Tom Whitehead: Showing my great technical virtuosity here…

So, RCA emerged although AT&T made an effort to interpret the patent laws through, through its plan for common-carrier broadcasting. RCA emerged with a predominant position and they owned a lot of radio stations, they started the NBC network. And it's important to remember that RCA's business purpose in promoting radio and starting NBC was to sell radios. There was a lot of discussion about what the proper economic model was for radio; some people talked about taxes like the BBC still does. People talked about license fees on vacuum tubes, license fees on batteries, advertising, which was not, not seen as a good economic base for broadcasting in the early days by anyone. But the purpose of, the economic industrial purpose of radio broadcasting, for many years, was that RCA and Westinghouse, wanted, excuse me, RCA, which was owned by GE and Westinghouse, wanted to sell radios. That was the economic model. Put on the programming, people will buy radios, we'll make money.

So the real purpose of radio in the early radio in the early days was to sell vacuum tubes. [Edwin] Armstrong, who was one of the early inventors of radio circuits proposed, developed and proposed FM broadcasting in the early 30s. And he did a lot to develop the technology of FM, pointing out that it was a far superior technology in terms of sound quality. But [David] Sarnoff, who was the head of RCA and was at one point Armstrong's employer, resisted that mightily. Part of his purpose was to continue the good thing he had in selling radios, AM radios, but partly he was a visionary seeing that television would become an important outgrowth of radio broadcasting and he wanted to save the frequencies which were proposed for FM broadcasting, which FM takes up a lot more bandwidth than does AM, so the proposed higher frequencies that Armstrong wanted to use for FM, Sarnoff wanted to save for television. And, indeed, that stalled process of stalling FM and waiting for the advent

of television went on for most of the 30s and in the late 30s, early 40s television was developed primarily but not solely by RCA to approach something that could be a commercial consumer reality.

And indeed, in the early 40s the FCC adopted standards and spectrum for both FM and television. That all kind of went into a stall during World War II for a lot of obvious reasons. And after World War II the commission and the industry revisited all this. They moved, they changed the FM standard and moved it to a different frequency than they had before the war which had the effect of obsoleting a modest number of FM radios that had been sold. And they also changed the standard and the frequencies for television which obsoleted even more television sets that had been sold prior to World War I, World War II. But after World War II, the commission adopted the standards that we now pretty much know for black-and-white television and the economic model was basically the same. RCA, which was the primary developer of technology, wanted to sell picture tubes because they had patents coming out of World War II and also going back to the 30s. So the basic economic model was still let's put on television programming over the air so we can sell television sets. Now, of course advertising began to seep in there. And as we know, advertising eventually became the primary economic underpinning of radio and television. But in the beginning of the television industry, particularly with RCA, it was very much to sell television sets and television tubes.

The, there was a proposal at the end of World War II to move television completely to UHF. And there were two reasons for that, one is even back then people knew that VHF was valuable for land-mobile use. And there was an effort to move television, since we were going to redo the frequencies and the standards anyway, let's move it up to VHF where it belongs. And at the same time CBS had developed a color-television standard which took up a lot more bandwidth and they, competing with

NBC, didn't like RCA's dominance of the technology so they had hoped to develop a color standard that was not reliant so much on RCA patents. And indeed the FCC in the late 40s did adopt the CBS standard for color television.

Following that, and that, of course, would have made many of the -- RCA's -- patents worthless so there was a lot at stake. There was continuing enmity between CBS and NBC. And in one of the more masterful lobbying performances in this town, Sarnoff managed to stall, obfuscate, develop new technologies, put on demonstrations, and finally hit upon the idea, not finally, but as part of his efforts, hit upon the idea that people had spend so much money buying black-and-white television sets that it would be poor public policy to adopt a new standard that would obsolete all those black-and-white television sets. Of course, he was one of those who had promoted the very rapid sale of black-and-white television sets knowing full well that once the public became hooked on that basic standard that they would be hooked and the country would be hooked. So RCA developed a backward compatible color TV, that is to say a way of broadcasting color TV so that the existing black-and-white sets could still receive it in black and white, but a new color television set could receive it in color. And we all accept that today as a given, to the extent that we think about black-and-white TV.

But it was a big deal in the development of the industry and the technology. And RCA very generously agreed to license all kinds of, essentially any comer could be licensed to build color television sets. There were, at, you might, that sort of sounds generous, but underlying that were two very important factors: one was that RCA earned about a $30 license fee on every color picture tube so they could generously encourage Zenith and others to manufacture color TV sets to compete with RCA, because Zenith had to pay a $30 fee to RCA to use the picture tube. The other factor was the Justice Department sort of urged them to

do that lest they face an anti-trust suit which, no doubt, got their attention. So the color television standard as we know it was adopted, and life went on. You people were born … Nothing much has changed and, then along came the subject of today's topic which is high-definition television.

It's, it's interesting that many of the patterns of previous standards also come into play here. We have the retention of the use of spectrum. HDTV has been seen as way to preserve broadcast spectrum and also as a way of freeing up VHF spectrum. Today however there is not dominant player in the consumer-electronics manufacturing business. So you don't have an RCA to organize manufacturing and organize technical standards and that led to the formation of the committee that Dick Wiley headed and you've read about and we'll talk about.

Another factor is the growth of the computer industry. An unforeseen entry into the development of HDTV standards was the perception that TV monitors and computer monitors were basically the same technology. And the computer industry wanted development of HDTV standards that would have the displays be compatible both with computer-driven video and output of a television signal. And that complicated things for Mr. Wiley as he will talk about. The, that, of course, led to what we now see and talk about as the merging of the computer and television phenomenon, I won't say the industries, because they're still quite separate industries. But thanks to the Internet, which none of us foresaw when Dick Wiley's committee was started, we do now have the merging of entertainment television and computers and indeed most people think that the dominant way we'll get television programming in the future will be over the Internet. So we will probably see broadcast television and Internet-delivered television becoming essentially the same thing, technically, although probably differing according to the content.

And the only other thing I want to point out is that this is, since the obsoleting of old FM and television standards in the early 40s when there was a very small installed base, this is the first time to my knowledge that the United Stated as a matter of policy has obsoleted a huge installed base of consumer-owned equipment; as we were talking before class, your analog TV set come January 2009, if you have it hooked up to an antenna, just won't receive anything, so…

Female Voice: If it's hooked up to cable,

Tom Whitehead: Hooked up to cable…

Female Voice: Is cable going to be allowed to reconvert [unintelligible] signals, analog for people who have an analog television of cable, or is that not going to be allowed and therefore even those people will have to go out and get either a new converter box or a new television set?

Tom Whitehead: The plan is that cable will continue to work as we know it. They will have to accommodate the HDTV signal from the local broadcast.

Female Voice: They'll have to send it, but if you have a television set with a cable hook-up and you don't have anything to receive digital, will you still get your local broadcast?

Tom Whitehead: You will still be allowed to interface with the cable through an analog connection.

Female Voice: But it will be cable that will be, if the broadcaster is only airing in digital, they will be the ones that will turn it back to…

Tom Whitehead: The cable box will turn it into analog for you.

Female Voice: Well, then people may not be all that running out to get new…

Tom Whitehead: No, no, I'm not saying they will run out to get new sets, I'm just saying that if you're one of those 15 percent who currently receive your television over the air, you're going to have to do something different. Which gets to the subject of the [Asters] paper, will there be a market in converter boxes that receive the signal over the air and convert it into something your TV set can display? Will people start signing up for cable? Will we subsidize those boxes? Will we subsidize local channels on cable? All part of our discussion for today. So that's kind of my twenty-minute survey of the 20th-century television.

Female Voice: Your comments raise something that now may not be the time to discuss but I wonder if we will, you mentioned TV over the Internet and I feel like I've heard about phone over the Internet, and everything going on in the Internet now, and I'm more confused about the Internet now than I was before this class because I just don't get, is there room on the Internet for all this stuff? I, now I don't understand what the Internet is, I [unintelligible]

Tom Whitehead: Well, I think that gets into another discussion of what is the Internet. What I really should have said was Internet protocol.

Female Voice: OK.

Tom Whitehead: And the cable companies for example are rapidly converting their digital delivery of television over to Internet protocol. It will go over their cable, it will still be the same cable service you know, but the technological format will be Internet protocol.

Female Voice: Which is the IP address and those switches concept?

Tom Whitehead: Packetizing, IP addresses, all of that. It doesn't necessarily mean because they are transmitting it on the Internet protocol that you'll be able to get it on the Internet. So you have to differentiate the Internet protocol from the publicly available Internet that you get through your ISP. However, as get more and more broadband Internet, the Internet is just the source of IP signals and I, for example, got my first video podcast the other day, OK? So I click on it and there's a video program. So if I can do that and I can deliver video-on-demand infomercials, I can deliver video-on-demand education, video, why can't I get the Super Bowl that way? The answer is economics. So it's, I think it's going toward Internet protocol, how the economic model is sorted out and how the technology between what you call your TV set in the living room and what you call your computer in your bedroom, still has to be sorted out.

Female Voice: So it's a different method of delivery but over the same hard line?

Tom Whitehead: Yes.

Female Voice: OK.

Tom Whitehead: Once everything goes Internet protocol, once, once the television programmers start putting it on the Internet protocol and once broadband is available to a sufficiently large number of homes, then it makes it possible to change the economic model, which suggests that the economic model will change. People will start producing entertainment television that they will distribute over the Internet and people will receive on their computer or they'll put it on their TiVo and display it on their home TV, which gets back to Dick Wiley because under the HDTV standards that were adopted, they were adopted to be compatible with either computer-driven video or the output of television.

Female Voice: Over the protest of many people.

Tom Whitehead: Over the protest of many people.

Female Voice: That's this, these excerpts from that book "Defining Vision" which I e-mailed to you. I couldn't get it up on [unintelligible] the scan.

Tom Whitehead: [unintelligible]

Female Voice: I kept trying to, but maybe it was too big. It's really a fun sort of insider's look at the committee. You can ask Mr. Wiley about it more when he's here about how all the different personalities and everybody hedged and, you know, and didn't want to give in and all, you know, the computer people wanted their standard adopted and other people wanted their standard adopted, and it's a really fun kind of look at inside Washington stuff.

Tom Whitehead: And it's, from my perspective, it's a pretty realistic book on how things really work. I was struck and I chose the excerpts on purpose to point out how the broadcasters very cynically had no interest in HDTV in the beginning whatsoever, it was simply an excuse to avoid [unintelligible] over the VHF spectrum [unintelligible] and eventually they got hoisted by their own petard.

Female Voice: Now is that truth or is that the term, this particular writer's version of the truth?

Tom Whitehead: Well, it's obviously his particular version.

Female Voice: Right.

Tom Whitehead: He doesn't do any balance, to my recollection. Let's put it that way. Do you want to talk more?

Female Voice: I do, but actually, Courtney and Wendy, one thing we did at the beginning of the class, at Samantha's prompting because she was interested to hear what other people were writing about, is talk a little bit about your paper proposals and so I'm wondering whether you can kind of give a few sentences about what you guys are doing although you [unintelligible] about theirs so we'll be talking about it more.

Female Voice: I'm going to do mine on multicasting must-carry in the new digital-television world and whether or not it would be constitutional and a good policy decision.

Female Voice: Can you explain what multicasting is?

Female Voice: Yeah. Right now when a broadcaster broadcasts a signal over the cable and satellite, the content-delivery people have to carry that signal and whether they like it or not, whether it's the kind of content that they want for their customers or not. And now that we're going from an analog world to a digital world, the broadcasters will be given, they were given six megahertz of spectrum in the analog world, they're being given six megahertz of spectrum in the digital world but in the digital world the spectrum is much more efficient and so they can splice it into at least six channels and they want to have the cable satellite and whatever else systems forced to carry all of their channels in a digital world, and I'm going to explore that, whether or not that's a good idea, whether it would be a constitutional issue.

Tom Whitehead: Wendy?

Wendy: I'm going to write my paper about satellite radio and I'm still kind of working on what I'm going to do with it exactly but one of the things I'm going to look into is intellectual-property issues with satellite radio because satellite radio is also a digital medium so people can access music through that the same way they can do it through the Internet as far as the quality they come up with, so I'm going to look into that and maybe some ways that the industry is looking to try to [unintelligible] off of digital-radio signals from satellite and also look into some past court decisions that relate to Internet music and digital TV and things like that to see if there are any judicial or policy solutions to help prevent piracy, because piracy catching and enforcing, you know, copyright laws for piracy of that kind is, you know, the scale of it is huge and it's difficult to enforce it so works out better to prevent it. They have limited policing resources.

Female Voice: And I'll just quickly. Jaime was writing about wireless mergers. Mike is writing about kind of how the First Amendment law is changing with new technologies coming into existence in the kind of the mass-media world. Samantha is writing about the clash between political access on the airways and what about if a politician wanted to have access to the airways but wanted to air something indecent, and there are laws that do not allow you to do that, on the other hand there are laws that you need to allow them on, so it's a clash of the titans again. [Yasser] is also doing digital broadcasting and kind of the subsidy proposals and analyzing those, how to ease the transition. And Jerry is writing a paper about the spectrum idea, a different way of allocating spectrum, a third way other than free market or command and control called the commons idea but you're going to be critiquing that to see whether it's more like the command and control or whether it's like a free-market approach. Taking a specific FCC wireless proceeding and looking at that; that's supposed to be a commons approach. Is that a good summary? So if you guys now see

each other in the hallway you can say, hey, how's your…? You know and talk to each other, that's allowed in some other classes like…

Tom Whitehead: You can even exchange paper proposals and drafts.

Female Voice: You can. That's, this class is a seminar, you know in my writing class, in my appellate writing class here, God forbid that you should, you know, exchange a piece of paper with anyone or talk to anyone so, this class can be done differently. And that's the whole idea with drafts and we're going to get views, but we're not the only ones with a lot of information, you guys are, too, so feel free to, to the extent anybody has time, while everybody is rushing past each other, so…

Well, I think you guys actually, not necessarily because we've taught it but maybe because of other classes and your reading and your general knowledge and your work, have a fair amount of knowledge about kind of the transition from analog to digital broadcasting, which, by the way, I still think that most people in America still don't know. I mean, people in Washington, people write about it, people talk about it, but I think most people just don't understand, you know, what's coming down the pike and I'm not sure that [word missing?] one understand and, you know, from their perspective it's going to be well, like, I'd love to get a better picture but I don't want to have, to necessarily have to spend the money to get a new television or set-top box to do it. And that's really all that the typical consumer is going to be interested in, but, of course, from the industry perspective and the FCC's involvement with it, there've been a myriad issues that have kept lawyers and economists and other people employed and making money. And busy since 1987 when the FCC started working with industry on the idea, and into the future.

And I couldn't separate the issues, and what were some of the issues that the FCC and industry were thinking about in the early days of, you know,

how are we going to do this? How are we going to promote high definition in the United States? And some of it based on the readings you kind of have seen was this fear that kind of Japan was overtaking us in kind of this area. And then kind of more recently I see some, some hot issues, intellectual property, the must-carry issue, and, you know, how to ease the transition, and then, of course, public interest obligations which, you know, has always been floating out there. There were certain obligations of broadcasters which we actually haven't read about yet or talked about all that much. But from the very beginning they had a public-interest standard, they had certain requirements.

How are those public-interest obligations going to be effectuated in a digital world where they may be broadcasting not on one channel but six? Do you impose - - right now they have three hours, they're supposed to have three hours of children's educational television a week, every broadcaster. And that's sort of, didn't the statute, the FCC have regulations about it, when the license comes up for renewal, there's a postcard renewal you need to check the box that says, yes, I've been airing three hours of children's television programming a week not just "The Jetsons," but something a little bit more than that. You have six channels, are you going to air three hours on each channel? Is it going to be on one channel? Or should we proportion it? Somebody in my seminar did a paper on that a few years ago. You know? Three hours out of the weeks, the hours per week nowadays, you know, is 2 percent, not even 1 percent of a broadcaster's programming. Well, should it be 1 percent over, you know, in the new digital world across all the channels or where do you put it? Anyway, so lots of issues that also bring up the question, should there be these public-interest obligations in the first place?

Just on broadcasters and not on other media providers and do these rationales continue to hold up? But because you guys know a lot about it, I'm actually going to throw it back to you and ask you some questions. If

you recall from your reading or general knowledge, why were, why was it decided, for example, in your view, if you can think about or just come up with a common sense reason, when they decided, OK, we're going to have, you know, we're going to try to have digital broadcasting, why did they go to the broadcasters who were already there and say, we're going to give you the extra license, we're going to give you this extra spectrum? Why didn't they just, you know, kind of in the late 80s or 1990s, why didn't they go to another group to just sort of open it up?

Female Voice: Well, I don't know for sure but my guess would be just based on being on the Hill, just being a political thing, they needed that political support in order to get done on the Hill. If they didn't give the incumbent broadcasters a lot then the broadcasters could have killed any bill to go digital.

Female Voice: Well, that's probably a very good point. They needed the broadcasters' political support, however the broadcasters argued. I mean there are plenty of people, from the beginning of broadcasting, who've been trying to get licenses and they are saying, you know, these renewals, it seems like it's the same people over and over, it's like politics, right, it's always the incumbents that get everything, why can't new entrants? You know, should - - new people could have gone to the Hill and said, "Award us a new digital license. Yes, we've never broadcast before, but isn't part of the idea in broadcasting to promote competition and new voices and all that?"

Tom Whitehead: Doesn't the [unintelligible] Communications Act require a comparative hearing?

Female Voice: It did at the time but it was changing in nineteen…when was auctions, in 1992? It was starting to, auctions were finally authorized in the early "90s, but yes, there would have had to have been a comparative hearing.

Tom Whitehead: Was that by statute or by FCC order?

Female Voice: It was a combination of statute and cases. So your point is?

Tom Whitehead: How did they avoid having comparative hearings for these new license assignments?

Female Voice: So, I think…

Male Voice 1: I was just going to comment to what she said, well, why didn't they and probably because these other people, the established networks, they have a track record, they know, they have a track record and they have a major stake in this. The politicians know that, you know, ABC has something to protect so they're not going to go too far over the line with their content, they're going to keep playing it safe so that they can still have political support.

Female Voice: Uh-huh. And what would the broadcasters argue? In terms of who should get these new digital licenses, you know, should we - - what are some of the things that they could argue legitimately about? Well, should we enter into comparative hearings for each of these new digital licenses for these new entrants or not? What would be some arguments that they could make? Let's try to support [unintelligible].

Tom Whitehead: When they go to the Hill, and argue, what will they say?

Female Voice: I'm going to go with Yasser, and then…

Yasser: Probably go with, like, we've already made all this investment and created the standard before, we've made all this investment in this area, we have the experience, we have the manpower and technology to

convert over where someone new coming into this field, you know, probably, you know, won't - - they're trying to protect their monopoly basically in their field so they're going to say anything they can and not let anybody in …

Female Voice: But it's not completely illegitimate for them to say we're going to be able to do it better. Did you have anything to add?

Female Voice: I would probably agree with him when he said that they [unintelligible] go what about the consumer and then harp on how is this going to affect the consumer, the consumer relies on [unintelligible] broadcasting or news, in an emergency [unintelligible] good at doing that.

Tom Whitehead: How will the public get "Desperate Housewives"?

Female Voice: Well, I think those are probably the arguments that were made. I'm not sure that it was that big of a jump for Congress to say, "OK, we'll basically award these extra licenses to the incumbent broadcasters." My only point, and you guys have been discussing it, is it could have been done differently. They could have said, "Well, we're going to take this spectrum that's going good for digital broadcasting and we're going to open it up. It's either going to be for comparative hearings or years later they finally authorized auctions and we're going to kind of let new people come in and compete with the incumbents." I mean, that could have been one approach but that wasn't the approach for, you know, whatever reasons.

So they give them this additional spectrum, Gosh, when did they grant it? I don't think, it was sort of again, it was one of the budget acts, they said you can use, you can keep your old spectrum and you can have this new one to work with to convert to digital. They don't make them pay for it because they haven't made broadcasters pay for their spectrum at any

point yet. Although, once we transition to digital, under the auction rules, if license, if digital licenses become available they will then be subject to auction. But, again, that's three years away. So it's very valuable spectrum that they give to the incumbent broadcasters, additional spectrum that could be used for other things, right? That's one of the points that in this book, the land-mobile people are coming along saying, Motorola is saying, "Hey, we could be providing all sorts of," I don't know if they used the word Internet at the time, they're probably just cell phone service, and "services for consumer." But instead it went to the incumbent broadcasters to start developing the digital standard.

Another issue right from the beginning, and this is, again, in your readings and what Mr. Wiley is going to talk about, is what standard should we use? Because there were a variety of different standards that people proposed: Should it be compatible with computers? Remember this is still - - you know, we had the 1996 Act and they still weren't quite on the, you know, what is the Internet? So for, you know, now it seems so obvious in retrospect. Sure, make it compatible with the computer standard, but at the time it wasn't necessarily obvious. It would be easier, less costly if we have a standard that's more broadcasting based than computer based. That's not a bad argument.

Tom Whitehead: But it's important that when this committee was dealing with the computer and television compatibility, the issue didn't have anything to do at all with what we think about today with television coming over the Internet. Hadn't occurred to any of them. The issue was a consumer-electronic issue. Doesn't it make economic sense to manufacture one set of compatible-display devices? And we people that manufacture computer displays would like to piggyback on the mass production of digital-television displays.

Female Voice: Right. And in terms of coming up with the standard, again, in all kinds of standard setting in technologies, there's always the issue of will the free market do it itself, what level of government involvement do you need? Now I think this is a case of, I mean, it took nine years but it really was industry standard setting which everybody says is the ideal, with a little bit of nudging from the FCC only to the extent of saying, "Get it done." So that was an interesting case study to see. And then there's the issue of well, OK, once they have, go digital, and, remember, what are they going to do with their six megahertz, right? Because, like Courtney said, it's not like it's a more efficient spectrum, but digital is more efficient way of sending a message, you have compression techniques, and things like that. So, instead of you could use your entire six megahertz where you newly are on the spectrum charts, your six megahertz, for one beautiful high-definition television signal. The most beautiful -- you could see every pore on the model, every sweat bead coming down from the athlete and presumably some people are really going to want that, or you could do other things with it and what was the FCC going to require or were they going to allow flexibility?

And what they ended up saying, interestingly enough, is that they allowed it to be flexible. They said so long as you have one, they called it advanced-primary signal, the signal that's, you know, using the digital format, it doesn't have to be the full HDTV, using up all the pixels, but so long as you have one primary channel, you can do whatever you want with the rest of your spectrum. You can provide five other channels if you want. You could provide one other channel that's even better [word missing?] digital. You can provide subscription services, right? Instead of it being free, you can provide paid television services with your extra digital. You can provide wireless services. I've had hypotheticals in my classes where I've had the broadcasters, you know, providing the one primary channel and then with the extra spectrum they're providing Internet services and should they get must-carry for that. Got to carry my

new Internet broadband service or else the free over-the-air television is going to die.

OK. But, an ongoing - - so what kind of services can you provide, and you know, there are, it's really hard for us to imagine what's going to be the case in three, six, ten years, I mean I've read things where they say, well, during the day we'll have six channels, and at night we'll go to one high-definition channel. I mean, who knows how innovative they could be in terms of television services and all kinds of other wireless services that they can do with this spectrum. The ongoing argument of when are you going to give back that spectrum. I mean the public-service people and Bridget who's not here today because she's on an interview, I forgot, she's doing her paper on these constant emergencies we've been having in the United States and the public-safety people not being able to have their wireless services compatible with each other. Well, for years the public safety people have been saying, my goodness, the broadcasters are sitting on spectrum - - I want to show you an advertisement - - that we could use to promote this compatibility. I'm sorry, go on.

Tom Whitehead: In the excerpts from "Defining Vision" those people who got to [unintelligible] the broadcaster's push for HDTV was to deny the spectrum for land-mobile use which was going to be primarily for public safety.

Female Voice: And so, you know, this is extremely valuable spectrum - - I thought I had this, it was like an advertisement. I keep finding it and then losing it. Oh, well. Where the public safety people - - and who in America is really realizing this, you know, it's at such a regulatory level. So the advertisement was like a fireman, you know, it was in like a newspaper, saying, you know, we need a, they don't even use the word spectrum because most people don't understand what that is, we need government help to make sure that, we, the emergency people can all talk to each

other. Call your congressman to tell them to free up spectrum for our use for wireless services. I mean, you know, they're kind of trying to get a gut appeal here. It's not just 36 megahertz versus 56, the technical jargon, they're trying to say what does it mean in real terms that the broadcasters are sitting on this extra spectrum and they're not required to give it back?

Female Voice: Talk about in the public interest, I mean, that's not even a commercial enterprise, is it?

Tom Whitehead: No.

Female Voice: And they're also, the FCC when they think about who gets spectrum they deal with the state and local public safety people. Well, there you go. But I don't want to bash broadcasters too much because what originally had happened is that it was in, I believe, it actually was in the 1996 Omnibus Budget Reconciliation Act that Congress stated that OK you'll have to give back this extra spectrum on January 1, 2006, which by the way is coming up, but only if things have progressed so much that 85 percent of people in local markets are able to receive digital broadcasting over the air. Have we reached that percentage? No. And it's been pretty clear that we're not going to reach that percentage, so now one of the main issues, and it's not really an issue anymore because there've been some concessions from the broadcasters, is, OK, when are they going to give back that spectrum? Are we going to have a, they call it, a drop-day date? And it's been reported in the papers that the broadcasters have agreed basically, I believe either it's January 1, it's sometime in 2009, they've agreed, OK, we'll give it back. But realize, when the Congress did this Budget Reconciliation Act, and they said, OK, the broadcasters are going to have this extra spectrum but then they're going to give it back by 2006 and then it's going to be auctioned off, although a portion of it is going to go to public-safety people and that isn't auctioned, they were counting, they had the dollar signs in their head to try to balance the budget and all

that which they do every year. And they actually had pressure on the FCC to auction the spectrum that the broadcasters are sitting on -- Hello. Hi.

In the anticipation of their giving the spectrum back but the FCC and others have said there's no point in auctioning this spectrum so early when it's going to be years before anybody can get on it and use it and build the network and build out and all of that. So that keeps getting postponed and postponed.

Tom Whitehead: Did we talk about, in class, the TV station, I think it was in Pennsylvania, that asked the FCC for permission to stop broadcasting analog? Why would a broadcaster today want to jerk their analog signal and go to pure digital?

Female Voice: To save money and electricity?

Tom Whitehead: No. Because of must-carry rules. Their signal on cable reached a larger audience than did their analog over-the-air signal so when they posted their rate card for advertisers on cable they would have a larger advertiser base to charge cable. So the economics and the politics of this has level upon level upon level which, if I may, leads me to the introduction of our guest speaker. Dick, would you…

Dick Wiley: You've already covered it.

Tom Whitehead: Would you mind coming up here so that…

Female Voice: We've got a clean slate for you.

Dick Wiley: You're taking out all the [unintelligible] I was going to rely on.

Female Voice: Oh, really? I get a feeling [unintelligible]. Did you know that you were going to be…?

Dick Wiley: Yes, he told me that.

Female Voice: For posterity.

Tom Whitehead: I will just say a word of introduction about Mr. Wiley. And you all have his bio and have read his impressive level of accomplishments, and we did distribute the newspaper article which had a picture of you and also some selected excerpts from "Defining Vision," [an] editorial selected by me and… I will only add that Dick is in many ways unique in the communications industry and I can't really go into all of the ways he is unique. One of the ways that was important to me many years ago when he and I worked together it was that he had a background in defense. And it's impossible even though we don't talk about it in this course and there's not much to talk about in general, without having an understanding in the role of defense in our communications and particularly in spectrum, it's really, you're really working with one hand tied behind your back in terms of understanding the kinds of decisions the government has to make about communications.

But Dick's skill and capability is well known, I'm not going to add much to it. I will just say that it's common lore to say that he is the sixth commissioner which I think understates his true position. Dick Wiley was in many respects born to be chairman of the FCC and I would argue that ever since he became chairman, and then after he left, he has been *de facto* co-chairman of the FCC for all of this time. It's almost impossible for a chairman of the FCC to deal with the kinds of issues he has to deal with without employing the good office and experience and skill of Dick Wiley and his law firm. So with that modest introduction…

Dick Wiley: Very kind introduction…

Tom Whitehead: We would appreciate it if you would talk a bit about really whatever you want to talk about but what we have been focusing on today is HDTV and the bit about the technology and the industry politics and the Washington politics so anything that you would care to say would be appreciated. We try to keep it interactive, so people can ask you questions if that's all right with you.

Dick Wiley: Absolutely. It's great to be here at George Mason. I was here Friday night, as a matter of fact, had a little debate with Reed Hundt on communications policy downstairs.

Female Voice: Oh, for the T-P-R-C?

Dick Wiley: Yeah, for the TPRC. It was billed as a dialogue - it was a debate, though, as it turned out. In any case, it's great to be here with my old friend, Tom Whitehead. We go back a long ways, longer that we want to attest, I think. Tom asked me to talk about digital television and it's hard to compress my involvement in any meaningful way because it dates back 18 years. But I'm going to take you through a little bit of the history on how the standard was set; some of the problems that occurred in the industry with the standard after it was established by the FCC in 1996 which slowed down its introduction;

where we are today in the nation's transition to digital television; and finally what does it all mean to you and me as citizens of this country. I'd really like at the end to focus on what you're interested in primarily because this is a subject that is of great interest to me but maybe not as much to anybody who is in this room.

Tom Whitehead: Let me just say that this is all off-the-record. The tape is just for our class.

Dick Wiley: I think I've said all these things at one time or another. So, it's perfectly OK. I really got involved in this whole issue in 1987. I was practicing communications law, then and now, in Washington. I got a call from Dennis Patrick who was the Chairman of the FCC during the Reagan years. And he asked me to come over and talk about advanced television as it was called. The FCC was aware that, for about ten years, Japan and Western Europe had engaged in research and development on a new generation of the video medium, with much clearer pictures and sound. The United States really was nowhere in this technology, and Patrick was interested in jump-starting our national involvement. So he said would you take on, *pro bono*, a two year project as he called it. Well, nine years later, I got finally finished with it, but when you're having fun who's counting, right? But in any case, I agreed to do it.

Basically what Patrick told me was, "I'm going to ask you to head a federal advisory committee, one made up of the major leaders of our broadcast, cable, satellite, equipment manufacturing, and program production companies. Computer concerns weren't involved at that time, but they did later play an important role. The Chairman didn't give me much more than that except that the mandate of the advisory committee was to recommend a new broadcast transmission standard for the country, one that would be adaptable also for cable and satellite, to replace ultimately the current NTSC standard by which all sets have to be manufactured in this country. We have what is called analog television today, and the analog transmission standard was set, if you can believe it, back in 1941 and then colorized in 1954, I believe. And that's about all I received from the Chairman.

So I went to lunch with an FCC staff person (Lex Felker) and, on the back of an envelope, we sort of charted out what our plan of attack would be: which was to set up an international competition to attract system

applicants that would serve as the basis of the new standard. And lo and behold, we had all of twenty-three applicants with concepts for so-called advanced television (no word was said about digital at that time -- it was too early). We also had to have some sort of way to evaluate these systems. So I talked with the consumer electronics industry, the National Association of Broadcasters and National Cable Television Association about building a laboratory in Alexandria to develop test procedures and test equipment so that we could evaluate a number of different systems and compare and contrast them. One of the important things we decided early on was that the system had to be capable of being tested – that is, you actually had to build a model, you couldn't just come in with a concept.

I had always heard that digital transmission was a possibility but it was sort of the Holy Grail. I was told by a very well-known engineer that it would be well into the next century before we would ever see it. In any case, we established June 1, 1990 as the date by which all the systems had to be certified as capable of being tested and we would cut it off at that point. You know it was lucky that it was not May 1, 1990, because as Joel Brinkley's book "Defining Vision," recites, we might have missed digital television. As it happened, I went up to make a speech in early May in New York and somebody came over to me and said, "You know, CBS actually got a presentation on a digital system today." I said, "Really?" "Well, make sure it gets to me fast because we're cutting the competition off on June 1 and I'm open to it".

By the way, Japan and Western Europe had spent a lot of government time on advanced analog television. The Muse system, as the Japanese called it, was very, very good. You went to various industry meetings and you saw these beautiful pictures way ahead of anything we were seeing on TV. But it was analog transmission and they were tied up in that in a very bureaucratic way. But we were a group of private-sector people and

my only role was really to foster what was the best technology for the country. I had no tie to any of the set manufacturers, system proponents, or anything of the sort. I was just looking for the best service. And when I heard about a digital system, I said I want to see it.

And this company, General Instruments, out of California and headed, incidentally, by Donald Rumsfeld at the time, came in just before the Memorial Day weekend of 1990 and said they had developed a digital-transmission system. I said get me a check for $175,000, which was the entry fee, and get your system in before the June 1 deadline. And that's just what happened.

Thereafter, I got visits from some of the other leading proponents – companies like North American Philips, RCA, AT&T, MIT, Zenith and what have you. They all came in and said, "What do you think about going to digital?" I encouraged everybody to think about going digital. And they also talked to me about mergers, and I encouraged every merger I could because I knew at the end of the day we would have a deuce of a time trying to distinguish between these various systems to pick the best one.

So ultimately what happened was we tested four digital systems, plus the Japanese NHK-analog Muse system. And the digital systems clearly outperformed the NHK system which had been developed for many, many years. But none was adequate to be anointed as the system by which we would set a new national transmission standard.

So I decided to give the four remaining proponents a choice. Either we're going to go through another expensive round of testing (and I got a lot of groans) or we could consider forming a single, best of the best elements, system. I used the term "grand alliance."

Tom Whitehead: What was the incentive for these competitors to compete? Did they have a patent on the system?

Dick Wiley: Yes, they had patents but I really stayed out of that.

Tom Whitehead: General Instruments, I think, was the largest manufacturer of cable setup boxes.

Dick Wiley: It was. And, Don Rumsfeld called me up and said, "You know, we think we won the first round of testing," and I had to tell him, "Well, you came close," and he wasn't pleased with that answer. And so what happened to make a long story short is that negotiations on a joint system ensued, as I was hoping. And finally there was a tumultuous meeting here in Washington, D.C. I got a call from the AT&T representative, who said, "You better get over here, the thing's breaking up, they didn't make it." I said, "Oh my goodness." So I jumped in a cab and went over to the meeting. And I said, to the parties: "Wait a minute -- and Brinkley tells the story -- "I know that you all have various disagreements. But can we find if there is anything we agree on? Don't we agree that high-definition television, which is maybe six times better than current pictures, is the way to go?" Yes, they said, we agree there. And I said, "Isn't that going to need about 1,000 lines, you know, double what we've got today?" And they said, yes. And I said: "Don't we agree the picture is going to be wider, we have 4 by 5 today, sort of a boxy television set. The new one should be more or less like the dimensions of the motion picture screen." Yes, they agreed. Then I said, "Couldn't we agree that progressive scanning (as used in computer technology) ultimately is the way to go – that is, we want to link the computer and the television set together so maybe we'll have a migration path to progressive - start with interlace scanning (as used in analog television) and move toward progressive scanning."

They then broke up into little groups and went to different suites and I went around, sort of a shuttle diplomacy, to encourage them. And by that evening, we were all on the same page. And we agreed to a press release announcing the grand alliance.

The next morning, at 7:30 a.m., I got a call that MIT said, "it had to be progressive from the outset," and that they were going to put out their own press release. And I said, "No, we can't have two press releases." Instead, I suggested a footnote that said we would move toward progressive on a transitional basis." And ultimately, everybody was on board.

But then they also had these business problems – basically, patent royalty issues which had to be worked out.

While we finally had the grand alliance concept, the system still had to be built. And so, for the next year, this best-of-the-best elements systems was constructed. And for each of its various elements, we had to make technology evaluations (what we called "bake-offs").

Finally, after the system was built, the Advisory Committee had to test it which was a lengthy process. But, eventually, it was completed and the Committee voted to adopt the grand alliance system as the basis of the new digital television transmission standard for the country.

That was at the end of 1995. It took about a year thereafter for the FCC to actually establish the standard. The Commission had to go through a public comment process. And then, after the standard was adopted, the agency also issued service rules. Because digital transmission is much more efficient than analog, we found that we were able to squeeze two broadcast channels into the existing broadcast band. With analog, you couldn't use adjacent channels in the same market. But, with digital, this

was possible so we could allow analog TV service to remain undisturbed on one channel while transitioning the nation to digital on the other channel.

The FCC did a magnificent job, in finding a second channel for every broadcaster. That process, by the way, is still going on - broadcasters are selecting which channel they're going to want when the transition ends. Some of them will stick with their old analog channel and some will take their new digital channel. They can only keep one. The plan also was that they had to turn in the other channel when the transition was completed.

In 1990, I thought it would take 20 years (based on the introduction of color television) to finish the digital transition, and that's about what it's going to be. I think Congress is likely to pass legislation this year to end the transition, I would say, in mid-2009. At that point, broadcasters would turn it the other channel and they would only, thereafter, broadcast in digital.

Now what can you get on digital transmission? It's about a 20-million-per-second bit stream into the American home. Most of the bits could be used for a single high-definition picture, but because the American standard is so flexible, you can actually break down the bits and give broadcasters for the first time the ability to get into multiprogramming – that is, they could have 4 or 5 so-called standard definition programs, which would be equivalent to what we have today in analog television as far as quality is concerned. You also could use some of those bits for data and interactive services, so if I'm watching an ad for a BMW automobile, and I want more information about it, I could receive it – and, similarly, with football statistics or what have you. The point is it's not an either-or system. I think that what's going to develop is what public broadcasting always told me they wanted: high-definition at night when you really want clarity for sports programming, movies or Discovery-type shows;

and then during the daytime, educational programming, soaps or talk shows where standard definition may be good enough. And, again, you could have data interspersed. Broadcasters, of course, are still working on the business models that might be employed.

After the standard was adopted, some technical disputes arose – once again, on progressive/interlace scanning. But, fortunately, Intel developed a chip which obviated the problem. Additionally, there were disputes over the modulation scheme (that is, how the TV picture is delivered). All of this consumed another year or two. But, ultimately, the FCC stayed with the basic advisory committee recommendation of the so-called grand alliance standard.

So our standard's set now, but the truth is that, because of these disputes, DTV got off to a very slow start. It really was a chicken-and-egg problem. You wouldn't build digital receivers unless you had digital programming to be transmitted over them. And you wouldn't transmit programming unless people had digital sets. It really was hard to put those two together

But FCC Chairman Powell, to his credit, set up a digital television task force which dealt with a lot of the inter-industry disputes which were delaying development of digital programming.

One problem was that cable requires a set top box. But a lot of people wanted integrated plug and play equipment which Powell's task force facilitated. A second major decision was the so-called tuner mandate: that all sets, over a certain size, would have to have a digital tuner built in them from the get go. And by 2007, that's going to be totally implemented for all sets 13 inches and above. The tuner mandate will mean that we're not going to have a lot of new analog sets after 2007. So essentially analog television is going to be outmoded.

But then there is a remaining big problem: what happens to the universe of 73 million analog sets that are in American homes? And what happens to the households that rely only on over-the-air broadcasting?

The Congressional solution (which we also conceived of in the 1990s) is the development of an inexpensive converter box that somewhat ironically in this new digital world would convert TV signals back to analog so you could view them on your analog sets. And the government may decide to subsidize this equipment to some extent – that is, give consumers a voucher that they could take into Circuit City and get one box per household. This will be expensive but the money could come from the auctions that are going to occur for the spectrum that's used for analog television and which will be given back to the public.

And so this is the political struggle that's going on right now. The struggles on Capitol Hill then are when will the transition end, will you have converter boxes and will there be a subsidy, and then the third one is an ongoing dispute between cable and broadcasting over digital "must-carry".

Tom Whitehead: Isn't there some debate about whether the broadcasters even get to keep all their spectrum or whether they just have enough for one channel on the digital?

Dick Wiley: No. The standard definitely envisions a six megahertz digital channel. I am a high definition advocate. I wanted to give the American public something better – a whole new viewing experience. But, on the other hand, if technology makes it possible to have both multi-program standard definition and HDTV, why shouldn't we allow that? And if you can also have digital data services, why not? Let the country have the best that technology offers was my view. But it all has to be within our 6 MHz channel system.

Tom Whitehead: But so NBC, once we go to the digital, will it definitely have the spectrum to carry six channels?

Dick Wiley: NCB is a program provider which also owns (and affiliates with) local stations. The network programming delivered to the stations during the evening will probably be transmitted primarily in HDTV. But, in the daytime, the bitstream could be broken up to accommodate, say, four or five standard definition programs (and interspersed with data).

Tom Whitehead: I will recount an informal poll I've been doing of friends and acquaintances who are buying the new television sets and the results are 100 percent. That once they get their HDTV set, they almost exclusively watch HDTV programming. And I say, "Well, what about the news, don't you watch CNN or Fox? Oh, a little bit, but I really like to watch the good picture, whatever's on there I want to watch. "

Dick Wiley: Yes, there are some people who don't like multicasting because all they want to watch is high definition. The good news is that broadcasters eventually will be able to transmit multiple high-definition signals. Currently what looks to be most possible is an HDTV signal and one or two standard definition signals or switch completely to 4 or 5 during, say, the daytime periods. One thing that has disturbed me is there is a lot of degrading of high definition, just to tell it like it is. I have an outdoor antenna so I get over-the-air high definition and it is an uncompressed signal. Some other systems have chosen to use some of the digital bits for other services – and that does degrade the HDTV picture to some extent.,

Tom Whitehead: It would be interesting to see as more and more HDTV capable sets get out there whether the viewing public gravitates toward the real high definition.

Dick Wiley: If they see it and know it.

Tom Whitehead: If they see it and know it, then, and that may reduce the incentive of broadcasters to try to go for lower-definition channels.

Dick Wiley: It may be, and it may cause these systems to deliver a better signal. But, remember, satellite capacity – for example -- is limited.

Tom Whitehead: I want to encourage the class to ask questions, but I want to make one more point before we do that. You listened to Dick's description of this advisory committee and its work, and I just want to point out to you that when you read the expression "advisory committee" in the literature, you tend to think of something rather technical, rather drab, a bunch of experts out there pontificating, and what we, in fact, got here was the co-chairman of the FCC acting without the restrictions of due process and FCC rule and regulations. And really, producing a compromise among government and industry and not just industry but television broadcast industry, television manufacturing industry, computer industry, so this was a highly proactive endeavor that Dick undertook and I think produced magnificently on.

Dick Wiley: Well, you're kind to say that. I'll make two comments. First it wasn't just me. I was the manager, you might say, but I had a thousand engineers working on this project. We operated under the Federal Advisory Committee Act (FACA) and all our meetings had to be public. That was actually a great thing because what happened is peer review. If an engineer was advocating a particular technology position, he would have to get up in front of his peers at these open meetings and make the case. And these other guys were just as smart and just as technically capable. And, so, the best ideas came bubbling up to the surface. And we ended up with the best technology. Europe now is also going digital (although, at

first, not decoding high definition). And the Japanese, in their very careful way, are just now adopting DTV this year. They will do a wonderful job because they're technologically very capable.

We have almost a thousand different models of digital sets for you and me to purchase, and the price has fallen by over 75 percent since they were first introduced five years ago. The quality is world class and you can get them at all different price ranges, depending on what you want. There are plasma sets, DLPs and LCDs. There's quite a variety.

What we desperately need in this country is consumer education. The average person doesn't realize that, in four years, his or her television set is going to be turned off. And they shouldn't be induced to buy analog sets today without at least knowing that they're going to need converter boxes. So what Congress is also thinking about is requiring as sticker on all television sets that says, "Beware. If you buy this set you will have to have additional equipment on it," and I think that's fair.

Tom Whitehead: Absolutely.

Dick Wiley: That's absolutely fair. And I think the set manufacturers are the real heroes of this whole transition. They have developed these wonderful sets, but on the other hand they're businessmen and they're still getting rid of their inventory of analog sets. If you buy one and you get a real cheap price today, just remember you're going to have to have a converter box in the future. And you can never get high-definition television.

Female Voice: I have what may be a three-part question. When they do the full switch over to digital broadcast, will people who have, who receive cable television, through Comcast or whatever, that have analog TVs be able to receive their cable with their analog TVs. So not receiving broadcasts but receiving cable.

Dick Wiley: It's a brilliant question. The bill that Congressman [Joe] Barton, chairman of the House Commerce Committee, is working on would allow the cable industry to down convert the broadcast signal to in effect analog quality which the broadcasters don't like. They've spent all this time developing high definition, and cable is going to down convert the signal. The reason cable wants to be able to do that is that they've got a lot of people among their subscriber base that have only analog sets and either they're going to have to install a lot of new equipment to satisfy those people or they're going to have to down convert these signals.

But that's very difficult thing to do technically.

Female Voice: Well, where I was going with it is if the answer was a certain yes, then my next question is the 85 percent goal for digital televisions and households, is that of all households in the market or is that of the 15 percent who still get their television over broadcast?

Dick Wiley: No, it's all the sets that can be reached by a single station, for example. Now, I think frankly the 85 percent was something the broadcasters very effectively did on Capitol Hill. A lot of people said, "Gosh, how are we going to meet this 85 percent standard?" Congress passed it and can get rid of it if they want to. I mean if you want to end the transition, you just have to decide what's the basis of doing so. But it's very tricky to figure what is 85 percent.

Female Voice: Well, so the third part, is that if you're able to receive cable analog on your analog set, then why would it matter that 85 percent, those televisions that can receive the signal anyway for the transition, why wouldn't it just need to be like a large majority of the households that only receive through antenna broadcasting?

Dick Wiley: You make a good point. This is a transition, and we're going through bumps and bruises. The Japanese are not going to worry about that because they waited and they're just going to go straight to digital. And we're doing the transition over a twenty-year period and we're going to have problems, no doubt about it. But the sunny uplands beckon. There's going to come a time when analog sets won't be sold in this country. Some of us will have our converter boxes for existing sets, but ultimately it's going to be all digital, and it's going to be better. Everything is going digital.

And here's the thing that I really felt good about. Terrestrial radio broadcasters are also going digital. And what are they calling it? They're calling it HD radio. It is because HD has become the big thing. If you read the Brinkley book you'll see how many times along the way people came over to me and said, "Forget HDTV". But I felt like the public should get a chance to see it, because it is better. Some people would say it's just prettier pictures. But, you know, television is an entertainment device as well as an information source. And I even like the news in high definition.

Tom Whitehead: You people are too young to remember, but it was the same with color. Those of us who grew up with black and white, said, why do I need color? You know, I don't really need color. But then you see color television and you can't go back and it's an important part of the viewing and the sensory experience and it just, you can never go back and will be the same with the HDTV.

Dick Wiley: One comment about color. When it was introduced, CBS and NBC had competing standards. We picked the standard that best fit with the existing black and white TV system because it all was on the same frequencies. It was an easier transition in that sense. Here, we had to find

virgin spectrum so that we could give engineers the ability to design the best digital system possible.

With color, we picked perhaps the second-best standard because it fit better over the dot-matrix system of black-and-white television.

Female Voice: Well, I was just going to say you keep talking about the transition with color, it happened to me with DVDs. Because it was just a few years ago and my husband was like, "We need to get a DVD player," and I was like, "Oh, you know, the videos, they're fine. I went away out of town for three days, I come back, there's a DVD system." And right? With DVD's - - and it seems crazy now from this perspective, because the minute I watched one I was like well, I'm never going to watch another video again. I only want to watch DVD. So it's just that same process of people saying, "Why do we need this?" but the minute you see it, you can't go back.

Dick Wiley: And remember, your DVD is only a transitional system; we want high definition DVDs.

Female Voice: Now I know that, I'll let him get the next technology. Why aren't the broadcasters, you know, consumer education, this fantastic product that they have, it seems to me if I were them, I would be running around neighborhoods, handing out antennas, putting it on people's roofs for them and saying, "Look what you can get." I mean, almost like a - - you're giving away the antennas, the antennas don't cost that much although I know in bulk, they do, it's just the kind of make people realize what you can get for free again.

Dick Wiley: In some communities, you can't put those antennas up. You know there are problems, zoning and all. There needs to be so much more consumer

education and I think a lot of the industries are missing the boat on this. But you're starting to see ads now on DTV sets.

At first, some broadcasters didn't want to make the conversion to digital. They would say: "I don't think it's needed. Someday maybe, if there's a marketplace for it, we'll do it." And I thought, boy, these guys just can't see it. I had a lode star and it was HDTV and maybe I was too focused on that, but I really think it's going to work out.

Female Voice 1: I have actually two questions. The first question is a technical question to pick your brain on. The standard, from analog to digital the broadcasters were given six megahertz.

Dick Wiley: Right.

Female Voice 1: That's the standard. And you said that was flexible and you can do data and Pay Per View on that. Is that…?

Dick Wiley: You can do interactive services, pay per view, standard definition - you can provide many different services.

Female Voice 1: And there are no restrictions on the broadcasters under current law they could go and take advantage of those?

Dick Wiley: They have to have at least one program that is of digital quality. FCC Chairman Hundt asked me, "Do you think that we should set a minimum percentage of HDTV?" which he was opposed to. And I said, "No, I don't think we should." Because even though I wanted HD, I thought this was a decision the marketplace uniquely could make. If the public likes HDTV it will go; if they don't, it won't. But they've got to get a chance to see it, that was my theory.

And, by the way, one thing we found was, it really didn't cost the broadcasters that much to transition to HDTV because their programs were being shot in wide-screen 35 mm cinematography – which is easily converted to HD. For a relatively low amount, they can transition to HDTV.

The HD transmission standard is either 1080i or 720p. We can't compress 1000 lines progressive into a six megahertz channel as yet. ABC and Fox have 720p; CBS and NBC have 1080i. They're two different scanning formats. I prefer 1080i simply because I know there are more individual pixels in that picture but, for all intents and purposes, they both look great.

Tom Whitehead: You had a second part.

Female Voice 1: Yeah. And in this six megahertz world where you can splice up into six channels…

Dick Wiley: Probably four or five, I mean, the more you get, the worst the picture looks. And I'm told that four or five is about the best you can get in six megahertz.

Female Voice 1: Well, right now in the must-carry regime you can opt for must-carry or you can opt for retransmission [unintelligible].

Dick Wiley: The statute reads that, every three years, broadcasters get a choice. They can say, cable, you've got to carry my signal (must-carry). Or they can get into a negotiation with cable for retransmission consent which is you give me something for the signal. Now, the broadcasters would like to get paid for their programming. Cable said they're never going to pay broadcasters money for it. But they do give them certain advertising; or

channel capacity. The reason why we see FX and CNBC is that they were negotiated for in retransmission consent deals.

Female Voice 1: And that comes to my question. How is [sic] the broadcasters right now allowed to take that six megahertz and say you will carry, transition a must-carry regime into you will carry six channels or four channels, how does that change the negotiation of the retransmission consent?

Dick Wiley: Well, first of all, the FCC has said it can't do that. There will be no must-carry for multichannel programs unless Congress changes the law. They could, however, negotiate for it. And, by the way, public television has done just that and the cable guys were really smart. The day before the FCC was to vote on digital multichannel must-carry, they announced the deal that they had struck with public broadcasters who were sympathetic figures. Now, the commercial broadcaster would like that same deal but they probably won't get it.

Female Voice 1: No, I'm saying, like for example, if a new bill pass that's out of Congress and the broadcasters are now allowed to exercise a must-carry of six signals rather than just one, how does that affect retransmission consent, is that a new template?

Dick Wiley: Probably it will be all multicasting at that point, although they may still try to get some money or other benefits.

Tom Whitehead: Do you think that Congress will override the FCC and impose must-carry for all the channels a broadcaster owns?

Dick Wiley: It's a real struggle. I don't know what will happen. But it definitely will affect negotiations in the future. My guess is it probably wouldn't end up being 4, 5 or 6; maybe just a couple of channels in order to develop a local news program or local weather channel.

Female Voice: Either that or missing people. We'll have a channel totally devoted to missing people.

Dick Wiley: I represent a very fine broadcaster I won't name. But they really are very public-interest oriented. They are into their community and really want to develop multi-channel local programs. But they say they can't afford to do it if it's not going to be carried by cable. I think they could probably work out a retrans deal with cable but they'd like to have the government require it. But that's a tough deal.

The Supreme Court precedent was based on congressional findings that analog must carry was in the public interest. But there haven't been any such congressional findings on multichannel digital. If Congress made some findings like that, you could see this matter ending up in the Supreme Court again someday. However, I am hopeful that cable and broadcasters will find a way to work this out. The satellite guys have a much more difficult problem. First of all, they have a tougher must-carry law. They have to carry all broadcast signals for every community they go into whereas cable has a capacity limit.

We've got to think in terms of a digital world. Again, there's a 19.4 million bits per second digital bitstream. And the question is how many bits do you use for what kind of program? For really fast action NCCA basketball, I understand you have to use something like 15, 16 million bits to really get a full HD picture.

For talking heads, much less. So it depends on the kind of program.

Male Voice 1: That's right. Rolling out video, how is that regulated today.

Dick Wiley: Now, the telephone guys are saying, "Forget all these must-carry disputes, we've got fiber optics, we'll carry everything. Just let us have your programming. We want to be the good guys. We'll make a deal with the broadcasters." Cable came along with a coaxial service which is broader than a telephone copper wire. But now the telephone companies have something even better: fiber optics. Almost unlimited capacity, really.

The problem for the telephone companies – at least, Verizon - is they've got to go to 10,000 communities across this country and get local franchises. And the cable guys aren't cutting them any slack on that, obviously, because they're competition. So, one of the big disputes in various states and on Capitol Hill is will we pass a new law that says you can have a state or national franchise? Some people on Capitol Hill think this is competition just like cable was competition to broadcasting.

And, of course, what's happening at the other end of the spectrum is that cable guys are going into telephony. So the future competitive struggle will be bundled services being provided by both cable and telephone companies. Cable will say: "We will give you your local telephone service, your long-distance telephone service, your video and your broadband Internet access. We'll give you all four." And the telephone company will say the same thing. Broadcasters, of course, aren't able to do all that but they always will be important program suppliers.

Tom Whitehead: And even the, even strong states-righters like me can see that this is where federal pre-emption makes an awful lot of sense.

Dick Wiley: We're representing Verizon on this matter so, naturally, I'm going to say I agree with you. In fairness, the other side of it is that the cable people had to negotiate with all the local communities one by one. But I think

that if you really want competition, you've got to let the telephone companies in.

Tom Whitehead: Absolutely.

Male Voice 1: How are they regulated, like cable?

Dick Wiley: Very good question. They're going to say they shouldn't been regulated in that manner.

Cable won the Brand X case before the Supreme Court, which said that cable should be treated as an information service, without all the heavy regulation that the telephone industry traditionally has had. But, now, FCC Chairman Martin also wants to make digital telephone delivery an information service.

Well, does that mean no regulation? Well, no, because there could be consumer fraud, new services like E911, universal service, etc., where regulation may be appropriate. My philosophy is you have got to move toward a less-regulated environment in digital but still protect the public.

Tom Whitehead: When Dick and I started in this business, it was three or four years ago, a few years ago, the sentiment was very much a Soviet-style command regulation of radio and television and everything. And there were times when I think Dick and I felt like we had to excuse ourselves and go out in the hall in order to talk about competition and communications in the same sentence. But, so it's especially nice for us to see this trend towards competition being used to produce innovation and to resolve these industry disputes.

Female Voice: So how did you guys work together? You actually had… Because some of the other, like Brian Lamb or [unintelligible]

Dick Wiley: I was at the FCC; you guys were at the NTIA.

Tom Whitehead: OTP.

Female Voice: Oh, at the same time.

Dick Wiley: At the same time. Do you know that the first general counsel of OTP, in the 70s when I was general counsel of the FCC, was Antonin Scalia.

Tom Whitehead: The two of them worked together very effectively.

Dick Wiley: So, in the early days, he was a communications guy as he reminds me from time to time.

Tom Whitehead: Which is why he had to dissent in Brand X.

Dick Wiley: Yeah, I didn't agree with him on that. What's made it easier is competition. You can't have deregulation if you have oligopoly or monopoly. But, fortunately, we've had a lot of wonderful technology in this country which is facilitating competition. Some of us weren't as far-sighted as we should have been when cable came along. But, Tom, you weren't one of those people. You were all for letting cable compete. The FCC was worried about undermining broadcast service. And, today, what we're seeing is, just let technology go and it will serve the public. We're going to be better than anybody else in the world, especially where there are lingering government-run bureaucracies.

In many countries in Europe, the government was the telephone-service system. That can't work anymore due to new technology and resulting competition.

Tom Whitehead: As the class knows, I'd like to look at these things and the historical perspective and this country has always been at the forefront in both telecommunications and broadcasting because of our vital private sector. And now we're getting true competition across the board, not just in equipment but in all these services.

Dick Wiley: But it's not without a struggle. I think the government has to be very strong, and really look at arguments against new competition and ask, "Do they hold water?" And we're just talking about this in the video field but across the whole Internet area. But, you do run into a lot of public policy concerns, too. Let's take the case of porn - on broadcasting, on cell phones, on the Internet. We want to protect our children and that suggests the possible need for regulation. These are always very tough issues.

Male Voice: You mentioned one of the things to ease the transition for the consumer as subsidies. There's a number of types of subsidies that you could do, but are there any other ways that we could ease this transition for the regular consumer.

Dick Wiley: I think more information to the public on the new products and services available is the key.

Female Voice: How much is an analog set? Maybe, what?

Dick Wiley: $300.

Female Voice: If you're going to pay $300 and you're able to get a set top box for how much, $50, that's still a fairly good deal, but you'll never get digital.

Dick Wiley: Yeah. You'll never get digital and you'll never get high definition. You're getting all the other services, so, it's certainly a choice the consumer can make today. I'm not saying it's completely irrational to buy

an analog set, but you'd like to know at least what your options are. And what's going to happen to your set in the future.

Female Voice: Could you comment on the way that Germany has transitioned, which I kind of read about that they kind of, digital on one day, or something…

Dick Wiley: Yeah. They had the Berlin plan. But, you know, it's simpler. No high-definition, small area, and they were able to just change it over. I think we've got to be careful about trying to adopt other countries' procedures because this country is just huge. There are rural areas and urban areas, and there are rich and poor, and the goal of this country is to make DTV available to everybody.

Tom Whitehead: Our tradition is quite different. Competition is a messy business. It's like democracy is a messy business but it's ultimately, we think, the strongest. In Germany, it's easy for their government to say, it's going to be like this. The consumer and the manufacturer fall in line and say, "Oh yes, it's going to be like this." But that produces a rigidity which forestalls the kind of more vibrant development that we see in our competitive process in this country, particularly when you get a strong cooperative effort going between government and industry, which, you know, sometimes we screw up. But in cases like what Dick did with his advanced television committee, worked splendidly well to bring out the most, the best of what both government and industry can do. Yasser, you had another question.

Yasser: I was going to comment on that Berlin model - - what about the model in London?

Dick Wiley: They're doing a better job right now than we are in trying to educate the public. They've got an educational plan over the next four years.

Yasser: I know they have to pay for set top boxes.

Dick Wiley: Yes, but they're very cheap. They're not very expensive. But between the BBC and private enterprises, they are providing free service.

Dick Wiley: You know, it's much simpler over there, because they don't have that many channels. But it is a cornucopia here; I mean hundreds of channels on broadcast, cable, satellite and telephone.

Yasser: It's like 20, 30 or 40 channels, no more than 40.

Dick Wiley: Although I was critical of them, I can understand why the Europeans simply wanted more digital channels and didn't worry at first about HDTV. After all, we had cable and satellite providing numerous channels. I think we have it all in this country. We've got the best, there's no doubt about it. And, by the way, in the Brinkley book, you can read how all these struggles came together.

It's a terrific book.

Female Voice: Are you sharing in the royalties, or something?

Dick Wiley: No, I don't. But that guy came to all our advisory committee meetings over 2-3 years. He lived it, and was there. He witnessed the struggles that we had. It's an interesting read, so take a look at it.

Tom Whitehead: Say a bit, if you would, about how the computer industry insinuated itself into this process.

Dick Wiley: It was really a slow discovery by a lot of us. The FCC left the industry out at first and they really wanted in. And it made sense to me, too. The only problem was that some of them wanted only a computer standard, progressive scanning only. But my goal and vision was, ultimately, tying

the computer and the television set together which is going to be a great development. In the early 90s, I wasn't as much of a computer lover as I am today.

Tom Whitehead: None of us were.

Tom Whitehead: So, I want to thank you very much for coming.

Dick Wiley: You bet. Thank you. Thank you.

Female Voice: Mr. Wiley, I have a political question for you.

Tom Whitehead: He doesn't know anything about politics.

Female Voice: I'm with you. I've actually seen you in a lot of the Republican National Lawyers' events because I volunteer at the desk at a lot of those events, but one thing that I think is interesting is that the Republican Party that I kind of came into I thought was about, you know, independent, individual responsibility, getting the government out of our lives, and I don't get how that ties in with this content formulation, with content censorship of our airways.

Dick Wiley: First, I think, you won't find any heroes on the Democratic side either. But I take it that you're more libertarian.

Female Voice: Exactly.

Dick Wiley: Well, the trouble is, let's say that you're a mother someday. And your 4-year-old kid is watching television and there are certain channels with more adult programming.

Female Voice: I know it's my responsibility to make sure that TV viewing is appropriate.

Dick Wiley: Suppose you're a minority working in an inner city and you've got to have two jobs, and your kids come home after school and watch programs that you can't monitor.

Female Voice: Yeah, I know, I know. I have the V-chip.

Dick Wiley: Look, I was FCC Chairman when the so-called Pacifica case arose. My hope always was, like yours, that broadcasters would self-regulate themselves. But if programming describing sexual or excretory acts was aired in a titillating manner during times when children were in the audience, the government had to take action (but, hopefully, in a reasonably restrained manner given First Amendment sensitivities). In recent years, I think the FCC may have gotten a little far afield – in particular, in the Golden Globes case where the "f" word was used in a non-sexual context.

Tom Whitehead: It was the broadcaster's fault for carrying it.

Dick Wiley: Well, it was a live program, NBC didn't know he was going to do it. If the context is non-sexual and if it's fleeting and ephemeral, people just have to take it. If they hear the "F" word, we're not all going to fall to dust, you know. It happens.

Tom Whitehead: And there are ways parents can police that.

Dick Wiley: Mostly, but I think the government has to help them by having these indecency standards but I agree with you, I wouldn't go too far. I think the government went too far, I think the Republicans went too far on that. But the Democrats, believe me, weren't dissenting. They were out applauding and saying more, more.

Female Voice: Now here's my topic and the paper I'm writing for this class, what if a politician wants to go on, a legally qualified federal candidate for office is responding to somebody else's ad that's already gone on the air, and they want to put something that would be considered indecent in their ad, can [unintelligible] FCC, at least, according to the DC Circuit? What happens…

Dick Wiley: And the government isn't supposed to censor political ads.

Female Voice: They can't censor it. But you're criminally liable as a broadcaster if you air it.

Dick Wiley: That's a tough issue. Very good.

Female Voice: It's weird. It's kind of fun.

Dick Wiley: Yeah, that's fun. Hey, when you get the answer, tell me.

Female Voice: OK.

Tom Whitehead: I think we've got one more question.

Dick Wiley: Oh, sure.

Male Voice: It's kind of a, off issue, I don't know if you'll be able to answer it…

End of recording.