versus "multicasting" is on reconsideration before the FCC in the digital carriage proceeding.

- *Consumer Adoption of Digital Television*—the Media Bureau proposal will help drive the consumer adoption of digital television. Last year, approximately 25 million analog television sets were sold. By adopting a clear date for the end of analog broadcasting, we can help shift the sales from analog to digital sets. Publicity over the next five years in advance of the 2009 date for the DTV switchover will combine with our recent tuner and plug-and-play mandates and increased production of HD programming to quicken the pace of consumer purchases of digital televisions.
- *Industry Benefits*—the certainty of 2009 would provide benefits to those that have a stake in an orderly transition, including broadcasters, public safety authorities, advanced wireless service providers, consumer electronics manufacturers and retailers. Advanced wireless service providers, for instance, could begin to develop business plans, place equipment orders and participate in auctions knowing that the 700 MHz band will become available on a nationwide basis in 2009. Retailers and consumer publications will have a date-certain for describing when analog-only televisions will need additional equipment and when it is time to buy digital equipment. Broadcasters will be ensured continued access to all cable subscribers, unless they voluntarily choose not to be down converted after the transition is over and not all subscribers have the equipment necessary to view the digital signal.
- *Survival of Over-the-Air Broadcasting*—the Media Bureau proposal will foster diversity and localism by protecting broadcasters, particularly those in smaller markets. All broadcasters will avoid the costs of running both analog and digital broadcasting, freeing up capital to invest in their digital services and programming to better compete in the marketplace.

These substantial public interest benefits will come at little cost to the public and the industries with a stake in the digital television transition. By January 1, 2009, the actual number of consumers dependent solely on analog broadcasting may be far less than the 15 percent statutory maximum. For those remaining analog broadcast viewers, the FCC's digital tuner and "plug and play" mandates will help to drive down the costs of digital-to-analog converters.¹⁶

Cable and satellite television subscribers would experience a seamless transition under the Bureau's proposal. During the transition, they will continue to have access to at least one programming stream from every must-carry broadcaster. Moreover, the growing levels of HDTV and other value-added digital programming to which these subscribers have access based on voluntary agreements will not be affected.

Finally, no additional capacity burdens will be imposed on cable television systems, either during or after the transition. This is in stark contrast to the questionable constitutionality and inherent legal risk of the "dual carriage" proposal advocated by some.

V. Conclusion

After many long years of hard work by all involved, the end of the DTV transition is now in sight. The Media Bureau recognizes that some Members of Congress have expressed specific concerns, particularly regarding those consumers who rely on over-the-air television service. We share those concerns and look forward to working with Congress to bring the transition to a successful conclusion that will benefit all consumers and the national economy.

¹⁶Manufacture of DTV tuners and plug and play sets will create economies of scale for use of the same technology, *e.g.*, chips, to be used for the digital-to-analog converters.

ATTACHMENT

FEDERAL COMMUNICATIONS COMMISSION
Washington, DC, May 27, 2004

PUBLIC NOTICE

DA 04-1497

MB Docket No. 04-210

**Media Bureau Seeks Comment On Over-The-Air
 Broadcast Television Viewers**

*Comment Date: July 12, 2004**Reply Comment Date: August 5, 2004*

Section 309(j)(14) of the Communications Act sets forth the conditions under which analog television broadcasting will end in the United States. Those conditions could be met as early as December 31, 2006, although the statute provides for extensions of that date if certain marketplace criteria have not been satisfied. As contemplated by Section 309(j)(14), up to 15 percent of television households in a given market could lose television service altogether if they rely exclusively on over-the-air broadcasting and have analog-only sets when the transition ends. In the remaining households, analog sets that are not connected to a pay television service could lose service as well.

In this Public Notice, we seek comment on options for minimizing the disruption to consumers when the switch-over to digital broadcasting occurs. We are primarily concerned with those households that rely exclusively on over-the-air broadcasting for their television service, but we seek comment more broadly on minimizing the impact on all consumers. First, we seek comment on the identity of those consumers that rely on over-the-air television broadcasting and why they do not subscribe to a pay television service. Second, we seek comment on potential options for minimizing the impact on these and other consumers when broadcasters are operating solely in digital.

Given the statutory directives and the nature of the potential solutions, we anticipate that the data submitted will be used primarily to help formulate possible recommendations to Congress. The Commission may, however, take other steps as appropriate.

Over-the-Air Television Viewers

We seek quantitative data on consumers who watch over-the-air broadcast television, including:

- (1) The number of households that rely solely on over-the-air broadcasting ("over-the-air households") for their television service;
- (2) The number of households that subscribe to a multi-channel video service provider ("MVPD") and have one or more television sets that rely on over-the-air broadcast service;
- (3) The number of analog-only television sets in use by the households identified in (1) and (2), above;
- (4) The number of digital television receivers in use in the households identified in (1) and (2), above, that are capable of receiving over-the-air digital broadcast television signals;
- (5) The demographic characteristics of over-the-air households, including age, race or ethnicity, and education and income levels;
- (6) The geographic characteristics of over-the-air households, including urban/rural and regional disparities;
- (7) Data on why over-the-air households do not subscribe to an MVPD service, including specific data on: (a) the number of over-the-air households that would like to subscribe but cannot afford it, (b) the number of over-the-air households that could afford to subscribe to an MVPD service but choose not to, and (c) the number of over-the-air households that would like to subscribe and could afford it but their MVPD service of choice is not available in their community (*e.g.*, no cable system or no satellite provider with local-into-local service).

Options for Addressing Analog-Only Television Sets

We also seek comment on options for addressing the potential disruption to consumers with analog-only television sets when the transition is complete. As an initial matter, we seek comment on the extent to which market forces can be expected

to deal with this problem-e.g., consumers voluntarily buying digital-to-analog converter boxes before the end of the transition, cable or satellite providers that carry all of the local digital broadcast stations connecting additional sets in subscribers' homes to their networks, and broadcasters, wireless auction winners or others voluntarily subsidizing or deploying converter boxes in order to accelerate the transition. If marketplace forces alone cannot be counted on to address this issue, can and should the affected industries be required to take steps to minimize the potential for consumer disruption?

If government action is warranted, we seek comment on the nature and scope of such involvement. Should the government subsidize consumers' purchase of digital-to-analog converter boxes, or should it procure and distribute the equipment itself? In either event, what minimum technical capabilities should the converter boxes have? What do converter boxes cost today and what are they expected to cost in the future?

If a subsidy is appropriate, we seek comment on the type and amount of subsidy that should be considered. For instance, we seek comment on whether the subsidy should be in the form of a tax credit, a refundable tax credit, or a voucher. We also seek comment on whether the subsidy should be available for consumers who wish to purchase a digital television set in lieu of a digital-to-analog converter, or for those who wish to purchase a multi-channel video service from providers that carry all the local digital broadcast signals.

We seek comment on the scope of any potential government action. Who would qualify for the government subsidy or other program? If the subsidy or other program is means-tested, what test should be used? We also seek comment on the number of devices that the government should subsidize. For instance, is one digital-to-analog converter box per household sufficient, or should the government subsidize the conversion of additional analog-only sets in consumers' homes? Should the government subsidize conversion equipment for over-the-air households that have at least one digital receiver and one or more analog-only sets? Should the government subsidize conversion equipment for MVPD subscribers who receive all the local digital broadcast signals on the television(s) hooked up to the pay service, but who have one or more analog-only sets not hooked up to the pay service?

Finally, we seek comment on how a government program would be financed and administered. For instance, in bands where we intend to auction new licenses for spectrum freed up by the digital conversion, we seek comment on whether, under Section 309 and our precedent, we could require as a condition of the license that auction winners pay for conversion of analog only equipment as part of a mandatory band-clearing mechanism. We note that in other auctioned bands, we have required new entrants to bear the costs to retune existing equipment to new bands or replace such equipment. We also seek comment on whether a government subsidy program could be financed directly through auction revenues, spectrum license fees, or other funding mechanisms, although we note that some of these options would require legislation.

The CHAIRMAN. What are the options for the over-the-air viewers?

Mr. FERREE. Chairman McCain, one option is to go ahead with the transition without any additional government involvement, in which case it would be up to the industries involved to take care of those viewers to make sure their TVs continue to work. And indeed all of the industries have a vested interest in making sure those TVs continue to work, not just the broadcasters, but the MPVDs, cable operators, advertisers want those TVs to work. Nobody wants to see those go dark.

In the event there is further government involvement, we can look at things like subsidizing set-top box, converter boxes for consumers. These are all issues which we put out in our public notice and sought comment on to get some input both on the demographics of who these people are and also what it might take to take care of them that way. What boxes may cost at various times, depending on how many you are buying and so forth. So that's all information we are hoping to get through our public notice.

The CHAIRMAN. Thank you. Mr. Lawson, welcome.

**STATEMENT OF JOHN M. LAWSON, PRESIDENT
AND CHIEF EXECUTIVE OFFICER,
ASSOCIATION OF PUBLIC TELEVISION STATIONS**

Mr. LAWSON. Thank you, Mr. Chairman. Members of the Committee. I'm John Lawson. I represent the public television stations. I appreciate your inviting me here to testify.

Mr. Chairman, public television is bullish on DTV, we have raised over \$1 million for this conversion. Most of that has been non-Federal. The Federal money has been crucial to getting our stations on the air and today about 70 percent of them are broadcasting a digital signal. Our embrace of digital television goes beyond meeting a Federal mandate. Our stations are beginning the actual deployment of real DTV services, these are real services for real people.

High definition multicast, standard definition, datacasting for education and for homeland security and I call your attention to the Appendix C in my written testimony, an article this week about a new project between us and FEMA, Department of Homeland Security, the public station WETA and PBS to use datacasting as a backbone for emergency communications here in the national capital region.

So we have made much progress, but major challenges remain. And if these challenges are not addressed the digital transition will drag on for many years. The good news is there are specific policy steps that can greatly accelerate the digital transition. Please allow me to illustrate the clear choice.

We conducted a survey of our members in February of this year, this is covered in Appendix A to the charts and the chart here to my right. We asked our stations if they knew that they were guaranteed full carriage of their digital signals post transition on cable and satellite, if they knew that low-cost set-top boxes, simple digital to analog converter boxes were available to serve the remaining over-the-air households, and three, if Congress created a dedicated funding source, a trust fund to support the production of digital content, when do they—when would they believe they would be able to turn off analog, what we call digital only broadcasting. The results were very surprising.

With these three changes, 81 percent, 81 percent of our stations said they could do it by the end of 2007. Without these conditions, 86 percent of the stations told us they would not be able to turn off analog until 2010 or much later mostly because of the need to serve over-the-air households.

Believe me, Mr. Chairman, running analog and digital is very expensive. Most stations don't want to run both any longer than they have to. Based on this research, we'd like to offer our blueprint for completing the transition. It's a work in progress, but we appreciate being able to share our thinking with you.

First, the Commission should immediately adopt rules for full digital post transition carriage of our signals, including multicast on cable. We believe this should apply to commercial, as well as public stations. We would prefer to negotiate these agreements, but it's critical that FCC and/or Congress be prepared to step in if necessary and that cable knows it. We have provided our views on the

re-authorization of the Satellite Home Viewer Improvement Act to the Committee.

Second, we propose that Congress create a digital education trust fund. The idea of a trust fund for public broadcasting has been around since the 1960s but this proposal is different. It would be conditioned on the voluntary early return of analog spectrum by public stations. It would be funded by auction revenues upon the return of public television spectrum with funding in advance by Congress to be repaid through the auctions. And funding would be targeted through the creation of digital education content.

Mr. Chairman, this plan would be an economic win-win for the Nation in two basic ways. Although the debate has centered on the auction revenue, we believe that the most important calculation should be the greater impact to the U.S. economy from freeing up the spectrum sooner rather than later, points that you alluded to from Mr. Hunt and others.

Second, we believe the trust fund itself will generate economic benefits. With it, we could make high-quality education and training available to citizens at all levels, becoming ubiquitous on a just in time basis.

Finally, Mr. Chairman, a few comments about the over-the-air viewer. After cable and satellite carriage, this is the greatest barrier to the transition, making sure that we take care of these over-the-air viewers that we are talking about, minimum, 14 percent of U.S. TV households, over 30 million people, plus our tens of millions of second and third sets in homes that aren't tied to cable or satellite.

Public television and Members of Congress are in exactly the same boat. We cannot just turn off these people's analog sets. We must give the consumer a simple halfway to go digital. Some subsidies may be necessary, however, we believe most consumers can be motivated to buy set-top boxes or new digital sets.

Price is a factor, and there is good news on that front, but the real key is for us broadcasters to get together and roll out and market new over-the-air digital services to those consumers.

Mr. Chairman, we believe we are developing a market-based proposal that will be good for America. It will advance the transition. It will unleash the full potential of analog spectrum, including for public safety, and it will deliver new generation of education services to the country. Thank you for the opportunity to be here today. I look forward to your questions.

[The prepared statement of Mr. Lawson follows:]

PREPARED STATEMENT OF JOHN M. LAWSON, PRESIDENT AND CHIEF EXECUTIVE OFFICER, ASSOCIATION OF PUBLIC TELEVISION STATIONS

Thank you Mr. Chairman. I am John Lawson, president and CEO of the Association of Public Television Stations, the national representative of our Nation's *local* public television stations. I emphasize the word *local* because, however one feels about increasing media concentration, one thing is clear: Local public television stations *are and will remain* locally controlled, operated, and programmed.

Historic Leadership from the Senate Commerce Committee

Let me begin by thanking you, Mr. Chairman, for your leadership in convening this hearing. Completing the digital transition is not just important for the communications industry, but for the economic competitiveness of our country as a whole.

You are a real driver in getting this transition completed, and I appreciate your inviting me to testify today.

I also want to acknowledge the long history of bipartisan support that public broadcasting has enjoyed from members and leaders of the Senate Commerce Committee, including Senators Warren Magnuson and Barry Goldwater. They played key roles in building Public Television into a unique institution of public service that reaches and has been welcomed into nearly every home in America.

This long history includes current leaders such as Senators Ted Stevens and Daniel Inouye. And I especially want to acknowledge, upon his pending retirement, the leadership of Senator Hollings. He has supported public broadcasting from his governorship of South Carolina, my native state, through today. I want to thank you, Senator Hollings, for all you have done for locally-controlled, noncommercial media in this country.

Innovation with New Digital Services

Mr. Chairman, Public Television is bullish on DTV. Since 1996, our stations have raised over \$1 billion for digital conversion, the majority of which has come from non-federal sources. This is \$1 billion over and above what we have to raise each year for programming and operations. When economic pressures caused state and private funding to decline early in this decade, Congress stepped up Federal funding, which has been crucial for many of our stations' getting on the air with a digital signal—currently 248 stations, or 70 percent of all public stations.

Our embrace of digital technology goes well beyond meeting a Federal mandate. In fact, it is no exaggeration to say that our local stations view digital as their greatest opportunity ever to serve the public. Our stations have continuing infrastructure investment needs. Nevertheless, many are beginning the actual deployment of exciting new digital services. We are entering a time of great innovation and experimentation with digital technology, and the early results are very encouraging.

Most stations are broadcasting high-definition television, especially in primetime. During the daytime, many are broadcasting new, multiple standard-definition channels, which are expanding citizens' access to quality children's and educational programming and public affairs coverage. The South Carolina Channel from SCETV, for example, is a new digital channel that provides gavel-to-gavel coverage of the state legislature and other local and statewide programming.

Many of our member stations are using some of their digital bandwidth for datacasting, another service made possible by DTV. Datacasting uses a station's digital signal for sending high-end video, audio, text, and graphics, directly to personal computers—wirelessly. Several stations are datacasting standards-based content directly to school computer networks to boost academic achievement. This is one way that stations are fulfilling their voluntary commitment of one-quarter of their digital bandwidth for education.

Notably, many of our stations also are providing DTV datacasting to improve emergency communications and enhance our homeland security. The June 7 issue of *Broadcasting and Cable* magazine (see Appendix B) reports on a soon-to-be-finalized agreement between the Federal Emergency Management Agency at the Department of Homeland Security, the Association of Public Television Stations (my association), local public station WETA, and the Public Broadcasting Service (PBS). The project will pilot DTV as a backbone of emergency communications for the National Capital Region and could be rolled out nationally after that.

I encourage members of the Committee to examine Appendix C of my testimony. It lists just some of the examples of how local public television stations are pushing the envelope in the use of digital broadcasting in real ways to help real people. Stations are launching new initiatives every day.

Clear Choice for the Federal Government

However, despite recent progress in the DTV transition, the Nation remains a long way from achieving the full benefits of digital. Carriage of the digital signals on cable and satellite is still uncertain for most stations. Broadcasters and elected officials are in the same boat when it comes to serving households with over-the-air analog television sets: we cannot just turn off people's access to free, broadcast television. And for public television, especially, we must find a way to fund the production of digital content that will help drive consumer acceptance of DTV.

The implication of the status quo in government policy is clear: without bold government and industry action to quicken the transition's pace, the benefits of digital television will remain beyond the reach of most households for an unacceptably long period of time. Furthermore, the current analog broadcast spectrum that is to be

returned to the government for other uses will *likewise* remain unavailable for the same unacceptably long period of time.

Clearly, it is time for a bold initiative to unleash digital. We applaud the work of the FCC's Media Bureau in developing a proactive framework for completing the transition. We continue to have questions about some elements of the plan as it has been crafted to date, but we appreciate the bureau's continued willingness to work with us. I would note that one key element of the Media Bureau's draft plan is a national "hard date" of January 1, 2009 to turn off analog broadcasting. The plan that we in public television are developing would free up considerable blocks of analog spectrum well before 2009. At the same time, we have an obligation to ensure that viewers who only own analog TV sets will not be stranded by the imposition of a hard deadline. We take our universal service obligations very seriously.

Public stations hold licenses to 21 percent of the Nation's broadcast spectrum. They know that they hold spectrum in trust, and that the government will reclaim the analog spectrum at some point. However, there is great disparity about when stations believe conditions will be in place that will allow them to switch off analog broadcasting and achieve what we call DOB—Digital-Only Broadcasting. In February, a survey of our member stations found that, assuming the status quo, 86 percent of stations do not believe conditions will be in place for DOB by 2009, the hard date proposed by the Media Bureau plan.

This is the bleak DTV transition scenario with which we are all too familiar. It led us to ask: What *would* it take to change that scenario?

So we asked the question again, this time proposing three reforms to take place:

- *first*—ensuring full post-transition cable and satellite carriage of digital broadcast signals, including multicasting;
- *second*—ensuring the availability of low-cost, digital-to-analog set-top converter boxes for serving households that rely upon free, over-the-air television; and,
- *third*—creation by Congress of a new funding stream, such as a digital content trust fund, for the production and distribution of a new generation of digital educational content to drive market acceptance of DTV.

The results were astonishing: *81 percent* of stations indicated that with implementation of these important reforms, the conditions would exist for *voluntary* surrender of analog by the end of *2007*, a year earlier than the Media Bureau would require. (See Appendix A)

Public Television's DTV Blueprint

Mr. Chairman, we think we are on to something here, and we would like to offer a blueprint today that would accomplish the triple goals of returning a significant amount of spectrum to the government in the next four years, providing a market-based boost for the transition and—most important—delivering new digital *services*, in the truest sense of the word, to consumers. Let me note that the plan we are presenting is still a work-in-progress, and much is dependent upon Congressional and FCC action. But we appreciate the opportunity to share our thinking with the Committee today.

First, we ask that the Commission adopt rules providing for full post-transition digital carriage rights, including multicasting, for local broadcast signals on cable and satellite, and that individual stations be accorded those rights *when they surrender analog*. We would rather negotiate these agreements with the cable and satellite industries, but it is critical that the Commission and/or Congress be prepared to weigh in if necessary. We have shared our views with the Committee regarding carriage provisions in the reauthorization of the Satellite Home Viewer Improvement Act.

Second, we propose that Congress create a trust fund, based upon auction revenues that would support the creation of digital education content by public stations and our partner institutions. The idea of a public broadcasting trust fund has been around since the 1960s, but this one is different. It is limited in scope, is highly targeted toward education and, we believe, will help unlock tremendous economic benefits for the country. Under our plan, public stations would be permitted to surrender their analog spectrum—on a market-by-market basis—almost immediately, if the policy changes we have outlined are instituted.

It is important that this be a *voluntary* plan. Stations in Roanoke, Virginia; Houston, Texas; Anchorage, Alaska; and Tucson, Arizona; have indicated they might be ready for Digital-Only Broadcasting by an early date if the above conditions are met. However, we need to protect consumers in states like Montana, Oregon and North Carolina where some believe that DOB may take much longer.

Our plan is based on the notion that it is not necessary or even desirable for all spectrum—public and commercial—to be returned at once. Moreover, all spectrum,

like all politics, is local. Wireless service providers or others who want access to UHF and VHF spectrum might find it advantageous to market test new applications in specific markets before rolling them out nationwide.

Here is a hypothetical example: If ten public stations were willing to surrender analog by the end of 2005 or even sooner, some of the new wireless applications we have heard so much about might be tested in those markets, to be rolled out more broadly as spectrum became available. We would expect that wireless broadband companies would seek to work with stations in those markets to speed the process: For instance, might a wireless company be willing to help underwrite set-top boxes in a particular market if it knew it would gain access to the spectrum sooner?

No Viewer Left Behind

This last point addresses the need for protecting universal access for consumers who rely upon over-the-air television, either exclusively or for second and third sets in the home. Taking care of these citizens is a prerequisite for completing the digital transition.

There may be, therefore, a need to subsidize digital-to-analog set-top converter boxes for some Americans, perhaps on a means-tested basis. However, we believe most consumers can be motivated to *buy* set-top boxes or new digital sets. The key is rolling out and marketing new, over-the-air digital services to consumers. The success of the *Freeview* service in Great Britain is very encouraging in this regard. Perhaps in America, there is an opportunity to re-brand and re-launch broadcast television as “wireless TV” for new generations who have known only cable.

Trust Fund for a New Generation of Digital Education Content

The next step under our proposal is for stations electing DOB and an early return of analog to file a “universal service plan” with the Commission outlining how they would serve their over-the-air analog consumers in a digital-only world. Again, presumably, they would likely have the assistance and support of commercial entities in crafting these plans.

Upon acceptance of the plan, analog spectrum would be surrendered and—this is crucial—stations would be eligible for grants from a new Federal digital educational services trust fund. This fund would *not* replace the current appropriation to the Corporation for Public Broadcasting; it would instead provide a new, targeted source of funding for Public Television educational digital content, paid for by future auction revenues.

Because stations would be unlikely to participate in this plan if they were forced to wait years for spectrum auctions, we propose that this fund be created by an initial appropriation. The Treasury then would be reimbursed later by the proceeds of the spectrum auctions but, in the meantime, local stations could begin immediately to deliver new digital educational content.

Mr. Chairman, I realize that much of the focus on the return of analog television spectrum has centered on auction revenue for the government. However, we believe there are much greater economic benefits at stake if the analog spectrum is freed up sooner rather than later. If the wireless industry is correct, their use of vacated spectrum will lead to a great deal of new economic activity. This means equipment orders, jobs, and tax revenue to the government.

The establishment of a digital educational services trust fund itself will have important economic benefits for the Nation. The fund would support the creation of a new generation of education and training content and services, and the link between education and economic growth is well known. A trust fund would allow for the localization of educational content and services; universal access to education; meeting the training needs for tomorrow’s workforce; building richer digital libraries; and finally, fulfilling public television’s original mission to provide quality educational services to the American public.

A Market-Based Solution

In sum, the Public Television digital transition plan, still in development, builds on ideas raised by the Media Bureau plan, such as full post-transition carriage rights, including multicasting, and goes a couple of steps further. We believe the voluntary, market-based solution we propose will free up large blocks of spectrum much earlier than would otherwise be the case with minimal consumer disruption.

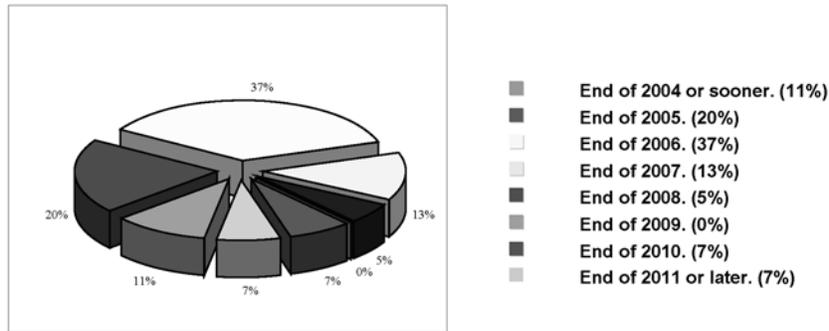
Furthermore, our plan would rely upon market forces and the involvement of future spectrum beneficiaries in ensuring universal service and the provision of set-top converter boxes rather than relying heavily on a Federal subsidy. The new educational content services that would flow from the creation of a dedicated fund would represent true digital public service that otherwise might not happen. And very importantly, our plan accelerates the day that public safety agencies will have access to the spectrum they sorely need.

Mr. Chairman, we believe this is a win-win-win proposal that will advance the transition, begin to unleash the economic potential of the now-bottled up analog broadcast spectrum, and finally, deliver a new generation of digital educational services to our communities.

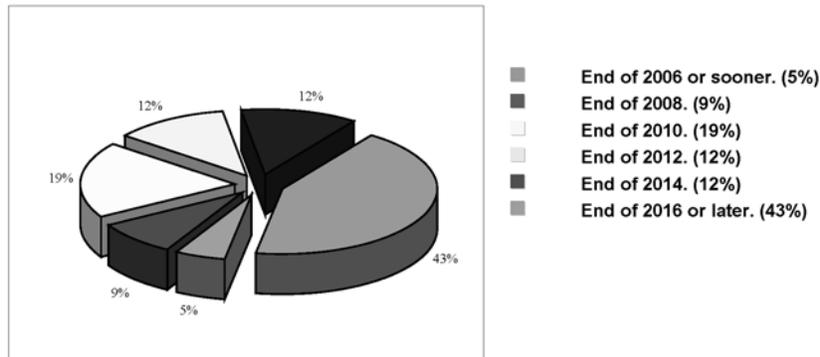
With the expectation that this Committee will consider reauthorizing the Public Broadcasting Act this summer, we believe there is no better time to launch an initiative such as this. We hope you will give this proposal your serious consideration and work with us to develop it. Thank you for the opportunity to be here today, and I look forward to responding to your questions.

APPENDIX A

Question A: If you knew that cable would carry your digital signals when you switch off analog, that low cost digital-to-analog set-top boxes were available to consumers, and that Congress would establish a trust fund tied to the return of PTV's analog spectrum, how soon would your station be willing to turn off analog?



Question B: Without cable carriage, low cost d/a set-top boxes, or a trust fund, how soon would you expect your station to turn off analog?



Source: APTS Online Member Consultation, February 2004

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BROADCASTING & CABLE
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PRODUCTION | TRANSMISSION | BROADBAND

TECHNOLOGY

BY KEN KERSCHBAUMER



WETA Washington can supply critical digital systems for emergency responders.

Safety First

FEMA, public TV join forces to save lives

Public TV isn't just devoted to British dramas and *Scavenger Hunt*. It's adding protection to its list of services. The Federal Emergency Management Agency (FEMA) and key public-broadcasting associations are planning a six-month pilot program to investigate the potential use of their digital airwaves in the event of an emergency or terrorist attack.

In short, can the digital spectrum aid TV, radio, cellular phone, and PDA communications?

"The challenge is not the technology but harnessing it, so we can give accurate, timely, and effective alert and warning messages nationwide," says Reynolds Hoover, director of the Office of National Security Coordination in the Department of Homeland Security's FEMA.

The deal with FEMA, expected to close later this month, involves the Corporation for Public Broadcasting, PBS, the Association of Public Television Stations (APTS), and WETA Washington, the local station that supplies the spectrum. And it's a welcome respite for FEMA. With congressional prodding, the agency has been inundated with proposals for new emergency communication. "The fact is that there is no one technology that is the perfect solution," says Hoover.

Unlike the project being tested by WNET New York (RFC, May 24), this system would be based on the regu-

lar DTV signal, not on the Instructional Television Fixed Signal. Any findings that result could be applied to nearly all DTV broadcasters, provided they supply the spectrum.

APTS President John Lawson says the bonus with public stations is that they already have the requisite spectrum. "This isn't a silver bullet, but it is something that is unique and robust."

His interest in using spectrum for emergency needs predates 9/11. And the stations themselves have initiated



WETA's control room, trained control for security needs.

talks about potential services.

"It's been a long haul getting the attention of the federal policymakers and have them understand what we're offering," Lawson says. "There is no national communications plan. One is emerging, but I think the government regards this as a local matter."

The problem? Individual stations and emergency organizations repeatedly reinvent the wheel instead of following a national, cohesive plan.

Currently, 54 of APTS' 142 stations have joined its Homeland Security

Coalition, paying extra dues and providing an explicit outreach on a national level. "We provide the stations with the resources to be successful at the state and local levels," says Lawson.

Plus, once APTS meets with emergency services providers and lays out the benefits, they quickly see the importance. The collaboration helps communications in an emergency but also aids in training. Videos can be sent to firehouse or police-station computers in the TV station's market.

"They could have a fixed commitment for bandwidth during the day for training emergency responders on topics like how to respond to pathogens," Lawson says.

The problem, however, is getting government officials to sign on before tragedy strikes.

Steve Bass, CEO and president of WNET Nashville, Tenn., discussed using datacasting in emergency situations with local officials in 2001. But it wasn't until a fatal nursing-home fire last November that the city realized the benefit. "The firefighters didn't know where the residents were. They said if they had a system that could download blueprints, they could have saved their lives," he says. "I told them our system could do that. All of a sudden, there was a need."

Two months ago, WNET began a test that Bass hopes will lead to a program that will be funded by government contract rather than appropriations. "We got lumped in with things that are nice, but get cut if there's a financial crunch," he says. "With datacasting, we can develop a set of services that are essential."

The test currently involves sending out video in the Windows Media 9 format to personal computers in the area. Emergency technicians can receive video updates produced by Vanderbilt University without having to suffer through an Internet streaming experience. Bass hopes the project will roll out to more than 250 sites in Tennessee. "It's a way of forging a new compact with the government," he says. "We can provide a valued service that they can support financially."

New Jersey Network has been involved with the State Office of Emergency Management for more than year in a system that involves placing receivers near the Oyster Creek Nuclear Power Plant. Conditional-access technology is used to ensure that transmitted material can be decoded only by those receivers. The basic infrastructure is already in place to provide secure links between the emergency authority and the transmitter.

Or as Hoover says of the overall effort: "The possibilities are endless." ■

How Public Television Stations Use Datacasting in the DTV Transition

One promise of the digital transition is the ability for stations to implement datacasting—using digital TV bandwidth to deliver data in many locations throughout the broadcast area of a local public television station. Much like a TV program is broadcast to many television receivers, datacasting delivers digital content—video, audio, data files—to local content servers. Datacasting provides significantly superior quality and reliability with several advantages over satellite or Internet mediums, such as:

- Datacasting is inexpensive compared to satellite transmissions.
- Datacasting is not dependent on large data pipes the way streaming is.
- Datacasting will not bottleneck limited network resources.
- Datacasting provides copyright protection to streaming.

Many APTS member stations are developing applications for datacasting that range from homeland security uses to education and workforce development as a vital part of the digital transition. Following is a sample of local station innovation in datacasting.

Homeland Security/Emergency Preparedness

- The *New Jersey Network (NJN)* was the first in the Nation to utilize public digital television to enhance emergency preparedness for nuclear power plants. NJN uses its broadcast signal to send emergency messages at high speeds to desktop computers at New Jersey Office of Emergency Management (OEM) sites around the Oyster Creek Nuclear Generating Station. This is yet another example of NJN's pioneering work in digital transmission technology and will serve as a model for other communities.
- *KLVX/Las Vegas* has worked with the Clarke County Emergency Preparedness office to take advantage of the system KLVX has in place to transmit video and other information to the 300 schools in the region currently linked to KLVX. Current emergency plans from the county designate the public schools as safe evacuation sites and KLVX can communicate with these centers in case of emergency. KLVX is now working to leverage the same technologies to provide for communication links to rural communities and the protection of incoming water supplies to the area.
KLVX is also using their television technology to help Las Vegas public safety personnel get up-to-the-minute information that can help them respond to emergencies. KLVX can use a portion of its digital television signal to beam information—such as building blueprints or video and audio files—directly to first responders' computers or mobile data terminals. The information can be received using a traditional television antenna that is connected to a special receiver that plugs into a computer or mobile data device. Through the over-the-air digital signal, emergency workers can receive files just as they would with an Internet connection. Because datacasting only uses excess parts of the spectrum, it doesn't interfere with the station's normal HDTV broadcasts.
- In partnership with the University of Texas Medical Branch-Galveston, the *KERA/Dallas* Homeland Security system can deliver crisis communications to discrete or general audiences, including simultaneously sending different messages to health departments, DMAT teams, hospitals, law enforcement/fire safety, and general public. The University of Texas Medical Branch-Galveston is the largest telemedicine provider in the Nation and the only academic campus in the U.S. with a maximum CDC-related biological containment laboratory (BSL4 research laboratory).
- The *Kentucky Network (KET)* is capable of datacasting significant amounts of information over the airwaves through their digital transmitter network in what could be called the "wireless portion of Kentucky's information highway." This digital datacasting capability will enable emergency and other high priority information to be delivered to computers around the state on a moment's notice. KET is working with partners such as the Dept. of Public Health, Kentucky State Police, Emergency Management, NDS, Inc., and several others to develop the potential of this new service.
- *Thirteen/WNET* in New York City is developing a program to test and analyze end-to-end communication with first responders over the station's digital broadcast spectrum. A prototype of the Smart Dissemination Networks Project (Smart Nets) is currently being tested. Smart Nets will incorporate a sensor

network to collect local data, integrate, disseminate and display video, other sensor data, and multi-source national intelligence data related to special operations for urban environments, perimeter defense, homeland defense, emergency response systems, emergency broadcast systems, and mobile command and control. Covering a 50–75 mile urban area, the system would also receive return requests for information in the same broadcast channel (“in-band return path”). The unique aspect of this system is that the architecture turns a traditionally one-way communications stream into a two-way band. In the event of a failure of cellular and landline communications during a catastrophe like that of 9/11 or the blackout of August 2003, Smart Nets would enable first-responders on the scene to remain in continuous contact.

“The FDNY is very excited about the kinds of capabilities that Smart Nets will provide our units in the field,” said Deputy Fire Commissioner of Support Services Milton Fischberger. “We have taken significant steps in improving our communications infrastructure since 9/11. The addition of Smart Nets will only further increase the scope of our ability to communicate to our members, and in turn, the ability to efficiently operate at emergencies.”

Education

- *KERA/Dallas* uses a local content server to receive and store transmitted information, which maximizes the available DTV bandwidth because information can be received 24 hours a day. Data transmissions can occur at anytime and are then stored for use at a school’s convenience. Beyond equipment, the KERA datacasting program includes installation, technical training and support, opportunistic bandwidth management (scheduling and capacity maximization), customer installations and front-line support, and the development of broad content networks to provide a wide range of quality titles and enriched content to the schools.

The real value is to the teacher and ultimately the students. Most content is readily accessible from the KERA on-site content library. At the user interface, teachers can easily search the large library by grade, subject, title or indexed learning objectives. Teachers spend less time acquiring and manually manipulating the video segments and more time enriching their lesson plans. The students get more information in a more interesting and entertaining format, which increases the probability of connection and information retention.

- *KCPT/Kansas City*, in partnership with three other Missouri stations (*KMOS/Warrensburg-Sedalia*, *KETC/St. Louis* and *KOZK/Springfield*), the adult education division of the Missouri Department of Education, and the state library system are looking to use datacasting to train librarians in local libraries to mentor students taking GED courses for certification. This project is in the discussion phase, but builds on a successful datacasting pilot project with two local colleges and one area middle school to test the educational and practical applications of this enhanced service.

This proposal offers a unique solution for those living in rural areas. Trained librarians, who will act as facilitators for the students pursuing a GED certificate, help make up for the shortage of money to pay teachers. Situating the “study groups” in libraries makes it more readily available to adult students who may get cold feet having to enter a classroom setting again after years of being away from this environment. Study groups will meet at the library to watch videos and use workbooks from *GED Connection* that will be located at the sites along with curriculums. Librarians will connect students, via phone or Internet, with tutors when needed.

Workforce Development

- *New Jersey Network (NJN)* is working with the N.J. Department of Labor, other state agencies and community-based organizations to provide workforce development services through the “New Jersey Workplace Literacy Program.” NJN is using a variety of technologies to deliver workforce training materials to welfare recipients, dislocated workers and other job seekers at 14 sites across the state. This program fully incorporates the *Workplace Essential Skills* video and web-based instructional system to teach individuals at the pilot sites basic skills needed for workplace success. A crucial element of the program is that it enables participants to address their own employment and skills issues at their own place. The videos teach basic reading, writing and math skills in the context of real-life work settings. At the same time, important concepts such as

making a good impression, employee dependability, making the most of introductory training and growing within the job are reinforced.

- *WHYY/Philadelphia* has been involved in a two-year datacasting pilot project to digitize most of the *GED Connection* and *Workplace Essential Skills* content from PBS LiteracyLink. WHYY made this instructional content and accompanying print materials available at 20 locations in four counties, including a homeless shelter, job centers and two community colleges.

The pilot project focuses on adult basic education: preparing the entry-level worker to enter the workplace and increase the number of residents in Pennsylvania completing their high school and college educations through distance learning. WHYY is participating in this pilot project to demonstrate the effectiveness and potential digital broadcast-based delivery to help bridge the digital divide and deliver training where people need it most.

The CHAIRMAN. Thank you very much. Mr. Calabrese.

STATEMENT OF MICHAEL CALABRESE, VICE PRESIDENT AND DIRECTOR, SPECTRUM POLICY PROGRAM, NEW AMERICA FOUNDATION

Mr. CALABRESE. Thank you, Mr. Chairman and members of the Committee for providing this opportunity. My name is Michael Calabrese, I direct the Spectrum Policy Program at the New America Foundation, a nonpartisan policy institute in Washington.

There is a general consensus that rapidly completing the DTV transition, thereby freeing up the beach front spectrum that corresponds to channels 62 to 69 is clearly in the public interest. Because wireless signals at this frequency range pass easily through walls and trees, reallocating the 700 megahertz band should jumpstart the deployment of more affordable wireless broadband connections.

As you have heard from Ken Ferree, the real DTV transition is taking place over the cable and satellite systems that already provide the primary TV service for at least 85 percent of American households.

Unfortunately, the Media Bureau plan by itself is unlikely to succeed. By focusing on the arbitrary 85 percent statutory industry threshold, the Ferree plan does not resolve the far more daunting obstacle, which is the 17 million households that continue to rely on over-the-air analog TV. We call this roadblock the last granny rule.

The political reality is that neither broadcasters nor the government will turn off analog TV when as many as 15 percent of Americans could lose access to their local TV stations. We believe it is necessary for Congress to step in and fix the problem it created in 1996 when it loaned broadcasters, with no strings attached, a second free channel of spectrum.

We believe that in three short years, the DTV transition can be completed, 108 megahertz of prime spectrum can be repurposed to public safety and wireless broadband. Tens of billions of dollars in new Federal revenue can be collected and the FCC's costly TV tuner mandate can be repealed.

All of this can be done, but only if Congress chooses to earmark roughly 10 percent of the likely auction revenue from this band to pay for a tax credit to help consumers who rely on over-the-air analog broadcasting. A rapid and smooth transition was completed in Berlin, Germany and can likewise be successful here.

We recommend that Congress both accelerate and improve upon the Media Bureau's plan by adopting the following provisions. First, announce a January 1, 2008, deadline for analog turn off and spectrum clearance. The Berlin switch took a total of 18 months. Assuming that Congress ask complete action by the end of its 2005 session, we believe that a two-year transition after that would be more than adequate.

Auctions of returned spectrum could then occur in 2006, and fetch full value, thanks to the certainty of turn off and—of a turn off and clearance deadline. Ideally, only an initial ten-year license term would be auctioned, reducing the up-front cost to bidders with an annual user fee kicking in at renewal.

The third and most critical element would be a consumer equipment subsidy. In Berlin, the government distributed digital to analog converters directly to 6,000 very low-income households. In the U.S. context, we believe that a one-time tax credit on the order of \$75 would be far more flexible and administratively efficient.

Currently, because so few are produced, converters with the capacity to down convert from high definition digital signals to analog cost over \$200. However, in mass production, electronics industry analysts expect that cost to fall into the \$50 to \$100 range. The tax credit should be available during a single 12-month period corresponding to the 2007 tax or fiscal year.

Unlike Berlin, consumers should have the flexibility to apply the credit not only to a converter but to a new DTV set or to a satellite dish or to the setup costs of a cable subscription. The trickiest issue is who should be eligible for the subsidy.

In the U.S., free TV has taken on the nature of a social entitlement. This means that legislation that makes analog TV sets obsolete will be keenly felt, even in middle class homes as a type of taxing.

There are two ways this can be mitigated. One is to revoke the FCC's over-the-air tuner mandate, a hidden tax that will cost American consumers more than \$1 billion for a year after it phases in, beginning next month. Because 85 percent of homes already choose not to receive their primary TV service over-the-air, the mandate imposes an unnecessary cost on everyone.

A second and more direct means to minimize consumer resistance is to make most if not all households eligible for the tax credit.

In my written testimony, I provide cost estimates for a range of eligibility options from means test to go universal. Limiting the refundable credit to the eight million households with incomes under \$40,000 and which rely exclusively on off-air reception would cost roughly \$600 million. This is less than 2 percent of the value of the returned spectrum based on receipt transactions for cellular licenses. Extending the subsidy to all 17 million households that rely exclusively on over-the-air reception would cost approximately \$1.3 billion.

A third option is to allow all TV households in America to claim a single credit. Assuming that 50 percent of cable and satellite subscribers claimed the credit to retrofit a secondary analog set, the total cost for all households is \$4.7 billion. This is roughly 10 percent of the return of spectrum's market value.

As a matter of equity, we believe it is also critical that the tax credit be refundable. There seems to be no good reason to deny the transition subsidy to a household, particularly a senior citizen or low-income household that cannot offset an income tax liability that particular year.

I'd like to mention three final elements quickly that would also require Congressional action. The first is reallocation of a frequency that has been freed up. Currently, public safety has been promised four of the 18 channels freed up. We recommend that Congress divide the remaining 84 megahertz equally between licensed and unlicensed spectrum.

Unlicensed spectrum for entrepreneurs and community networks is particularly important for rural and low-income areas, where wire connections are unavailable or unaffordable. Today, more than 1500 wireless start-ups are using unlicensed spectrum to offer high-speed broadband connections to 300,000 homes and businesses up to 30 miles over the airwaves. At low frequencies, unlicensed wireless broadband could be a far more affordable alternative to cable and copper as an Internet connection.

The final elements and perhaps most neglected aspect of the DTV transition is the need to update the public interest. DTV licensing gives potential revenue and increased capacity. We urge the Committee to enact a minimum requirement for local, civic and electoral programming along the lines performed by the Public Interest, Public Airwaves Coalition.

Modeled after FCC's license renewal guidelines for 3 hours of children's educational programming, the Coalition proposes that stations air a minimum 3 hours-per-week of local, civic and electoral coverage on the most watched channel as well as additional hours equal to 3 percent of the additional multicasting they are able to do.

Thank you for your time. I look forward to answering any questions.

[The prepared statement of Mr. Calabrese follows:]

PREPARED STATEMENT OF MICHAEL CALABRESE, VICE PRESIDENT AND DIRECTOR,
SPECTRUM POLICY PROGRAM, NEW AMERICA FOUNDATION

"COMPLETING THE DIGITAL TELEVISION TRANSITION: A CONSUMER CONVERTER SUBSIDY CAN REDUCE THE DEFICIT AND REDEPLOY UHF SPECTRUM FOR WIRELESS BROADBAND"

Good morning. My name is Michael Calabrese, Vice President and Director of the Spectrum Policy Program at the New America Foundation, a nonpartisan public policy institute here in Washington. Thank you, Mr. Chairman and members of the Committee, for this opportunity to testify today. I will focus on our proposal for a consumer subsidy that can bring the long-stalled DTV transition to a swift conclusion while also ensuring that no American loses their access to "free" over-the-air programming.

There is a general consensus that rapidly completing the digital TV transition—thereby freeing up the 108 MHz of "beachfront" spectrum corresponding to TV channels 52-to-69—is clearly in the public interest. Because wireless signals at this frequency range pass easily through walls and trees, the 700 MHz band could jumpstart the deployment of more affordable wireless broadband connections, particularly in rural areas.

Although Congress has already reallocated a portion of these TV channels for public safety agencies (to address interoperability problems) and for auction to licensed cellular services (which could yield \$30-to-\$40 billion in Federal revenue), the DTV transition is badly stalled. There is no fixed deadline for redeploying these precious

frequencies from analog broadcasting for the few to productive broadband for all. And, as FCC Media Bureau Chief Kenneth Ferree testified before the House Commerce Committee last week, under current law it could take decades before these economically critical frequencies are cleared for wireless broadband and other emerging technologies. The controversial question is how to end analog broadcasting without stranding the roughly 15 percent of consumers who still rely on analog over-the-air reception for their “free” TV.

How U.S. Households Receive Television, Comparing 1993 and 2003¹

TV Households in United States	Dec. 1993 (millions)	June 2003 (millions)	Change (%)
<i>Over the Air Only</i>	33.9 (26%)	12.5% (11.7%)	-63%
<i>MVPD Subscribers*</i>			
Cable	57.2	70.5 ²	
DBS	.07	20	
Other	3	3.4	
<i>Total Subscription MVPD</i>	60.3 (64%)	93.9 (88.3%)	37%

*MVPD = Multichannel Video Programming Distributors are Cable, Direct Broadcast Satellite, and other service providers.

Last month the FCC’s Media Bureau floated a new DTV transition plan that represents a fairly radical departure from the government’s current approach. Rather than relying on additional subsidies to broadcasters, the “Ferree Plan” recognizes that the real DTV transition is taking place not over the air, but over the cable and satellite systems that already provide the primary TV service to at least 85 percent of U.S. households.³ By counting all cable households as capable of receiving digital broadcasts, the FCC could declare that the statutory 85 percent threshold of DTV-capable homes in each market has been reached—and on that basis schedule the termination of analog broadcasting, and the reallocation of the spectrum used by TV Channels 52-to-69, for January 1, 2009.

Unfortunately, while the Media Bureau plan is a step in the right direction, it is insufficient. By focusing solely on meeting the 85 percent statutory threshold for ending analog broadcasting, it ignores the far more relevant obstacle to redeploing the 700 MHz band to public safety and wireless broadband: the 17 million consumers who continue to rely on over-the-air analog TV. The switch from analog to digital-only broadcasting would currently force millions of households to purchase a digital TV, to purchase a digital-to-analog converter (so that their current TV still functions), or to subscribe to a paid cable or satellite service.

It is true that product obsolescence is an everyday fact of life for Americans. Every year Americans throw away tens of millions of perfectly usable computers and mobile telephones because new technology comes along that makes them obsolete. Yet the potential backlash from consumers who continue to rely on terrestrial (over-the-air) broadcasting means the Ferree Plan is unlikely to succeed without a one-time consumer equipment subsidy.

We believe it is necessary for Congress to step in and fix the problem it created when it loaned broadcasters, with no strings attached, a second free channel of spectrum in the 1996 Communications Act. At a cost equal to about 10 percent of the likely revenue the government can receive by reassigning Channels 52-to-69, a consumer subsidy can facilitate a two-year switchover from analog to DTV. By January 1, 2008 the DTV transition can be completed, the 108 MHz of channel 52-to-69 spectrum can be re-purposed to public safety and wireless broadband, tens of billions of dollars of new Federal revenue can be collected, and the FCC’s costly DTV tuner

¹FCC, “Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming: Tenth Annual Report,” January 28, 2004. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-5A1.pdf.

²Of these 70.5 million cable subscribers, an estimated 22 million receive digital cable, see <http://www.ncta.com/Docs/PageContent.cfm?pageID=86>

³As of June 2003, according to the FCC only 12.5 million U.S. households relied on terrestrial (over-the-air) for their primary TV signal. More than 94 million of the Nation’s 106.6 million TV households subscribed to cable, direct broadcast satellite or other multichannel video program distribution service. See *supra*, note 1, FCC, p. 54. However, because other credible survey data from the broadcast industry suggests that the OTA reliance may be as high as 17.5 million, or 16.1 percent of the Nation’s 108 million TV households (as of Nov. 2003), we use that conservative estimate here. See Andrew D. Cotlar, “Digital-Only Broadcasting: A Roadmap for Early Return of Public Television’s Analog,” Association of Public Television Stations, Feb. 2004, at pp. 12–13 and Appendix C.

mandate can be repealed *if* Congress chooses to earmark a fraction of the spectrum auction revenue (between 5 and 15 percent) for a tax credit to offset the cost for consumers who still rely on analog over-the-air broadcasting. A rapid and smooth DTV transition along these lines was completed last year in Berlin, Germany—and can likewise be successful here.

Summary of New America's DTV Transition Proposal

We believe that that this Committee can best serve the public interest by adopting an enhanced version of the Media Bureau's plan that emphasizes two goals:

First, to protect consumer choice and consumer access to local broadcast programming. It's important to note that preserving every American's current ability to view their local OTA channels is *not* the same thing as requiring every American to watch digital-quality pictures.

Second, to quickly clear and reallocate Channel 52-to-69 spectrum for both unlicensed and licensed wireless broadband, which will generate even greater economic and social gains in the long-term than the spectrum auction revenues generated in the short-term.

We recommend that Congress both accelerate and improve upon the Media Bureau's DTV transition plan by adopting the following provisions:

1. *Fixed Turn-off Date*: Announce a January 1, 2008 deadline for analog turn-off and spectrum clearance.
2. *Reschedule Auctions*: Schedule auctions for assignment of licensed portion of the returned spectrum for 2006 (ideally only the initial license term would be auctioned, specifying an annual user fee to compensate the public thereafter).
3. *Consumer Converter Subsidy*: Using a fraction of auction revenues, authorize a refundable tax credit available to consumers during a 12-month period (calendar or Fiscal Year 2007) to offset the cost of converting from analog to DTV reception.
4. *Consumer Choice*: Give consumers the flexibility to apply the credit to a digital-to-analog (D-A) converter boxes, a new DTV set, or for initial satellite dish or cable set-up costs.
5. *Revoke the DTV "Tuner Tax"*: Reverse the FCC's 2003 DTV tuner mandate, which seeks to reach the statutory 85 percent DTV threshold by requiring manufacturers to integrate over-the-air digital reception in every set over 13 inches by 2007—increasing the cost to consumers by at least \$1.4 billion annually—despite the fact that the 85 percent of consumers who receive TV by cable or satellite may not need or want an OTA tuner.
6. *Spectrum Reallocation for both Unlicensed and Licensed Wireless*: In addition to the 24 MHz allocated for public safety, divide the remaining 84 MHz equally for use by licensed and unlicensed wireless broadband providers.
7. *Switch from Analog to Digital Must-Carry*: Upon return of their analog channel license, a broadcaster should be allowed to choose single channel digital must-carry (with no signal degradation); after Jan. 1, 2008, cable systems must pass through broadcasters' primary digital signal, but can choose to cease down-converting the digital signal for analog reception.
8. *Update the DTV Public Interest Obligations*: The obligations of broadcast licensees should be extended to all "free" over-the-air programming streams and expanded to air each week the lesser of 3 hours, or 3 percent of programming time, of local civic and electoral programming (half of this in prime time).⁴
9. *Earmark spectrum revenue to capitalize a PBS trust and DOIT*: A portion of the spectrum auction revenue should be earmarked for investment in the future of public television and digital education, capitalizing a trust fund for the future of PBS and/or a Digital Opportunity Investment Trust.⁵

Time to Shift from Broadcaster to Consumer Subsidies

There are two general approaches to speeding up the DTV transition. The first is what we call the "Broadcaster Subsidy Model." This is the approach America has taken to date. The second approach, implemented successfully last year in Berlin,

⁴See "Proposed Processing Guidelines for DTV Public Interest Obligations," submitted to the FCC April 7, 2004, by a coalition of nonprofit groups including Commons Cause, New America Foundation, Alliance for Better Campaigns, Center for Digital Democracy, Media Access Project, et al. Available at <http://www.ourairwaves.org/docs/index.php?DocID=56>

⁵See The Digital Opportunity Investment Trust Act, S. 1854, sponsored by Senators Dodd, Snowe, and Durbin. A bill summary and Report to Congress by the Federation of American Science is available at http://www.digitalpromise.org/legislation_hearings/index.asp.

Germany, is the “Consumer Subsidy Model.” This latter approach is premised on earmarking roughly 10 percent of the auction value of just a portion of the channel 52-to-59 spectrum to give *every U.S. household* (not just low-income households, as they did in Berlin) the option to claim a tax credit to offset the cost of converting from analog to digital reception.

During the past 15 years, local TV broadcasters have lobbied for and won a myriad of government subsidies justified by the Federal industrial policy in favor of transitioning to DTV while preserving “free” (ad-supported) over-the-air TV. The most valuable of these include:

- “*Free Spectrum Loan*”—An indefinite, interest-free loan to existing broadcast TV licensees of a second 6 MHz channel with no fixed termination date.
- “*Spectrum Flexibility*”—Rights to use new digital technology to transmit ten or more standard definition TV programs (or two or more high definition TV programs) in the 6 MHz of spectrum that could previously only transmit one standard definition analog program.⁶
- “*Pay TV over Public Airwaves*”—Rights to use as much as 90 percent of the DTV spectrum channel for pay TV or other pay data services, the revenue from which is supposed to subsidize ad-supported (“free”) broadcast DTV services (subject to a 5 percent ancillary services fee to the government).
- “*DTV Tuner Mandate*”—Last year the FCC adopted an OTA tuner mandate—which begins phasing in next month (for high end TVs) and applies to all new sets by July 2007—prohibiting consumers from purchasing a new TV set without a broadcast digital TV tuner inside it, even though the vast majority of TVs will never be used OTA.
- “*Broadcast Flag*”—A requirement that all consumer electronics devices include a “broadcast flag” to prevent retransmission of an FCC licensed broadcast signal out-of-the-home without payment to the broadcaster.
- “*Plug and Play*”—A requirement that all set top boxes sold for cable TV include built-in compatibility with broadcast DTV.
- “*More Eyeballs*”—Expanded geographic and household coverage for existing broadcast TV licensees.

After more than six years of this DTV industrial policy, the Consumer Electronics Association projects that only 53 percent of U.S. households will receive digital signals by 2007, the target date for the end of the 10-year transition adopted in 1996. The overwhelming majority of these digital signals will be received by cable and satellite subscribers until many years after the government’s DTV tuner mandate becomes fully effective in 2007.⁷ This is a primary rationale why many savvy insiders believe that the broadcast DTV transition, as defined under current law, won’t be complete until 2025 at the earliest.

“The Last Granny Rule”

In addition to the tens of billions of dollars in costs imposed on consumers—both directly and because the spectrum is not available for advanced wireless services—the basic premise of the broadcaster subsidy is a fraud: Although current law assumes TV licensees will return their analog channel when 85 percent of the households in their market are capable of receiving digital signals, the political reality is that neither broadcasters nor the government will order the unplugging of analog broadcast TV when as many as 15 percent of Americans who rely exclusively on analog TV will lose at least partial access to their local TV stations. This is an unwritten obstacle to ending the DTV transition that we call “The Last Granny Rule.”

The Consumer Subsidy Model

The theory behind the Consumer Subsidy Model is that if granny needs to be subsidized to speed the DTV transition, why not subsidize her *directly* rather than *indirectly* via handouts to producers? The Consumer Subsidy Model is derived from the successful broadcast DTV transition completed in the Berlin-Brandenburg area of

⁶This assumes use of a state-of-the-art digital compression technology. The current broadcast standard is generally thought to be able to support only about six standard definition programs or one true HDTV program and several standard definition programs. Microsoft Media Player 9 needs only about 1.5 Mbps for a standard definition program. With a 19.4 Mbps broadcast DTV data rate, 13 standard definition programs per DTV channel would be feasible. Broadcasters are only required to provide one standard definition program for owners of 1st generation broadcast equipment; they can use the rest of their spectrum for enhanced services.

⁷Drew Clark, “Deadline for Transition May Be Missed Despite Progress,” *TechDaily*, March 29, 2004.

Germany (henceforth “Berlin”). A similar model was briefly proposed but not seriously pursued by the Clinton Commerce Department in 1996 during the debate over the 1996 second (DTV) channel giveaway. This testimony suggests a number of changes to the Berlin Model to fit U.S. circumstances better.

The Berlin Transition

On February 13, 2002, the Berlin-Brandenburg, Germany regulatory authority known as MABB (the FCC-like regional regulatory agency) ruled that the digital TV transition would begin on November 1, 2002 and be complete by August 4, 2003. According to all reports, the Berlin DTV transition went smoothly. As a result, very similar transitions will soon be implemented in half dozen other states in Germany.

The Berlin transition was very much a win-win proposition for consumers and industry alike. Consumers in general benefited because, thanks to the wonders of digital compression technology, they could receive approximately four times as many free (*i.e.*, 100 percent ad-supported) standard definition TV programs after the transition as they could with analog broadcast TV before the transition. In addition, they could receive new types of data services such as on-demand news and weather reports.

In Berlin, only 7.4 percent of households were primarily reliant on free, broadcast TV. The rest chose to receive their TV from cable or satellite TV. However, the government didn’t want low-income individuals to face the burden of either purchasing a digital TV set or doing without free (ad-supported) TV. So it purchased digital-to-analog converter boxes for 6,000 low-income individuals.

Broadcasters benefited because whereas before the transition they were only able to provide one standard definition TV program, after the transition, thanks to digital compression, on the same spectrum space they are able to provide additional channels of programming plus other types of services. In addition, the government mandated that after the DTV transition, cable TV companies continue with the status quo requirement that they broadcast analog versions of local TV broadcasts. Thus, cable subscribers were not affected by the transition.

Cost of a One-Time Consumer Tax Credit Subsidy

In Berlin, only low-income households received subsidies to purchase digital to analog converter boxes. However, although low-income homes have a greater need for a converter subsidy, because “free” TV has taken on the nature of an entitlement in American culture—and legislation that makes analog TV sets obsolete will be keenly felt even in middle-class homes as a type of “taking”—the combination of modest cost and the ability to pay for it with a fraction of the likely auction revenues from the band suggest that a limited but *universal* subsidy should be employed. As explained just below, a refundable tax credit would provide the most efficient and flexible means to distribute the subsidy, while enforcement issues would be minimized by making eligibility as broad as feasible.

Another difference with the Berlin experience is the nature of the subsidy. In Berlin, the government purchased and distributed DTA converters directly to 6,000 very low-income households. In the U.S. context we believe that a one-time tax credit that reimburses consumers a flat dollar amount (*e.g.*, \$75) would be far more efficient and flexible. To simplify IRS implementation, the tax credit should be available only during a 12-month period corresponding to a single tax year (*i.e.*, 2007). Although the government could certainly procure converter boxes in bulk at a wholesale price, the administrative costs of a government distribution could be excessive and unpredictable. A tax credit streamlines the process and makes the public cost more predictable.

As a matter of equity, it is important that the tax credit be “refundable,” which means that if a family has no income tax liability during that particular tax year, the subsidy would still be paid as a refund (the Federal Earned Income Tax Credit works this way). Considering the public purpose of the converter subsidy, there seems to be no reason to deny its benefits to a household—most typically a very low-income household—that cannot offset an income tax liability that particular tax year.

The Cost of Four Options for a DTV Transition Consumer Subsidy⁸

Household eligibility based on reliance on over-the-air (OTA) TV	Number Of Credits (TVs Eligible)	Refundable Tax Credit (Subsidy/Converter)	Total Cost (100% Subsidy)	Total Cost (Progressive Subsidy)
<i>Option #1:</i> Only low-income OTA exclusives; Limit one set/hh	7.7 m (44% of OTA Only HH)	\$75	\$578 m	\$578 m (100%)
<i>Option #2:</i> All exclusive OTA hh; Limit one set/hh	17.4 m	\$75	\$1.3 B	\$942 m (100% credit for low-income; 50% for all others)
<i>Option #3:</i> All TV hh; Limit one set/hh	62.5 m (17.4 + 50% of 90.1 million non-OTA hh)	\$75	\$4.7 B	\$3.4 B (100%, low-income; 50% others)
<i>Option #4</i> (NAB Scenario ⁹): OTA sets in all hh; No limit on sets/hh	82 m	\$75	\$6.2 B	\$4.4 B (100%, low income primary set; 50% others)

Sources: Options #1 and #2,¹⁰ Options #3 and #4

The Table above shows estimates of the cost associated with a range of eligibility options for a one-time \$75 refundable tax credit to offset the cost of a digital-to-analog (D-A) converter, or other qualifying device. Currently, because few are produced, the price of a D-A converter with the capacity to down-convert high-definition broadcast signals for display on an analog set is between \$200 and \$250 each. However, the price of D-A converters, like other computer products, will fall substantially over time and with economies of scale. If the government creates a market for five million or more D-A converters, analysts at the Consumer Electronics Association estimate that the cost should fall into the \$50 to \$100 range. Although the FCC's Media Bureau and the Association of Public Television Stations use a \$50 estimate, the cost estimates here are based on a more conservative \$75 per converter, consistent with preliminary electronics industry projections.

Option #1 would limit the \$75 refundable credit to the approximately eight million households that rely exclusively on OTA reception and have incomes under \$40,000. This means-tested approach would cost roughly \$578 million—less than 2 percent of the value of the returned spectrum based on recent transactions for cellular licenses. A second, more obvious option would be to extend the subsidy to *all* 17.4 million households that rely exclusively on OTA reception, regardless of income level. Assuming each taxpayer/family is limited to a single converter credit, the cost would be approximately \$1.3 billion.

While Options #1 and #2 would each cost the government less than 5 percent of the returned spectrum's likely auction value, the tax credit would be denied to a household that subscribes to cable or DBS, but which also owns a secondary analog

⁸Source: November 2003 Television Bureau of Advertising (TVB) study states that 17.4 million U.S. Households, rely exclusively on OTA reception. See *supra*, note 3, Cotlar, pp. 12, 14, 44.

⁹Option #4 is the solution most called for by the NAB, which assumes that a converter credit be made available for every analog TV set in all households that rely on OTA (*i.e.*, all sets not connected to cable, DBS, or another subscriber service.) See Reply Comments of NAB, MSTV, ALTV, In the Matter of Carriage of Digital Television Broadcast Signals, Docket 98-120, August 16, 2001, p. 22; Comments of the NAB, In the Matter of Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, CS Docket 01-129, August 3, 2001.

¹⁰Option #1: 44 percent of U.S. households earn less than \$40,000. 16.1 percent of U.S. households (17.4 million) exclusively rely on terrestrial OTA broadcast TV (44 percent X 17.4 million = 7.7 million).

set that is used OTA only. Equity aside, it would be difficult if not impossible to enforce a rule limiting the tax credit to households that do not already subscribe to a paid TV service, since the IRS has no way to know how particular taxpayers receive their TV signals.

Thus, a third alternative (Option #3) would permit all TV households to claim a single credit for the purchase of qualifying DTV equipment. We assume that only 50 percent of households already subscribing to cable or DBS will bother to retrofit a secondary analog set and claim the credit, which puts the likely cost at \$4.7 billion—roughly 10 percent of the returned spectrum’s market value.¹¹

Qualifying DTV Devices: If Congress authorizes a consumer subsidy, we believe there is no reason to limit consumer choice to a D–A converter box. A refundable tax credit could as easily allow consumers to choose to apply their rebate to reduce the cost of a new DTV set, or to the equipment costs for a new cable or DBS subscription. Moreover, whereas a D–A converter simply preserves the consumer’s ability to watch analog TV, greater choice will lead many consumers to make the switch to high-definition platforms.

Other Key Elements to Complete America’s DTV Transition

A Fixed Deadline for Analog Turn Off. In Berlin, the total time from passage of the law to completion of the transition was approximately 18 months. The transition began nine months after the law was passed and was completed nine months after that. In contrast, the Media Bureau plan would drag the transition out more than four more years, until 2009.

Assuming Congress can complete action by the end of its 2005 session (by November 2005), we believe that a two-year transition period would be more than adequate. Both consumers and manufacturers would then also know more than a year in advance of the coming 12-month window (presumably corresponding to fiscal or calendar/tax year 2007) for the procurement of digital-to-analog converters. Consumers need this time to be educated about the need to purchase either a D–A converter or a new digital TV set, and manufacturers need time to ramp up mass production. Any auction for the reallocation of returned spectrum could occur in 2006—and fetch full value thanks to the certainty of the January 1, 2008 turn-off and clearance deadline.

Phased in Transition: According to the Television Bureau of Advertising, thirty markets have 10 percent or fewer households that rely on over-the-air reception. In nine markets, the percentage is even lower than in Berlin. An even earlier (2007) transition in some of these markets—as trial markets—has some advantages in terms of reducing public education costs, increasing lead times and competition among manufacturers, and learning from experience.

Allowing Down Conversion for Analog Cable Subscribers. The cable DTV transition should be viewed as a completely separate issue from the broadcast DTV transition. The key question is whether cable TV’s transition should be market-based or not. We believe it should, since pay TV customers can always choose to receive their local TV stations over-the-air. Moreover, the cable TV industry has strong motivations to transition to digital because it can then use its bandwidth far more efficiently. By transitioning from analog to digital, a cable system opens up capacity for hundreds of new DTV channels and allocates more spectrum for next-generation broadband service. This allows cable to charge for additional services as well as better compete with both satellite and telephone competitors.

On the cost side, digital conversion over cable can be accomplished by adding a \$25 chip to a standard set top box, or by providing customers with a \$75 standalone converter box. When this cost is amortized over the lifecycle of a set top box or cable subscription, its cost per month is expected to be negligible compared to the benefits it provides. One major cable company, Charter Communications, has already converted to DTV all its subscribers in Long Beach, California.¹²

In short, although this Committee may want to extend the one-time consumer credit to cable households, whether a cable customer ends up watching in analog or digital-quality should not be dictated by the government. For this same reason—

¹¹Option #4 indicates that it would cost a comparable amount to convert all analog sets owned by households that do not subscribe to a paid TV service. However, there appears to be no compelling reason to subsidize multiple sets per household, or to distinguish between the secondary sets of OTA and subscription TV households.

¹²See “Cable,” *Communications Daily*, January 20, 2004: “Converting to digital from analog recovers capacity that can be used to provide more high-definition TV, as well as targeted services, including video-on-demand and specialized subscription packages. Charter said all-digital service would save money by using lower cost digital-only set-top boxes. Entry-level digital set-tops that support broadcast, interactive and on-demand services cost about 50 percent less than comparable analog/digital set-tops . . .”

and because a consumer equipment subsidy would make the statutory 85 percent analog turn-off threshold irrelevant—we urge the Committee to repeal the FCC’s digital tuner integration mandate, thereby saving pay TV subscribers at least \$1 billion annually. It is the height of regulatory arrogance for the government to force manufacturers to charge non-OTA households extra to integrate a piece of equipment that consumers have overwhelmingly demonstrated they do not want or need.

Allocation of Spectrum After the Transition. Currently, public safety is promised 24 MHz (channels 63, 64, 68, and 69) of the 108 MHz (channels 52–69) available after the broadcast DTV transition. We recommend that Congress reallocate the remainder of the cleared 700 MHz band so that it is evenly divided (42 MHz and 42 MHz) between licensed and unlicensed spectrum, with the licensed spectrum auctioned to the highest bidder.

We also urge the Congress to earmark a larger portion of the spectrum revenue from Channels 52-to-69 to address the distinctive information market failures of our information age, with 50 percent of the proceeds used to fund the public TV trust fund proposed by the Association of Public TV Stations and 50 percent used to fund the Digital Opportunity Investment Trust Act (S. 1854) introduced by Senators Snowe, Dodd and Durbin.

An Opportunity to Expand Unlicensed Wireless Broadband

In addition, guard band and unassigned channels in each market below Channel 52 should be opened up as soon as practicable for unlicensed providers of local wireless broadband networks. Wi-Fi is just beginning of a wireless paradigm shift—a radio revolution premised on shared, *unlicensed* access to the airwaves that will determine if the U.S. will be a leader or a laggard in the next generation of network technologies. While the Wi-Fi boom has been about short-range mobility, more than 1,500 wireless Internet service providers (WISPs) already are using unlicensed spectrum to offer high-speed broadband to homes and businesses up to 30 miles from the Internet backbone. This is particularly important for rural areas, where wired connections are unavailable or unaffordable. WISPs such as AMA*TechTel and Prairie iNet are building wide area networks on unlicensed frequencies that cover 20,000 square miles or more in rural and small town Texas, Oklahoma, Iowa and other states.

As a national goal, we need to think and plan not merely in terms of universal broadband access, but in terms of pervasive connectivity. We can try to do this by relying on a pair of regulated monopolies—one cable, one copper—to trench fiber into every home and small business. We also could wait for a few national wireless carriers to invest tens of billions to blanket the Nation with a thick quilt of cell towers needed to extend high-speed connections everywhere. Alternatively, we can spread our bets by promoting competition in the last-mile by opening more spectrum to thousands of entrepreneurial WISPs and nonprofit community access networks that are already offering last-mile connections on unlicensed frequencies.

Unlicensed access is especially important for connecting rural and low-income areas. We urge the Committee both to reallocate a portion of Channels 52-to-69 for unlicensed wireless broadband and to express support for the rulemaking the FCC opened last month, in which it proposes to open empty TV channels below Channel 52 for unlicensed broadband.

DTV Public Interest Obligations for Local Civic and Electoral Programming

Perhaps the most neglected aspect of the DTV transition is an updating of the public interest obligations of local DTV broadcast licensees in exchange for the tremendous increase in broadcasting capacity they receive in the switch from analog to digital. As the age of DTV multicasting dawns, Congress and the FCC has a fresh opportunity to create meaningful public interest obligations for broadcasters. Licensees should be required to use DTV’s enormously increased capacity to expand the coverage of diverse viewpoints and of local civic affairs and election contests.

We urge the Committee to include in any DTV transition legislation a provision that adopts the local civic and electoral programming obligation proposed by the Public Interest, Public Airwaves Coalition. In April the Coalition presented the FCC with a proposed “processing guideline,” modeled after the FCC’s guideline on children’s educational programming, that allows for expedited license renewal for stations that air a minimum of three hours per week of local civic and electoral programming on the most-watched channel, with at least 50 percent aired between 5 and 11:35 p.m. Additional hours of civic affairs and election coverage—no less than 3 percent of the aggregate hours multicast—would be required on licensee’s additional “free” (ad-supported) OTA programming streams. Strengthened disclosure

requirements would also help the public determine whether this obligation and others was being faithfully fulfilled by individual stations in individual markets.¹³

Conclusion

The producer subsidy model has been a dismal failure. Local TV broadcasting, perhaps the most profitable legal business in America today, has arguably received the largest government subsidies in U.S. history. Yet there is no end in sight to the OTA digital transition. Every year this delay imposes an opportunity cost of tens of billions of dollars on taxpayers and consumers who are deprived of both payment for commercial use of the public airwaves and the economic value that spectrum-starved wireless broadband services providers could provide more efficiently at low frequencies.

We urge Congress to earmark a portion (roughly 10 percent) of the Federal revenue likely from reassignment of TV Channel 52-to-69 spectrum for a one-time refundable tax credit to enable the remaining 17 million households relying on analog OTA reception to switch to digital-only—and to deal address the social dimensions of the DTV transition by extending TV licensees' public interest obligations and by earmarking spectrum revenue to invest in the digital future of public broadcasting and education technology.

Thank you again for this opportunity to testify. I will be most happy to respond to any questions or to assist staff as the Committee develops its own solution to this important problem.

The CHAIRMAN. Thank you very much. Mr. Gelsinger.

STATEMENT OF PATRICK P. GELSINGER, CHIEF TECHNOLOGY OFFICER AND SENIOR VICE PRESIDENT, INTEL CORPORATION

Mr. GELSINGER. Thank you. My name is Pat Gelsinger, I'm the Chief Technology Officer for Intel, the largest semiconductor manufacturer in the world, second largest provider of communications chips. I oversee development, including wireless, I oversee policy activities, including those in the area of spectrum. It's an honor to appear before the Committee today.

In my written testimony, I have discussed the benefits of Moore's Law, the heartbeat of the semiconductor industry, this doubling of transistors every 2 years and the benefits it will bring to radios in the near future, or radio revolution, which will make radios far more prolific and flexible.

But radios need spectrum. Unfortunately, the vast majority of spectrum today is governed by a command and control model which provides very mixed and limited uses for that spectrum creating an artificial spectrum. We encourage unlicensed spectrum as well as far more flexibility in the licensing of spectrum to solve this problem.

We think the single most important thing that could be done to accelerate broadband deployment in the Nation is the allocation of the TV spectrum. I want to emphasize two things in my oral comments. First, the value of that spectrum. And second, such specific proposals with respect to how we can accelerate the allocation of that spectrum.

Broadband wireless, we believe, is on the cusp of a major revolution much like Wi-Fi has littered the globe with millions of hot spots in the last couple of years, we see broadband wireless creating a similar phenomenon of hot zones.

This creates a third pipe, an alternative, complement to DSL and to cable. We see this as complementing the national priority as

¹³The Coalition proposal and supporting information is available online at <http://www.ourairwaves.org/>.

President Bush has emphasized a broadband nation by 2007. We see it as a matter of international competitiveness, an opportunity to follow or an opportunity to lead in the broadband revolution.

The TV spectrum, given its propagation characteristics, is uniquely valuable. Propagation characteristics allowed it to cover much larger rural areas, much larger geographic areas allowing a significant cost savings. Our estimates indicate a quarter of the costs of capital for base stations but penetrates walls allowing mobile, consumer, self-install, minimizing the cost. Literally, it is the beach front property of spectrum.

I emphasize in the most underserved areas of broadband availability today, rural areas the spectrum is by far the most value, delivering broadband services we believe very effectively to those customers. We see three proposals that are balanced, complementary and can be acted on very quickly.

First, the FCC has a notice of proposed rule around the availability of unlicensed use of unused TV channels today. This would represent on the order of half of all TV channels, even in densely populated areas and far more in more rural areas. Radio technology today is clearly capable of listening before talking, and being able to detect when a noninterference is possible. We would encourage the FCC to act on this before the end of this year.

Second, we support the Mass Media Bureau ban. We encourage an end certain date, as is proposed here of January 1, 2009. We would also see that the TV spectrum 62 to 69 a clear channel of 108 megahertz, 124 for public and 84 for broadband wireless. If anything, we believe this plan should be accelerated before January of 2009. We would also complement that by other actions that could be taken more expeditiously.

We believe that should be a voluntary turn back program that's made available that broadcasters who want to make their spectrum available more rapidly would be incented to do so by participating in a pro rata portion of the results at auctions. We believe this would accelerate DTV conversion, as well as accelerate broadband deployment.

In summary, we see there is an opportunity before us today to significantly accelerate broadband wireless. We also see that the value of the TV spectrum is hugely important to accomplish that. We see that there is a win, win, win. A win for users in new devices and servers, an even bigger win for rural deployment, a win for public safety and a win ultimately for the United States. Thank you very much.

[The prepared statement of Mr. Gelsinger follows:]

PREPARED STATEMENT OF PATRICK P. GELSINGER, CHIEF TECHNICAL OFFICER,
INTEL CORPORATION

Executive Summary

I am Patrick Gelsinger, Chief Technical Officer of Intel Corporation. Today, I want to address four topics: the coming revolution in radio technology, the need for spectrum policy reform, the value of TV spectrum for wireless broadband applications, and three possible ways of making TV spectrum available for new uses.

The Coming Radio Revolution. Moore's Law is going to revolutionize Marconi's transmitter. Phenomenal "silicon" improvements will produce two profound effects in radio technology. First, radios will continue to get "digitized." The result will be that every electronic device will include a radio and more importantly there will be an explosion in the number of wireless devices used for communication, commercial,

medical, entertainment and numerous other purposes. Radio communication, like music files or video DVDs, will become another function on your computer. Second, additional processing power will make radios much smarter and more flexible. Once the radio itself is primarily digital, it will be able to change radio air interface standards by downloading different software. One new radio technology Intel is particularly excited about is WiMAX, an IEEE standard (802.16-REVd) that has been architected to cost effectively deliver broadband services.

The Need for Spectrum Reform. The biggest obstacle facing the coming radio revolution is artificial spectrum scarcity created by over reliance on “command and control” spectrum management. Two promising spectrum management techniques can serve as a guide for reform—the grant of increasing flexibility to exclusive licensees and the creation of largely unregulated, unlicensed bands. The flexible licensed approach fostered enormous innovation and investment on the PCS spectrum and unlicensed use created the Wi-Fi revolution at 2.4 and now 5 GHz. These techniques have succeeded because they give users more freedom to innovate and respond to changing market forces without seeking government approval. Intel actively supports both types of reform.

The value of TV Frequencies. The ability to use TV frequencies would accelerate the growth, expand the reach, reduce the cost and improve the quality of broadband wireless service. Even when compared to the 2.5 GHz frequencies—the best alternative available to WiMAX in the U.S.—the TV frequencies make it far more economical to serve rural areas and to compete with wireline broadband alternatives in urban areas.

For a given level of quality to a given coverage area, the TV frequencies require fewer antennas and use less power than 2.5 GHz frequencies. To cover the same geographic area we estimate that using 2.5 GHz frequencies would approximately result in an 11db drop in signal strength. (For non engineers, a simple rule of thumb is that every 3 dB of additional loss represents a factor of two difference in signal strength.) This drop in signal strength would require 4 to 5 times as many base stations to achieve equal geographic area coverage, for a given air interface and bandwidth. Of course, one could “make up” for this loss by introducing innovative antenna enhancements or increasing the transmit power at 2.5 GHz. The former is being done in the WiMAX standard but at increased system costs. The latter—a greater than ten-fold increase in transmit power—is not feasible. Receiving devices would have to exceed FCC power limitations to successfully transmit back to the base station.

Also, because TV frequencies better penetrate walls, they would be less dependent on line of sight transmission to outdoor antennas. Besides the value that consumers could derive from portability, indoor use would also facilitate self-installation, avoid expensive truck rolls and make it attractive to launch market wide marketing and advertising campaigns. And indoor service to untethered laptops will accelerate the integration of WiMAX radios into microprocessors thereby generating the efficiencies from Moore’s Law.

Three Possible Reforms of the TV Spectrum. If the United States were to move forward expeditiously to make this spectrum available for new wireless broadband services, the resulting gains to American consumers, especially in rural areas, would be stupendous and U.S. based companies would achieve important first to market advantages.

1. Intel supports the FCC’s recently opened Notice of Proposed Rulemaking considering unlicensed use on vacant television channels. Given the current limitations of television receivers, most of the TV channels in any geographical area are unused. Advanced radio techniques, however, permit unlicensed use, without any adverse impact on the broadcasters. Indeed, because the channels “in use” seldom changes, agile radios may be able share these frequencies. Intel has and continues to do extensive due diligence to demonstrate exactly how unlicensed devices can access vacant TV channels with no significant risk to over-the-air broadcasters.
2. Intel believes that the Mass Media Bureau has proposed a very constructive plan. It would enable consumers and a myriad of other affected interests to plan towards a certain end date, January 1, 2009. It would also free valuable spectrum. Channels 52–69 represent 108 MHz in the 700 MHz band—24 MHz for use by public safety and 84 MHz for use by advanced wireless services. *Indeed, if I were to recommend any change to the Mass Media Bureau plan, it would be to move the date certain forward. 2009 is almost five years away.*
3. Intel believes that the FCC should explore giving broadcasters incentives to turn back their channels in advance of the 2009 for a *pro rata* share of the auction proceeds. This approach would compensate broadcasters for clearing before

they would be compelled to return their analog channels. Under this approach, they would have strong incentives to voluntarily clear their channels early. Their compensation would be set by the marketplace. If the Mass Media Bureau plan is the “stick,” a linked auction could be the “carrot.” The two approaches could be highly complementary.

Introduction

I am Patrick Gelsinger, Chief Technical Officer of Intel Corporation. Intel is the world’s largest semiconductor manufacturer and a leader in technical innovation. Intel is also a leading manufacturer of communications and networking chips. Our mission is to accelerate the convergence of computing and communications through silicon-based integration.

I manage much of Intel’s research and development activities including those targeted at developing radio innovations. During my 24 years at Intel, I have worked in a variety of areas including microprocessor and computing platform (PC) design and the development of wired and wireless communications technologies. As CTO I also head Intel’s technology policy and standards activities including content protection and digital rights management and spectrum policy and planning.

It is an honor to appear before this Committee to testify on whether and how the digital television (DTV) transition should be expedited. Let me begin by saying that Intel has long recognized the great potential of DTV and has invested significant R&D in DTV including the development of DTV tuners for PCs. In 1998 Intel and the PBS teamed up to deliver “Frank Lloyd Wright”—the first digital television trial that allowed viewers to obtain Web-based content while watching TV. Also, Intel’s experimental station KICU, broadcasting from Intel’s headquarters in Santa Clara, was one of the first over-the-air DTV broadcasters in the Bay area.

Today, I want to address four topics:

- The coming revolution in radio technology,
- The need for spectrum policy reform,
- The value of TV spectrum for applications such as wireless broadband, and
- Three possible ways of making TV spectrum available for new uses.

Moore’s Law and the Coming Radio Revolution

Moore’s Law is going to revolutionize Marconi’s transmitter. Over 30 years ago, Intel founder Gordon Moore predicted that the density of transistors would double roughly every 18 months. These improvements in density increase speed and reduce cost. In the past 30 years, microprocessors have increased 1,000 times in speed and decreased 100 times in cost. If Moore’s Law continues to hold, as we expect it will, by 2010 a single microprocessor will contain ten billion transistors and process a trillion instructions per second.

These phenomenal “silicon” improvements will produce two profound effects in radio technology. First, radios will continue to get “digitized.” Increasingly, radios will encode information digitally, increasing the robustness of its transmission and allowing it to be processed by general purpose microprocessors. Radio communication, like music files or video DVDs, will become just another standard function on your computer. As Moore’s law produces still more powerful chips, the percentage of the chip needed to provide radio communications will become trivial. Only somewhat facetiously, I call it “Radio Free Intel.” The result will be that every electronic device will include a radio and more importantly there will be an explosion in the number of wireless devices used for communication, commercial, medical, entertainment and numerous other purposes.

Second, additional processing power will make radios much smarter and more flexible. Separate circuits will not be needed to decode an AM, FM, GSM, CDMA, NTSC or DTV signal. Once the radio itself is primarily digital, these functions can be added by downloading different software. The FCC recognized this eventuality when it enabled these flexible “Software Defined” radios or SDRs.

In addition to making radios more flexible, additional processing power will enable radios to alter their operating parameters to make the most efficient use of the available frequencies. Today’s cell phones can scan multiple frequencies, switch from GSM or CDMA air interfaces and when roaming choose which carrier offers the best business arrangement. Verizon states that its “CDMA transmitters adjust power levels 800 times per second—to ensure that only the minimum power necessary is used to maintain a connection.”¹

¹ Comments of Verizon Wireless in Facilitating Opportunities for Flexible, Efficient and Reliable Spectrum Use Employing Cognitive Radio Technologies; ET Docket No. 03–108, p. 3.

One new radio technology Intel is particularly excited about is WiMAX. Like Wi-Fi (802.11), WiMAX is an IEEE standard (802.16-REVd) that is expected to be accepted as a global standard. WiMAX is expected to be deployed for both licensed use (like Cellular) and unlicensed (like Wi-Fi) applications. With the latest in modulation techniques (such as OFDM) and antennae techniques (such as MIMO) WiMAX has been architected to cost effectively deliver broadband services. Before yearend we expect to see radios using the WiMAX to provide wireless broadband access to fixed locations and in 2005 we expect the mobile version of the specification (IEEE 802.16e) to be complete. It will be deployed for Line of Sight at ranges of 50 kilometers or more and non-Line of Sight applications at somewhat shorter ranges.

A wireless ISP using a small 802.16 installation could provide sufficient shared data rates (up to 75 Mbps) to simultaneously support more than 60 businesses with T-1 style connectivity and hundreds of homes DSL-speed connectivity.² In 2006 WiMAX will begin to be deployed in laptops. Intel has announced that it intends to put WiMAX radios in its chipsets by 2007—just as it has done with Wi-Fi in its Centrino™ chipsets beginning in 2003.

WiMAX is expected to improve bandwidth and service while radically reducing radio costs. The result WiMAX should dramatically spur wireless broadband deployment as a third broadband pipe augmenting DSL and Cable. It holds special promise in rural areas or developing markets where service providers haven't deployed wired infrastructure. Countries around the globe are already beginning pre-standard trials of WiMAX.

General Spectrum Reform

The biggest obstacle facing the coming radio revolution is artificial spectrum scarcity created by over reliance on “command and control” spectrum management. The current system is cumbersome, litigation-prone and politicized. Its tendency to “lock in” inefficient uses and technologies has become more costly with the burgeoning demand for diverse wireless uses and the increased ability of technology to minimize interference.

The FCC's Spectrum Policy Task Force identified two promising spectrum management techniques that can serve as a guide for reform—the grant of increasing flexibility to exclusive licensees and the creation of largely unregulated, unlicensed bands. The flexible licensed approach fostered enormous innovation and investment on the PCS spectrum, *e.g.*, the creation of 147,719 cellular base stations.³ Unlicensed use created the Wi-Fi revolution at 2.4 and now 5 GHz. In the fourth quarter of 2003 alone, worldwide Wi-Fi sales exceeded half a billion dollars—16 percent growth over the previous quarter.⁴ These techniques have succeeded because they give users more freedom to innovate and respond to changing market forces without seeking government approval.

Importantly, these reforms need not be mutually exclusive and should be considered simultaneously. Some advocates of spectrum reform espouse a “property-rights” approach. They believe that we should spend all of our efforts in creating a license structure that better emulates markets for other resources such as land. Other spectrum reformers espouse only unlicensed reforms. These advocates of so-called “spectrum commons” believe unlicensed spectrum can meet most if not all of society's spectrum needs.

Intel does not take an “either/or” approach. In fact, you might say we are in the “and/both” camp. The reality is that over 80 percent of the radio spectrum from 300 to 3,000 MHz is managed under the “command and control” approach. Less than 10 percent is devoted to what could be called flexibly licensed and less than 10 percent is allocated to unlicensed. What we need are significant increases in the amount of spectrum available to exclusive but flexible use and unlicensed use. Intel has been active on both fronts.

I would like to give you an example of each kind of reform. On the licensed front, Intel supports reform of the 2.5–2.7 GHz frequencies under consideration in the MMDS/ITFS proceeding that the FCC has scheduled for consideration tomorrow. Currently, these frequencies are primarily allocated to 1-way video services by industry (MMDS) and educational (ITFS) licensees. While most ITFS spectrum is leased to commercial interests, the fragmented band plan has impeded developing new more valuable uses. Hopefully, the FCC will restructure the band to create contiguous blocks of spectrum—132 MHz in total—that could be used for several purposes including WiMAX.

² WiMAX Press Teleconference Script, April 8, 2004.

³ Cellular Telecommunications & Internet Association, *Annualized Wireless Industry Survey Results* (June 2003).

⁴ Dell'Oro Group Wireless LAN Report, 4Q03. www.delloro.com/feature_story.shtml

Intel has also aggressively supported unlicensed reforms. For example, we were active in NTIA and FCC deliberations about whether the 5 GHz mid-band frequencies could be made available to Wi-Fi use. Intel and other high tech companies worked closely with NTIA to set parameters that would assure that a Wi-Fi system would reliably identify when a military radar begins to operate in its channel and rapidly move its operation to a different unused channel. Ultimately, this approach was adopted at the June 2003 World Radio Conference.

Reform of the TV Spectrum

The focus of today's hearing is whether and how the DTV transition can be expedited so that the analog channels currently used by broadcasters can be returned to the FCC and put to valuable new uses. I want to address how valuable this spectrum could be for wireless broadband service—a likely new use for the returned analog TV channels. I also want to speak briefly in favor of 3 possible reforms which could accelerate improved use of this spectrum.

1. The Value of the TV Spectrum

The television spectrum would offer enormous advantages for wide area wireless broadband services. The frequencies currently available for wireless broadband are up in the 2.5, 3.3 and even 5.8 GHz region. In contrast, TV channels are much lower in frequency—from 700 MHz all the way down to 76 MHz.⁵

It is true that technology has continually improved our ability to feasibly use higher frequencies. In Marconi's day, very low frequencies around 100 KHz were preferred because they hugged the earth. As technology advanced, it was discovered that short-wave frequencies, from about 2 to about 30 MHz, could bounce off the ionosphere, giving them dramatically greater distance. In 1962, conquering distance changed again with the introduction of geostationary telecommunications satellites that use frequencies in the GHz range.

Notwithstanding these improvements, lower frequencies still travel farther at given power. This simple fact enables VHF television licensees to provide a better quality over the air signal with less power than its UHF television counterpart. Similarly, a cellular system operating at 800 MHz can provide better coverage than a PCS system operating in the 2 GHz range.

The ability to use TV frequencies would accelerate the growth, expand the reach, reduce the cost and improve the quality of broadband wireless service. Even when compared to the 2.5 GHz frequencies—the best alternative available to WiMAX in the U.S.—the TV frequencies make it far more economical to serve rural areas and to compete with wireline broadband alternatives in urban areas. For a given level of quality to a given coverage area, these frequencies require fewer antennas and use less power.

Chris Knudsen of Vulcan Capital estimated the capital and operational costs of providing wireless broadband service in Bellevue/Seattle, Washington using 2.6 GHz. Then he estimated what happened to the capital and operating costs of providing wireless broadband service to the same territory using 700 MHz. He found that using TV frequencies required only $\frac{1}{3}$ to $\frac{1}{4}$ of the cell sites. Even more importantly, it required about only $\frac{1}{2}$ to $\frac{1}{3}$ of the capital to reach positive free cash flow.⁶

For purposes of this testimony, we did our own analysis of the advantages of 700 MHz *vis à vis* 2.5 GHz frequencies. Our results were similar to those of Vulcan Capital. For a given level of quality to a given coverage area, the 700 MHz frequencies require fewer antennas and use less power than 2.5 GHz frequencies. To cover the same geographic area we estimate that using 2.5 GHz frequencies would approximately result in an 11db drop in signal strength. (For non engineers, a simple rule of thumb is that every 3 dB of additional loss represents a factor of two difference in signal strength.) This drop in signal strength would require 4 to 5 times as many base stations to achieve equal geographic area coverage, for a given air interface and bandwidth. Of course, one could "make up" for this loss by introducing innovative antenna enhancements or increasing the transmit power at 2.5 GHz. The former is being done in the WiMAX standard but at increased system costs. The latter—a greater than ten-fold increase in transmit power—is not feasible. Receiving devices would have to exceed FCC power limitations to successfully transmit back to the base station.

⁵ 76 MHz, VHF Channel 5, is the lowest channel considered in the FCC Unlicensed Operation in the TV Broadcast Bands NPRM, and hence potentially available for wireless broadband. Broadcast television in the U.S. begins at 54 MHz, channel 2.

⁶ Chris Knudsen, "Lower Frequencies Improve the Subscriber Operating Model," June 3, 2004, WCA Convention, Washington, D.C. For interpretation and analysis of Knudsen's work see slides presented by Pierre de Vries, Chief of Incubation at Microsoft at the NTIA Spectrum Management Forum held in Santa Clara on March 8, 2004.

Also, because TV frequencies better penetrate walls, they would be less dependent on line of sight transmission to outdoor antennas. Besides the value that consumers could derive from portability, indoor use would also facilitate self-installation, avoid expensive truck rolls and make it attractive to launch market wide marketing and advertising campaigns. And indoor service to untethered laptops will accelerate the integration of WiMAX radios into microprocessors thereby generating the efficiencies from Moore's Law that I discussed at the outset.

While perhaps obvious, the cumulative impact of these differences on the feasibility of providing wireless broadband in rural areas bears emphasis. The upshot for some rural areas is that opening the TV frequencies to wireless broadband use would likely make the difference between a high quality wireless broadband alternative and none at all. In simple terms, frequencies below 1 GHz are premier beach front property. We believe the allocation of these frequencies for licensed and unlicensed use could dramatically accelerate broadband deployment with nationwide benefit but particular benefit toward rural and underserved areas.

2. *Permit Unlicensed Use of Vacant TV Channels*

Policymakers should consider three possible reforms that could increase the use of the TV spectrum. First, the FCC recently opened a Notice of Proposed Rule-making considering unlicensed use on vacant television channels. Given the current limitations of television receivers, most of the TV channels in any geographical area are unused. Advanced radio techniques, however, permit unlicensed use, without any adverse impact on the broadcasters. Indeed, because the channels "in use" seldom changes, agile radios may be able share these frequencies. The technology required to use these frequencies without interference to existing stations is comparable to what is deployed in today's cell phone. Even inexpensive TV sets have the ability scan for over-the-air channels as part of their set-up routine. Intel has and continues to do extensive due diligence to demonstrate exactly how unlicensed devices can access vacant TV channels with no significant risk to over-the-air broadcasters.

Another method under consideration is to use Global Positioning System receivers built into the unlicensed devices to determine the device location relative to fixed broadcast transmitters. Again, rural communities could especially benefit from this approach. They have the greatest number of vacant TV channels and fewer wireline broadband alternatives. Rural deployments might also be accelerated by allowing somewhat higher power levels to increase coverage with minimal capital costs required.

Ironically, by creating the incentive for millions of devices to be able to scan TV channels, unlicensed use of vacant TV channels could create, as Chairman Powell stated, "potentially an enormous opportunity for broadcasters."⁷ Indeed, making it possible for millions of devices to interact with on air broadcasters could promote the FCC's second initiative in this area: the DTV Transition.

3. *Expedite The DTV Transition*

Currently, each broadcaster has two 6 MHz channels—one channel for analog distribution and one for digital distribution. Congress established a DTV transition plan that in essence requires a broadcasters return its analog channel to the FCC by 2006 or when 85 percent of the households in its market can receive digital television, whichever occurs later.

The Mass Media Bureau has proposed a plan that would accelerate this transition and provide a date certain by which broadcasters would return their analog channels. There are many details in the Bureau's proposal and I do not purport to be expert on "must carry" and other regulation.

Essentially, it provides that broadcasters' must-carry rights on cable systems would switch from their analog signals to their digital signals on January 1, 2009. At the same time cable operators would be required to make the digital must-carry signals available to all subscribers. They would have a "down conversion" or an "all digital option."⁸ Satellite operators in "local-into-local" markets would have analo-

⁷ Statement of Chairman Michael K. Powell regarding "Unlicensed Operation in the TV Broadcast Bands" (ET Docket No. 04-186) at FCC open meeting held May 13, 2004.

⁸ The Mass Media Bureau's proposal provides that the cable operator could: (1) "down-convert" a single digital broadcast stream from digital to analog at the cable head-end so that all subscribers, including analog-only subscribers, could continue to view the programming or (2) pass through the digital must-carry signals to subscribers' homes, where the system has converted to "all digital" transmission and all subscribers have the ability to receive and display the digital signals (either on a digital set or down-converted by a set-top box for display on an analog set). Written Statement of W. Kenneth Ferree, Chief of the Mass Media Bureau, Federal Communications Commission, on "Advancing the DTV Transition: An Examination of the FCC Media

gous requirements.⁹ The cumulative reach of cable and satellite providers together with the impact of the FCC's DTV tuner mandate and new "plug-and-play" DTV sets would almost certainly assure that the 85 percent metric would be met everywhere by January 1, 2009.

Intel believes that the Mass Media Bureau has proposed a very constructive plan. It would enable consumers and a myriad of other affected interests to plan towards a certain end date. It would also free valuable spectrum. Channels 52–69 represent 108 MHz in the 700 MHz band—24 MHz for use by public safety and 84 MHz for use by advanced wireless services. In channels 2–51, the analog channels would be available for auction.

As I indicated above, the benefits from making this spectrum available for wireless broadband could be enormous. *Indeed, if I were to recommend any change to the Mass Media Bureau plan, it would be to move the date certain forward. 2009 is almost five years away.*

4. Move Forward with Auctions of Channels 52–69

That brings me to my third proposal. Once the date certain is set, it may be possible to provide incentive for broadcasters to vacate their channels even earlier. The FCC might be able to spur their movement by simply moving forward with the spectrum auctions of the unassigned spectrum for channels 52–69. The auction winners would have strong incentives to buy these broadcasters out and help them move to their digital channels. When the FCC proposed to auction these channels a few years back, several broadcasters appeared ready to move to their digital channels and vacate their analog channels earlier than they would have been required to under the law in exchange for compensation.

Now it may possible to structure the auctions to induce the broadcasters to voluntarily clear these channels much earlier than 2009. For example, FCC could give broadcasters incentives to turn back their channels in advance of the auction for a *pro rata* share of the proceeds. This approach would compensate broadcasters for clearing before 2009—the new date by which they would be compelled to return their analog channels. Under this approach, they would have strong incentives to voluntarily clear their channels early. Their compensation would be set by the marketplace. If the Mass Media Bureau plan is the "stick," a linked auction could be the "carrot." The two approaches could be highly complementary.

I have not worked out all the details. Nor have I fully considered all the legal ramifications. I leave those to the FCC and to the members of this Committee. But I do think this approach is worth considering. In fact, I am confident that if there is the will, a way could be found.

In the end I keep coming back to the benefits to our country of clearing this spectrum in 2005 instead of 2009 or beyond. Even if limited to channels 60–69, the benefits from clearing the 24 MHz that has been allocated for public safety use and the 30 MHz that could be used for wireless broadband use would be stupendous.

A Final Thought

I want to close by returning to the potential benefits of clearing the TV spectrum for new uses such as WiMAX. There could be significant first mover consequences in this market. If the United States were to move forward expeditiously to make this spectrum available for new uses, it could start a bandwagon effect. I believe the benefits of the new wireless broadband services would be so compelling that a critical mass of other countries would quickly move to clear spectrum in this range. The resulting gains in economies of scale would give American consumers still lower prices and U.S. based companies important first to market advantages.

On the other hand, the U.S. does not have a monopoly on spectrum reform. In particular, emerging countries have a special interest in developing wireless broadband alternatives because they have less wireline infrastructure. Also, they frequently face fewer transition costs because they have fewer broadcasters and other incumbent users.

In short, the opportunity is great and the challenge is equally great. The time to begin reform is now.

Thank you.

Bureau Proposal," before the Subcommittee on Telecommunications and the Internet, U.S. House of Representatives, June 2, 2004, p. 4.

⁹The Mass Media Bureau's proposal provides that satellite operators in local-into-local markets would be required to make sure that its customers either: (a) to carry one standard-definition digital programming stream from each broadcaster in the market (down-converted from HDTV to standard-definition, if necessary); or (b) to pass through the digital broadcast signals to subscribers' homes, where all subscribers have the ability to receive and display the programming. *Id.*

The CHAIRMAN. Thank you very much. Mr. Hazlett.

**STATEMENT OF THOMAS W. HAZLETT, SENIOR FELLOW, THE
MANHATTAN INSTITUTE, CENTER FOR A DIGITAL ECONOMY**

Mr. HAZLETT. Thank you, Mr. Chairman, and thanks very much for having me at the hearing. The official opening of the advanced television proceeding at the Federal Communications Commission occurred in 1987. It was a rather rude response to requests made by cellular equipment manufacturers such as Motorola and public safety organizations to reallocate some part of the little-used TV band for other services. It put these requests on hold, waiting for high definition television where they still sit today, 17 years later.

Meanwhile, TV spectrum, an extremely productive block of radio frequencies that is more than twice the bandwidth of all the airwaves devoted to mobile telephone service continues to support traditional broadcast TV service and virtually nothing else. That constitutes a regulatory debacle for two reasons.

The first is that U.S. consumers would dearly love the wireless services that the TV band could host. We know from analyzing the intense usage of commercial mobile radio services band that there is huge pent up demand to utilize additional bandwidth for voice and data. Currently, wireless phone service in the United States generates about \$90 billion annually. Historical data indicate the consumer surplus, benefits to customers over and above what they pay is at least another \$80 billion per year.

I have recently estimated that allowing another 80 megahertz, a fifth of the TV band spectrum, another 80 megahertz of radio spectrum to be used by cellular operators would lower per-minute wireless charge by nearly 25 percent, increasing usage by about 47 percent and generating over \$30 billion-a-year in annual, most per year, annual, and \$30 billion in annual benefits. Underscoring it.

These gains are so large because the use is spectrum hungry. European Union countries average between 250 and 300 megahertz of allocated radio spectrum for mobile services, while the U.S. struggles to allocate 189 megahertz. Nearly 30 megahertz of course has been tied up for nearly a decade now on the next wave problem. Germany uses 302 megahertz of spectrum, the UK, 340, the Netherlands, 355.

If the U.S. can come close to this spectrum allocation, efficiency here would increase dramatically. That would lower prices for customers, cell phone use and high-speed wireless data would be far more widely deployed. Additionally, American businesses would become much more competitive in both domestic and international markets, as has recently been noted.

The second reason the TV band should be made available for alternative uses is that it offers Americans very little value in its current deployment. Let us be very clear. The programs TV broadcasters create are popular and generate consumer value. The 400 megahertz distribution channel TV broadcasters plug up, however, is hugely inefficient, only about 10 million households today remain without subscription television service. At \$300 for a cable box or satellite dish, a price that includes installation, virtually all of these homes could be added to existing distribution networks at a one-time cost of under \$3 billion.

From there, the retransmission of broadcast programming has zero marginal costs to society. Well, various details of all subscriber transition are interesting, none bear costs that come close to the magnitude of the benefits garnered in freeing up radio spectrum for advanced wireless services.

Unfortunately, this reharvesting of valuable frequency space has become enmeshed in the digital TV transition now playing in slow motion for nearly two decades. There are signs that there may be light if not at the end of the tunnel, at least gleaming through a crack in the ceiling. The most important is that policymakers jet-tison the policy goal of high definition television in favor of pushing the airwave reallocation.

The interminable waste of valuable resources is receiving public frustration it deserves. Why has the TV transition not worked? Government has planned the entire policy and so politics, not market efficiencies, have driven the process. There is nothing exceptional about the digital TV transition. It was a classic tragedy. Nor is the problem particularly challenging in a technical or economic sense.

Americans are constantly upgrading technology, but the economic incentives have to be right. To get there, I believe two things should be done. One, awarding incumbent TV broadcasters flexible use rights to the air space implicitly defined in their current TV station licenses.

Two, award similarly flexible rights to use the spectrum allocated to each unoccupied TV channel and then allocate this spectrum to overlay licenses assigned via licensed auctions. Some may recognize this as the plan suggested 8 years ago by U.S. Senator Larry Pressler. It relies on the overlay concept successfully deployed in the PCS band where incumbents are grandfathered.

Getting these economic incentives in place is no mean task, of course. Broadcast TV relations is a public policy train wreck. The issue of exclusively assigned spectrum rights similar to those employed by cellular operators offers an exit strategy.

What is to be avoided is to impose central planning to yet another generation of wireless service. That is the approach represented by the FCC's current rulemaking to consider authorization of unlicensed devices, accessing the TV band. By imposing government-mandated spectrum sharing rules the FCC would block market forces from revealing the value of the band to entrepreneurs or consumers.

Technologies not fitting into the FCC's approval of very low power devices including powerful 4G wireless broadband systems now deployed in Australia and other countries would be ruled out. This central planning approach is the cause of the current problem. The superior program is to allow technologies to be selected by rivals. Outcome would be networks would compete and jockey to introduce an array of innovative applications.

This is the pro-consumer way to reform and it is the one way to curb windfalls without punishing consumers with the collateral days of delay and inefficiency. 17 years of transition have inflicted quite enough of both. Thank you.

[The prepared statement of Mr. Hazlett follows:]

PREPARED STATEMENT OF THOMAS W. HAZLETT
 EXIT STRATEGIES FOR THE DIGITAL TV TRANSITION

Thomas W. Hazlett¹

The official opening of the Advanced Television proceeding at the Federal Communications Commission occurred in 1987. It was a rather rude response to requests made by cellular equipment manufacturers (such as Motorola) and public safety organizations to reallocate some part of the little-used TV band for other services. Yet, that spectrum—an extremely productive block of frequencies that is more than twice the bandwidth of all the airwaves allotted mobile phone service—continues to support traditional broadcast TV service and virtually nothing else. That constitutes a regulatory debacle for two reasons.

The first is that U.S. consumers would absolutely love the wireless services that the TV band could host. We know, from analyzing the intense usage of the commercial mobile radio services (CMRS) bands, that there is huge pent-up demand to utilize additional bandwidth for voice and data. Currently, wireless phone service in the United States generates about \$90 billion in annual revenues, and historical data indicate that consumer surplus is at least another \$80 annually.²

In recent economic research, Roberto Muñoz and I have found that the price of mobile phone service is strongly related to two important variables: the degree of competition among suppliers, and the amount of bandwidth made available to wireless networks. Based on a model calibrated with data from 29 countries, we estimate that allowing another 80 MHz of radio spectrum to be used by cellular operators would lower per-minute wireless charges nearly 25 percent, increasing usage by about 47 percent and generating over \$30 billion annually in consumer benefits. Allowing operators to make productive use of greater TV band radio spectrum would result in still higher social gains. See Figure 1. (Please note that these are gains accruing to consumers rather than suppliers. They should not be confused with license values or expected auction receipts, which are relatively small.)

¹Senior Fellow, Manhattan Institute for Policy Research; former Chief Economist, Federal Communications Commission. Relevant research by the author includes, *The Rationality of US. Regulation of the Broadcast Spectrum*, 33 JOURNAL OF LAW & ECONOMICS (April 1990); *Assigning Property Rights to Radio Spectrum Users: Why Did FCC License Auctions Take 67 Years?* 41 JOURNAL OF LAW & ECONOMICS (Oct. 1998); *An Essay on Airwave Allocation Policy*, 14 HARVARD JOURNAL ON LAW & TECHNOLOGY (Spring 2001); *The US. Digital TV Transition: Time to Toss the Negroponte Switch* AEI-Brookings Joint Center for Regulatory Studies Working Paper 01–15 (Nov. 2001); *Property Rights and Wireless License Values*, AEI-Brookings Joint Center for Regulatory Studies Working Paper 04–08 (March 2004); *We Don't Want our DTV*, WALL STREET JOURNAL (Aug. 8, 2002); *Finally, Something Good on German Television*, SLATE (Oct. 7, 2003); *As Berlin's TVs Go Digital, Airwaves Lie Unused*, WALL STREET JOURNAL EUROPE (Nov. 24, 2003); *Would Last TV Station Turn Out the Lights* THE HILL (March 23, 2004). These articles are available online: www.manhattan-institute.org/scholars/hazlett.html. Contact: tw hazlett@yahoo.com

²This calculation is given in Thomas W. Hazlett and Matthew L. Spitzer, *Advanced Wireless Services, Spectrum Sharing, and the Economics of an Interference Temperature*, paper submitted to the Federal Communications Commission, *In the Matter of Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile and Satellite Frequency Bands*, ET Docket No. 03–237 (April 5, 2004).

Table 1. Annual Consumer Gains from Increased Availability of CMRS Spectrum							
		<i>Increase in Spectrum Available for CMRS</i>					
		80 MHz		140 MHz		200 MHz	
Variable	Initial Value	Final Value	% Change	Final Value	% Change	Final Value	% Change
Average Price/min.	0.112	0.084	-24.59%	0.069	-38.42%	0.056	-49.97%
Min. of use/month (millions)	78,340	115,098	46.92%	135,763	73.30%	153,038	95.35%
Change in Consumer Surplus (millions)		\$31,850		\$55,072		\$77,419	

Source: Results are estimates based on empirical model calibrated in: Thomas W. Hazlett and Roberto Munoz, *Welfare Effects of Spectrum Policy*, Manhattan Institute for Policy Research (June 2004).

One reason that these gains are so large is that the U.S. is spectrum-hungry. European Union countries average between 250 and 300 MHz of allocated radio spectrum, while the U.S. struggles to allocate 189 MHz, nearly 30 MHz of which is involved in the NextWave licensing fiasco and has yet to be productively utilized. In contrast, Germany uses 302 MHz of spectrum, the United Kingdom 340, and the Netherlands 355. If the U.S. could come close to the spectrum allocations of these nations, efficiency would dramatically increase. Consumers would enjoy lower prices and much better service, with cellphone use and highspeed wireless data being far more widely deployed. Additionally, American business users would become much more competitive in both domestic and international markets.

The second basic reason the TV band should be made available for alternative uses is that it offers Americans very little value in its current deployment. Let us be very clear here. The *programs* TV broadcasters create are popular and generate substantial consumer value. The 400 MHz *distribution channel* TV broadcasters plug up, however, is hugely inefficient. Only about 10 million U.S. households remain without subscription service. At \$300 for a cable “drop” or a satellite dish, a price that includes installation, virtually all of these homes could be added to existing networks at a one-time cost of under \$3 billion. From there, the retransmission of broadcast programming has zero marginal cost to society. While various details of an all-subscriber transition are interesting, none bear costs that come close to the magnitude of the benefits garnered in freeing up radio spectrum for advanced wireless services.

Unfortunately, this re-harvesting of valuable frequency space has become enmeshed in the digital TV transition, now playing in slow motion for nearly two decades. There are hopeful signs, however, that there may be light—if not at the end of the tunnel—at least gleaming through a crack in the ceiling. The most important is that policy makers appear willing to jettison the industrial policy goal of “high definition television” in favor of pushing airwave reallocation forward. The interminable waste of valuable resources is at long last receiving the public frustration it deserves.

Yet, it is vital that we understand why the digital TV transition has not worked if we are to chart a successful exit. Government has planned this entire policy, and so politics, not market efficiencies, have driven the process. There is nothing exceptional about the digital TV transition—it is a classic “tragedy of the commons.” Nor is the problem particularly challenging in technical terms; Americans are constantly upgrading. But the economic incentives have to be right.

Such incentives are in place where well-defined rights to use radio spectrum are found. Take the strikingly undisastrous analog-to-digital transition in cellular. When FCC licenses were awarded in the 1980s, mobile phone carriers were mandated to install analog systems. But the advantages of digital transmissions were already apparent. In 1988, cellular operators were belatedly allowed to use digital standards. By this time, however, scores of major markets—with millions of subscribers—were offering analog cellular service.

Over a number of years, mobile phone carriers invested billions of dollars to upgrade to digital. They carefully migrated customers, coordinating shared use of cel-

lular frequencies. Carriers gave away digital handsets to customers, subsidizing technology adoption and smoothing transition. This was very expensive but economically smart: by getting customers to use better phones, calls spewed less interference, leaving greater capacity for others. As network operators with exclusively-assigned rights, cellular carriers captured some of the increase in value.

You'll note that no calamities befell the transition to digital cellular, a delicate and complex process that is nearing completion. The situation contrasts sharply with that in television where rights to control radio spectrum are extremely fragmented. Instead of seeking to subsidize transition, incumbents actively seek to sabotage it. This is not a matter of bad character but of poor public policy. Economic incentives—and the behavior of both incumbents and entrants—would change instantly were two things to happen:

1. Incumbent broadcasters were awarded flexible use rights to the airspace implicitly defined by their TV station licenses;
2. Similarly flexible rights to use the spectrum allocated to each unoccupied TV channel were allocated to overlay licenses and sold at auction.

This is the plan put forth some eight years ago by U.S. Senator Larry Pressler.³ It relies on the “overlay” concept successfully deployed in the PCS band,⁴ where incumbent users in a band are grandfathered while a new licensee obtains permission to use surrounding frequency space. Vast bandwidth is available for productive use in the TV band. There are only about 1600 full power TV stations for 210 TV markets—8 stations per market, compared to a total of between 49 and 67 allocated channels, depending on how one counts. With the right economic incentives, broadcasters and other wireless companies would negotiate to figure out reasonable interference rules, and a plan to rationally use airspace in the new millennium. Rather than blocking new technologies, broadcast stations would seek out more efficient video distribution platforms, capturing part of the social gains created.

Getting these economic incentives in place, of course, is no mean task: broadcast TV regulation is a public policy train wreck. Issuing exclusively-assigned, flexible Use spectrum rights—similar to those enjoyed by CMRS operators—offers a reliable exit strategy. What is to be avoided is to impose central planning to yet another generation of wireless service. That is the approach represented by the FCC's current rule making to consider authorization of unlicensed devices accessing the TV band.

By imposing government-mandated sharing rules, the FCC would block market forces from revealing the value of the band to entrepreneurs and consumers. Technologies not fitting into the FCC's approved list of very low powered devices—including powerful 4G wireless broadband systems now deployed in Australia and other countries—would be ruled out by administrative fiat. This approach is the cause of the current problem. The superior solution is to let technologies be selected by market rivals.

The outcome would be that networks would compete to offer current services at much lower prices, and jockey to introduce an array of innovative applications. This is the pro-consumer way to reform, and it is the one way to curb windfalls without punishing consumers with the collateral damage of delay and inefficiency. Seventeen years of “digital TV transition” have already inflicted quite enough of both.

The CHAIRMAN. Why do you think, Mr. Hazlett, that there has been such a delay in this transition, if it makes sense economically and technologically and every other way?

Mr. HAZLETT. The delay, I was being generous when I only traced it to 1987. This has been going on since the late 1940s that we have been trying to take away TV band spectrum from TV broadcasters. You asked the question to Congressman Harman, why are the broadcasters so intransigent, and I think the answer is because they can be.

Under this regime, the incumbent broadcaster has the right to veto a reallocation and they have been vetoing reallocations literally since the late 1940s. There was a huge hassle that took

³ 142 CONG. REC. 10672, 10672–76 (1996). See discussion in: Hazlett, *An Essay on Airwave Allocation Policy*, 14 HARVARD JOURNAL OF LAW & TECHNOLOGY (2001), 442–43.

⁴ See Peter Cramton, Evan Kwerel, and John Williams, *Efficient Relocation of Spectrum Incumbents*, 41 JOURNAL OF LAW & ECONOMICS (Oct. 1998), 647–675.

many, many years of course to peel away a little bit of spectrum between channel 70 and 83 in the 1970s to get 50 megahertz for cellular. That's where that came from.

Broadcasters blocked that for years, saying people would die if you took away those TV station slots. They are waiting for regulatory payment to remove themselves. That's the game that's played under this central planning regime. Those are the rules of the game. I suggest the game be shifted and so economic incentives be put into place where the broadcasters would have an incentive to in fact do something efficient which is to reallocate and cooperate with the reallocation plan themselves.

If you go head-to-head and try to do this, we know that story. It's been going on for well over 50 years.

The CHAIRMAN. Mr. Calabrese, do you have any comment on that?

Mr. CALABRESE. Yes. I think Tom may have missed one point or two, which is I believe, and Mr. Ferree sort of suggested this a month ago, that the broadcasters have also I believe been holding out for a payoff on the second free channel they were given to make this transition back in 1996, and members—

The CHAIRMAN. Even though they were given it free, they want a payoff?

Mr. CALABRESE. Right. Of course, this committee dealt with that in 2002 when you passed the Spectrum Reform Act. That was when the Commission was going to do what Tom was requesting. They were going to get back a few of the channels on channel 69, take two-thirds of the auction revenue, sell their licenses to the second free channel directly to the cell phone industry and turn off analog.

And this committee reported out a bill that the President signed that canceled those give away auctions. That's why we are here today to finish the job. Just before that FCC order, the top analyst for the broadcast industry, Tom Wolz, even spoke before the NAB and told them your primary business is no longer broadcasting. You are spectrum farmers. The value of the licenses you hold are worth twice as much as the market value of all your stations combined.

And he said, you know, harvest it wisely, and they have been trying to do that politically. They have succeeded at the FCC so far, and I think it's up to this committee to really make the switch at least on 52 to 69 from broadcast to broadband.

The CHAIRMAN. Mr. Lawson?

Mr. LAWSON. Mr. Chairman, I think Mr. Hazlett's plan and some of the other comments that we hear really discount what over-the-air broadcast television means to the American public. This is not spectrum farming. And I can tell you—

The CHAIRMAN. I don't mean to interrupt, but I have heard no testimony that doesn't want to take into consideration those Americans that are receiving over-the-air television, whether it be \$578 million for the poorest or as much as \$3 billion for others. So I don't quite understand your statement there—because I think every witness has said we have to take care of those people. Particularly since they are the lowest income Americans, generally speaking. Go ahead.

Mr. LAWSON. Certainly, granting broadcasters flexible rights to the spectrum they hold would be a motivation for them to do something different. We question whether that's politically viable for one thing, and in fact is it fair?

The CHAIRMAN. Could we make the argument that if you're talking about tens of billions of dollars in revenue as associated with the digital spectrum or the analog spectrum that would be made available, that a couple of billion dollars to provide every American with either satellite, cable or set-top capability is an answer?

Mr. LAWSON. Yes, sir. In fact, we are proposing a variation that is also market based. We believe that the real driver for the digital transition will be to create the content of the services to motivate consumers to buy set-top boxes, to buy new digital sets. We believe that the value of the spectrum for us is if we could convert that into a trust fund that would allow us to create that content to help drive consumer acceptance.

We also think there are other market solutions beyond that to getting set-top boxes and digital set penetration. It could be that the interests like Intel and others who would like to develop this spectrum could be brought into a process of making sure that consumers are taken care of, that over-the-air consumers are taken care of and perhaps underwriting the cost of some of these boxes.

But we believe that free over-the-air television is important. We believe it's poised for a comeback in the United States. We have seen a great example of that in England, and content really is the driver.

The CHAIRMAN. Mr. Ferree?

Mr. FERREE. Well, thank you, Mr. Chairman.

The CHAIRMAN. We can't leave from this discussion the absolute criticality of the public safety aspect of the allocation of the spectrum, and none of us will go home without having heard from the chief of police, the firemen, the mayors, others who are deeply concerned about this issue of interoperability and freeing up of spectrum to be used for emergency services. Add that to your comments.

Mr. FERREE. Sure. No question about it. You won't get any philosophical disagreement from me with anything that's been said. Obviously, this is one of the most important policy initiatives for the Nation, getting back this spectrum not only for the economic benefits that we have already talked about but for these public safety benefits, the first responder spectrum.

The only thing I would add is that our plan was an attempt to do it within the existing statutory framework and not to rethink the entire framework. I don't have any philosophical difference with trying to think of other ways to do this and perhaps faster, just recognizing that the sooner we do this the bumpier the ride will be, so to speak, for the consumers.

If we do this today, we have a lot of consumers that would have to face getting the converter boxes. Boxes would be relatively expensive today. We think by moving it from the existing statutory date, in essence from the January 1, 2007 to January 1, 2009 will have more local penetration by DVS, but a lot more consumer education time.

The prices of the converter equipment will come down dramatically, by the way, because of our tuner mandate which drives the mass production of the tuners which are the same technology that goes into the converter boxes. All of those things will happen and we also think, by the way, by 2009, the number will be far less than 15 percent, perhaps on the order of 5 percent.

So it's a smoother transition at that point, too. It's just a policy tradeoff. I don't have any philosophical difference with moving it up.

The CHAIRMAN. When can we expect a formal proposal from the FCC?

Mr. FERREE. We are drafting this now in two different dockets. There are two dockets involved in this, and we will be presenting it to the Chairman's office in short order. We need to get back our comments on the 15 percent cure so that we can also educate the Chairman and the Commissioners on our thinking about what to do about those folks.

The CHAIRMAN. Senator Dorgan?

**STATEMENT OF HON. BYRON L. DORGAN,
U.S. SENATOR FROM NORTH DAKOTA**

Senator DORGAN. Mr. Chairman, thank you very much. You talked about the ability to watch someone eat maggots on Fear Factor on HDTV is hardly less enlightening than old style television. I think we are converting perhaps less aggressively than we had expected when we began to develop these policies to digital, HDTV. But I think, Mr. Calabrese, you have used the point, you have used the comment that those who own the spectrum, in fact, we simply license the use of the spectrum. Broadcasters do not own the spectrum, do they, technically?

Mr. CALABRESE. That's correct. It's a temporary license which needs to be renewed.

Senator DORGAN. The spectrum belongs to the American people and we license its use and we attend to that license certain requirements. Can someone here, perhaps Mr. Ferree, maybe you could tell us, what are the requirements that we use when we license this spectrum to a broadcaster? What do we expect of the broadcaster?

Mr. FERREE. The general standard is they have to serve the public interest and necessity. The Commission has developed a number of rules and policies to add substance to that more general requirement that may have to do with more certain children's programming requirements, complying with certain advertising rules, political advertising rules, and in general, serving the public interest.

Senator DORGAN. The reason I asked the question is there is a distinction here about ownership. And Mr. Hazlett, you talked about the market driving this and certain efficiencies driving that. I guess one of the questions I would ask you is if efficiencies are obvious in a certain direction, why does one need incentives to induce enterprises to move toward efficiencies?

Mr. HAZLETT. That's a great mid-term question. Because the—efficiencies that are obvious when you step back and look at what consumers want and are willing to pay for and what a various group of suppliers and technologists will be happy to offer them,

those are the efficiencies I'm seeing. And you are seeing everybody talking about what we can do that's more productive with this bandwidth.

But the people right now who have a right to use it are very seriously constrained for exactly the reason you suggest. They don't have a right to radio spectrum. They have use permits that allow them to operate transmitters according to the public interest rules so they don't have a right to aggregate the spectrum, to move the channels around. I have no doubt that there may be some long-term life for over-the-air broadcasting.

I'm absolutely certain, however, that you will not in 50 years see anything remotely like what we have today in terms of this 400 megahertz allocation because it is so inefficient that I expect between Congress and the FCC and the industry, they will work out a much better set of rules, so that the players that actually make productive investments here can make them.

But under the current rules, those incentives are not there.

Senator DORGAN. Mr. Chairman, first of all, I think this hearing is really important. There is a thicket of issues that are very complex. I must say, and I think it also relates in a larger sense to the questions that we have dealt with with respect to concentrations of ownership because as we go down the road here, the term that Mr. Calabrese used with respect to owning spectrum, there is an assumption, even though broadcasters don't technically own spectrum, they would speak of it as they own the spectrum.

As we talk about the other issues of broadcast ownership and concentration and a whole range of enterprises, it, I think, really requires us to try to develop new strategies and new approaches that we think will serve the public interest.

I mean, there are a whole series of very large private interests involved and industries have become very large in this sector and so I regret I was late. I have read most of the testimony. And I think that this is a really interesting hearing and a good contribution to a very important set of questions. I'm perhaps developing more questions than answers the more I learn about this issue, but thank you very much for holding the hearing.

The CHAIRMAN. Thank you. Senator Stevens.

**STATEMENT OF HON. TED STEVENS,
U.S. SENATOR FROM ALASKA**

Senator STEVENS. Mr. Chairman, my mind was going back to the time when we fought for 3 years to get the right to have a spectrum auction, as opposed to lottery to pick up the spectrum that had been let go of by failing companies or by changes in ownership. And the luxury of now looking at spectrum from the point of view of its total use I think is really the greatest part of the change that has come about.

But I have got to go to another meeting. I would just say this, that I do think that the hearing, this hearing is very important and it's opening the door for us, as Senator Dorgan said, to issues that we should explore thoroughly.

Can I just ask one question? Mr. Ferree, what is the time-frame for the two actions that you say you are working on now?

Mr. FERREE. Certainly this year, Senator, and hopefully sooner rather than later. Again, we want to complete the comment cycle asking for input on the true over-the-air viewer, those that receive their programming solely in analog over-the-air format now, so that will probably take us until sort of end of June, early July and then we will be presenting something to the floor over there.

Senator STEVENS. The participation of those two proceedings, is it industry-wide or limited to specific applications?

Mr. FERREE. No. They are industry-wide notices of proposed rule-making. The record is complete and the dockets are ready for action.

Senator STEVENS. No more hearings before the FCC?

Mr. FERREE. I do not know what the FCC will do. There is no need for any further hearings or comments or notices or anything of that nature. Both dockets are ripe for decision.

Senator STEVENS. You say final decision will be made this year sometime?

Mr. FERREE. That was my hope.

The CHAIRMAN. Senator Nelson?

**STATEMENT OF HON. BILL NELSON,
U.S. SENATOR FROM FLORIDA**

Senator NELSON. Thank you, Mr. Chairman. I approached this with the simple question, what is in the interest of the public. Clearly, I think what has been enumerated here, freeing up spectrum so that some of these emergency responders and law enforcement agencies can have that spectrum, in the rude awakening that we had in the aftermath of September 11th. That is clearly a goal worth achieving.

So in light of that, Mr. Ferree, the broadcasters claim that your plan actually thwarts the Congressional intent by slowing the universal availability of digital services to the American public. What is your response?

Mr. FERREE. That's just flat wrong. The plan that I—the outline that I briefed earlier has to do with must-carry stations and their rights are on cable systems and satellite systems that are delivering local—into local service.

There are countless broadcasters, I think something in the range of 400 today, that have negotiated voluntary carriage of their digital signals. So consumers are already seeing in most markets digital and indeed high definition broadcast programming on their cable systems from those retransmission stations, in addition to quite a bit of now cable digital programming, cable high definition programming, things like ESPN HD and Discovery HD.

There is quite an incentive for consumers to go out and buy digital equipment to see that programming. With all due respect to the must-carry broadcasters out there, it's typically not the must-carry stations that are driving the transition. It's not their programming. For the most part they are not doing high definition programming, the kinds of things that people are going to want to run out and buy an expensive TV set to get.

Indeed, if one were to do that, to buy an HD set and then be disappointed that their cable system was not carrying voluntarily the digital programming of a must-carry broadcaster, because of our

tuner mandate, the consumer would then be able to switch off air and receive that service, and it's at least sort of ironic to me that the broadcasters seem to forget that they have this other transmission platform, *i.e.*, broadcast, to reach their viewers.

Senator NELSON. Mr. Calabrese, Berlin accomplished a successful DTV transition. To what extent can we learn from the Berlin example or why might Berlin not be a good example?

Mr. CALABRESE. That's a good question and I think its relevance has been called into question somewhat. You know, I think it is a good example of just bringing some certainty, you know, that they said OK, we are going to have just a one-year switchover, date certain. We'll provide subsidies to certain low-income people and just get that done.

What is very different, I think the greatest difference in some ways is it was more obviously a win-win there for both consumers and broadcasters, because Germany had not yet given away a—they hadn't given a second channel to their broadcasters. So what they did in their switchover was they told broadcasters if you go along with this, then we'll let you keep as much spectrum as you are using for analog and with digital compression, you can offer at least four times as many channels.

And so the broadcasters went with government subsidy from having one channel to having four and they got their carrot as part of the deal. Unfortunately, here that horse is out of the barn. We have given not only all the extra capacity that digital provides for nothing, but a second channel in addition, so now broadcasters have 2 6-megahertz channels, one of which they are reluctant to return as required under the law because they can still possibly get a pay back for that, and the other, they can—they can in the future broadcast as many as two HDTV signals or as many as 10 standard television channels.

What is different from Germany is use, is just go ahead and do this with the subsidy since we have already given away the producer subsidies of broadcasters.

Senator NELSON. Mr. Lawson, the public television stations have taken a lead role in introducing digital services. What public interest obligations should be applicable to digital broadcasters?

Mr. LAWSON. Well, I can speak to public broadcasters. We take our obligations very seriously.

Senator NELSON. How about speaking to digital broadcasters?

Mr. LAWSON. I believe that having a license from the government, so this spectrum does impose certain obligations to serve the public interest. I'm not an expert on what exactly those should be for the commercial broadcasters, but I can tell you that public affairs coverage, local coverage is to me, has to be at the top of the list as items that are obligations here.

And we believe, we are—our stations are committed to using some of our spectrum for public safety. The current emergency alert system is broken. There are people in the government who are looking at ways to re-create that. Our stations are willing to place bandwidth at the disposal of emergency authorities as needed, as part of an emergency alert system, whether it's severe weather or something man-made.

So we see an obligation, but we also see a great opportunity because of the expanded capabilities that we have.

Senator NELSON. Thank you, Mr. Chairman.

The CHAIRMAN. Senator Ensign?

**STATEMENT OF HON. JOHN ENSIGN,
U.S. SENATOR FROM NEVADA**

Senator ENSIGN. Thank you, Mr. Chairman. I appreciate your holding this hearing because I think it's a critical issue to the future of our economy. Senator Nelson mentioned, what is the public interest and overall what is the public good as we go forward with this digital migration.

Our role, and the role of the FCC—is to make sure that we are doing our jobs right so that the public gets the maximum benefit. And just from some of the comments, it is clear that if we can get the broadcasters off this spectrum it helps public safety.

One thing that wasn't mentioned that I have talked to various people about is that a lot of new technologies will be developed that we can't even foresee. Obviously, the huge amount of revenues that would come to the Federal Government, especially when we are running the deficits is much needed, I think everyone would agree that the faster we do this, the faster we'll get to, auction the spectrum and lower the cost of the televisions or converter boxes.

There are going to be more produced so the costs will come down. So that helps consumers. It was mentioned, I think Mr. Calabrese, in fact I think several of you mentioned the idea of U.S. competitiveness in the world. When you are talking about broadband and all of the different applications for consumers, we have to think about competitiveness in this global market.

When we have countries that can outcompete us because of labor costs, we have to look at every way that we can maintain an edge and certainly this is one of those issues. And obviously, decreasing the cost of broadband for the consumers is another aspect. And in making broadband more available, especially to rural areas with WiMAX. I think that the idea of using the spectrum for that certainly makes sense.

The comment that was made about a date certain, and we spoke to Chairman Powell about this, we need a hard date, I think 2009 is too late, frankly. Mr. Ferree, with a hard date, the spectrum would dramatically increase in value because then people would know that okay, we can develop a business model, our business plan based on a date certain.

Would any of you care to react to any of the things that I just said? Let's start with Mr. Ferree.

Mr. FERREE. Briefly, I think that's right. You give people a certain date. They know there is going to be a nationwide transition at that point which is 24 months after the statutory date of January 2007. The auctions can actually occur before then because you don't need to wait until that date to auction the spectrum.

Equipment can begin to be made beforehand. These new technologies that you referred to, again, it's somewhat speculative, but it's a reasonable speculation that those new technologies will be developed there. And perhaps Mr. Gelsinger can add to that, but that process can start, too, once people know that the spectrum is in

fact going to be available and not at some indefinite time in the near, distant future.

Senator ENSIGN. Mr. Hazlett, people talk about interference and how technology and smart radios, can take care of some of that.

Mr. HAZLETT. Well, there is enormous possibility for this huge block of frequencies. The problem is using it for distributing broadcasting when we have other ways to get broadcasting out and 90 percent of households have elected to pay extra for those alternative distribution platforms.

In this kind of a world those opportunities are exactly where we ought to be focused. It may be an improvement, an innovation to go to a 2009 regulatory intervention that moves it along, but it has to be very disappointing to have this transition be 17 years to this point and then have people talking about the improvement of a 5-year date certain.

In terms of estimating the value of these things and you talk about advanced wireless technologies and obviously Intel is on the cutting edge and knows about many of them, but the interesting metrics that I gave, I think, should be understood. I'm not talking about license receipts or auction revenues. Those are absolutely trivial.

Through 2002, let me just toss out, the total auction revenues in this country were \$14 billion, that was the total amount collected by the U.S. Government. Annual revenues in wireless telephony, \$90 billion a year. If we got a fifth of the TV band to be available for cellular services, we would generate \$30 billion plus per year in consumer benefits. That's not, that's way above any license revenue forecast, and so I think really you have to look at how you get there quickly, and I think 5 years is a long time.

Just one thing I want to mention about the Berlin switch. Michael has been talking about that. In Berlin, they had 160,000 households that did not have access to offer digital TV signals because they did not subscribe to cable or satellite. In those 160,000 households they had to buy their own new digital tuners. August of last year, no off the air TV. TV sets went blank. There was no revolution.

There was a subsidy plan, very limited, 6,000 households got one box, one time. That cost a very small amount of money so you can't think about a transition. Consumers got more signals. They went from 12 over-the-air signals to 27. So the greater digital choice softened the blow of spending \$20 million to—20 to get a new TV set.

Senator ENSIGN. If this happened in the U.S. with the size of the market, the volume of those converter boxes would be so huge the price would have to come down dramatically?

Mr. HAZLETT. No question.

Senator ENSIGN. My time is up. If you could summarize briefly.

Mr. GELSINGER. On the interference aspect that you questioned, most of the TV regulations were established with the technology 50-years-old. Today we can build radios much better than that. We are underway in understanding those issues with the FCC and feel very confident that there aren't any real factors there, that they can be resolved. It's an engineering problem.

You mentioned the competitiveness issue. The United States is not competitive in its broadband service today. Our definition of

broadband is anything over 100K bits. If you were in Japan, anything less than 10 megabits is considered broadband, and the comparison of those and the potential incentive that we could have by making the spectrum available for broadband wireless is the most valuable thing that we could do.

I want to say broadband is in many regards a medium of many services. For that matter, it could carry radio. It can carry TV as well as education, websites, all sorts of different commerce activities, and I think the importance of that can't be understated.

Senator ENSIGN. Thank you, Mr. Chairman, for this hearing.

The CHAIRMAN. Senator Sununu.

**STATEMENT OF HON. JOHN E. SUNUNU,
U.S. SENATOR FROM NEW HAMPSHIRE**

Senator SUNUNU. Thank you, Mr. Chairman. Mr. Gelsinger, maybe I'll pick up on that last point. Are you saying that the single biggest reason for our lag in broadband deployment relative to other countries is the lack of building penetrating bandwidth of the type that we are talking?

Mr. GELSINGER. Today's environment for broadband is driven by duopoly and demand for DSL. These are growing businesses that are—both of those types of services are growing today. Most other nations around the world, they have taken much more aggressive, national policies to build their broadband infrastructure and are thus dramatically ahead of where we are in the U.S. with two-tiered regulated environments, structures of both local LECs as well as national carriers has created a largely broad process to get broadband structure in place.

There is an opportunity right now where we can leap ahead of what have largely been central driven programs in the rest of the world and actually create a free market environment around broadband wireless making the spectrum available, large portions of it. The U.S. is already well positioned in some of the fundamental technologies as both service providers and some experiments that we have recently, in market trials, completed. And shown phenomenally good results.

The CHAIRMAN. Senator, since the two of us are here, can I interrupt a second. Your question is very important. When we have had continuous testimony that we rank 10th, 11th, 20th in the world yet when we had a panel of experts on this issue of broadband, I asked every one of them, would you adopt a policy that say South Korea or any of these countries have. They said absolutely not, that they would not adopt the national policies of these countries that have been successful.

So it seems to me it's facile to say we are behind the other countries yet no expert believes we should adopt them. And also comparisons are not exactly accurate when you compare us to a country like South Korea, where they are basically a very urbanized country with tall apartment buildings and far different from the United States of America.

I just think that's important to add in this discussion as we talk about our failures to provide broadband services to all Americans.

Mr. GELSINGER. I believe much of the testimony that was provided wouldn't argue with central planning, but they also would

argue that many of the policies of the U.S. have prevented the acceleration of market forces, delivery of fiber or other technologies like that. So while there have been regulatory encumbrances to allow market forces to keep us in a competitive position in the world, that's what we have with broadband wireless.

Senator SUNUNU. To clarify that point a little bit about the value of making some of this spectrum available whether it's unlicensed or not, for wireless and broadband services, I think Mr. Calabrese proposed using half of the 84 megahertz for unlicensed uses.

What is the relative availability of similar spectrum for wireless or broadband services today?

Mr. GELSINGER. The primary spectrum that's being considered for things like WiMAX, 3.5, 5.8 and 2.5 and those are being proposed. So there are meaningful portions of spectrum being pursued. However, the propagation characteristics—

Senator SUNUNU. Those do not penetrate buildings effectively? Not with the effectiveness of this range.

Mr. GELSINGER. Correct.

Senator SUNUNU. I'm curious to know whether there is similar licensed or unlicensed uses for broadband services at this frequency, that is with the potential—

Mr. GELSINGER. None that we are aware of.

Mr. CALABRESE. Senator, there have been studies that involve conjectures and the former DARPA engineer who now runs a company, Shared Spectrum, for example, did a study in West Virginia for Senator Rockefeller showing that the cost of broadband deployment goes down by nearly a factor of 10 when you are in the broadcast band with wireless broadband, compared to being up at 5 gigahertz, which is the only new spectrum for unlicensed that's been given out.

Senator SUNUNU. By 10, that's a big number?

Mr. CALABRESE. In terms of the number of cell coverage sites.

Mr. GELSINGER. For the testimony today, we have some materials we produced specifically for studies, two and a half, approximately a quarter, when you get to the 5 gigahertz, it's approximately a tenth.

Senator SUNUNU. Mr. Hazlett, do you want to speak to all the economists in the world on that point?

Mr. HAZLETT. Just to embarrass them. There are other frequencies used there, unlicensed and licensed, some of which is used for broadband. But the big picture is that this is the mother load. The TV band is really where you want to look if you want to get broadband and other wireless services, advanced services rolled out.

Senator SUNUNU. The distinction for those of us that aren't experts in the technical aspects, the distinction is it's not just that it's bandwidth, it's characteristics, though, behavior characteristics for carrying high data volumes and carrying broadband signals over long distances effectively, is that correct?

Mr. GELSINGER. It's the population characteristics, the lower frequencies travel farther and they penetrate buildings without any interference.

Senator SUNUNU. Given that, it seems like such an obvious valuable use of very valuable spectrum, I can't help but be rent with

fear that we'll somehow find a way to handle this very poorly. And to that point, it seems that the biggest stumbling block, at least with the current set of rules is defining what 85 percent is, and the fact that we can agree on what 85 percent means is a little bit unnerving.

Mr. Lawson, you talked of, or tried to emphasize the importance of the over-the-air broadcast to the American consumer. It seems to me that the American consumer can't run away from over-the-air broadcasts fast enough. Over the last 10 years alone, the number of consumers choosing to receive their TV signals over-the-air has been cut in half. It's now 12 percent of households, and it continues to fall.

Rich, poor, inner city, rural consumers across all spectrums are choosing some kind of subscription service or alternative to over-the-air services. Now, over-the-air broadcasters, great history in this country, and consumers from the testimony we have heard are interested in local content and local broadcast. But that's very different than choosing to receive your signal over-the-air.

So given that consumers are choosing not to select over-the-air broadcasts, why would you say that there is a special or a unique relationship or interest.

Mr. LAWSON. First on the numbers. The FCC is undertaking a notice of inquiry to look at the over-the-air population in the U.S.

Senator SUNUNU. Right. Demographics.

Mr. LAWSON. The demographics. It is not clear that that number is continuing to drop. We have been told, in fact, by other experts, research people, that it is not dropping. We have also been told that although we use the 14 percent number for households that rely exclusively upon over-the-air television, based on Nielsen data, if you factor in other uses of television, other places where television is used it might be 22 percent.

Senator SUNUNU. For what other places are you talking about?

Mr. LAWSON. Mobile homes, RVs, public stations where television is displayed, dorms, college dorms. We also know that there are tens of millions, perhaps 79 million—

Senator SUNUNU. I'm sorry to interrupt, but I would be very interested in you providing for the record the college dorms in the country that use over-the-air signals. I would be—I'd be very interested to know. I'm not denying that there are any, but I would be very curious to know where they might be.

The CHAIRMAN. Lest the over-the-air television is covering ESPN, Mr. Lawson.

Mr. LAWSON. I'm just relaying third party information. We can't turn off analog until we understand who these people are. We know there are 10 million homes that have satellite and cable, we have one in the kitchen that uses rabbit ears. If those go dark, you and we have a political problem. I'm not sure of the trends or the demographics, the numbers there.

Second, I think it's important for our country to maintain over-the-air broadcasting for other reasons, even if people are buying cable and satellite, if they are choosing to do that, having the option to take free over-the-air television is a powerful economic tool for consumers to just say no to cable rates and satellite rates.

And third, I do believe it's important for our country as a democracy to maintain other channels for different voices to come into people's households. If all of our media is controlled by one or two pipes that come into the home, I'm not sure how healthy that is for our democracy.

Senator SUNUNU. I have got to at least provide some response there. Well, why don't I ask someone that might want to respond to those last couple of points. Mr. Ferree?

Mr. FERREE. Sure. Senator Sununu, I would not challenge the notion that broadcast today is a challenged platform. It certainly has—and some of the trends we have seen are the trends you suggested. I actually admire my friend, John Lawson, for being one of the few in that industry that is thinking creatively about ways to turn broadcasting into a service that can be truly competitive with cable and satellite and offer a third choice, third vehicle for consumers. But in large part, I agree with your statement.

The CHAIRMAN. Isn't that third alternative wireless?

Mr. FERREE. It's wireless TV, as Mr. Lawson says, creating a platform that offers consumers a reasonable choice of services, something they actually want to see, free over-the-air and perhaps even there is a part of it that's a subscription service.

I don't know what that model is going to look like, but it seems to me it's a good thing for consumers if there is another choice.

Mr. LAWSON. Senator, we talked about Berlin a moment ago. Perhaps another model for us is the UK. The UK launched digital for broadcasting as a pay platform called I TV Digital. It failed. The government recalled those licenses, recompeted them in a non-auction, beauty contest, and a consortium, unlikely consortium of the BBC, Rupert Murdoch's company and another company. They could not figure out a way to do a pay platform, so they came up with free view, a free platform and made a very simple offer to the British consumer.

Now you get nine analog channels, if you go digital, you can get 30, one-time payment and set-top box. They have gotten very cheap over there. Never have another cable or satellite bill. Last time we checked, they were selling 100,000 of these boxes a month. And that's why I believe if the broadcasters, if we could get together, a critical mass of us and rebrand and relaunch, as Ken says, wireless TV for new generations of Americans who are total cable babies and don't even know this stuff comes over-the-air, you might be able to see a resurgence of free over-the-air broadcast.

Senator SUNUNU. Are they broadcasting in analog now in the UK?

Mr. LAWSON. They are. They are simulcasting and the British government is now seeing, I think, a blueprint to turning off analog, based on consumer penetration where they are not going to strand people because people are buying the boxes.

Senator SUNUNU. Mr. Calabrese, what are your most significant areas of agreement and disagreement with Mr. Ferree's plan?

Mr. CALABRESE. Well, I'm in basic agreement with the plan. It just doesn't go far enough because the FCC's authority doesn't go far enough. I suppose in terms of particulars—

Senator SUNUNU. With respect to the tax credit and the trust, those would be the two most significant?

Mr. CALABRESE. Exactly. And I think it's important with respect to what John was saying that one reason that we suggest offering a single converter credit to every household is then we don't need to worry about whether we are talking about 17 million or 22 million.

And I think if Congress can pass this by the end of next year, we should be able to do it, there should be no problem completing this by January 2008, rather than 2009. But yes, the biggest difference is just that the FCC cannot do it alone, and so it really doesn't matter.

The 85 percent number we should just throw out the window. It's meaningless because the FCC can go through the motions of doing this rulemaking this year, and when push comes to shove, we are not going to—that's my last granny rule. We are not going to unplug analog TV without some sort of mechanism to take care of these faults.

The CHAIRMAN. What do you think of Chairman Barton's proposal that it can be done by the end of 2006?

Mr. CALABRESE. Personally, I don't think that can happen, both because the biggest thing is manufacturers need to gear up. That point was made earlier. The converter boxes will be—they are over \$200 now and they are only going to drop below \$100 in mass production. But if manufacturers know, for example, that in 2 years a window, a 12-month window will open for the tax credit and effectively consumers are being forced to buy these things so they know they have a market for 5, 10, 15 million then the price, electronics industry tells us the price will come down to the \$75 range.

Mr. HAZLETT. I'm surprised to hear Michael say that. I would think moving it up would just move it up. The incentives for mass production are there when the market is there. Now we are delaying that market.

I mean, I would be very much in favor of trying to keep this 2006. 2006 was feasible a few years ago. Why set it back?

The CHAIRMAN. As the broadcasters assured us when they received it for free, there would be no problem.

Senator SUNUNU. Mr. Gelsinger, your company still manufacturers things. I would be curious to know your thought about the amount of time it might take. Is 2 years too little time to move from a \$200 mass produced box to a \$100 mass produced box?

Mr. GELSINGER. To see an effect on price within any 2 years based on a volume of economics if there was a clear target for the industry. My first point would be setting a clear target. The clear target is more valuable and clearly understood and accepted then the particular date. Technically, the sooner the better. I think 3 years might be politically more acceptable but clearly 5 years is clearly an eternity.

Senator SUNUNU. Mr. Hazlett, what are your most significant areas of agreement or disagreement with the points afforded by Mr. Ferree?

Mr. HAZLETT. The most important thing they are doing at the Commission is looking at this 85 percent rule. The 85 percent rule is basically the kill switch on the whole transition. It's very important now that the Commission is trying to figure out some way to

get us to 85 percent, but the way that was written in the 1997 Budget Act, we are just not going to hit it.

If they attack that and get the 85 percent to be a real goal, I think that that's very important. I think the argument about the year is very important, too, and I think there are other issues there that we might not agree so much on, but I think it's important that they are trying to fix that 85 percent rule.

The CHAIRMAN. It's also of interest the way that rule, where that rule appeared legislatively, certainly not legislation from this committee. Another indicator of how broken our legislative process is that an issue this critical, talking about hundreds of billions of dollars, would be written in a balanced budget act amendment. It's remarkable.

Mr. FERREE. Could I add one comment? I don't disagree with any of these folks.

The CHAIRMAN. You are trying to do the best you can.

Mr. FERREE. I'm surprised that I'm the one saying slow down there.

The CHAIRMAN. Bureaucracies never do that.

Mr. FERREE. I have been chastened by the broadcasters for trying to speed this whole thing up. The one element that I don't want to lose sight of is the consumer education part of this. We are seeing consumers buying over 20 million analog TV sets a year now. For that set to stop working without some kind of ramp down—

The CHAIRMAN. Aren't you also seeing, really since the cost of HDTV is finally getting down in the consumer range, are you seeing a dramatic increase in sales of HDTV?

Mr. FERREE. Definitely. Over the next few years, the pain, as it were, for consumers would be considerably less than if we try to do this tomorrow.

Mr. LAWSON. If I may, what we are offering is regardless of a hard date, we have a lot of stations that under certain conditions would be willing to get off of analog by the end of 2005 or 2006. We have three stations off the air right now. One voluntarily who are broadcasting in digital only. And—

The CHAIRMAN. So you are not highly regarded by the NAB, I guess, then, Mr. Lawson?

Mr. LAWSON. Well, we prefer, let's say a market driven, market by market approach ending the transition. We think that our stations hold license to 21 percent of U.S. television spectrum. We think that under the right conditions we would voluntarily get off of it early.

Mr. GELSINGER. We would just emphasize that whatever date is set, it's probably more conservative than this group would appreciate or enjoy, based upon the testimony today. But there would be incentives put in place for accelerations voluntarily by broadcasters allowing us to begin the deployment of new services on an accelerated basis.

Senator SUNUNU. I don't understand. Why do you need a mandate, and an incentive to comply with a mandate? Either you mandate it or you create a set of incentives to accelerate its eventuality, but I don't see what the justification is for doing both.

Mr. GELSINGER. If there is a fixed certain date, let's take 2009, the one proposed in the Mass Media Bureau to date, that's still 3, 4, 5 years away depending on what date is selected.

Senator SUNUNU. So if you choose a date that isn't timely, if you choose a late date like 2009, it would be nice to have incentives so it could happen faster.

Mr. GELSINGER. Even 2006 is 2 years away. I think there is—a voluntary turn back program will simply accelerate the overall market of conversion to HDTV and services.

Mr. HAZLETT. There is a very important incentive to have these in for early turn back. It makes the eventual turnoff real. That is to say when you see the migration happening and it's in effect, that tells customers, OK, this is here and it tells the other TV stations that haven't done it, yes, and their excuse to not turn off is undermined by the fact that all of these other stations have done it.

Mr. CALABRESE. If we have any incentive, I don't believe that it needs to be some new financial incentive at taxpayer cost. I mean, certainly the best thing would be to make it soon if we can, but remember, broadcasters have incentives even without more payments. They can save electricity costs and that's something that John Lawson's group has emphasized by turning it off, yet still being assured that all viewers will be able to see it.

And also under the Ferree plan, they get a choice of carriage when they turn off. And so they do have some incentives. Also what makes this spectrum so valuable, at least in the license side, not on the unlicensed so much, unlicensed we can use it market by market but on the licensed side, you recall when this committee reported out the Spectrum Reform Act it was heavily lobbied in favor by the cell phone companies.

And you know, one reason they gave was they wanted the certainty of clear national channels because that's how their equipment worked. And so just having some small commercial broadcasters get paid to go off the air early in a few small markets is really not going to do anything much, certainly on the license side, for broadband or for increasing the auction value.

And to the extent that they do go off early with incentives I mentioned, we can allow public safety for those communities who use it.

Senator SUNUNU. Thank you, Mr. Chairman.

The CHAIRMAN. I want to thank the witnesses. This has been very helpful. This is obviously an issue of tremendous importance and we appreciate your input. Thank you. This hearing is adjourned.

[The hearing adjourned at 11:10 a.m.]