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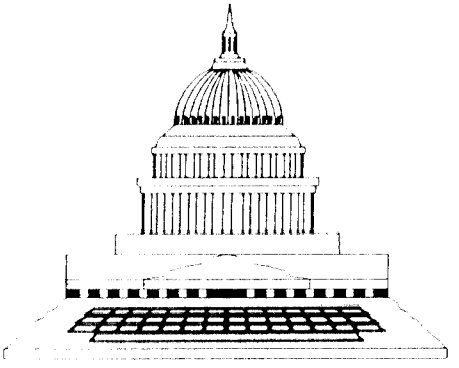
Information Management and Technology Division

September 1991

U.S. Communications Policy: Issues for the 1990s

Panelists' Remarks



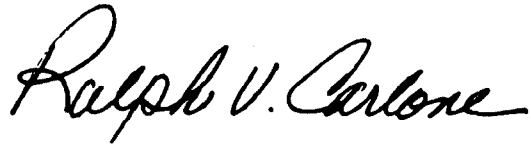
GAO/IMTEC-91-52B

Preface

This publication is the second volume of our report highlighting communications policy challenges facing U.S. policymakers. In the first volume, entitled U.S. Communications Policy: Issues for the 1990s, Results of a GAO Roundtable (GAO/IMTEC-91-52A), we summarized the panel discussions of nationally acknowledged experts who attended our conference, "U.S. Communications Policy: Issues for the 1990s," held on February 11, 1991, in Washington, D.C. This publication presents the panel discussions in their entirety, as well as the luncheon speech delivered by Congressman Edward J. Markey, Chairman, Telecommunications and Finance Subcommittee, House Committee on Energy and Commerce. Appendix I contains a brief biographical sketch of Congressman Markey.

To elicit a wide range of perspectives, we invited government officials, academicians, and industry executives to explore and debate critical policy issues in a series of roundtable discussions. The conference included four panel discussions, each addressing a separate policy issue. The issues addressed are (1) how the communications infrastructure should develop to promote innovation and maximize the benefits of competition, (2) the role of communications policy in promoting economic growth and development at home and competitiveness abroad, (3) how the United States should allocate the spectrum to effectively support the growth of communications services as a major element of the nation's communications infrastructure, and (4) whether the U.S. communications regulatory structure is effective at promoting opportunities for technological growth and innovation, as well as providing benefits to users. The conference was moderated by Patricia Diaz Dennis and Harry M. "Chip" Shooshan III. Biographies of the moderators and panelists can be found in appendixes II and III, respectively.

Should you require additional information on this publication, please call me at (202) 275-4892.



Ralph V. Carlone
Assistant Comptroller General
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Abbreviations

AT&T	American Telephone and Telegraph Company
ANSI	American National Standards Institute
BOC	Bell Operating Company
CAD/CAM	computer-aided design/manufacturing
CBS	Columbia Broadcasting System
CCTU	Committee of Corporate Telecommunications Users
CDMA	code division multiple access
CEO	chief executive officer
CFR	Code of Federal Regulation
CNN	Cable News Network
CPE	customer premises equipment
C-SPAN	Cable Satellite Public Affairs Network
CTIA	Cellular Telecommunications Industry Association
DAB	digital audio broadcast
DARPA	Defense Advanced Research Projects Agency
DBS	direct broadcast satellite
DOS	disk operating system
EC	European Community
FCC	Federal Communications Commission
GAO	General Accounting Office
GTE	General Telephone and Electric
HDTV	high-definition television
IBM	International Business Machines
ICA	International Communications Association
IMTEC	Information Management and Technology Division
IRS	Internal Revenue Service
ISDN	integrated services digital network
IT	information technology
ITT	International Telephone and Telegraph
LAN	local area network
LATA	local access and transport area
MFJ	Modified Final Judgement
MFS	Metropolitan Fiber Systems
MIT	Massachusetts Institute of Technology
NAB	National Association of Broadcasters
NAM	National Association of Manufacturers
NARUC	National Association of Regulatory Utilities Commissioners
NBC	National Broadcasting Company
NREN	National Research and Education Network
NSF	National Science Foundation

NTIA	National Telecommunications and Information Administration
NTSC	National Television Standards Committee
NTT	Nippon Telegraph and Telephone
ONA	open network architecture
PC	personal computer
PCN	personal communications network
PCS	personal communications system
POTS	plain old telephone service
PSC	public service commission
PTT	postal, telegraph, and telephone authority
PUC	public utility commission
RBOC	regional Bell operating company
SONET	synchronous optical network
SMR	specialized mobile radio
SS7	signaling system 7
TELCOS	telephone companies
TCI	Tele-Communications, Inc.
TDMA	time division multiple access
UHF	ultra-high frequency
USSB	United States Satellite Broadcasting Co.

Communications Infrastructure

Ms. Dennis: Welcome to all of you.

To set the stage a little bit, I think that we need to decide and discuss the importance of telecommunications. Indeed, does it form part of the infrastructure of the nation?

Irwin, I'm going to ask you to help us at this stage here. We've taken telecommunications for granted in this country for quite awhile, perhaps because we've had such a good system, and now it's become chic to discuss the need to improve and enhance the quality of communications as part of an infrastructure. Is it appropriate to think of telecommunications as an infrastructure, and why?

Irwin Dorros

Mr. Dorros: First, let me point out that I'm not going to follow the ground rules, because the ground rules say that you want us to fight with each other.

Ms. Dennis: Not exactly. I think we said, "Take issue."

Mr. Dorros: Chip said to pick a theme that we wanted to get across and fight. That's what he said in the advance material he sent us.

One of my themes is that what we're lacking is industry cooperation. It's hard to portray industry cooperation in an atmosphere that Washington thrives on: a good fight. My major theme is that industries have not cooperated with each other in deciding on what we want this country to have for its infrastructure for the next 20 or 30 years.

Your question is very broad, probably too broad to have a concise answer, and I don't have enough time to develop a question such as, Is telecommunications an infrastructure?

Ms. Dennis: How important is it?

Mr. Dorros: We still have the best voice network in the world, but the only reason we still have it is because of the momentum prior to divestiture, and the companies have been following virtually the same services that we've had for voice since before divestiture. They've developed them through the motivation of competition, we've become more efficient, and we still have a good network that still works.

But since equal access, we haven't introduced a single national new service that came and was developed and conceived since divestiture. Even services like caller I.D., as controversial as it is, are still limited because they are only local, and the local exchange carriers have not gotten together to offer national caller I.D. That's just one example.

So voice is still good, but the current structure doesn't have the appropriate cooperation to even develop voice better. What we don't have, though, which I think keeps being talked about as the infrastructure for the information age, is a data or information-networking infrastructure. We don't have that. The voice network is, at best, a substitute for carrying data on dataphone datasets. There are more in use today than there ever were, but they provide a very limited capability compared with what we need. We need a high-speed broadband ubiquitous network for interconnecting the workstations of the future, which will be the partners of the intellectual knowledge workers over the next 10 or 20 years.

These will not necessarily be only in offices. These will be also in homes because people will be working at home. So we need a network that can interconnect those networks together. We don't have it, we don't have a plan for it, and we don't have an industry structure that's going to cause it to happen. Yet we need it. I think that this is really the subject of the conference. The advance material has covered that, and there have been numerous articles written on it.

The best article that I've seen is an article by Mike Dertouzos of MIT (Massachusetts Institute of Technology), head of the computer lab there. It's an excellent article on what we have and what we need and what we don't have. He also says that we don't have the mechanism for getting it.

Let me just stop there.

Ms. Dennis: Carl, do you have any views? I know that you believe that there is convergence between computers and communications. What kind of infrastructure development do you see is necessary, and why?

Mr. Cargill: I'm going to hedge just a little bit on that question.

Ms. Dennis: I'm used to that.

[Laughter.]

Mr. Cargill: I think that what you are seeing is a basic convergence of absolutely divergent opinions, and the IT (information technology) industry, which I seem to be the sole representative of, has always used technology as a lethal competitive weapon. If we had an advanced technology, we would spring it on the market as quickly as we could put it out. It gave us a significant competitive advantage.

The telecommunications industry, on the other hand, has learned to share very well. In other words, it shared the technology and competed on a slightly different bias. You couldn't use a unique technology, because if you're unique in a system, it buys you nothing, whereas the IT industry could use a unique technology because it gave us a competitive advantage.

Ms. Dennis: So technology was used as a strategic tool?

Mr. Cargill: Yes, and the thing that we're learning with standards is that we can't product-standardize anymore because we need to standardize 5 to 7 years out. That has caused a certain amount of concern in the industry. We're doing what we call anticipatory standards. We standardize something before we develop it, and we develop it before we productize it. So we're standardizing for the future. As we start to "future standardize," we get economic interests involved. The minute we get billions of dollars involved in the standards committee, with long-term economic benefits, we create a certain amount of chaos. It's not a clean, easy discipline anymore.

The difference between telecommunications and the IT industry, while it theoretically is growing closer—(we are in fact merging)—the old attitudes have maintained themselves and what you're having is a merge of technology, but a complete lack of merge of the cultures, methodologies of competition, and even concepts of development. So while the technologies are the same, the things that drive those technologies are absolutely different.

Ms. Dennis: Well, we're certainly getting different perspectives here.

Jan, what about fiber? Where does fiber fit in for the infrastructure?

Mr. Suwinski: Well, I'd like to come back to what Irwin said. I think that fiber is a mechanism or a vehicle to deliver some benefits. I think the public policy issue is, What sort of an infrastructure, what sort of communications capability are we going to need to compete as a nation?

I agree with Irwin that we need a high-speed broadband capability for data, images, and video. Fiber is one way to get that. So I think that if you agree that this is the kind of network we need, then fiber plays a key role.

Ms. Dennis: Go ahead, John. Anybody interrupt at any time. That's what we want.

Mr. Sie: Every time I come to one of these sessions, I get a little bit perturbed about the definition of the phrase, "information age", and "telecommunications." I think that the government ought to look at a much broader definition. I mean that when you talk about information, most people think about computers and data. Yet from a distributive information point of view, when the Persian Gulf War broke out, what did you watch? CNN (Cable News Network), cable, visual, you also read newspapers. So I think that in terms of defining the information age, you have to include distributive information, broadband information, as well as data information.

I think that to narrow information to computers and data is dangerous. Second, to limit communications to telecommunications is also dangerous because the—

Ms. Dennis: I wondered when somebody would jump in.

Mr. Sie: The world is getting a little blurred between the broadest prospect of communications, and the traditional "buttonholes" that we've been used to because we have various departments and various businesses. I think that if we want to have an enlightened government, we ought to look at the broadest overall fabric of the U.S. infrastructure in the broader sense of communications. I would just like to set that tone.

Ms. Dennis: Clearly that includes cable, direct broadcast, over-the-air—

Mr. Sie: Also newspapers and magazines—I mean that really you can look at some infrastructure as a highway system, but that highway should cover a lot of possible technology and distribution media.

Ms. Dennis: Stan, you wanted to say something?

Mr. Hubbard: I'd like to get right down to the bottom line and start the argument.

[Laughter.]

Ms. Dennis: And you're seated next to Irwin.

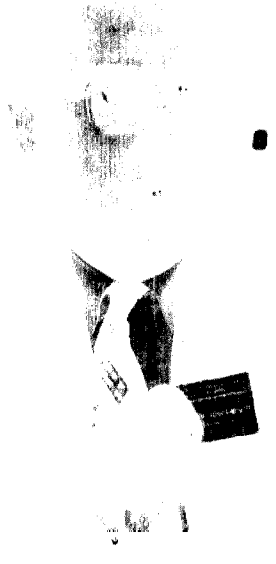
[Laughter.]

Mr. Hubbard: I want to make this statement. I'm not a scientist, but I'm prepared to debate this with anybody at any time. There is absolutely no reason whatsoever why we have to run fiber optics to every home in America. That's nonsense. It's a Trojan horse, the only purpose for which is to get the telephone companies into the cable television business. Anything that needs to be done on a computer can be done with a copper wire. We do not need fiber optics to bring video into the home. There are other ways to bring video into the home, and I'm saying that we ought not to spend the money to do it.

I can give you a lot of reasons why fiber optics is not a desirable system.

Ms. Dennis: George?

Mr. Vradenburg: I agree. Let me add an exclamation point to John and Stanley's remarks.



George Vradenburg III

One of the reasons that we haven't had to think very much about the infrastructure of this country is that we've had such a great system in the past. When you think about the video communications system in this country, it is the most competitive and the most diverse in the world. Today, in the broadcast system alone, viewers get 8 or 9 channels in the average home, and cable viewers can probably get an average of 30 channels in the home across all of American households. The broadcast system is the only system in the country that is universal. It is universal because it's advertiser supported.

Let me talk a little bit about what people don't tend to talk about at these conferences—broadcast television. We have a broadcast television system in this country that serves very, very important social, economic, and I would submit political goals. The news and information that broadcast television delivers around the world and every evening into American homes serves to inform the American citizenry on details of what's going on in its Government and what's going on in governments around the world.

With all the credit that's due to CNN and its coverage of the Persian Gulf, on the opening night of the Persian Gulf War, more people watched CBS (Columbia Broadcasting System) as the third-ranked news network that evening, than watched CNN. So when you talk about simply delivering to viewers the information that they need about this country's government and about what's happening in the world, you're talking about a broadcast system.

When you talk about social issues, some of the few things that this country shares in its language, its trends, and its values, are delivered every night through broadcast television—for example, family values ranging from those of the Cosbys to those of the Simpsons—but in fact millions of people every night get reinforced in their basic values, their basic language, and their basic understanding of social trends by what's coming out of their broadcast system.

Finally, economics. The broadcast system provides to an American advertiser access to virtually every American, every evening and every morning. That ability to reach all your potential consumers, as an advertiser, drives consumer purchases in this country, drives the economies of scale in both manufacturing and service industries that have made this country such an economic engine for the world.

So I would submit that as we talk about the infrastructure of the future and as we talk about fiber, we should remember the broadcast system, now complemented by cable, which, in fact, serves very important political, social, and economic goals of this nation. Before you venture hundreds of billions of dollars of effort somehow to tinker with improvements, think about what damage you may be doing to the infrastructure that you have.

Ms. Dennis: But, George, you're looking backwards. You're representing an incumbent mature industry. The same thing is true of cable. We have a lot of technologies now that—and many have argued that indeed we are seeing a flip-flop, that what have traditionally been received over the wire, are now increasingly being received and transmitted over the air. The same is true of video: what's been traditionally transmitted over the air can now increasingly be received through a wire, fiber for example. And there is increasing demand for mobile telephony. There is increasing demand to have over-the-air communications so that people can call people and not places any longer.

Now that 90 percent of the American public has access to cable and 65 percent subscribes, why should policymakers continue to protect broadcasters at all cost when indeed your message can be as clearly delivered over a wire?

Mr. Vradenburg: In the last 10 years, the government has done absolutely nothing to protect broadcasters.

Ms. Dennis: What about HDTV (high-definition television) and protecting that spectrum?

Mr. Vradenburg: Let me talk about what's happened over the last 10 years.

The government, I would say, up through about the mid-1970s, protected broadcasters from the potential competition of cable. But starting in the mid-1970s, perhaps through a variety of ad hoc decisions, but certainly as a national policy starting in the mid-1970s to early 1980s, the government has been energetically, affirmatively encouraging the growth of cable television as a competitor to broadcast television. It has been trying, as a national policy, for 10 years to encourage direct broadcast satellites as a competitor first to broadcast and now to cable.

So, as national policy, the government set out about 10 to 15 years ago to encourage competition to broadcast television while continuing to regulate it with regulations that date back, in some instances, 50 years. So I would submit that the government is hardly protecting broadcasting today. Indeed, the government has gone out of its way to make sure our product is available to our competitors through compulsory licenses, but at the same time, we're not permitted to charge cable or anybody else for the use of it.

You mentioned HDTV. It seems to me that the government's HDTV policy, with respect to broadcasting, is simply now to allow broadcasters to see whether they can take a revolutionary technology development to maintain technical parity with the rest of the media. In fact, the UHF (ultra-high frequency) spectrum right now is not being used by anyone else. We're proposing to use it to upgrade our technical infrastructure to try to maintain, as much as possible, a technological parity with what cable, with what DBS (direct broadcast satellite), and with what the telephone industry say they might be able to deliver in the future.

But whether or not HDTV is, in fact, as revolutionary as we now think it is depends on the year; it's either a fad that's in or a fad that's out, but we still don't know. It could be 3, 4, or 5 years before we really know whether or not HDTV is as much as we tend today to think it is.

Mr. Hubbard: As a broadcaster, I don't think that the purpose of the FCC (Federal Communications Commission)—and I'm privileged to be a member of the Commission's committee looking at HDTV—is to protect broadcasters in putting frequencies aside for HDTV. I think they intend to protect the public so that the public may indeed one day have the opportunity to have HDTV free over the air from the local broadcast stations. I don't think it's an attempt to protect broadcasters.

Mr. Phillips: I think that before we get bogged down in such controversies as HDTV and other popular discussions, I'd like to share with you a few thoughts about the underpinnings and assumptions concerning the nature of information, because that's what is our base here.

I think that both Irwin and John alluded to this, and I would like to suggest to you that the fundamental nature of information has changed. I usually always start with a riddle. What do a greengrocer and a telephone company have in common with one another?

The answer is that they are both dealing with something that has a very short shelf life. In other words, today—I don't care if you're talking about CNN or financial services—the shelf life of information as concatenated. As information accelerates toward the speed of light, the value of that information shortens over time. In other words, that's an abstruse argument in favor of broadband. The value of chromium on the Zaire commodity market 10 minutes ago is of no value. Five years ago, you could sell that information for thousands of dollars.

This is the real-time war that we're watching. If you see it 6 hours later, it's of no value. You're not going to get a market share, and you're not going to be able to sell beans or spaghetti to your advertisers.

What does that mean? It means that the metaphor of the circulatory system to describe the relationship of telecommunications infrastructure in the United States is tempting but archaic. We're talking about a great deal more than about bridges and tunnels.

What we've found—and we've addressed this both with Congress and in a number of other fora—is that to the extent that we're encumbered by

an anachronistic regulatory structure, the users are going to build their own infrastructure. We've had discussions of bypass; we've had discussions of universal service; we've had discussions of HDTV. This could go on ad nauseam. The fact remains that we're in a market dominated by a series of ten dynamics.

Some of the members of the CCTU (Committee of Corporate Telecommunications Users) operate networks. I don't like to call them private networks because I think, as the outline for today's discussion alludes to—and there's a piece of Solomon's wisdom in this—such networks should be viewed as shareable infrastructure. I was very excited about the prospect of coming here today because this is the first conference where I've seen an advisory to the panel that starts out by saying that these are interdisciplinary questions. No longer is communications to be considered the plumbing for electrons. These things are inextricably linked to the entertainment industry, to industrial competitiveness, and to tax policy.

Some of our users operate networks that if they were independent telephone companies, would be the fourth, the fifth, and the sixth largest in the country. They do this not out of any disaffection for telephone companies or common carriers but because they need what Irwin was alluding to. They need an integrated digital environment running at SONET (synchronous optical network) rates.

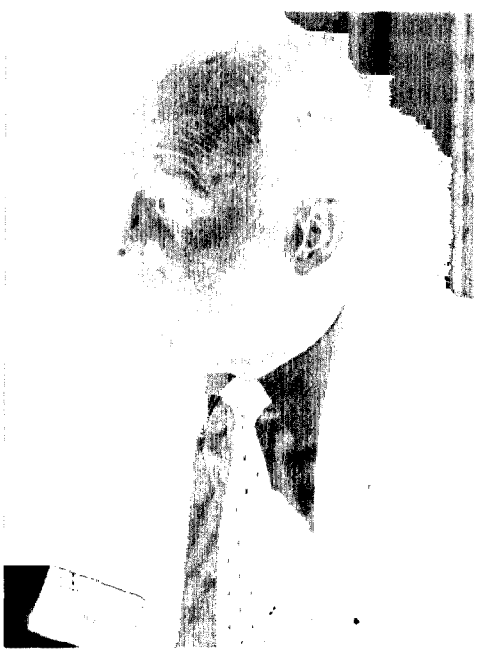
The future of these services is very important, yet—I'm very mindful of what George said about understanding the past, because if you do, you will see that the term "common carrier" has nothing to do with telecommunications but rather came about as a result of a riot in Chicago over standards having to do with the width of trolley car lines as new immigrants moved to the city and weren't being served.

We have achieved universal service. We're now in the realm of having to address how to support the information needs of an ever-expanding and ever more-educated public, which is more willing to pay for these information services as they become more economical.

As we provide staple services, such as entertainment, the incremental marginal costs of providing 56 and 64 kilobits, the voice telephone call, the synchronous connection between your home computer and data bases all over the world drop. Indeed, we did a study simulating these types of things up at MIT. If you're providing an entertainment signal at 100 megabits, then the incremental marginal cost of providing some of

these very basic services drops significantly to about 3 percent of the cost of the backbone loop, if you assume you have 8,000 subscribers in the central office and the loop is three miles or less, which represents a majority of the urban markets.

So just to draw this together, I just wanted to share with you a few of these dynamics of information before we get bogged down in what are seemingly highly politicized debates over HDTV. I would argue that it has nothing to do with television and everything to do with communications. Whatever standard we ultimately end up with, we have to bear in mind how compatible that standard is with other areas of communications, as John was alluding to.



Stanley S. Hubbard

Mr. Hubbard: I am just saying this to you: Nonsense. We do not, in this country, need a digital communications two-way at sonic speed to and from American homes. It's a con job and don't let all this wonderful rhetoric put you off the—

Ms. Dennis: Why is it a con job, Stan?

Mr. Hubbard: Because it won't bring any benefit to the American people; it will bring a benefit only to the telephone companies. There is no question that IBM (International Business Machines) and General Motors have to have high-speed digital sonic speed. But the guy that lives in my neighborhood doesn't need that. The guy that lives in your neighborhood does not need that.

Mr. Mosco: Stan, I think that you raised a good point here. People don't need the technology.

Ken, with all due respect to your point about the short shelf life of information, in preparation for this session, I read a speech of Pericles.

Ms. Dennis: That's discouraging, actually.

[Laughter.]

Mr. Mosco: It's about 2,500 years old. In it he says that people who say that politics is none of their business have no business being in society. He goes on to talk about the value of democracy. That reminds me of an important point in our discussions of infrastructure. The problem with discussions of infrastructure is that we simply talk about technologies

as if they were separate units in society that have impacts. We fail to talk about our goals and what we want to achieve with whatever technologies are out there.

I submit that one of the reasons why we don't like to talk about goals is that the specter of government and other sorts of intrusion raise their heads. So we set goals aside and we argue about whether we need HDTV, et cetera, without any sense of our goals. Are we trying to achieve market dominance? Are we trying to achieve democracy? Are we trying to better educate our citizens? What is the point of the technology?

My argument here, then, is that we need to discuss the social infrastructure in any discussion of technology. What are our goals?

Mr. Sie: I'm not an academician, but I would certainly like to frame the questions. I don't think that Stanley was saying that we are against technology or advanced technology. I think that there is a balance in terms of understanding the modality of communications. There is distributive communications, mass distributive communications—the same information is distributed to everyone—versus personalized—I get the information that I want at the time I want.

They are vastly different modalities. To confuse the two would be dangerous, first. Second, we have to understand an optimization of capacity. We all understand that in transportation that there are interstate highways, there are state roads, and there are county roads. They all serve a purpose. The reason why we don't have an interstate highway to every home is that economically it could never be justified and there is no consumer demand; nor would it serve any national strategic rationale.

I think that for us to say broadly that we need everything for everybody all of the time is the ridiculous part of what Stanley's trying to say. We have to optimize economic reality, consumer demand, and national interest, not just to become dogmatic and say that fiber is this and fiber is that. Cable has been a very strong proponent of fiber, and we'll probably get fiber closer to the home faster than the telephone companies. And yet, we already have in place a very viable, 1,000-megahertz of bandwidth in the last mile to the homes (the coaxial drop).

Mr. Shooshan: Why do we need DBS, then, Stan?

Mr. Sie: Because DBS is—

Mr. Shooshan: I know that you're in that business, too, John, but let's go to one of the pioneers.

Mr. Hubbard: Why do we need DBS?

Mr. Shooshan: Yes.

Mr. Hubbard: Because the American people will be able to have more information at lower cost and with greater ease than any other system can possibly provide. For example, there is no way that cable television or that over-the-air broadcast television could economically distribute this panel discussion nationwide. If 0.5 percent of the people are interested in what goes on in this room today, DBS could deliver—

Mr. Shooshan: It's pretty good by C-SPAN (Cable Satellite Public Affairs Network) standards, though.

Mr. Hubbard: Well, I don't think that C-Span is going to carry this, but maybe it will. But if you had an audience that constituted only 0.5 percent of all the American people, you'd be looking at 500,000 homes. The only way you can economically achieve this kind of small segmented audiences is through DBS. DBS, I think, is going to offer more opportunity for more information distribution than anything ever devised.

Mr. Dorros: Can I jump in here?

Ms. Dennis: Jump in any time, Irwin.

Mr. Dorros: I also represent a mature industry. The only thing is that our industry has invested throughout its maturity in research and development. The one thing that we have gained from that research and development is vision as to what is possible and how technology can be used in the future. As the future has unfolded, a lot of those visions have become reality.

The only thing is that in the last 20 years or so I've been involved in that research and development, out of Washington—I guess other places as well, but mostly out of Washington—has come all of the "can't do's." I've spent the last 20 years fighting the "can't do's" from Washington, along with participating in generating the technology that would have exciting potential.

Just as an example, one of the "can't do's" coming out of Washington was cellular radio. For 10 years we worked on the "can't do" cellular radio. Finally, we put it in. But during that period, I remember, Motorola, which was an established supplier in the dispatch radio, said that the nation didn't need cellular radio. It fought hard, and it petitioned the FCC as to why the public should not devote the frequencies, and, that we didn't need cellular radio. As a matter of fact, let me make a small confession. Even in AT&T (American Telephone and Telegraph Company), we did some market research after we filed for the frequencies, and the market research that AT&T paid for said that there was no market for cellular radio.

So there was an activity within AT&T about how to gracefully get out of the petition that we had given to the FCC for those frequencies. Thank God they couldn't figure out how to do it and that the cellular industry is now growing by leaps and bounds. So I think that people who say that we don't need something are really, really sticking their necks out.

The road to stagnancy is paved with people who said that we don't need this or that. I don't know what we need or don't need, but there are all kinds of visionaries that say how broadband access to everyone everywhere is going to make their lives that much stronger when they have access to information wherever it's stored, at anytime, anyplace, anywhere, and in any quantity. And we know how to do it.

In fact, we're in the early stages of building a demonstration of a national network that will show how broadband digital capability can be used, first in academia and other research facilities, and then you'll see, just as lower speeds have found their way through the rest of society, broadband will find its way through the rest of society.

I don't know if what I'm saying is going to materialize or not because other things that have purported to be visions have not materialized, but I think it's absolutely silly for us to say that we don't need it and therefore not do it. If there are investors that want to do it, I don't understand why we have to have another round of "can't do's" out of Washington.

Mr. Hubbard: I agree.

Mr. Shooshan: That's a key point.

Mr. Hubbard: I agree, but I'm saying, "Don't shove it down the throats of the American people by putting it on the rate base of the telephone company." If people want to buy it, wonderful. I have no problem with that, Irwin, but don't force it down me as a telephone user that I have to pay for it if I don't want it.

Mr. Shooshan: Let me try to focus this, if I can, away from the inside-the-Beltway inter-industry disputes to a broader focus on policy. Let me ask a basic question. Do you think that a fundamental role of government, in dealing with an industry where technology is changing as rapidly as it is in all the industries represented here today, is to be making decisions about what people need as a precursor to setting government policy? Or should government be standing back letting these technologies develop, letting the marketplace decide, and letting people in that marketplace decide?

Carl?

Mr. Cargill: I'd like to start from the information technology industry. In the IT industry, roughly 10 to 15 years ago, there was a visionary who decided on something called local area networks (LANS). The visionary was soundly abused by everybody in the industry by being called not only a fool but a damned fool. It didn't bother him especially because information technology people aren't especially bothered by things like that, and he persisted.

Information technology industry now has a multibillion-dollar smaller industry in local area networks. We changed them as rapidly as possible. We're now looking at fiber in local area networks.

Because this person, martyred as he was, didn't have enough sense to be beaten up and accept conventional wisdom, he created a multibillion-dollar market. There was nothing in the industry that said his idea would succeed, and there was nothing in industry that would have allowed it to succeed. The fallout of what he did, however, is that we now can dump, on any manager's desk, a megabyte a second.

The truth is that there is not a manager in the world who can manipulate that information. We have managers who are up to their eyeballs in information, and all they really want is knowledge. But they have no idea how to obtain the knowledge from the vast amounts of information they're receiving.

We've also managed, with local area networks in any company, to destroy the hierarchical organizational structure of management. There's not a management school in the United States that has risen to that challenge, to put something together to replace bureaucratic management. That's what they teach, that's what they know.

Two minor spin-offs of a change in technology are that we have destroyed our ability to manage effectively, and our ability to create knowledge out of information. These are minor spin-offs that will have a dramatic effect on the United States' competitive base.

The standard of technology is immaterial to what we're doing. It's the long-term or intermediate-term effect of that technology that is important. Whether you have cable to the home or smoke and beads to the home makes no difference: what's important is what's going to happen in the home with that information. If you look at the traditional manager today who can in fact get an entire data base at his desk, you'll see that he can't do a thing with it. Most people can't manipulate more than three or four variables at a time, and we're asking him to manipulate 100 or 200 real-time variables.

The problem is deciding whether to have cable or not have cable to the home. So what? What are you going to do with it once you have it? I'd like to see this panel focus on that. What does a person in a home do with a screen that can do 4,000 windows, complex graphics? They sit and they says "Hmmm."

[Laughter.]

Mr. Cargill: What do you do with it, for God's sake?

Mr. Phillips: Well, that's an opportunity.

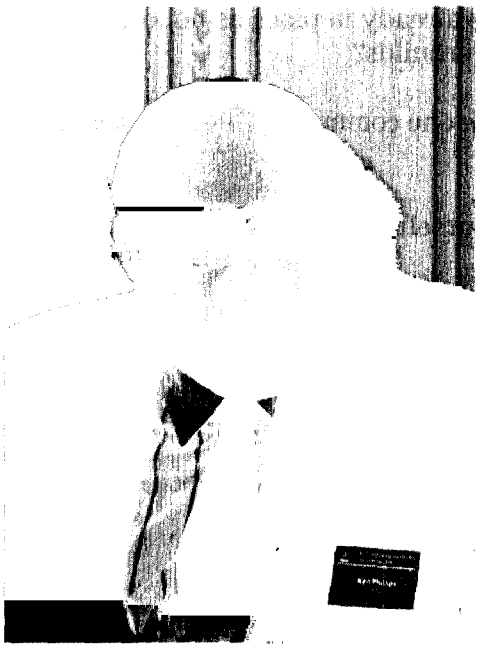
[Laughter.]

Mr. Cargill: An insurmountable opportunity, I might suggest.

[Laughter.]

Mr. Phillips: I don't think so.

One of the things that we discovered when we went around and spoke with several hundred users about 4 years ago, when the CCTU did a



Kenneth L. Phillips

study of that issue, was that home banking was a failure. Most banks lose $10 to $30 a month on every customer who subscribes to it. We asked homeowners if they wanted energy management or remote security services. The key question in this: What's it going to cost me? At today's baseline fully distributed costs, nobody wants it.

The reason why we're interested in broadband—or one of the reasons—is that if these services, which don't require megabits (they don't even require 56 kilobits), are added to the channel, their cost is so low, from the telecommunications standpoint or distribution standpoint, that these services can be offered at a fraction of what they're offered at today. At that point, there seems to be more of an interest.

Information pollution, or information overload, indeed is a horrendous problem. It doesn't matter if you're talking to Mrs. Adams receiving Compuserve and a zillion other sources of endless information, or the CEO (chief executive officer) of one of the Fortune 10 who now gets reports from data centers that are hundreds of pages long full of minutiae.

I wasn't being cynical when I said that this situation represents an opportunity. I don't like cliches like artificial intelligence, because there usually isn't much natural intelligence behind it. But these types of things are opportunities. We don't know very much about that. We do know that humans process information according to four distinctly different cognitive styles. We know that only one of those styles is represented in software development. Therefore, it's not surprising that Mrs. Adams in Cedar Rapids, Iowa, can't use a PC (personal computer) because she isn't interested in learning DOS (disk operating system).

Apple may think that it has a transparent interface that provides this, but it doesn't understand the difference between a symbol and an icon. When these issues are answered and when machines can alter the way in which they present information based on the cognitive style of the user, then we will begin to see some change. Then we will begin to see the demand for bandwidth to take off.

The point is that these services are interactive. My question to our cable experts—my understanding is that in the United States the infrastructure for cable is not up to that of some other countries because of its inability to handle these interactive services because of the Christmas tree architecture and the linear op amps. Is that a problem because

clearly that's an infrastructure that is already in place as opposed to cable, which may require fantastic overbuilds?

Mr. Dordick: I would just like to make one comment. I didn't expect that I would jump in this quickly.

Mr. Shooshan: Could you identify yourself, first, please?

Mr. Dordick: I'm Herb Dordick of Temple University.

I'm very disappointed at the way this panel has gone. We've quickly come away from what I thought would be a rather interesting discussion on the nature of infrastructure, what the word infrastructure means, and how this must be applied to information in the usual internecine battles that happen in Washington between one industry and another.

I would like to bring this discussion back to the infrastructure and what infrastructure means. In the 1950s, we decided—someone decided—to build an interstate highway system. That was called an infrastructure. It wasn't a transportation infrastructure; it was a highway infrastructure. We ended up with a highway infrastructure that provided the ability to travel short distances by car and long distances by air but no transportation in between because we didn't deal with a transportation infrastructure.

Similarly, now we're dealing with a data transport, or an information transport infrastructure, rather than an information infrastructure, which is supposed to provide information in some manner that allows everyone to use it.

Now, traditionally, an infrastructure does not of itself create an enormous amount of revenue. It is a system that facilitates other money-making operations on that infrastructure. Why don't we think a little more about what we mean about an information infrastructure in the broadest sense? When you start thinking about it that way, you begin to think about some of the issues that were raised by one panel about the question, What about the individual? What about the last 14 inches from where whatever comes off whatever that person has in front of him to the person's head? What about the use of that information? You might even begin thinking that the information infrastructure has to include terminals.

Mr. Shooshan: Let me go back on that note to the panel. That's the second reference that we've had today to telecommunications as analogous to the interstate highway system. John Sie made the first analogy and Herb Dordick made one as well.

I want to go to Michael Nelson because in looking at the question that we have to have all these panels really driven by today, I'd like to know: What are the policy consequences of all this?

Senator Gore has spoken out on the need for a supercomputer highway, in effect, an electronic interstate highway system to link together supercomputers. He has talked about the government's actually intervening by funding, at least in part, that kind of endeavor. It seems that with Congressman Brown's support and support from the administration, that may actually happen sometime this year. Mike, can you comment a little on that?

Mr. Nelson: Well, the first thing to point out is that the NREN (National Research and Education Network) is more than just the network itself. This was pointed out earlier.

Mr. Shooshan: Do you want to define the term NREN?

Mr. Nelson: That's the National Research and Education Network, which is part of Senator Gore's legislation and which was included in the President's budget request this year. It would set up a research and education network to link about 1,000 universities and about 1 million users around the country. This would be much like the corporate networks that IBM has, or Bell Labs, or any of the other major users, except that it would be a lot faster. The aim is to get up to about a gigabit speed by 1995 or so.

Senator Gore is fond of calling this the first step in an electronic highway system. It will be. It will provide a catalyst to show the way for developing this type of technology, and most importantly it will show what you can do with a gigabit network linking 1 million people.

In that sense, it is infrastructure. It is something that will be a public good. It will benefit all these different communities that will be using it. It's also something that won't be provided by the private sector as things are set up right now.

Mr. Shooshan: Why not?

Mr. Nelson: Because there really isn't a clear market there, yet. The government has to step forward and say that it is going to invest half a billion dollars over the next 4 years to make this thing happen. Right now, you have a lot of different efforts going a lot of different ways, and there isn't a federal leadership that is really needed. There isn't a guaranteed customer.

In many ways, this situation is like the situation in the aviation industry back in the 1930s. The federal government decided that it wanted to have airplanes for military uses. It poured a lot of money into developing the technology that was needed to build the fighter aircraft for World War II and the jet aircraft after the war. So we're seeing the same kind of thing happening with this very high-end technology.

This federal funding will be a catalyst, encouraging private sector investment in new telecommunications technology. We're going to have to rely on the private sector to develop and deploy much of this technology, the lower-speed networks—the roads if you will—that will provide access to the gigabit "superhighways."

So it's clearly an evolving situation. Things are changing very quickly. There are many commercial sector groups that are getting into high bandwidth networking, but there is still a need for the federal government to provide some leadership. The government is not going to pay for the whole thing; it's not going to lay any cables. The NREN will use cables owned by whoever offers the best price. But there is a need for the government to get out there and provide the money to build the electronics and set the standards that can provide this network.

Mr. Shooshan: What kind of services are going to be supported by this? Why do we need it?

Mr. Nelson: We've had several hearings on this, and the research community has lots of very good ideas. DARPA (Defense Advanced Research Projects Agency) is funding something that is called the gigabit testbed network. Bob Kahn at the Corporation for National Research Initiatives is leading this effort.

Mr. Shooshan: That's an interesting analogy there, isn't it? A lot of the work that came out of DARPA really helped lead to the digital packet switching technology that's in use today. Do you see the same kind of opportunity here for providing some leadership?

Mr. Nelson: Exactly. The difference between ARPANET and the T1 networks we have now is about a factor of 1,000 in bandwidth. The gigabit technology we're talking about is about 1,000 times faster than the T1 lines we have today. So you can expect to see the same kind of radical growth in industry and the same kind of innovative new applications that you've seen in the last 20 years.

Researchers are finding ways to make computers talk to each other at gigabit speeds allowing distributive computing around the country with supercomputers. The thing to remember, though, is that the supercomputer we have today is going to be on your desk in 10 years. So if we're not working on gigabit networking now, we're not going to be ready to link the PCs of the 21st century.

Mr. Dorros: Chip, I think—picking up on this and the previous question about the infrastructure—that we use the interstate highway system. It's been used over and over again here today and elsewhere. I think that we have a better analogy as to what we mean by infrastructure. We have 100 million telephone lines, or 150 to 200 million telephones, and nobody thinks very much about those telephones' being able to reach any one of those other 200 million telephones in this country, and maybe 400 million in the world by just picking it up, in a well-known dialing plan, getting a dial tone, dialing some digits, and getting connected with a fair degree of certainty. There's a large degree of certainty that they're going to get connected. When they get connected, they'll be able to carry on a conversation.

That's the analogy. We have over 1 million LANs in the United States that have workstations and PCs connected to them that have local connectivity. But we don't have connectivity of those LANs with each other in the United States and we won't. We don't have the numbering plans, we don't have the billing systems, we don't have the dial-up capability for any of those LANs to get connected on an "at will" basis to any other LAN or any workstation to any other workstation.

There are even various versions of electronic mail. Some of you may say that you can send electronic mail. Well, I can, too, but only in my own company. As soon as I have to send it to another company, I have to go through a much tougher arrangement. A lot of companies just plain can't do it because of incompatibilities.

So we don't have the infrastructure in place for connecting workstations to workstations, LANs to LANs, and private networks to private networks in the information society.

Mr. Shooshan: Irwin, is that a failure of the planning process?

Mr. Dorros: As we get supercomputer capabilities on the desks, then the very broadband, very high-speed, 100-megabit capabilities will add to this same desire of supercomputer to get connected to supercomputer, desk to desk, and the infrastructure has no prospects of being in place unless we do something.

Mr. Shooshan: Before we leave this, I want to go back again—this is a public policy conference. You said that there is this problem with lack of connectivity between private networks or local area networks. Is that a result of any government policy or a lack of government policy, or is that something that's going to work out in time? What policy recommendation or what policy issue stems from that concern? I think that Ken alluded to it earlier when he said that to the extent that regulation prevents us from doing in the public network what we like, customers will go to private networks.

Mr. Phillips: These things go in cycles. At the turn of the century in New York City, there were six telephone companies. In theory, to reach anyone, people had to have multiple phones on their desks. A snowstorm came around and knocked all the wires down. To sort it all out would have been hopeless.

Mr. Shooshan: But let me interrupt. The government could have resolved that problem by ordering interconnection.

Mr. Phillips: That's right. I'm not arguing against intervention in this. I'm simply saying that history is informative. These things do go in cycles.

What Irwin was alluding to—and I'm faced with the same thing every day—I'm on six corporate networks. They don't talk to each other. In order to pick up the E-mail every day—something I don't do because I don't want to spend 2 hours of it every morning when I come in or have my secretary do it—I would have to sign on and sign off these things.

The NREN provides an opportunity to inject some transparency into this situation. I would also like to respond to what Herb was saying because I

think that he was alluding to a very, very important notion. The notion of infrastructure covers now a lot more than bits and bytes; which processor you have; and or whether you have fiber, cable, or whatever it may be. The BITNET and the ARPANET today are helpful. I got on there last night and broadcast a question out, "Who is interested in high-speed synchronous protocols for use in real-time imaging?" This can go out to a million people, in theory, and anyone who is interested in that topic can see this in a broadcast mode and electronically raise their hand and say, "I am," and send a message back. That can be accumulated in a file. And you give the file a name, and every time you want to talk about that, you simply broadcast to that file.

That ability to leverage intellectual property, I would argue, is enormously valuable. It's essential to academic and scientific endeavors. It is indeed an asset from the standpoint of infrastructure.

Mr. Hubbard: What about the policy question?

Mr. Shooshan: One second, Stan. Let's go to Vincent first, then Carl, and then—

Mr. Mosco: You raised the question about the role of government. I think that government has an important role because the market shuts out a lot of people. My concern—

Mr. Shooshan: Be specific.

Mr. Mosco: We're talking about supercomputers on one's desk. There are many people in this country who can't afford a telephone. You can talk about the fact that universal service has arrived and that the penetration rate is 93 percent but not quite so high for low-income people, for minorities, and for unemployed people. The penetration rate is lower than that in my own country, in Scandinavian societies, and the like. People are shut out of telephone service, and even more so, they are shut out of cable. Before we talk about supercomputers on your desk, let's talk about access to the technology for all Americans.

That leads to a concern that I have. There are policymakers who are very concerned about this. I have a great deal of sympathy for people in the policy community. Calvin Trillen once said that the worst thing about being middle-aged is that the people you know start to get put in charge of things.

[Laughter.]

Vincent Mosco

Mr. Mosco: He is wrong. The worst thing about being middle-aged is that you start to get put in charge of things.

So I have a great deal of respect for policymakers. But when I look around at the telecommunications industry and its regulation, I become worried. We have established the first national telephone welfare system in the history of the United States to deal with the poor and access to telephony. What does that mean? We're worried about the fact that a lot of people don't have access to the telephone. They've been complaining to the Congress. Local telephone rates have gone up. We need to do something about this.

So what do we do? We take a New Deal-style welfare system, and we lay it on the telephone system. So now we have 48 states operating individually based welfare systems. So if you live in Oregon, you might have access to a life-line service. I like the euphemisms, too. We don't call them phone stamps, as Lee Johnson once suggested we ought to. Rather we call them lifeline and linkup America. Isn't that wonderful? (Euphemisms have an important role here.)

I think that this is quite important because when we ask about the role of government, you may also want to ask, "Do we want a system where, if you live in Oregon and you're on food stamps, you can have life-line service?" If you live in South Carolina, however, you have to be a Medicare recipient or over 65 years old to afford linkup.

Mr. Shooshan: Are you suggesting that it was more efficient the way the old subsidy was handled in the telephone service?

Ms. Dennis: This is a more targeted subsidy. Isn't that what many regulators think is—

Mr. Mosco: It's also a more degrading subsidy. Like all welfare systems, it requires a means test, administration, and policing.

Mr. Shooshan: So we ought to subsidize the ski resort operator in Aspen so it isn't degrading for the welfare recipient in South Carolina?

Mr. Mosco: Pardon me?

Mr. Shooshan: We ought to subsidize the ski resort operator in Aspen because it's degrading to the welfare recipient in South Carolina?

Mr. Mosco: No. A ski resort operator has nothing to do with a person in the South Bronx who needs a telephone for emergency communication.

Mr. Shooshan: Under the old style of subsidy, in building the local subsidy into the long-distance rates, we subsidized people in rural areas whether they could afford it or not.

Mr. Mosco: Chip, you're right. It's an important point. This is not necessarily a question of going back to the 1950s, 1960s, or 1970s style of government intervention. But before we take on the Minitels of the world and argue that this is a case of excessive government intervention, let's look at some real government intervention in the United States. We've established essentially a copy of a welfare system that we have consistently argued doesn't work in other areas and applied it to telecommunications.

Mr. Shooshan: I want to go to Carl now.

Carl F. Cargill

Mr. Cargill: I was just going to make some comments about the telecommunications infrastructure.

That was good because technology changed slowly. That's being worked on by the market. Market forces are driving that. If you look at the voluntary standards activities, you'll see that most of those are moving toward closure and that they're being driven by the users who, as the User Alliance has so eloquently stated, "We're sick and tired of it. We're not going to take it anymore."

Users are tired of not being able to interoperate. It's a very simple, blunt message that they're delivering with dollars. They're telling us to make it work or they will go buy somewhere else where it does work. The idea of regulating technology to make it interconnect sounds wonderful, but if you regulate technology now, in 5 years, you're going to be regulating obsolete technology. If you want to cripple the United States real easily, regulate obsolete technology. It's solid and it's stable. You can't deal with it, it's no good, and the private networks will supersede it very quickly because we can't use obsolete technology. We have to keep moving.

Mr. Shooshan: Are there regulations in existence today that you would change?

Mr. Cargill: From my own bias, I would throw a lot more emphasis on the voluntary standards process, which is market driven in some cases and in some cases not. From the information technology industry—it hurts me to say this because I'm probably at odds with the rest of the entire IT industry—I would look at more government help in the voluntary standards process. Of all the major industrial nations, the United States is the only one without governmentally driven or heavily influenced standards bodies.

I don't mean to be mean to be anti-ANSI (American National Standards Institute) with this, but ANSI, about 3 or 4 years ago suddenly came to the stunning realization that standards were a business proposition and not a technology proposition. This was stunning to ANSI. It was realized in 1954 by the German Standards Organization. The Japanese realized it soon afterwards. ANSI has now suddenly come to this conclusion, and they're working real hard to do something about it.

There's a proposal within the United States that a thing called normology be set up, which is the study of standards and standard bodies. ANSI doesn't even know how much we spend a year on standards in the United States. It has estimated somewhere between $14 billion and $30 billion. There are four colleges that teach information technology standardization. Of the 3,000 engineering schools, not more than 23 have courses in it.

Is it a major area of opportunity? Yes, it's a future direction trend-setting methodology, and it's a strategic planning methodology. And we sort of ignore it because it's boring? It might be boring, but there's a lot of money in it.

Ms. Dennis: I don't think it's necessarily boring. I think that the concern is exactly what you stated clearly before: that you freeze in technology what might indeed become obsolete. It's difficult for government regulators, having sat there at one point, to know exactly what is the best decision. That is better left to those who know the industry better and know what they hope to achieve from the standards process.

Mr. Cargill: But that's the technology. Tell us what the functionality is, and we'll give you the technical answer to it. Don't tell us what the technology is, because we're better at technology than almost anybody else.

Tell us what function you want to solve. Do you want pull-down screens in the home by the year 2020? Do you want people to have megabits? Tell us so that the industry can work toward it.

Ms. Dennis: So you're saying that government should be telling you that?

Mr. Cargill: The rationale of government, it would appear to me, is to set what is the social best. What is the functionality? What do you want? This goes back to some of Vince's argument.

Ms. Dennis: Does anybody—

Mr. Shooshan: But, Carl, in the mid-1970s—going back to George Vradenburg's point—government decided that we should stifle the growth of cable to promote and protect over-the-air broadcasting. Are you comfortable with that kind of decision?

Mr. Cargill: Did it work?

Ms. Dennis: It worked for 20 years.

Mr. Shooshan: It didn't work because the policy changed. But I think that we would have gone to cable a lot faster if government hadn't intervened.

Mr. Hubbard: I think I was next.

[Laughter.]

Mr. Shooshan: You've got it, Stan.

Mr. Hubbard: By the way—and I have nothing against cable and this is not what I was going to say—without the Compulsory Copyright Act of 1976, which deprived CBS, NBC (National Broadcasting Company), and local television stations of the right to have exclusivity of their products, we wouldn't have cable the way we do today.

Mr. Shooshan: Would you change that policy?

Mr. Hubbard: Yes, I would. I don't think that I should be able to steal his product, and I don't think he should be able to steal mine.

Mr. Sie: Stanley, there were two Supreme Court decisions before that.

Mr. Hubbard: I know that.

Mr. Sie: So please let the audience know that it fully gave the right to cable and that it was a political compromise that we reached in the Copyright Act.

Mr. Hubbard: Yes, but you would have had to pay copyright fees.

Ms. Dennis: No, not before—

Mr. Hubbard: Then why do we have a Compulsory Copyright Act?

Mr. Shooshan: Let's see if we can't get this policy issue resolved now.

Mr. Hubbard: Why do we have a Compulsory Copyright Act?

Mr. Shooshan: Let me ask a question. You say that you ought to have an exclusive right to—

Mr. Hubbard: I'm saying that if I buy "Roseanne," which I've purchased for next year, and I pay a tremendous amount of money to bring "Roseanne" to the viewers within the coverage area of my television station, just like a movie theater buys a movie, I don't think that when I'm paying $1,000 an episode, a cable company should be able to bring that from WGN in Chicago and pay $50 or $100 an episode in the area where I have bought exclusivity. The Compulsory Copyright Act of 1976 allows that to happen. I still want to ask Irwin my question.

Mr. Shooshan: I know. We'll get back to that. We're getting into a real policy discussion here.

Ms. Dennis: Yes, but a little far-fetched from infrastructure.

Mr. Sie: A little bit off, I'm afraid.

[Laughter.]

Mr. Sie: First of all, there is a law, and there were two Supreme Court decisions before that. We fully agree with the right of exclusivity. We said basically that it is the government's desire to give the consumer diversity of programming. Cable rebroadcasts and broadcasts over-the-

air signals for two reasons. First, otherwise the consumer could not receive it, so in that sense, cable increases the reach of the broadcaster. Second, it provides a convenience so instead of using an A/B switch, the consumer just pushes the remote control button and improves the reception. Those are the only two functions we serve.

Now there is the argument that if—we don't mind having a private negotiation with the broadcaster as long as we can negotiate one-on-one rather than the broadcast industry saying that if they carry, they must carry all and they must pay. That's probably unconstitutional anyway. We fully agree with the exclusivity provisions, and the syndicated exclusivity law has promulgated that.

Mr. Shooshan: Would you give up the compulsory license?

Mr. Sie: Yes, over the long term, but if I don't think that the public wants it because—

Mr. Shooshan: It's been 16 years. How much longer do you need? I think that Patricia was going to make the point that somehow this debate doesn't affect infrastructure, but in fact when government adopts policies that favor one industry over another, we do have an industrial policy. I think that this is a key point that we need to address.

John J. Sie

Mr. Sie: We have industrial policy every day, but I think that the government—

Mr. Suwinski: God is interfering with you, John.

[Laughter.]

Mr. Sie: I think that I agree with Carl that government should not get involved in deciding technologies because it fails every time. However, it should worry about standards that may have downstream effects. The typical example was the onrush in 1988 toward an HDTV production standard, which was favored by some of my colleagues. We came out against it, not because having production standards in itself is no good but because the production standard would determine the transmission standard which has not been proven or decided, as of today. If we pick the standard that was agreed upon, 1125/60, it would have dictated a certain kind of television set. It's that kind of downstream effect that

the government should be involved in. But otherwise, I think that government should stay out of technology.

Mr. Shooshan: Stan, you still have the floor.

Mr. Hubbard: Yes, I still have my question. On my way to the question—

[Laughter.]

Mr. Hubbard: We could sit and discuss this all day long. Could we not, John?

Mr. Sie: Yes, we could.

Mr. Hubbard: We could discuss it all day long. But it's interesting to note that all of a sudden, in the last year and a half, since cable has become very concerned about DBS and where DBS is going to get its programming, cable is in favor of copyright protection.

My question earlier was this: Let's assume that we have this wonderful infrastructure of fiber optics that goes to all the homes. Here's where the policy consideration comes in. Two weeks ago, our power went out and was out for a considerable amount of time. If we had had a fiber-optic telephone system and the copper wires were gone, would my wife have been able to pick up the telephone and call Northern States Power Company? The answer is no.

[Laughter.]

Mr. Hubbard: Fiber optics requires 120 volts. When the power goes out, you lose your fiber-optic telephone. That's a very serious question.

Mr. Dorros: The answer is yes. She will be able to use the phone. That's one of the things that we—

Ms. Dennis: But when, Irwin?

Mr. Dorros: The way you use a phone today is that the telephone company sends the power from its central office to the telephone. That's not the only way to be able to use the phone when the power fails.

Mr. Hubbard: I want to ask you how the power is going to come. And I've talked to a lot of people who are pushing fiber optics and have yet to have anybody tell me how today a fiber-optic telephone can be powered if the Northern States Power goes down where I live.

Mr. Dorros: With a battery.

Mr. Hubbard: With a 120-volt battery? That's a big battery.

Mr. Shooshan: The debate is becoming one of economics and technology, and the conference is one of public policy. The question is, What public policy framework should we have?

Mr. Hubbard: I submit that if people are going to do a lot of telephone service during times of emergency, then that's an important public policy consideration.

Mr. Sie: He's right.

Mr. Shooshan: So we should stop telephone companies from getting into fiber because there's a problem.

Mr. Hubbard: We should stop telephone companies from getting into fiber using the rate base when people don't want it.

Mr. Dorros: We should stop Stanley Hubbard from making assertions about what technology makes possible without his knowing what he's talking about.

[Laughter.] [Applause.]

Mr. Williams: I'm Fred Williams. I usually work at the University of Texas. Right now I'm on leave at Columbia University.

I'd like to do what Professor Dordick said about talking a little bit more about infrastructure issues and a little less of your ax-grinding in your particular areas.

I think that a real important infrastructure issue that we have right today is use of telecommunications in public school education. In a couple of the large-scale research projects that we've had that looked at the schools and their use of telecommunications, we saw the growth of this use of interactive television classrooms. That's an infrastructure

issue, a real one, an item that schools need, and they find it very, very difficult because all the current regulations and laws fly in the face of fibering schools.

For example, a school district may go to the local phone company with the big issue of whether this is going to be reflected in the rate base or not and whether it has to go to the PUC (public utility commission), and a whole bunch of new things have to be thought out. If you're dealing with a local exchange company and that education network is going to cost a LATA (local access transport area), then say good-bye to the local exchange company. It doesn't want the hassle of all that.

In a case we're looking at in Bergen County, New Jersey, they first went to the cable companies to wire Bergen County and the cable companies accused them of not knowing what they were talking about and not knowing what business they were in, had absolutely no thoughts that anything like that would ever work. Finally, Bergen County was able to strike a deal with New Jersey Bell.

Here's a case where our schools are hurting in this country. There are plenty of good demonstration products on-line, like the one in Minnesota, the ones coming up in New Jersey, and one that we're working on in Texas, which demonstrated that a telecommunications infrastructure with certain specifications—like somebody called for here—can very much benefit education.

We have examples where current policy doesn't serve this. Current policy flies in the face of this. I wonder if any of you could address some solutions to this.

Mr. Sie: I think that there are a lot of things that the school system can do before putting fiber in the schools. A company that I've been involved with is called the Discovery Channel. We've provided interactive disk programming so that the Discovery Channel programming can be used in the schools with their curricula. But try to get the school interested in that. There are so many available tools today that the schools could use. We have a much broader issue of teacher resistance and a question of budgets.

Mr. Williams: I'm talking about schools that want this, have the plans laid out, and are trying to build it. Why don't you just dump all that other baggage for a moment? I agree with you on that. I'm talking about

schools that want to have interactive television classrooms and have a good plan. Current telecommunications policy makes it very difficult.

Ms. Dennis: Maybe you should talk to John afterwards, because he has a very good program with Discovery. I've actually seen it.

What I'd like to do now, in the few minutes remaining, is to ask each panelist to spend 1 minute describing as succinctly as possible and in as detailed a fashion as possible what policy the government currently has in place that you think should be changed or what new policy you would have the government implement to enhance our communications infrastructure.

Mr. Shooshan: One per customer.

Ms. Dennis: Yes, that's right. I'll start with Michael at that end.

Mr. Nelson: Well, I'm a little biased. The first thing that government should do is to pass the bill I've been working on for 3 years because the NREN does help provide the infrastructure needed for research and more importantly for education, and would provide a demonstration of what gigabit networks can do.

I'm not on the Communications Subcommittee, so I wouldn't presume to tell that Subcommittee, the Congress, and the FCC how to make telecommunications policy. We need a policy. But clearly we need to understand what we're doing here, and we need to really decide on who is going to do what. For the last 5 years, we haven't done so.

Ms. Dennis: What do you think the policy should be, Michael?

Mr. Nelson: Again, I'm not on the Communications Subcommittee, but I think that we need to understand what the "Baby Bells" are going to be doing in this whole thing. We need to understand how to resolve the debate between TELCOS (telephone companies) and the cable companies. We really have to decide what different sectors of the industry can do and make it clear that that is going to be the policy for the foreseeable future. Right now, there is so much uncertainty, as you mentioned, that people who want to get networked can't get networked. It's a very frustrating situation.

I see this as a Science Subcommittee staffer seeing individual schools working through the regulatory hassles. It's clear that we need to do

something. The Commerce Committee in the Senate is moving this year to seriously examine these problems, make some policy here, and really do something useful. I think that we're in pretty good shape that way.

It's not going to be easy, but at least there is movement. Every year, the Commerce Committee sits down and sets out its goals for the Congress. The two things at the top of the agenda this year are communications and aviation. It's clear that Senator Hollings, Senator Inouye, Senator Gore, and Senator Burns are all spending a lot of time doing a lot of work trying to resolve some of these issues. They're not just sitting around arguing about what the policy should be but rather are just making policy and laying it out for the next 5 to 10 years so that we can take advantage of these technologies.

Ms. Dennis: Thank you, Michael. George?

Mr. Vradenburg: I think that if there was one thing that I would ask the federal government to do, it would be to retreat to public policy issues rather than tinker with regulations over what it sees as particular interstitial problems.

This country, in the 1930s, decided on a communications infrastructure—I'm now speaking of video—a broadcast communications infrastructure that has been built first in radio and then in broadcast television, which is flexible and has multiple uses. It's flexible because it serves both an advertising engine, which, in fact, drives the American economy, domestically and worldwide; it supports a worldwide news-gathering media, which, in fact, informs and educates the American public; and it is socially supportive of all Americans.

There has been a public policy drift in this community to be fascinated first with cable and now with fiber to the home because of the supposed wonders of the technology. Cable does not serve all Americans, and with increasing racial and ethnic diversity in this country and with the increasing inequality in this country, we need a communications infrastructure in the areas of news, entertainment, and sports that will serve all Americans at an affordable price. The price affordable to them is simply the cost of watching the commercial and watching it with a very low-cost television set.

So if I were to ask the federal government to do something, I would say to pull back; forget about this great fascination with technology; and

focus on the broad, overarching public policy goals of serving all Americans with news, entertainment, and sports.

Mr. Shooshan: Name one policy that you would either change or that you would adopt to advance that goal.

Mr. Vradenburg: The chain broadcasting rules. The perspective of the chain broadcasting rules was that the broadcast medium had to be regulated and had to be forced to give up some of its product and some of its strength in order to support the growth of its competitors. Now that its competitors are fully formed, growing, and strong—

Mr. Shooshan: Are you talking about cable networks in particular?

Mr. Vradenburg: Cable networks, cable systems, and now the satellite carriers to rural areas and DBS. The broadcast system has been asked—and indeed by law required—to give up a good deal of its exclusivity and its economic strength in order to support the growth of its competitors. Now is the time to permit the broadcast industry to fight on its own footing and not have to give up its product to others.

Mr. Shooshan: Thank you.

Ms. Dennis: Carl?

Mr. Cargill: We were asked to look at change or new regulations. I would request a new—and it's possibly idealistic—but to move from a communications infrastructure to an information understanding, which would require some form of long-range plans, some knowledge about how information is used. Get rid of the fascination with technology moving to needs and goals; let the technology supply what the functional requirements are; understand how information is used, how people can use it, how people will use it, and how to use and teach it.

I think that one of the early comments was that this was a social-cultural concept. You're dealing with a social-cultural concept here. You're not dealing with specific technology but rather the redoing of an American society to make it an information society. That's what the infrastructure supports. It's not something that you're going to do by putting neat cables into everyone's house. You're looking at what people need from information, what people want, and what America must have. That requires a very long-term social-cultural change, which I thought is the long-term ramification of policy.

You're looking at how to change information into knowledge. You do that in any of a multiplicity of ways, depending on what the respondents need. But the basic thing is to start to emphasize the long-range plan, let the technology fall where it is—and because I have my bias in standards—and somehow get involved more—this is going to bother Jim Burrows—more directly, more completely in the standardization process, and possibly from a stronger national position. They need to create a strong national position to enable the people that participate in standards to begin to do some planning.

Ms. Dennis: Well, not quite an exact policy, but some goals articulated there. Jan?

Mr. Suwinski: I'm going to make my comments in the context of a long-range race that we're in. We're in an economic race with other countries.

Ms. Dennis: Do you think we're ahead or behind?

Mr. Suwinski: That's a complex question. If I'm going to use 1 minute—

Ms. Dennis: Can we give him 2 minutes?

Mr. Shooshan: We'll have to stay for the next panel.

Ms. Dennis: That's right.

Jan H. Suwinski

Mr. Suwinski: We are in a race, and one of the facts of life is that the amount of information that we have to deal with in running that race doubles every year. The winner in this race is going to be the society, the organization, or the individual that can move and manage that information to a competitive advantage. This is where the infrastructure comes in.

Then the policy question is, How do you determine what this infrastructure should look like? I think that there are two ways to do this. First, government can mandate it and say that this is what it's going to look like and that everybody must build to these standards, or we can let the marketplace and all the creative people working on it determine what is best suited to our needs. I favor the latter. The reason I favor the latter is what was pointed out this morning. No one can predict exactly what is going to happen to the technology. Also, no one can predict exactly what needs we will have 5 years from now or 10 years from now, and to have some sort of a mandated blueprint, I think, would be a mistake.

Let me just give you an example. Someone said earlier that if you had all this whiz-bang technology or capability in the home, people wouldn't know what to do with it. If your conclusion, therefore, is that we shouldn't try or that we shouldn't make it available, I think it's the wrong conclusion. Today, there are 35 million people in this country that work at home, and that number is growing every year. Those people don't just do their home budgets. They are linked with their offices, businesses, and so forth. A lot of them run small businesses. These people need the infrastructure to participate in the economic race.

So back to my point: You have two choices on infrastructure. First, you can mandate it, or two, you can let the market decide. My vote is to let the market decide because we can't predict what's going to happen to the technology, what people want, and what they're going to use.

Now, regarding specifically what I would change, as has been pointed out by this gentleman, there are certain obstacles now to people's participating in providing new services. Specifically, telephone companies cannot provide information services and video services and cable companies cannot provide voice services. I would start by examining those two sets of regulations and allowing more competition than the provision of—

Ms. Dennis: So you would remove those two restrictions?

Mr. Suwinski: Yes, I would.

Ms. Dennis: Kenneth?

Mr. Phillips: I'd like to make one final point, coming back to this economic race. We can debate this question in panels like this now, next year, the year after, and the year after, but I just want to be sure that everybody knows that the Japanese, who are one of our main competitors in this race, have already decided that they are going to have a nationwide broadband network for their people to use in this race and are starting to deploy it.

I now just want to hit on a couple of areas in direct response to your question concerning what policy initiatives are required to bring about the type of change and that I think there's an underlying agreement in favor of here, despite certain short-term differences based on industries and things of that sort. Some of these areas we haven't had time to talk about. So they may seem a bit out of context.

The first, which seems very boring but is very important indeed, is that the government should establish a realistic set of guidelines with respect to depreciation and tax on the regulated side of the telecommunications industry. If you were to walk into the IRS (Internal Revenue Service) today and ask to see a depreciation schedule for common equipment, as we did a few months ago, it would produce a list that refers to 800 ohm loading coils, relays, and the rest of this sort of antiquated approach to the telecommunications technology and infrastructure.

Until that policy is set straight with respect to the dissolution of boundaries between computing and telecommunications, very basic issues, we're not going to see sufficient incentives presented to local telephone companies to make the sort of changes that were today discussed regardless of whether you buy off on whether fiber should be in the home or any of these other issues.

Another issue that we haven't touched on that's very important is to study privacy. What do we do with information about the use of information, what I call meta-information? Today the banks have relationships with one in five Americans. AT&T has launched a credit card, that for the first time links the patterns of purchasing behavior of American citizens with the telephone numbers they dial. That credit card has both a Visa number and an RAO code.

Who owns that information? Who has rights of access to it? What sort of contractual privacy commitments exist when you obtain telephone to service? Who has access to the credit information supplied to the telephone company at the time you obtained telephone service and likewise for financial institutions, when you apply for credit?

These are issues that are going to have to be addressed. In my admittedly random walk through federal regulatory agencies, all of them have said not to ask those questions because they are not within their jurisdiction under the CFRs (Code of Federal Regulations). We need to define whose jurisdiction these questions are under and what the policy implications are.

I would remind you that history informs that the origin of the data protection laws stem from the Second World War, the fact that the Germans routinely went into telephone central offices and looked at the little slips for long-distance telephone calls. If you called places that they didn't particularly approve of, you suddenly vanished in the middle of the night. I'm not suggesting that this is about to happen here, but I am suggesting that the value of this information is enormous, and we need to have clear policy on what you do with it before we implement the technology that generates it.

Ms. Dennis: Okay, Ken, I'm going to cut you off there because we need to move on and get the policy proposals from others. Thank you.

Mr. Mosco: Let me say that it's not simply a question of deciding between an intrusive government and a benign market. Markets belong to those who have market power. In the state of concentration of the information and communications industries today, we need to recognize that the market itself can be enormously intrusive and selective.

Consequently, there is an important role for the government. In addition, it's not a question of whether government will or will not intervene. It will intervene. It has, it continues to, and it will. The question is, How will it intervene? Will it intervene by simply laying on old social policies on new problems? For example, this would include old welfare programs, as I described earlier, or old laws and regulations regarding industry structure. I refer here to applying laws that essentially permit some of the most advanced companies in our industries to develop the infrastructures of other countries and not that of the United States.

Ms. Dennis: Do you have a specific policy in mind?

Mr. Mosco: There is an implication of a policy in what I just said. I thought you would understand that. I think that there's also a problem, though, in asking about specific policies because that essentially assumes that one can introduce a specific solution and not get on with the broad sociocultural transformation that one of our earlier speakers referred to.

How do we go about doing that? Frankly, I think that we can't do that at the FCC because it's essentially involved in resolving intra-industry disputes. You can't do it at NTIA (National Telecommunications and Information Administration) because NTIA is located in the Department of Commerce and is involved in commerce and market-based decisions. It cannot institute the broad-based debate that is required to educate people about information issues and to involve our other institutions in society.

Perhaps if I'm calling for anything at this level—and I recognize full well that this has been proposed many times before—it is that we need to establish a Department of Communications at the federal level and encourage similar developments at the state level to get on with the business of education, to deal with the needs of an information age and resolve the debate about what those needs ought to be so that we simply don't relegate important decisions about our social and cultural future to the marketplace.

Ms. Dennis: Professor Mosco, thank you. Irwin?

Mr. Dorros: We chose competition over monopoly over the last 10 or 20 years, and I think that this was a good choice. There is more choice now, and there are a lot of benefits of competition.

On the other hand, the vestiges of regulation and monopoly are inhibiting us from doing things like investing in this infrastructure that we've been talking about. My recommendation to the government is to continue on an accelerated basis toward changing those regulatory and legal restraints on full-fledged competition. What that means is regulatory reform for the carriers in my industry; antitrust reform that allows portions of the industry to work together for an end-to-end success on the part of users; and MFJ (Modified Final Judgement) reforms since they were conceived in another era.

Those would then encourage investment on the part of those that were willing to invest, instead of taking their investment overseas as they are

doing instead because of the constraints that they have. In the rest of the industry, we should also continue to open up markets. Cable should be able to provide telephone, and telephone should be able to provide cable in any way that the market dictates—the same with DBS and the same with broadcast—so that whatever regulations or legal constraints there are today ought to be thought out carefully as to whether they're protectionist.

What we ought to have is enabling legislation and enabling rules in an enabling atmosphere rather than a protectionist atmosphere if we're really going to achieve the benefits of competition.

Ms. Dennis: Stan?

Mr. Hubbard: Yes, I am a great believer in a free marketplace, and I do think that we have a marvelous communications infrastructure in this country. I also think that the policies of the U.S. government, for the most part, are adequate and right in place. We have a wonderful telephone system, a wonderful over-the-air television system, a wonderful radio broadcasting system, and a wonderful cable television system, and we're soon going to a direct broadcast satellite system. All this was brought about by free enterprise and letting the marketplace work.

I think that it is, however, important that the government see to it that there not be any kind of interference with important emergency services that are needed by the people. As I said, if a telephone goes out and you have a fiber-optic line, you have to have some kind of 120-volt backup. That may be batteries, as has been said, but I think it's important for the U.S. government to say, if we're going to put in that kind of system, who it is that will pay for the batteries and what it will cost, because it's important for people to be able to pick up their phones, dial 911, and get help when they need help.

Ms. Dennis: So instead of Minitels, the government should distribute batteries?

Mr. Hubbard: I'm not saying that it should distribute batteries. I think that you'd better look at the cost. I think that this becomes public policy.

Ms. Dennis: I'm just trying to get to what specific policy you're referring to.

Mr. Hubbard: My policy is that the government should make sure that what we have in the way of a 911 hookup is not taken away because the telephone companies want to get into the video business.

Now, in terms of fiber optics, I think that it's wonderful. I think that businesses should be connected, as they are now, by fiber optics; I think that schools should be connected by fiber optics, and I think that government policy ought to encourage that. If fiber optics is to be sent into the home, the telephone companies could do that right today. The telephone companies will not do that today because the only reason that people would pay for fiber optics is that it was required in order to get news, entertainment, and television programming. I think it's obscene to think that the government of the United States ought to let the telephone companies, with their subsidized rate base, get into the television business. That's really what we're talking about here. So fiber optics, yes. Telephone companies into the television business, no.

Ms. Dennis: John, you have the last word.

Mr. Sie: First, I want to thank my colleague, Stanley Hubbard, who is usually fighting against me. I'm glad you are on my side today.

[Laughter.]

I would like to just make some comments. The whole bottom-line issue seems to be—after we take away all the euphemisms and discussions—whether Irwin's vision of a totally deregulated marketplace means fiber to the home by the TELCOS and accelerated depreciation by the TELCOS so that they can increase their revenues because they are a guaranteed rate of return business. Does that make sense?

I want to caution that I've never seen such a good promotional job done by the TELCOS and the technocrats—I happen to be a technocrat, so I know—regarding the intoxication with fiber to the home. All I've asked in the last 3 years is that if the telephone companies want to have fiber in the home, very simply as the first step, before we make these big tectonic plate shifts and paradigm changes, they should put together a cogent business plan to show how much it's going to cost, who's going to pay for it, what technology will be used, and whatever assumption they want to use to show that there is a true return on investment to somebody.

I think that without that, we should stop discussing telephone companies getting into the video business, into the video dial tones. Let them come with a cogent plan first. It could be baseline and it could have all kinds of assumptions; but it should be integrated and complete. I've never seen one, because it's not economical, at least in my opinion. If it's economical and it can be shown to be marketplace reality, then at least its worthwhile discussing the paradigm changes. That's my first thought.

Second, I think you ought to be careful—like Stanley said—because all of the other infrastructures are built on risk capital. The telephone industry's infrastructure is built on guaranteed rate of returns, and there is a big difference.

Third, please don't be scared by the Japanese. I just heard what Ken said about Japan's already deciding to provide broad-based systems to all of its homes. That's poppycock. NTT (Nippon Telegraph and Telephone) has suffered such loss that it is probably delaying any decision for fiber to the home. In the next 5 years, it will go through a big study program. NTT is going to privatize; its earnings are so bad that its equity loss is seriously limiting its access to funds. This country did the same thing in 1988 on HDTV. We said that we had to jump on the bandwagon and get a production standard for HDTV because by 1990 and 1991 these videodisc and videocassette HDTV players are going to come and we have no defense.

I'm just saying that Americans are very innovative. The United States has a lot of good technology, and it is market responsive. I think the government should stay out of defining which segment should have what technology because technology is neutral.

Ms. Dennis: I hope you'll stick around for the global competition panel that follows.

Communications Policy, Economic Development, and Global Competition

Mr. Shooshan: One of the things that was mentioned by Jan Suwinski of Corning in the last panel was that the debate that's taking place here in this country, he felt should not take place in a vacuum but that we really need to understand that there are things going on in the rest of the world that have implications for how fast we move ahead with developing our infrastructure here at home.

I alluded earlier to the fact that Bill Davidson has looked at this issue and has studied the state of telecommunications infrastructure here in the United States and also abroad. Bill, are we ahead of or behind the rest of the world, and why should that matter?

Mr. Davidson: Thanks, Chip. I'm kind of used to stepping up and painting the bull's-eye on my face to start these kind of sessions.

[Laughter.]

Mr. Shooshan: It becomes you so.

[Laughter.]

William H. Davidson

Mr. Davidson: Thank you. Chip, I want to repeat a couple of statements that might be relevant in reference to your question. First, we have the best telecommunications system in the world, we always have, and we always will. Second, the lack of a dynamic information services industry in the United States is a demand failure, not a supply failure. And third, don't worry about the Japanese; they're not a problem.

I've heard those things—and I heard one of them again this morning—repeated time and again in sessions like this.

Mr. Shooshan: You scared me for a minute. I thought you were changing your mind because of the way you stated all that.

[Laughter.]

Mr. Davidson: No, I'm really repeating some of the statements that I've heard in sessions like this for several years in the United States and elsewhere. I must say that it gives me great cause for concern. In our review of the status of the U.S. telecommunications infrastructure, we found some great cause for concern.

In many of the areas that we might use to reflect the level of sophistication of the public telecommunications network, the United States already trails a number of foreign countries. Based on the projections that we were able to secure from carriers in a dozen different countries, we will lag behind virtually all of those other nations in almost every indicator of public network sophistication by 1994. There is great cause for concern, and I'll be glad to go into that in more detail if you would like.

Ms. Dennis: Would you give us some specific indicators?

Mr. Davidson: Certainly. I think that some of the most-straightforward indicators would be, for example, the level of network digitalization, the percentage of access lines served by digital technologies, and deployment of signaling system 7; services would be another good example and variety of specific information services as well.

Ms. Dennis: And what countries are ahead in, e.g., digitalization?

Mr. Davidson: Well, we need look no further than Canada for starters. In fact, in most, if not all, indicators, Canada shows today a higher level of sophistication than we do in the United States. France has been well noted. I think Sweden is another nation we might look at. Even the United Kingdom, which has tremendous momentum at present, shows superior numbers in a number of different areas and much greater progress than we're showing as well.

As long as I have the floor, there's another indicator that we might look at as well. There's a premise that I would like to put out to you as something to ponder. Given technological trends in this industry, the last dollar you invested is the best dollar you've invested. The power per dollar of investment has been rising steadily as technological capabilities have improved. Therefore, spending levels are a very important indicator of our progress in building a modern infrastructure.

In each of the nations we looked at, we saw dramatic increases in spending, while network investment in the United States has declined for 4 consecutive years and will decline again this year, given all current indicators. That's another cause for concern.

Mr. Shooshan: All right. I sense from things that I've read of yours, Leland, and heard in the past that you might take a somewhat different

view of where we are today than Bill. Do you want to comment on what you just heard and add to it in any way?

Mr. Johnson: Thank you, Chip. I do disagree with some of what Bill has said or at least how one would interpret what he said.

When we look at net investment annually, we have to ask what we include in investment. Are we looking only at the carriers that report to the FCC? That's a very important reference volume, to be sure, but one that certainly does not capture the full range of investments relevant to our concerns today.

In the United States, we have companies investing a good deal in telecommunications infrastructure that don't get reported by the FCC. I would guess that there is much more activity by private companies in the United States than there is in other countries. If one were to include that, one would see a somewhat different trend in overall investment activity of the sort that's directly relevant to our concerns today.

Third—

Mr. Shooshan: Let me stop you at that point and go back to Bill Davidson. Bill, in your analysis did you look at private networks in other countries and the extent to which they were being developed?

Mr. Davidson: We certainly tried. It's very difficult to do. I would just very quickly suggest that Leland makes a very important point. My guess is that investment in private facilities is probably roughly equal to investment in public facilities each year in the United States. The only nation, in my opinion, that rivals that in terms of the level of spending is Japan. There is a substantial amount of private investment in what they call semipublic facilities. That would perhaps be the only other country that would rival us in that regard.

I would also ask why we're seeing this level of investment in private facilities.

Mr. Shooshan: I interrupted Leland. Let me go back to you with your third point.

Mr. Johnson: My third point is that I have recently purchased a PC for use at home. I will soon put in a modem, and I will be connected into the mainframe at RAND Corporation. This is a very typical procedure.

Indeed, a large number of staff members at RAND Corporation have exactly the system that I'm now putting in.

My question is this, Does my investment in this PC get included?

Mr. Davidson: In numbers that I'm looking at, no.

Mr. Johnson: Well, let me suggest that that investment in providing a person's home with an enormous capability to receive, store, and process data and to send it back to company headquarters, or indeed to send files anywhere around the world, is an enormous step forward. To neglect that investment is a serious shortcoming of any analysis that seeks to look at how the United States stands relative to other countries.

I would conjecture—though I've not seen good data—that if we took into account the investments that people are making in their workplaces or at home in PC terminals, then again the United States would show very favorable figures relative to what we see elsewhere.

Mr. Shooshan: Bill, would you like to come back to that?

Mr. Davidson: I would love to have that information, and I certainly agree with the premise that we want to look at all sources of investment in infrastructure. I would have to ask several questions about the efficiency of some of these patterns, however, given the levels of redundancy that we see in the United States and the problems of connectivity. I would also raise the question to Leland as to what type of communication linkage he expects to have to his home so that he might be able to use his PC to connect to other individuals in his own organization and around the world. That's an issue that jumps right back to where we started.

Ms. Cornell: Could I jump in here?

Mr. Shooshan: Sure, Diane.

Ms. Cornell: To some extent, I agree with Bill. I think that we do need to look at the public switched network from a public policy standpoint, and the FCC has been looking at information on, for example, signaling system capability, digitalization—and some of the trends are beginning to level off a bit, as Bill has said. There are various reasons for this. Some have argued regulatory restrictions or whatever. But it is an issue of concern. I do think that some of the other countries have been able to

leapfrog us, in a sense, because they started at a much lower base than the United States. But it is still an issue of great concern to the FCC.

You can look at private networks all you want. I think that that's also very important. But I think that the interconnectivity provided by the public switched network is something that from a public policy standpoint, we have to really pay attention to.

Mr. Shooshan: Does that stimulate additional comments? We'll keep moving along this line, if we can. Ken?

Kenneth W. Bleakley

Mr. Bleakley: Let me pick on this because I think that a strict comparison of structure with structure or the infrastructure of the United States with that of the other industrialized nations may miss the fundamental trend that's taking place when we talk about globalization. That is, as long as our resources are more than adequate to do what has to be done for the infrastructure, a lot of these questions are resolved in a globalized market.

To answer the question of who's ahead and who's behind, you really have to get to the heart of U.S. competitiveness in terms of goods and services in this global market and not simply compare infrastructure with infrastructure.

I think that the impression is that we're beginning to move out again in terms of our global competitiveness, but there are three things that I would note that are inhibiting it.

First is a subject that was raised by your earlier panel: standards. We see that the European Telecommunications Standards Institute, coming right out of the EC (European Community) and dominated by public sector PTTs (postal, telegraph, and telephone authority) has a much more coherent way of approaching this issue than does the rather fragmented system in the United States.

The second element that you see hitting us time and time again is simply one of presence. The Europeans and the Japanese, for their own reasons, have had to move out very rapidly in terms of establishing their commercial presence in the rest of the world. We've been much slower at that. You notice that day in and day out, where we're not on the scene or haven't been to the degree that some of our competitors are.

The third is finance, our inability sometimes, when we have competed on every other technical basis, to be able to deliver the finished product because we can't put together as attractive a financial package.

I think that those three things overlay the question of a strict comparison of infrastructure with infrastructure.

Mr. Shooshan: Henry, go ahead.

Mr. Geller: I'm not arguing that it isn't important to look and see that we don't fall behind. It is global competition, but the fact is that the United States tried to get in this century the best possible telecommunications structure it could because it was important to the nation. We should continue to do so regardless of what is happening globally. I would add to the list that it seems to me that means that if you want those efficiencies, if you want the contribution to quality of life, you have to stop giving off false economic signals. You can't run significant subsidy schemes. And we still do both in the interstate and particularly in the intrastate.

I think that you have to rationalize prices there. Once you do that, you can get to true open network architecture. It's inhibited now by what effect it has on local pricing. If you get to true unbundling of the transport and the switch, you again stimulate competition and you get a lot of efficiency. This is important, not only in global competition but also to the nation.

We also inhibit competition and suppress competition. That's not good if you want to get efficiency. This is so in the Modified Final Judgement. We also suppress competition, such as from the cable companies.

Finally, the most important matter is economic depreciation. I'm getting back to what Bill Davidson said in the last hour. You're not going to wait and use electromechanical switches; you're going to allow carriers to move as fast as possible to digital switches. And that raises an issue when we get to fiber.

Mr. Shooshan: Let me read a—

Ms. Dennis: Before you go on, I'd like to get back to the basic question again. We've made some assumptions here thus far that there is a link between telecommunications and competitiveness. I would like the panelists to address how important they really think telecommunications is

to our country's being more competitive. Why is it more important in education, having an educated work force, the state of our national economic health, for example—where would you rank, on a scale of 1 to 10, the importance of our telecommunications infrastructure as opposed to a lot of other issues that could be addressed in terms of our ability to compete abroad?

Mr. Shooshan: Kent?

Mr. Foster: I think that most of us grew up in a period in our country where our telecommunications was so much superior to that of the rest of the world that we really don't understand the power it has. Sometimes, if you look at other countries, you begin to see the enormous impact that the absence of world-class communications has. For example, in Chile, the leading export product used to be copper. Right now, I think that it's fruits and vegetables. The reason for that was the penetration of the public switched network out to the countryside so that the farmers could access markets in Europe and the United States.

So we unfortunately have not had the experience. The reason I say "unfortunately" is that we don't understand the impact of what getting behind could mean.

I think that there is a real question as to why the gap has narrowed between the United States and Europe and Japan and other places, even Singapore. It could be that they were so far behind that it was very easy for them to close the gap by making a limited investment, while we continued to increase that gap.

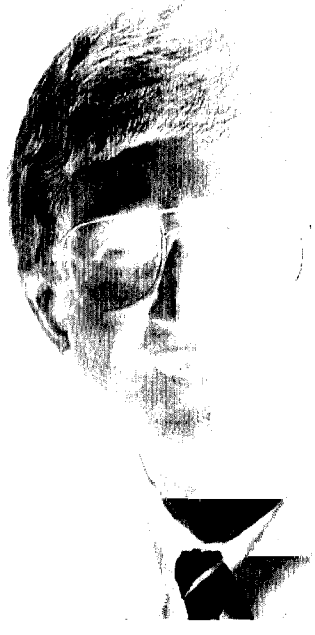
But I think that Bill Davidson made a very, very important comment when he said that the power of the last dollar invested is enormous. I think we are going to learn the consequences of that, but we are going to do it when we realize that our society has been disadvantaged because those like me who have had some minor responsibility for developing the public switched network are going to turn over a network to succeeding generations that is not going to be two decades ahead but may, in fact, be behind. I think that our thrust ought to be how we keep this leading edge as opposed to falling behind other countries.

Mr. Shooshan: Let me explore a point because it's been made several times now by you and previously by Diane. It's implicit in the debate between Bill and Leland.

People keep talking about the importance of the public switched network, yet the observation has been made that if the innovation is occurring in the United States because of our more-procompetitive open market in private networks and terminal equipment, why should we care? Why is the extent to which the public switched network does all these things important, Kent?

Mr. Foster: I think that all the networks are important. But one asset we had better watch very, very carefully is the public switched network.

Mr. Shooshan: Why?



Kent B. Foster

Mr. Foster: Because the ultimate effectiveness of all the networks is directly related to how effective the public switched network is. For example, the private networks and those like my corporation has are effective only if ultimately they can interconnect with the rest of the world. They will serve us as a company to a certain degree, but ultimately we're not going to be any more effective in our ability to communicate with everybody else in this country.

People who are trying to sell products and services, like IBM and Westinghouse and Proctor and Gamble, are not selling just to major corporations. They are trying to access the entire country. I'm afraid also that the gap between "the haves" and the "have nots" is going to increase as major corporations and major centers develop very sophisticated communications and the rest of the country then becomes disadvantaged. So rather than the whole country's being advantaged by a rising tide, certain boats are being lifted as opposed to the whole infrastructure. I think it's a grave danger.

Mr. Shooshan: Leland, do you want to comment on that?

Mr. Johnson: Yes. I think that Kent is exactly right. We certainly need to be concerned about the future of the switched network. When I put in my modem at home, I'm going to be using that network. It's of critical importance.

But there are two things at work here. First is the question of overall investment in the United States as compared with investment elsewhere. Here one must take into account the other components of investment, going beyond just the investments of common carriers. Second, one must

focus on the growth and the evolution of the public network. Here we have questions of whether traffic is rising annually at a healthy rate for public switched service. Are investments sufficient to provide public service, quite aside from what the Japanese are doing, in terms of the United States—how well are we doing? And then, what public policy issues need to be confronted?

One might advocate more rapid depreciation. That would be a straightforward policy recommendation.

Mr. Shooshan: And somebody just did, I think.

Mr. Johnson: That might be a suitable policy option to consider. It's not the question of neglecting the public switched network in favor of private networks or people's putting PCs into their homes, because these other networks obviously depend very critically on the switched network. The question is what we focus on in terms of deciding about answers to important public policy issues, things like accelerated depreciation, for example.

Mr. Shooshan: Bill, did you want to say something?

Mr. Davidson: Yes. To go back to the question that Patricia asked, I believe that competitiveness really is the central issue facing the United States in this era. I also believe that our information infrastructure is the key, the single most important element in our competitiveness equation. I think that the ability to manage and move information at the leading edge is central to future competitiveness.

For proof of that assertion, I would point to just exactly the investments now being made in private networks. The organizations making those investments completely understand the importance of information management and movement. That's why they're investing these funds in private infrastructure. Is that good? Is that the solution to our competitiveness equation?

Mr. Shooshan: While the thought is fresh, let's let Leland comment on that.

Mr. Johnson: Well, I immediately have to express misgivings about what seems to be an exaggeration here. It's not obvious that information of the sort discussed here is the most important thing in determining competitiveness. Lots of things are important, as brought out before.

How important is education? How important is transportation? There are lots of things that determine the competitiveness of nations.

Mr. Davidson: You needn't lecture me on that topic, Doctor Johnson.

Mr. Shooshan: But, I think, we would all agree that it is an important factor. We need to know what kind of public policy we should have. What we all should focus on, it seems to me, is not whether the Japanese are ahead of us or behind us today or whether the French are ahead of us or behind us today, but where we're going to be at the end of this decade and what kind of planning process and what kind of public policy process we have in place to get us to that point by the end of this decade.

Henry?

Henry Geller

Mr. Geller: I just want to add to the private network discussion. I think that it's a strength of the United States that large companies can decide to gain a number of efficiencies that you hear of by doing that. The only point I make—and it is a public policy one—is that they ought to enter because they decide that it's in their best interest to do it and not because they're trying to get around some stupid public policy as to subsidies. That is the false economic signal that I talked about. I think that public policy not only ought to do accelerated depreciation, but should also make sure that the public switched network, which we all agree is very important as a bedrock here, is allowed to develop properly. It isn't proper, if you run a subsidy scheme in the public network, to let people escape it by going the private route.

Ms. Dennis: But haven't our policies generally been that if you want it, then you build it?

Mr. Geller: Yes.

Ms. Dennis: And what does that do for Aunt Minnie?

Mr. Geller: I think that policy ought to continue, but you ought to have a basic one that says that you build it because you really do gain efficiencies and the nation gains because Citicorp or Proctor and Gamble or General Motors can operate better with a private one and therefore can compete better. All I'm saying is that they ought to do it because the efficiencies are really there and not because government policy says

that it is going to support the ski resorts and middle-class people. That's kind of a stupid policy. Citicorp then did something not because it's more efficient but because it wanted to get around an inefficient government policy.

Ms. Dennis: What about small businesses, though, and the medium sized businesses that can't afford their own PBXs (private branch exchanges).

Mr. Geller: Again, that's the importance of the public switched network and of having accelerated depreciation: to make sure that they have the most efficient system and to have all kinds of policies that don't suppress competition from the public switched network.

Mr. Shooshan: Henry, let me follow up on that point for just a second. You suggested several times—this, I think, can illustrate a dilemma for policymakers—that one thing that you would fix is the pace of regulated depreciation. You would accelerate that somehow?

Mr. Geller: Yes.

Mr. Shooshan: The purpose of that is to get this new technology out there and to enable companies to make investments that will benefit all ratepayers.

One of the common arguments, though, that you hear against that policy is that Aunt Minnie doesn't want that. The argument is that if you increase depreciation rates, you may raise current telephone rates.

Mr. Geller: Sure.

Mr. Shooshan: How do you deal with that dilemma? People don't want the higher rates today, but they want the wonderful new features in the future. Wasn't your acronym PANS?

Ms. Dennis: POTS (plain old telephone service).

Mr. Geller: As I said, I think that what you have to do is have the leadership at the federal level, the congressional level, and the state level that says that this is necessary and that this is very important for efficiencies and for quality of life. And you just can't do what some consumer groups want: Keep plain old telephone service very cheap. We're going to have to pay. You'll have to look at how much you're going to pay and over what time period. The change has to be orderly; it can't be

too disruptive. But if you worry that much about Aunt Minnie's bill, you're liable to lose the future of her grandson. That's not a very wise decision to make.

Mr. Shooshan: So it's an intergenerational trade-off?

Mr. Geller: I'm also saying that not only is this an intergenerational trade-off but also that right now we're subsidizing the middle class a great deal. There is no reason to subsidize the middle class or the rich in their telephone bills. We don't do it in electric, we don't do it in gas, so why are we doing it here? We ought to target the people who need it.

Mr. Shooshan: Let's go to Kent.

Mr. Foster: Well, I think that it's interesting that each month, most of our customers pay more to their local cable television companies than they do for local telephone service. So I think that the issue is the willingness of people to spend money for service. I think anybody will tell you which service is more valuable to them if they lose it. It would definitely be the access to the world. Cable television is not interconnected and not interoperable and has no must-carry obligation.

So I think that our nation fully understands the implications of the public switched network. What I don't think it understands is the tremendous potential, or lack thereof, that could exist if we don't evolve this network in an appropriate way.

I think that in terms of public policy, there are really three issues here. Should we prohibit companies from doing certain things? Should we permit them to do certain things? Or should we promote? Some countries are promoting, like Singapore. I read Bill Davidson's report very carefully. It's clear there that they see it as a competitive edge for their economy. In our company right now, I think, most of us would say that we have prohibitions against doing certain things.

I think, at least from my perspective, that we have chosen the free marketplace to drive our nation's telecommunications system, so at least we ought to be in a permit mode—not promote or prohibit—but we need to permit companies to go out and try to serve the market. That's the way that I think public policy ought to be shaped.

Mr. Shooshan: Ken, you had a comment to make.

Mr. Bleakley: Yes, I did. I'm going to take you on. You said that this was a conference on telecommunications. This is a conference on communications, not telecommunications. Patricia made the same point in asking how important infrastructure is.

We're making a big leap here. Communications is obviously, in all that it implies, essential to national competitiveness and to national welfare and is becoming more so every day. You almost state those kinds of assertions without fear of contradiction.

The role that telecommunications—particularly the telecommunications infrastructure—plays in that is obviously important. I don't think that you can make the leap, though, automatically to say that public subsidies in the form of accelerated depreciation, for example, follow naturally until you've made a much closer link between the importance of the infrastructure itself and the issue of communications in its broadest dimension.

Mr. Shooshan: Okay. I wanted to go to Charlie on this because NTIA has had for the last year or so a major proceeding going on infrastructure. One of the areas that you focused on is the implications of telecommunications infrastructure for economic development and for service to rural areas, addressing some of these very points of what the objectives are of adopting policies along the lines of what Henry has talked about. Can you elaborate more on this?

Charles M. Oliver

Mr. Oliver: We have a comprehensive inquiry under way on the telecommunications infrastructure, and we have received about 10,000 pages worth of comments on it. One of the things that has emerged from the inquiry is that Aunt Minnie probably needs the telecommunications infrastructure for things other than calling her sister Mary. About two-thirds of the output of the telecommunications sector, according to the latest update of the input and output tables, is supporting business. People need jobs. They would like to have jobs where they want to live. So it's not a question of taking something away from Aunt Minnie and giving it to business.

On the other hand, nobody that I've talked to in government is thinking about telling the telecommunications companies to try to equal the number of ISDN (integrated services digital network) lines or SS7 (signaling system 7) hookups compared with some other country. The question is not really whether we're behind or whether we're ahead but whether there are any artificial impediments to the private sector's being able to respond to customer needs in the business and residential sectors.

Mr. Shooshan: Do you have any tentative conclusions in terms of answers to that question? Are there impediments?

Mr. Oliver: Yes, we believe that there are substantial impediments at the state level, in particular, and also at the federal level.

Mr. Shooshan: Could you identify, at least generically, some of the types of policies that you're talking about there?

Mr. Oliver: I could give a few examples, but the list would go on, frankly, for a couple of hours.

Mr. Shooshan: I'll settle for a couple of examples.

[Laughter.]

Mr. Oliver: Okay. One example that has already been mentioned is depreciation policy. When we talk about accelerating depreciation, we're not talking about subsidizing the development of new technologies but rather about bringing depreciation schedules more in line with economic reality. It is, frankly, absurd to have a depreciation schedule that presumes that someone will be using copper wire for the next 30 years,

at this point in time. I'm not talking about just clearing the way for fiber but clearing the way for advanced radio technologies as well.

The whole question of joint cost accounting imposes lots of artificial constraints on the system. If, for example, both the state and the federal levels were to adopt a price cap system that said, "Look, guarantee us that you will be able to provide basic small business and residential service for the following inflation adjusted price," then you wouldn't really have to worry about joint cost accounting. That would free up the telephone companies to provide a lot of advanced services that aren't available today.

Mr. Shooshan: That's a big "if." Again, I want to try to get the policy issues out on the table. To what extent—and I open this question to anybody—do you think that we should be concerned about the fact that in the United States, we have a system of regulation with the federal government regulating some aspects, the state governments other aspects—and to include our friends in the cable industry—local governments in some other aspects? That may well be inevitable. It may be that politically there is nothing we can do to change it. But is that something we should be concerned about in dealing with in some fashion?

Mr. Oliver: Chip, I think that this system is like white water canoeing. It can work quite well, but if you're headed downstream toward a rock in the middle of a rapid and one paddler wants to go to the left and the other wants to go to the right, you're going to have a problem. That if the state governments and the federal government can reach agreement on some basic goals, I think it could work quite smoothly. It's not working smoothly now.

Mr. Shooshan: It's not working smoothly now?

Mr. Oliver: No.

Mr. Shooshan: Henry?

Mr. Geller: I think it's a very bad system because there is no federal captain. I have nothing against the states regulating. I think it's true to call them laboratories. They have been ahead of the federal government in the area of price caps, for example, and it's very important to let them experiment. I think that they're better also in the grass roots aspect. They're closer, and the feds would have a difficult problem doing a lot of the regulation.

But the absence of a federal captain makes absolutely no sense at all. The federal captain could say that CPE (customer premises equipment) would be deregulated, and that would be a huge plus. It can't say that enhanced services, which are the equivalent of CPE, will be deregulated because of the 1986 Louisiana PSC (public service commission) case. I think that particularly because of the failure of Congress to act here, we ought to return to preemption the way it was before Louisiana. Before Louisiana, if the state regulations had effects beyond the state border that interfered with the full effectuation of a federal policy, the feds could preempt. Now, you have to find infeasibility, that it renders nugatory the federal policy, which is a much, much harder standard.

I think that it's very lousy governmental policy. No other nation follows it. I don't know what you're going to do to change it, but it's all wrong.

Mr. Davidson: As you mentioned that, Henry, I was thinking that the Louisiana precedent has been used by some states to accelerate depreciation beyond the FCC. So it's not all bad either.

Mr. Geller: But I want to point out what you could have. Regarding enhanced service, you have Florida and the District of Columbia making movements that are very troublesome.

Mr. Davidson: That's correct.

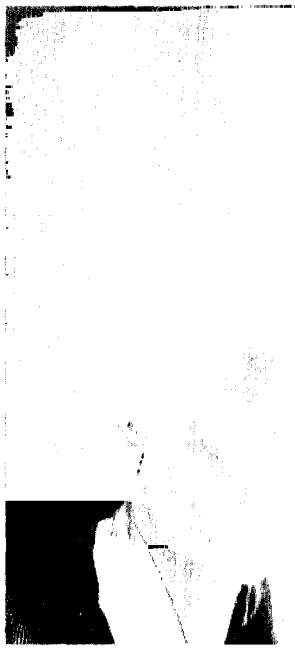
Mr. Geller: The federal government correctly is moving now to free up the spectrum for personal communications networks. If the state wanted to frustrate that, it could do so on the critical local level. ONA (open network architecture) in New York is moving better than the Feds on ONA, but if the Feds decided finally to do what's right on ONA, they could be frustrated again at the state level. I don't think that this makes sense. I'm not arguing against state regulation, but I'm arguing for the need of a federal captain. The Congress has abdicated to such a great extent that at least the FCC should be able to preempt the way you can in—

Ms. Dennis: Henry, how would you get there, though? Would you have the Congress pass a law?

Mr. Geller: I think that the leadership ought to come first of all from the executive branch; it should point out the enhanced service problem and go to Congress. I know that's not politically popular, but I think they ought to say that this is crazy and that there ought to be an amendment to section 2(6). The problem is that we're back to the same drawing

board. The Congress does not act in this field, particularly when the political pressures come from the other side. But at least the government ought to point out that this system is not the proper system.

Mr. Shooshan: Diane?



Diane J. Cornell

Ms. Cornell: I basically agree. I'm very sympathetic with a lot of what's being said here, but the federal-state issues are very difficult. Let's take depreciation as an example. In the federal realm, so to speak, there have been what have been characterized as fairly generous depreciation policies during a limited time period during the 1980s. Some of the telephone companies didn't take full advantage of the depreciation amounts available to them to make capital investments.

So the question is, What kind of things could be done to promote actual investment to match the depreciation funds available? As you have just mentioned, some of the states have been adopting more aggressive depreciation policies.

They're in a better position, in some ways, to do it because they're a lot closer to what's going on with their individual telephone companies. They know where the telephone companies are—first of all they control 75 percent of the investment, and therefore they are in a lot better position than the FCC, for starters. But they have been taking, in some cases, a very direct role in what kinds of investments, such as SS-7 or digitalization, should be made.

That's different from ONA, for example, where I think it is more appropriate for the FCC perhaps to take a leadership role. But in some situations, it's very tough. I do think that depreciation is a very important factor here, but how you work the federal-state relations is a tough call.

I think that one of the things the FCC has been trying to do is to focus on a cooperative effort, a lot more education, and a lot more dialogue. I think it has had a very dramatic effect in the last couple of years on policies such as depreciation and ONA. The FCC and states are a lot closer than they were several years ago. I think that's been very beneficial.

Mr. Geller: I agree with that.

Mr. Shooshan: If the argument about international competitiveness and the importance of telecommunications as a factor there is so compelling;

if the concerns about economic development, again, are so compelling; and the importance of expanding and improving and allowing the public switched network to evolve, why do we assume somehow that state regulators are not going to be moved to "do the right thing?" I hear the federal regulators always saying that the state regulators are the problem. Marta Greytok was here this morning. I wish she were here right now to get some equal time. Is it divided jurisdiction that's the problem?

Mr. Geller: No. I don't think that either Diane or I can—

Ms. Cornell: It's Aunt Minnie.

Mr. Geller: It is Aunt Minnie, but neither one of us is saying that you should get rid of state regulation. We agree that states function as laboratories—

Mr. Shooshan: Just when you disagree with it, right?

Mr. Geller: But the problem stems from state regulation that has effects beyond its borders. Let's take CPE. Suppose North Carolina won that. You would not have deregulation of CPE, and that has been a huge success. Enhanced services are the equivalent of CPE. You can use customer premises equipment, or you can use enhanced services to do it. Half of enhanced services are deregulated if it's not a carrier. It makes no sense to have the regulation of the other half, the carrier-provided enhanced services. It's a national issue that the federal policy ought to be able to control. I don't think that anybody on this panel would say that the states ought to be able to regulate enhanced services. Yet they have the power to do it, and a couple of them are moving to do it when they argue that enhanced services are intrastate services.

All I'm saying is that there ought to be a federal captain. Every other nation has a federal captain. In our country, it's Congress, and Congress sucks.

Mr. Shooshan: We'll give Chairman Markey equal time at lunch today.

[Laughter.]

Mr. Geller: I deny that I said it.

[Laughter.]

Mr. Oliver: I just had to mention something in response to something that Henry said. Janice Obuchowski, my boss, is on record as saying that state regulation of enhanced services would be a disaster. In fact, she published a law review urging that the preemption policy be reinstated either by the Supreme Court or by the Congress. The FCC chose not to seek certiorari on the 9th Circuit decision, so now it will apparently have to be Congress.

On the other hand, I think, it's also correct to say that some of the things that the states are doing these days are more advanced than what the federal government is doing. Some of us are looking back to 6 or 8 years in the past when we were accustomed to the idea that the states were always sort of lagging behind. Today, in some cases, they're doing things like deregulating high-capacity fiber-optic circuits.

By contrast, the FCC, even though it recently adopted price caps for the larger phone companies, says that if you want to reduce prices for high-capacity fiber-optic lines by more than 5 percent a year, you have to come in and make a special showing. What if we had imposed a policy like that on IBM for computing costs in 1970? I think that in cases like this, it does us good to have the states act as laboratories for change.

Mr. Shooshan: Bill?

Mr. Davidson: I was just going to add to that. Given a vacuum in the federal policy arena, more power to the states is probably a positive thing. We certainly do seem to have a vacuum at the federal level in terms of policy in the extended communications area.

There is a general statement—I think that we've heard it several times this morning—that the market will solve our problems. That seems to be our statement of policy. I, for one, think there are some very dangerous assumptions inherent in that particular perspective. I'd be glad to go on, but I think that this is an issue that you want to think about.

Mr. Shooshan: Let me read a quote to the panel from Michael Porter's recent book, The Competitive Advantage of Nations. This goes to my question about whether divided jurisdiction is really the problem here.

Porter says—and, again, he's talking about the issue of how we structure domestic markets and the implications of that on our international competitiveness—"Regulation of competition, usually works against the upgrading of competitive advantage in an economy by stifling rivalry

and innovation. Without open competition, firms lose dynamism and become preoccupied with dealing with regulators and protecting what they have."

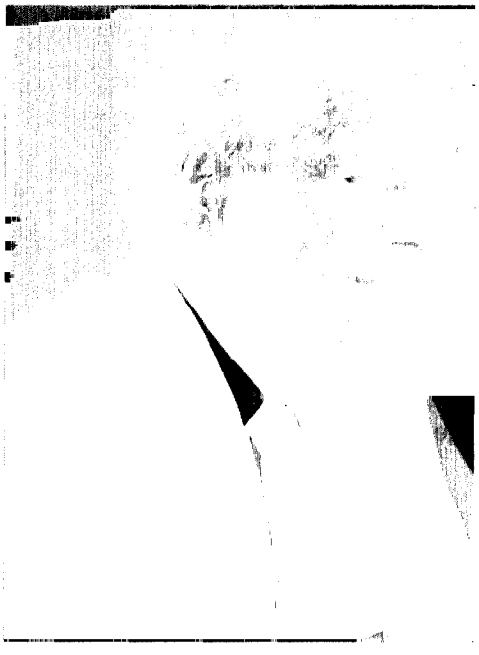
Again, the question to the panel is, to what extent is it a problem, the very process that we have chosen for dealing with telecommunications or communications in this country, which is to heavily regulate it and provide a process that, in fact, competitors can use to hold back technology and depress rivalrous competition? I might suggest a specific example. We've had a lot of discussion today about the problems of state regulators and the need for better depreciation policy. Yet, it's the cable industry that has been intervening in various depreciation cases at the state level to try to stymie those changes so as to protect Aunt Minnie. Is that the concern?

[Laughter.]

Mr. Shooshan: I think that you get the gist of the comment and the question. Does anybody want in on that? Leland?

Mr. Johnson: I think Porter's observation is quite perceptive. I think the appropriate direction is one toward more competition, the reduction and removal of barriers to entry, wherever we find them—

Mr. Shooshan: Such as?



Leland L. Johnson

Mr. Johnson: Let's take the MFJ, the one that's, in a sense, the most critical. It would be easy to say that the restrictions should be removed. There is a lot to be said in favor of doing so. There is only one potential downside, one that keeps coming back to me as a legitimate concern, and that is cross-subsidization—the problem posed for the monopoly ratepayer, who, in principle, could be threatened if the firm were to go into competitive markets and to cross-subsidize.

An appropriate solution to that problem, I believe, is, along the lines of Charlie's comments, to have price caps that ensure that these monopoly ratepayers will not see rising rates over time but will see declining rates. We would use price caps as some protection—not perfect protection to be sure—but some protection against cross-subsidization, and then tie the price cap plan to relaxation or elimination of the MFJ restrictions. That would seem to me to be one appropriate way to go. Where we see other barriers to entry, we need to see what can be done to eliminate them.

Mr. Shooshan: Let me ask you a specific question on that score. Take a company like Pacific Bell. In fact, all but a very small fraction of its facilities are in the state of California. Pac Bell now is under price caps in both the federal and state jurisdictions. Would you say, based on your calculus, that the time has come now to remove the MFJ restrictions, at least for Pac Bell.

Mr. Johnson: Well, I would want to look more carefully at the specific price cap program in California.

Mr. Shooshan: The devils and the details, right?

Mr. Johnson: Right. But in terms of direction, where do we want to go as a country in this particular area? An appropriate direction is to impose improved forms of price caps. It is important to make a judgment—and I can't make that here—about whether the system instituted in California is now adequate to help—and I emphasize the word help—protect against cross-subsidization. If the judgment is favorable, we can then move toward eliminating those barriers to entry that have been a source of concern to all of us for many years now.

Mr. Shooshan: Henry?

Mr. Geller: I certainly agree with the price cap point Leland made, but even beyond that, when you look at some of the arguments, you'll see

that the argument on information services comes down to content because Judge Greene has allowed them to do any information service that is transmission, such as electronic mail or voice storage and forwarding. All the ones where there are difficult issues of cross-subsidization he has allowed them to do.

But he has not allowed entry where there are no difficult issues—as was pointed out—in content, where you can use a separate sub. And I think the FCC ought to use one because after all, there are no economies of scale or scope when you're doing content. You're not using joint marketing or joint maintenance. Why shouldn't the Bell operating company (BOC) be in electronic publishing like electronic yellow pages? The only reason is protectionism of the newspaper industry.

I think a more important issue is the one you raised, and Porter is right. Competition is what works much better than regulation. In the interstate field, you can see that the FCC is moving toward some light at the end of the tunnel. When you get to the local area, you have a long way to go. It seems to me that there are two policies: One is real unbundling, true open network architecture, and the second one is personal communications services and other ways that can compete with that loop. There is a real opportunity coming in this decade to get some competition in there besides the competition of Metropolitan Fiber, Teleport, and hopefully at some point cable companies.

Mr. Shooshan: Kent?

Mr. Foster: I'd just like to amplify what Leland said. Competition has done more for our industry than any other single thrust, and we all fought it tooth and nail from occurring. In the past 10 or 15 years, we have dramatically improved our cost position, our quality, and our availability of services. Yet in the first panel this morning, we heard the discussion of holding people in the regulated boxes that they're in so they can't get out. Leland just offered what, I think, is a very appropriate response for permitting the free marketplace to work and for preventing people who have monopoly powers to abuse them as long as they have those monopoly powers.

Certainly, for our industry, for a long time in many communities, we will be a monopoly, regardless of what anyone says. We will be the only basic service available to them. So you can't say that competition is going to take care of it and just let those guys do anything they want.

On the other hand, with price caps, the local subscriber is protected, and if the company wants to make investments in fiber optics to offer additional services, that is being done really at the shareholders' risk. That is the difference between the approach that was discussed by the first panel and Leland's approach, which I obviously support.

Mr. Shooshan: Let me ask you the question of what the government's role ought to be. Despite the fact that you may remain a monopoly provider in your local service area for the time being, does GTE (General Telephone and Electric) favor policies that legally endorse your monopoly status, or would you give up those policies in return for the ability to compete in other markets yourself, such as the video market?

Mr. Foster: We don't view ourselves as being in a position of enjoying a franchise that others can't attack in any market. In any market that we have today that's economically viable on its own, we will have competition. We can't stop it and no one else can stop it. There are too many ways for people to come in and offer service. We have alternative access providers, and we have all sorts of competition. So our whole thrust is to get our cost down and our quality up and to be prepared to compete with some very, very effective companies. So that's our mindset. We don't feel that we have a monopoly anywhere.

Now in Nebraska or Montana, there are places where our customers don't have an alternative and we're a monopoly. But we're a monopoly not because someone couldn't come in and offer services, it's just not economically attractive for them to do so.

Mr. Shooshan: I wanted to turn to the audience here— you've been very patient here—and see if there are any comments or questions. John?

Mr. Sie: Well, I like what Leland suggested—

Mr. Shooshan: John, for the purposes of the person transcribing this, could you please identify yourself?

Mr. Sie: Sure. This is John Sie from TCI (Tele-Communications, Inc.) representing the cable industry, since our names have been used in vain up there.

I think Leland's suggestion on the surface makes a lot of sense. I think that if you look at the past 3 years, according to the FCC's study, it

shows that the divestiture has worked and that the competition in the manufacturing sector has brought prices down drastically so that the average rate of investment has decreased.

I think that from a theoretical modeling if we can use that which is really a declining price cap, which covers the trend, and then any other investment they would like to make will be on a competitive basis. We would welcome that. But what we have heard about is really an accelerated depreciation into not so much the local loop but the local loop in distribution with no economic justification. Therefore, the price cap goes up. I think that's the key, sir, to the institutional cross-ups that the telephone company is talking about.

So we agree on removing the barriers. From a social basis, I think, we ought to look at a trend. I don't think that if the telephone industry is willing to take a de-escalating price cap that matches some economic model of the efficiency that was accrued, I, as an individual, would object to reviewing that kind of analysis.

Mr. Foster: I think we would be happy to follow the rate trend set by the cable television industry over the past 5 years.

[Laughter.]

Mr. Foster: Which, by the way, is an unregulated monopoly.

Mr. Sie: That's because we are using anticipatory pricing based on risk capital we raised from the banks and is not off the back of the ratepayers on a guaranteed rate of return.

Mr. Shooshan: Henry?

Mr. Geller: Because John is here, I want to raise something that does not concern efficiencies but is an attack on the cable industry so that he can reply. We have been talking about efficiencies. But regarding quality of life—besides education, besides health, and besides whatever contribution—and I associate myself with Ken Phillips and Irwin Dorros on that—there is the question of democracy and how information comes to us—the First Amendment issue, which is terribly important to the United States.

I think that one of the functions we want out of public policy in the 21st century, and as early as we can get it in an orderly fashion, is a common

carrier broadband distribution way into the home. I'm not arguing that it's the only way. I like the diversity of over-the-air broadcasting, DBS, and cable, but you need a common carrier in there for the Associated Press Principle—that the underlying assumption of the First Amendment is that American people get their information from diverse and antagonistic sources.

You can say that we do have a broadband common carrier: it's called cable television and goes by 85 percent of the homes. It is a television packager, a telepublisher, and it claims to control the content of all those channels into the home.

The 1984 act tried commercial—

Mr. Shooshan: Henry, I think John has the gist of your comment.

[Laughter.]

Mr. Geller: I think CNN is wonderful. But the reason why you have only one 24-hour news system in this country is not that the market couldn't support more but that TCI said no. After that, NBC, which is spending $300 million for news, came back with CNBC. The contracts say that CNBC is not to go into any general news. The FCC laid it out in the report, and I believe that what we have is a First Amendment horror here in the cable industry. We need, in the 21st century, to promote that broadband common carrier highway.

Mr. Shooshan: Okay, I think that he gets the point, Henry.

[Laughter.]

Mr. Shooshan: John, by necessity, a quick response, please.

Mr. Sie: Yes, I'll give a quick response. First, I hope that you'll respect the cable industry's own First Amendment rights to put in some risk capital and do things.

The question of access to information—and I think people are also confused in terms of cable's trying to get access for various voices to speak. That's a little different in the practical application where you have a lot of what I would call videophiles that want to produce programming to put on the air.

I'm all for that. I think cable has been more than generous in its negotiation with the city to provide that kind of access. As far as commercial access is concerned, so far the least access has not worked because it has not been economical, in our opinion. We have never had people come to us and say that they want to lease that capacity from us.

So I think that we have a network. We have a network that in the future will provide the capability to lease to somebody else the capacity without abrogating our own First Amendment rights.

Mr. Shooshan: Okay. You can use your 1 minute for this, if you want.

[Laughter.]

Mr. Shooshan: What I want to do is the same thing that we did this morning: go down the line, starting with Ken. I'll ask each of you to take 1 minute. We will keep you to that minute—because we don't want to keep Chairman Markey and the lunch crew waiting—to suggest one current policy that you would change or one new policy that you would like to see adopted.

I'm going to spare Charlie and Diane from that. They can use their 1 minute for whatever they want.

Ken, go ahead, and please keep it to 1 minute.

Mr. Bleakley: As a government spokesman, I'm going to find it difficult to talk about changing policy, but I'm going to issue one warning to everyone else and use my minute for this. There is a lot of good, healthy debate on domestic issues in the United States today, for example, the valid points raised by the panel and by the audience. You have to be careful about trying to link this to some sort of international goal when you may not have made the case.

We do have tremendous problems in international competition. The United States is unique in the world and you see it in two very important areas.

First, this question about divided jurisdiction is almost unique to the United States. The Federal Republic of Germany—the Soviets have to face right up to it.

[Laughter.]

Mr. Bleakley: But it's almost unique to us. Second, regarding competition, I'm amazed to hear people trying to justify policies in terms of the need for more competition, with which it is easy to agree. But then to say that somehow the reason that we have to do something domestically is that the rest of the world is so competitive is not correct. The fact is that the United States is still well out in front of the rest of the world in terms of introducing competition into its telecommunications structure.

My only point would be not to attempt to create links to international policy that may not be there.

Mr. Shooshan: One minute, Leland, please.

Mr. Johnson: In so many debates about telecommunications infrastructure and international competitiveness, I've seen so much of a tendency to search for the technological silver bullet. If only, for example, we could have fiberization of America, that would somehow improve our competitive advantage. We must avoid focusing on particular technologies as being the solution to any of our problems.

Rather we should think about the process. What is the process with which we go down the road for the next 10 to 20 years?

Mr. Shooshan: What would you change about it?

Mr. Johnson: What would I change?

Mr. Shooshan: Yes, quickly.

Mr. Johnson: I would emphasize price cap regulation, going into the details that John Sie is concerned about—

Mr. Shooshan: Okay, there's your 1. Henry?

Mr. Geller: The function we need is a broadband switched common carrier highway going into the home. I would use accelerated depreciation. I think that it's a federal-state area. I think you need true open architecture, the unbundling of transport, and the switch. I think you have to rationalize prices, at the local level particularly, and target the subsidies to those who need it. I think you need a federal captain. And I think you have to stop suppressing competition the way we are. And finally, one of the most—

Mr. Shooshan: 10 seconds.

Mr. Geller: I'm not over my minute yet.

[Laughter.]

Mr. Geller: And in the spectrum area, we have to give flexibility to everybody and allow them to use whatever technology they want and to auction the spectrum.

Mr. Shooshan: That's a good lead-in for the third panel.

Mr. Foster: I don't think that it makes any sense to restrict what seven great telephone companies—none of which I'm associated with—should be able to do in this country. I think that we should lift the MFJ as soon as possible. I think we ought to eliminate the cable cross-ownership ban. I'll stop at that.

Mr. Shooshan: Very good.

Bill?

Mr. Davidson: I think it's great that I get the last word, because the rabbit never wins the race. I hope that you appreciate the pace I got these greyhounds to run at by starting off the session.

[Laughter.]

Mr. Davidson: I want to make a couple of points. First, I question the assumption, again, that marketplace and private network solutions are going to be the answer to our problems in this area. There are social dimensions to the policy issues we've been addressing.

I also question whether the private networks themselves are the best solutions for the corporate community of the United States. I see us building, in essence, a lot of great corporate jets without any landing strips.

Mr. Shooshan: How about one quick policy change?

Mr. Davidson: I spent a lot of time on the minutiae of alternative regulation programs in various arenas. We need to let the public networks

compete, and we need a nonadversarial relationship between the parties to public network telecommunications policy.

Mr. Shooshan: Actually, Charlie and Diane will have the last word.

Are there any additional comments from the perspective of NTIA or the FCC that you would like to provide?

Mr. Oliver: Well, I would just like to address a point that Patricia made early-on concerning the question of whether telecommunications is more important than education. The answer to that question is no. Knowledge is everything, but knowledge, like money, has velocity. We have to be able to move knowledge and information around.

This is particularly important in the arena of international competition, because 42 percent of America's manufactured exports come from technology-intensive industries. That's a higher percentage than any other country in the world has. That is our comparative advantage. It's very important that we be able to link together not just the subsidiaries of Boeing aircraft and other big companies, but that the smaller boutique outfits also be able to participate in the exchange of CAD/CAM (computer-aided design/manufacturing) engineering and the exchange of customer-oriented cash register information.

Mr. Shooshan: Thank you. Diane?

Ms. Cornell: I'm going to pick up on this theme of competition, which is getting a little redundant at this point. I just want to respond to a point that Ken made. The Commission at least—and, I hope, other government agencies—is going to be looking toward finding ways to introduce competition as much as possible, not because it's done in the Western world but because it's been proven to work. Look at the interexchange market, for example. But we have to be aware that it has to be some kind of effective competition. I don't mean competition in the cable sense, but it has to be competition that takes cognizance of the players involved and the market power of players as they are. I think that we can move that way, be it PCS (personal communications system), if we have to find spectrum, that's a way to go, safeguards on cross-subsidization—whatever we need to do, I think that's where we're going to head.

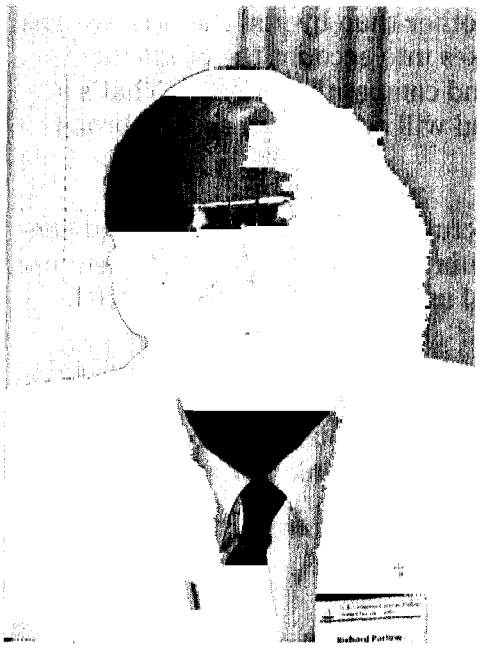
Mr. Shooshan: I want to thank this panel very much for an enlightening discussion. We got some policy points out on the table and even some linkages to this afternoon's panel. So we can end the morning completely satisfied with ourselves.

Spectrum Management

Ms. Dennis: This morning we had a nice segue to the issue that we're going to be discussing this afternoon when Henry Geller started out with his wish list of a number of policies that he would like to see changed or implemented. Among them were flexibility and the usage of spectrum and auctions as a different means of allocating spectrum.

First, we should ask if anything is broken. What is wrong with the current method of allocating spectrum? Clearly with the burgeoning of personal communications and the need for spectrum; the need of industry for mobile telephony; and the need for small business users, for example, to be able to use mobile phones in their cars to enhance productivity and increase productivity in this country, the specter of spectrum wars is increasing.

I'd like to start with Dick. I know that there has been a spectrum study, the results of which have not yet been released by NTIA. It was started last year. Why did the Commerce Department think it important to look at spectrum issues?



Richard D. Parlow

Mr. Parlow: Well, Patricia, I think we can look at the subject of spectrum and the use of radio communications and agree that new technologies provide the potential for many new service offerings to our governmental agencies, the private sector, and to the general public at large. Spectrum and the management of the radio spectrum is an extremely important subject that has received a lot of recent attention nationally and internationally.

If you look back over the years, you'll see that spectrum management hasn't received a real hard look in over 20 years. Our view regarding the need to review the process complements the actions of a lot of U.S. industry—and I think it's something that we see happening in government more often—the concept of total quality management, where we can look at processes and the products and the customers, recognizing that there is always room for improvement.

Our view was that a need to look at it existed, a need to look at the processes and a need to look for areas of improvement. We also recognized the fact that it's a subject that is extremely important to our federal agencies and our industry and to our competitive picture around the world.

It was our view that it was timely, and there were a number of key areas that had to be looked at. We felt that it was important to take a look at our regulatory process and the relationships that are there. We felt that it was extremely important to take another look at the way spectrum is blocked out by various services. Anyone familiar with the process can recognize, just by looking at the allocations table, that it's a real hodgepodge of services and of footnotes, and this tends to be somewhat restrictive in terms of opportunities for innovation and flexibility. It's important to look at ways of incorporating more flexibility in the process so that our entrepreneurs and industry can move on and do a much better job.

One other area that we felt was important to look at is the concept of spectrum value and the introduction of economic considerations in the disbursement of spectrum. This morning, Henry Geller made some comments with regard to this subject, and clearly it's an area that needs to be addressed.

Ms. Dennis: You mean a different way of allocating spectrum?

Mr. Parlow: Of disbursing spectrum other than by just the processes as we see them today, a process that takes into account the economic dimensions, the value of spectrum, and competitive bidding. That's a subject that I'm sure has received, and will continue to elicit, a broad variety of views.

Ms. Dennis: Dick, I have one final factual matter. I've read a lot of conflicting analyses of how much spectrum is allocated for government use, how much is allocated for commercial use, and how much is shared. What is NTIA's view of the actual fact?

Mr. Parlow: Well, the Dingell bill said that the government controls 40 percent of the spectrum below 5 gigahertz. If you look at all the allocations and the footnotes and things like that, I think you will find that in that block of spectrum—

Ms. Dennis: What do you mean by "footnotes?"

Mr. Parlow: Footnote allocations. In addition to the allocation table, there is a footnote that says that a particular block of spectrum or group of frequencies can be used by any number of users, government and nongovernment, for the various purposes.

So getting to the bottom line, roughly about 15 percent of the spectrum is used exclusively by government users and around 30 percent is used exclusively by nongovernment users. The rest is primarily shared. So most of the spectrum is shared in one form or another. But there is a certain amount of imprecision in coming up with those numbers. I think that the key is how you take and meet the national needs and the mutual interests of both the government and the nongovernment users in the national interest. I think that's what the spectrum manager's goal ought to be.

Ms. Dennis: Have you reached any preliminary conclusions? In other words, is the process broken, and do you need to fix it?

Mr. Parlow: I think that there are a number of things that can be fixed. Right at the present time, we're just in the process of doing the final editing and putting points together. I think that it will be out on the street very soon.

Ms. Dennis: Anything you can share with us now?

Mr. Parlow: I think there will be a definite recommendation to apply competitive bidding for new spectrum that's made available. I think there is also a need to incorporate significant additional flexibility into the allocation process. I think that is extremely important because the services are becoming much more blurred. If you consider mobile satellite, there is maritime, and aeronautical, and land mobile. All services look similar; they're all being provided from similar platforms. Why not just call them all the same thing? I think that this would provide additional flexibility. These are just two very short little examples.

Ms. Dennis: Doctor Stanley, when I first came to the Commission in June of 1986, there was a docket ongoing at that time, the 800/900 megahertz docket. It was quite contentious. I was told that I was going to break a tie, although it was one-one-one-one vote and not a two-two as some thought. It ended up being a three-two vote and we ended up allocating 10 megahertz to cellular carriers, 6 to public safety, and 10 to private radio; 4 were held in reserve.

I remember that in going through that process, there had to be a better way because I did not know where truth was. I had engineers who I thought were scientific—apologies here to engineers. But there were conflicting analyses by different engineers. It was very difficult, if not impossible, to assess the conflicting needs. How could you balance a

need of a fire department to have spectrum in Los Angeles against the need of the cellular industry in that same city? It was very, very tough.

Has the Commission, because of the difficulty of making spectrum decisions and allocations, had the same approach, or is it looking at something different from the historical allocation process along the lines of NTIA? Are you going to listen to NTIA? What are you guys doing at the Commission?

Mr. Stanley: That's a very good question. I would say that the Commission is largely following the same process that was there when you came and was there when you left.

Ms. Dennis: A political one, then? You just get beat-up by all sides and throw your hands up and hope that you guess right?

Mr. Stanley: I would prefer to describe it largely as one of an administrative decision.

[Laughter.]

Mr. Parlow: You're the salami in the sandwich. Remember that.

[Laughter.]

Ms. Dennis: Salami in the what?

Mr. Parlow: Salami in the sandwich. You're always pressured from all sides.

[Laughter.]

Mr. Stanley: Spectrum allocation is an administrative decision. For example, it was our job to bring forth the technical aspects of the administrative decision. There are significant policy and economic aspects. Not unlike other processes that are clearly judicial decisions, the current process depends on the political astuteness of Commissioners, such as yourself, as to how the commodity spectrum should be used.

I think that anyone that has done the job for more than 2 weeks would say that surely there must be a better way. We have struggled over the years to try to get more technical and economic information upon which

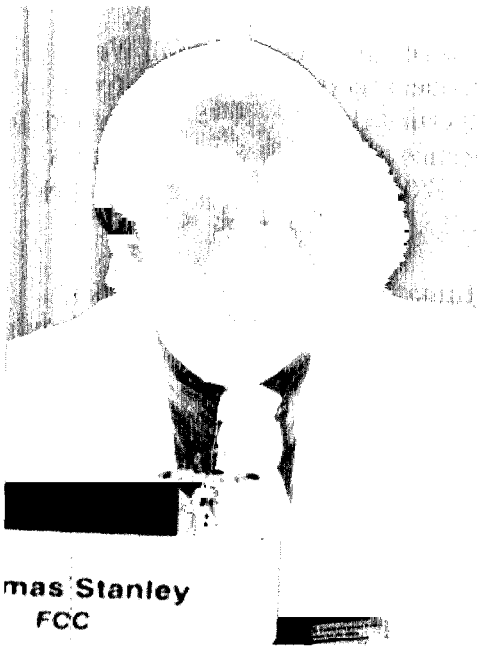
to make the spectrum decisions a little clearer in one direction or another, but, I would say, that's still largely one of administrative detail.

Many of us inside the Commission look to a more economic distribution of the spectrum resource as something a little closer to being fair—to a decision that many people could probably live with. Spectrum economics is the longer-term way out of this; the FCC certainly has not been shy about pointing this out to a variety of Congresses and to the administration over the past decade.

Ms. Dennis: I know that there have been some interim steps suggested, for example, flexible use of the spectrum. Do you want to describe that and then tell us why the broadcasters objected to it?

Mr. Stanley: Shall I describe it?

Ms. Dennis: Yes, Tom, go ahead and describe it.



Thomas P. Stanley

Mr. Stanley: Let me just pick the example that I would consider semisuccessful. There is a very large hunk of prime real estate in 800/900 megahertz that you referred to. We have 50 megahertz allocated to two cellular carriers in each community. Currently those numbers largely are—

Ms. Dennis: And we'll get back to that set-aside later.

Mr. Stanley: This is largely, I would say, a vestige of policies from the 1970s and the early 1980s as to how much spectrum that industry needed. It's pretty clear—and it became clearer in the mid-1980s decisions that you assisted with—that in some areas, if the pace of growth was to continue, even that spectrum was going to be used up. So the Commission asked, Why should the cellular industry have to come back to the Commission and ask for more spectrum or to be able to come up with a new technology?

So the Commission said in this particular band, the spectrum resource is largely the cellular industry's to develop in terms of technical standards and operational principles. So the use of alternative technologies, alternative operations that would lead to a more complete use of the band,

was virtually exclusively in the hands of the cellular providers themselves. In effect, this will be the means for getting from the first generation of cellular technology that we're using now to the second generation.

If you look at it this way, you'll see that the first generation took us 11 or 12 years to implement. The second generation is simply a matter of sending a postcard to a deputy division chief in the common carrier bureau. So we really feel that there is no regulatory barrier now because of this flexibility. We're very happy about that.

Ms. Dennis: Why did you oppose it then, Barry?

Mr. Umansky: Because of our concerns over the flexible use of spectrum, based upon some of the most fundamental principles that have governed NAB's (National Association of Broadcasters) position on most spectrum issues.

Ms. Dennis: You mean that we got it and we want to keep it?

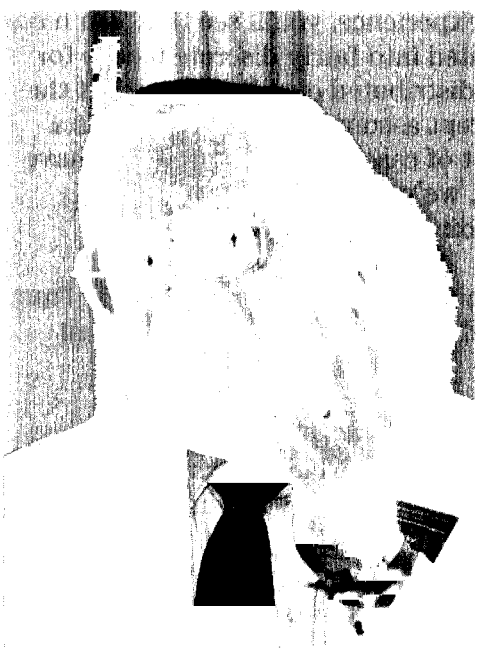
Mr. Umansky: Basically, we want to have a nice, clean signal. We depend on the spectrum as our only mode of getting a program from point A to point B. We were quite concerned that the concepts of flexible use of spectrum and effective interference and many other principles that were being discussed during the 1970s and 1980s would not work to the best interests of our signal quality.

Right now we would like to see a continuation of the notion of block allocation of spectrum so that we can use that spectrum with certainty. The notion of progress and advancement in technology is not foreign to us. In fact, I'm hopeful that later on today, we'll be talking about a whole variety of ways that we would like to have that certainty of allocation in order to enjoy technological advance. We're on the cusp of HDTV.

Digital audio broadcasting is within our grasp provided that there are the right choices made by this government in terms of spectrum allocation and taking best advantage of that mass of stations now distributed equitably among states and communities. There are 11,000 radio stations and 1,500 television stations. We think that this group of broadcasters, providing a free service—as George Vradenburg discussed earlier today—should not be ignored as we move into the future. There

is no reason why we couldn't use new technologies to enhance that service for the public free of charge, something that no one else at this table plans to do.

Ms. Dennis: Leonard, your former Chairman of the Board, Bob Galvin, gave a fascinating speech a few years back. He talked about that big hunk of UHF spectrum that broadcasters currently have allocated. Would you like to share with us his vision and respond to Barry here, if you can?



Leonard S. Kolsky

Mr. Kolsky: First, let me say what Bob Galvin didn't say, because that misconception aroused the furor in the broadcast community. Bob was not giving a view of 1988, 1989, or 1990; rather he was projecting over a 40-year period. He carefully pointed out that if one went back in time and tried to project what the world of telecommunications would have looked like in 1987 when he made the speech, it would have been dramatically different than one could have foretold.

It was his belief that over a 40-year period, it would be improbable, unlikely, and undesirable for the radio frequency spectrum to be the carrier of what we'll call entertainment communications. He felt, and feels, that that is ultimately going to be carried by cable and that those channels, that spectrum, will ultimately be freed up for more 21st century kinds of developments.

I think that on a logical basis, he is correct. I agree with what you said earlier—and this doesn't apply just to NAB—all the "haves" want to keep on having and they don't want "have nots" in. I don't expect NAB to embrace this concept today, but ultimately we're going to have to make spectrum allocation a part of a national policy and not just the purview of private interest. I think Bob Galvin was pointing in that direction.

Ms. Dennis: There is an underlying assumption in the Dingell bill—it's not so underlying—that there is a spectrum shortage and that there indeed will be spectrum wars. Morgan, do you believe that?

Mr. O'Brien: Yes, I think there is a spectrum shortage as long as there are businesses who would make the investment to provide a service if there were spectrum to do it. We know from the PCN (personal communications network) proceeding at the Commission that there are probably dozens of such businesses, all of which, if they knew where to put it, would be putting some kind of a new personal communications network

in place. But at the moment, there is no such place. You would have to say that there is an example of a shortage of spectrum.

Now, there may be spectrum that has been misallocated and that is being underutilized. In that sense, if you want to step back, you might say that there is sufficient spectrum but that there is just a faulty allocation and assignment process.

Ms. Dennis: Can you give us an example of that?

Mr. O'Brien: If you look at all of the uses of spectrum in the private radio area, where I have most of my experience, you'll see that you have a great deal of spectrum that is allocated into fairly discrete blocks for particular users. Those users are not distributed evenly throughout the country, but the block allocation concept assumes that they are. It's a simplifying assumption, which in a lot of cases is wrong. For us to have maximum utilization of the spectrum, we're going to have to find a device for moving away from the rigidity of the block allocations.

Ms. Dennis: Dale, do you have any thoughts on how to move away from the rigidity of the block allocations? Everybody on the panel can just jump in as well.

Mr. Hatfield: I think that we've already touched on this matter, to a certain extent. First, existing users who have large chunks of spectrum should be given the option and the flexibility of using their spectrum in the way that will put it to its highest-value use.

Ms. Dennis: As long as it doesn't interfere with anyone else.

Mr. Hatfield: Right, just like we do with real estate and so forth. The government has a very definite role in protecting property rights, and it would do the same thing here—

Mr. Shooshan: Can I interrupt for just 1 second?

Mr. Hatfield: —The government should allow the licensee to decide how to use it and give them the ability to transfer it to others.

Mr. Shooshan: Dale makes a very good point. What if the recipient of that largess doesn't want it, as in the case of the NAB? It said, "Thank you, but we don't want that flexibility."

Ms. Dennis: Does the government then force it down their throats?

Mr. Hatfield: I guess I ultimately believe enough in the marketplace that I would give the individual broadcasters the right to use spectrum in the way they chose. If for some reason they don't choose it then they are not profit maximizers; I think we have other problems in the economy. Our system is based upon profit maximization, and if people were given the flexibility, they would use it. So, yes, I would give them the flexibility.

Barry D. Umansky

Mr. Umansky: You're talking about the "haves" and the "have nots." For example, I think that if you remove video from the spectrum and rely on fiber and cable television, it would be a tremendous loss. In terms of the issue of using the same portion of the spectrum for different purposes, that takes away a very critical element of certainty for receiver manufacturers, for the public, for broadcasters, and for everyone else.

It's really unrealistic to think that you can use in Des Moines a frequency for over-the-air television and use it for something else in Mississippi. I think that these are interesting theories, but they don't really wash in the real world.

Ms. Dennis: Why is it upsetting?

Mr. Umansky: Why is it upsetting?

Ms. Dennis: I didn't quite hear the word that you used, but you said that there is a problem with using the spectrum differently in Des Moines than you would in another city. Why is that?

Mr. Umansky: The notion is that consumers should be able to invest in a receiver and use it nationwide. Manufacturers want to have certainty of knowing where that spectrum is going to be and having technical standards that are clear and distinct. That's another thing that we're trying to push with the FCC now. While you have the non-decision in AM stereo, the FCC moved back to the right decision with TV stereo. We hope for the same for HDTV. We hope that for digital audio broadcasting there will be a single selection of a standard so that we can move ahead and have that kind of certainty for investment.

Block allocation has taken a bum rap thus far in our discussion. It has been that kind of certainty that has led to the kind of investment that has resulted in tremendous technological advances in this country.

Mr. Shooshan: Maybe Leonard can comment on this. It seems to me to be an assumption in what Barry just said that we couldn't, with all of our microprocessor capability and fancy electronics that we have available today, build equipment that would work unless we had a block allocation approach.

Mr. Umansky: At what additional cost, though?

Mr. Shooshan: That's the question I want to ask Leonard.

Ms. Dennis: Is it cost prohibitive?

Mr. Shooshan: Right, is it cost prohibitive?

Mr. Kolsky: I can't really answer whether we could apply techniques that are going to be used in the land mobile field to broadcast, but there is no doubt that we're moving to a point at which transmitting and receiving—

Mr. Shooshan: I want to make sure that you understand my question. Maybe I asked it inartfully. The suggestion was that one reason that you couldn't use UHF spectrum in one part of the country for television and in another part of the country for mobile radio was that it would impose certain costs on the building of transmitters and receivers that would swamp the value of having that mixed use.

I'm just asking you, from your perspective, from a technical point of view, Couldn't we build radios that worked in that environment?

Mr. Kolsky: I think I was answering your question. I'll answer it in two ways.

Mr. Shooshan: Okay.

Mr. Kolsky: First, as I started to say, we're going to have transmitters and receivers that are essentially frequency insensitive because channels are irrelevant to the typical user, whether he be a broadcast listener or a land mobile transmitter. All he wants to do is talk and be received. So we can do that.

What I don't know is whether that same set of technical principles can be applied to broadcast spectrum commingled with land mobile.

Now for the second question. What we have today, at least in the land mobile field, is an urban congestion problem. We don't have a national congestion problem. If you go to Wyoming or Iowa, you can find broadcast channels available and you can find land mobile channels available. Now we're getting to the point that if we're going to implement a—let's call it technical flexibility, for example, digital—the issue is, Should we impose that technology on the entire nation even though there are large geographic areas that don't need it, in order to achieve economies of scale, or do we just put those improvements in where they are needed?

If you're talking about cellular, you might argue that as a national system you would have to put in a common technology for an across-the-nation compatibility. In the private land mobile field, we don't think that's necessary. And we expect that there will be a surgical scalpel kind of approach, not a meat-ax approach, to bringing these telecommunications improvements in. I don't see why you couldn't apply the same principle to all services.

Ms. Dennis: Morgan, speaking about being much more surgically oriented, do you want to tell us a little bit about what Fleet Call is trying to do?

Mr. O'Brien: Well, we're a company that very much believes what the FCC says about improving the efficiency of spectrum voluntarily. It just makes a lot of sense.

We acquired a number of frequencies in the most congested markets in the United States that were available for SMRS (specialized mobile radio), and we have consolidated them and aggregated them. We now are seeking permission to move the technology to the next generation and digitize and whatever. So although there is no Commission requirement that we do that, that we make the investment to do it, our desire to serve the market that we see out there is driving us to do it.

So if the Commission creates an environment—and I really think it has—an environment in which entrepreneurs are given incentives without the need for regulatory intervention to move to the next generation of technology, as the Commission has done with cellular, which Tom talked about before, it makes perfect sense. It's just a much better way of doing it. If we give the entrepreneurs the incentive, they will

make the investment to bring new technology in and increase the capacity of the spectrum.

Ms. Dennis: When you talk about increasing the capacity, isn't the cellular industry itself having difficulty picking a standard to go digital? Tom, do you want to address that?

Mr. Stanley: Sure. Having difficulty, yes, but it's not an easy problem to begin with.

Ms. Dennis: But won't that enhance the capacity of the spectrum?

Mr. Stanley: That is correct. The same system that is currently being fielded was designed over a decade or so ago, and the industry is rightfully proud of going through a very rigorous process of looking at next-generation alternative technologies for feature-related improvements, for spectrum efficiency improvements, and so on.

Standards-setting is not an easy decision process. In a sense, I'm kind of happy that the industry is doing it, and I'm not having to understand the issues and then try to package them up and convince a Commissioner that it should be CDMA (code division multiple access) or TDMA (time division multiple access). I think the best people making those decisions are those close to the problem, namely, the operators and the manufacturers.

Ms. Dennis: But you heard earlier today that there are some who believe that government should intervene more, that standard-setting is an area where there should be more government intervention and not less. In fact, Barry just mentioned the catastrophe of the early 1980s when the Commission did not choose a standard for AM stereo but indeed left it to the marketplace, and the marketplace is still thrashing about between two standards. What do you think?

Mr. Stanley: The point is a good one, and maybe the cellular is a great contrast. But generation one of cellular was completely defined, detailed, and developed and then put under the FCC's rules. It's the most regulated thing you can imagine. The second generation is virtually without the same kind of technical detail. We have some relatively minimal interference requirements. Not interference to yourself, but interference-to-your-neighbor-type rules.

HDTV is another very good example, although the FCC has yet to package up the alternatives. I don't want to call the process regulatory or deregulatory, but my guess is that the decision will involve fairly clearly defined options as to what the service is, where it should go, and what some of its major features are.

So I would hate to characterize the Commission in any one of its decisions as very regulatory or deregulatory. It looks as though it's a shifting partnership. In some areas, the Commission is very clear about wanting certain details nailed down. In others, it's not necessary for the FCC to specify every little jot and tittle of the regulations.

Personal communications, as several people have mentioned, actually has both regulatory and deregulatory extremes. Many people look to the radio part of PCS as not necessarily having to be regulated, since it's all very low-power communications—microcell—and very close to the personal side. But by the same token, they leap in and say that, therefore, you also need a particular worldwide uniform numbering system.

So some degree of detailed structure or guidelines in communications regulations seems to be necessary. We kind of look at each system and service as the decision comes up. We don't look for things not to do.

Mr. Shooshan: It seems to me that there is a fundamental trade-off that's sort of lurking beneath the surface in a lot of comments here. I want to see if I can bring that out.

To some extent, it appears that it's the trade-off between getting more spectrum and using the spectrum that one has more efficiently and that in effect we have perhaps a skewed environment today, meaning it's relatively costless to an industry to go to the government and ask for more spectrum. In fact, once you go through the regulatory process, we give it away for free, in effect.

On the other hand, it's very costly to change the technical standards to use the spectrum more efficiently. It imposes costs on the service provider and on the consumer who has that equipment out there. So the tendency under the current environment is always to go the government and ask for more spectrum rather than creating incentives to use the spectrum that industry has more efficiently.

Is that a legitimate concern? If so, how can we change the signals so that government can make a more informed decision along those lines?

Mr. Parlow: It seems to me that basically there is no more spectrum. That avenue seems to be foreclosed right now.

Ms. Dennis: At least in the short term. I mean, if the Dingell bill gets passed—

Mr. Parlow: But even there, Patricia, it's going to have to be taken from somebody on the government side and handed over to somebody on the other side. The days of the FCC—and the 800/900 megahertz—were taken away from UHF television use. Everything is going to be in the nature of refarming. There will be no easy decisions.

Mr. Shooshan: How are we going to make those decisions, then? Is it going to simply be a political call by the FCC?

Mr. Umansky: It can be a technical call. If you look at the future that we talked about from the broadcast side, you'll see that the HDTV systems that we begin testing this spring by and large are much more spectrum efficient than the NTSC (National Television Standards Committee) system, as it is used right now for over-the-air television. Digital audio broadcasting, the Eureka 147 system, which is being given the most scrutiny by the industry right now, is four times more efficient than FM radio.

So I think the broadcasters that we represent are not the spectrum gluttons that they are sometimes characterized to be. We look toward a future, after a transition period, of much more efficient use of the spectrum. I think that the Dingell bill and the Inouye bill are good ideas. We've been supporting them publicly.

Mr. Parlow: I also think that if you look at the spectrum that's out there today, you'll see that there's nothing that's going to be coming free. I think Morgan brought that out. If there are going to be changes in how the spectrum is being used, there will have to be changes, transitions, and people will have to be moved, whoever they may be. Morgan mentioned earlier quite specifically that his organization, Fleet Call, saw an opportunity. The opportunity was to be innovative and try to make that spectrum that he has available more efficient and more effective in bringing in new technologies.

I think you're seeing that same thing happening in the cellular side. I was out to the CTIA (Cellular Telecommunications Industry Association) convention and talked to a number of people out there. When I see what

things are being done in terms of looking at all the different modulation schemes, sectorized antennas, and lots of other things, I can see a tremendous amount of capacity. That capacity is now being generated because of the demand that is being created out there in those very highly congested areas. As Leonard said, the problems are in the city areas and not out in the boondocks someplace.

Mr. O'Brien: If the cellular industry thought that it could get new, clean spectrum for nothing, obviously it would take that because that's the cheapest solution. But it's clear that there isn't any more free spectrum.

Mr. Shooshan: Let me ask a question. Let's assume that the Dingell and Inouye bills pass and we have 200 megahertz of spectrum at some point that can be utilized. How should we make the decisions about what it's utilized for? And once those decisions are made, who gets to utilize it? The administration, in its latest proposal, has talked about a spectrum auction of some kind, I believe, for about 30 megahertz of that spectrum. There at least is a suggestion that has been put on the table.

Let's assume that we do find more spectrum for commercial application. How should it be allocated? How should it be assigned? What are the mechanisms that we ought to use? Dale, do you want to address that?

Mr. Hatfield: First, let me go back to your earlier point and take that one on directly.

Mr. Shooshan: Okay.

Dale N. Hatfield

Mr. Hatfield: When you say that there is a choice here between trying to get more spectrum or trying to use existing spectrum more efficiently, I think that's the right issue. What do we rely upon to do that? We rely upon price signals. You have to have the right price signals, and having them then guides the behavior in the marketplace.

We have the same thing here. The obvious solution is to try to go to some sort of market mechanism, particularly an auction sort of scheme or something like that, so that people make rational choices concerning whether to use more spectrum, use wire, or use another technology. So to me it goes right back to the pricing.

Ms. Dennis: How is public safety going to bid?

Mr. Hatfield: Well, we don't give public safety free gasoline; we don't give public safety free ambulances; and I'm not so sure why we necessarily, as a matter of public principle, have to give it free spectrum. Having been here in Washington a few years ago, however—

[Laughter.]

Mr. Hatfield: —I realize that may not be politically possible.

Mr. Shooshan: Did you ever get visited by the Los Angeles County Sheriff's Department?

Mr. Hatfield: You bet I did. And I understand that. So if that's true, the same way we allocate land by setting it aside for public parks and for other public uses, if we need to do that here, that's fine.

Mr. O'Brien: I would argue that that's what the FCC does well. It can do that.

Mr. Hatfield: If you don't do it, though, you're going to count on the fact that public safety will put in multiple channels when it could get by with one because it will get the spectrum free. You should realize that if you give it to public safety free, you're going to encourage some inefficiency on its part. But maybe that's what we have to do to move toward a more market-oriented solution. Maybe we just have to zone it that way to begin with.

Ms. Dennis: Leonard, do you want to say something?

Mr. Kolsky: Yes. This issue is always sort of amusing to me. In the first place, Patricia, I thought that you, as FCC Commissioner, did a fine job, given perhaps inadequate information.

Ms. Dennis: You also got 10 megahertz, Leonard.

[Laughter.]

Mr. Kolsky: Then I have an office that has been driven to try to improve that spectrum because there isn't any more.

But let me get back to the auction point. In the first place, every time auctions are mentioned, people say that we can't take on broadcasting.

Ms. Dennis: Why do you think that is, Leonard?

Mr. Kolsky: Because we can't take on broadcasting.

[Laughter.]

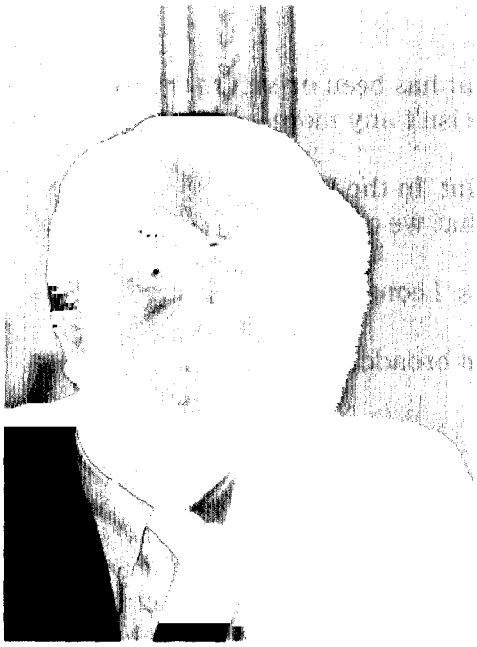
Ms. Dennis: Come on.

Mr. Kolsky: I see that Dale is now going to exempt public safety. Pretty soon, you'll have three or four cats who are fighting over a scrap. That scrap, therefore, is going to have a disproportionately high value. What we have been advocating is that if you want to auction spectrum, let's auction all spectrum. Now let's create a real valid balance between supply and demand. Then if the market value of spectrum is whatever it is, that's fine. But I think that if you take a sliver of spectrum and take services such as cellular private land mobile, and some others and argue over it, what's going to happen is inevitable. If you go to an auction, there isn't much doubt about who is going to win that battle, is there?

When you start to exempt public safety, I think, there are two problems. First, you have to make a decision about how much you're going to save for public safety. Then let's assume that the auction is a success. Does anybody really think that next year, people won't say that public safety can get by with a little less because that would put more in the auction pot?

I think you make those judgments all the time. If you want to—

Mr. Shooshan: Leonard, don't you think, though, with all due respect, that the problem is that if we do this in one area—such as this new spectrum for PCS—it might work and that will undermine all the myths about how we can't use a market?



Morgan E. O'Brien

Mr. O'Brien: Are you suggesting that it would be new spectrum today and old spectrum tomorrow?

Mr. Shooshan: I'm saying that—

Mr. O'Brien: What need do we have for auctions once the only available spectrum has been made available?

Mr. Shooshan: Proceed on my premise, Morgan. We're talking about new spectrum that is going to be made available after the passage of the Dingell bill.

Mr. O'Brien: Right.

Mr. Shooshan: Let's assume that happens. As a matter of public policy, how would you assign that spectrum, and then how would you award the use of it and the licenses for it once it's been allocated?

Mr. O'Brien: I'm somebody that has been through dozens of private auctions for spectrum, so I think anybody who argues that we don't have spectrum auctions now just has never been in one. I would much rather see that money go to the government than to every Tom, Dick, and Harry.

So I'm in favor of it. I'm just trying to raise the question of whether you're looking at auctions as a redistribution of existing spectrum mechanism.

Mr. Shooshan: I'm looking at auctions as a way of getting some market signals to come back to decisionmakers so that Tom Stanley's job can perhaps be done more efficiently. Tom, do you want to comment on that?

Mr. Stanley: Yes, let me respond. I would say that the most direct response to your question really is that we have two major paths.

First, we have the existing administrative process, sort of a battle of hyperboles, in terms of who needs more and who needs what. That's something the Commission can sort out.

Ms. Dennis: That's a kind description.

Mr. Stanley: Yes, I was trying to be polite.

[Laughter.]

Mr. Stanley: The alternate path, I think, is a political one. It is a political process, and it will take a political process to change it. You're hearing a lot of this here—and, I guess, we've heard it in different forums—that if a particular community—say manufacturers; operators; or, heaven forbid, the communications bar—has no real reason to change a particular process, it doesn't get changed. In a sense, who has the incentive? Where do you hear that there has to be a better way? You hear that largely from the Federal Communications Commission, which has to implement a change. It knows how imperfect a process it is.

Ms. Dennis: One of the things that we would like to do is to encourage more audience participation. I understand that there are some people out here with burning questions. Now they have become silent. Is there anyone who would like ask a question now?

Mr. Shooshan: Who is on fire to ask a question?

Mr. Webre: My name is Philip Webre with the Congressional Budget Office.

I was interested in talking to the people who would be arguing against the NAB position. When you talk about putting in essentially smart land mobile radios that can tell your frequency, you're talking about a situation where you have at most a few hundred thousand of those units.

There are, I think, about 200 million NTSC receivers out there. The question of changing them over to different parts of the spectrum strikes me as not a technically or economically small issue. So I would be interested in hearing more about what you're going to do if, in fact—and I suspect that Mr. Hatfield is right and that he can auction off his spectrum—they start doing it and pretty soon all the 200 million television sets out there are useless.

Mr. Shooshan: What's the question?

Mr. Webre: I'm interested in playing out the economic scenario. If that is the inevitable road, as I think you are forecasting, that you're going to go into, as a political animal, I would say that there are going to be a lot of forces that will go in there to stop it, even the small auction that there is, because of the inevitable train of events that might follow.

Mr. Hatfield: I think you have an underlying hypothesis there that I don't think I'm quite willing to accept. For example, the way that HDTV will be done is to put a signal into currently unoccupied channels in a way that will not cause interference to existing sets. So I would argue that if one can put an HDTV signal into an unused channel, one could also put a digital audio broadcast signal in that same channel and not obsolete existing television receivers as well.

So I'm not sure that the issue is quite as either/or as you're saying. Obviously, we do have a huge investment in existing receivers out there, and you can't allow people to run high-powered land mobile radio systems on channel 12. I don't think that that's what is being proposed, though.

Mr. Parlow: Dale, you've also brought up a very good point, that we're going more and more toward a digital world and a digital bit stream is a stream of information that can, in fact, be controlled. So there are many, many things that can be done with that. I think that we have to be innovative in our thought process in terms of trying to take advantage of that.

It may turn out over the long run—depending on what direction HDTV takes—you're going to have a totally new system out there and NTSC may just, at some point, cease to exist.

Mr. Umansky: I think you're both right. The question you had about land mobile's interference with existing television is absolutely a problem. It would be a huge problem. There is $66 billion worth of equipment in the hands of consumers, and they don't want to see these receivers not work.

The future for over-the-air broadcasting—there has been mention of HDTV and digital audio broadcasting—will, by and large, concern the movement to new spectrum. For digital broadcasting, there will be a transitional period. We want to have new spectrum to occupy, then eventually perhaps give up the existing FM spectrum.

AM can't really be used for much other than broadcasting and might be retained primarily for long-distance coverage. For HDTV, there are several scenarios being painted right now, but again, I think you're talking about how after a period of years, you won't have these kinds of conflicts.

Mr. O'Brien: It is true, however, that we share spectrum with the broadcasters right now, after the last 20 years. It can be done.

Ms. Dennis: I'd like to ask a question—and you all just join in. The big, sexy issue right now is personal communications services. Chairman Markey asked at lunch why it suddenly became PCS after being PCN beforehand. I don't know whether that's important enough to answer right now, but on PCS, where do you think the spectrum is going to come from? Doctor Stanley?

Mr. Stanley: That question should be directed to other countries; the answer is roughly in the 2-gigahertz arena. The Commission's inquiry into the process asked rhetorically, Why not 800/900, or why not this 2-gigahertz band? We may have mentioned others. But I think that in a sense, it is relatively wide open. We cannot look the other way, however, when a large fraction of the world seems to want PCN at approximately twice the current frequency.

Ms. Dennis: Does everybody seem to agree with that statement?

Mr. Parlow: Well, I think the technology is driving you into that block between one and three and it's a matter of where you select. I think that there are a lot of factors that come into play, one of which Tom brought out. Where is the rest of the world going? We're no longer an island. If we're going to talk about some kind of seamless communications infrastructure over the long run, if we want to have any type of mobility and roaming, if mobile is going to be the wave of the future—which I think it is—you have to recognize where the rest of the world is going. Either you influence it to go in the direction you want, find some middle ground, or go in the direction it wants. So it's a big trade-off. Where is it going to be? That's a good question.

Mr. Kobb: I hope that we get back to that point, but I have a question about an earlier matter.

I'm Benn Kobb with Federal Communications Tech News.

I'm interested in how the advocates of spectrum auctioning propose to deal with the role of nonlicensed radio services, which promise to play an even greater role in PCS of the future. A number of the parties in the PCS inquiry are advocating nonlicensed services as ways to meet at least a portion of the need, possibly a lot of the need, for PCS. The FCC also has a proposal for a new part 16, which would take some of the successes in part 15 and fine-tune it a bit to make it more attractive and less risky for manufacturers. Who is going to advocate for an adequate allocation to nonlicensed services when there are no particular parties who would come in to contribute money to the federal government?

Mr. Hatfield: I would just make a quick comment. I think that a nonlicensed service, by definition, doesn't convey a property right. If it doesn't convey a property right, it's kind of hard to auction it. I would look at that as more of a common area in which everybody has rights. Everybody can go into the Boston Commons. I think that that's more what you're talking about. I see those as being two very, very incompatible things. I don't see how you can auction something that you can't get any kind of exclusivity for.

Mr. Shooshan: Let me ask a question just to try to get another set of policy issues out on the table here. One of the, I'd say, controversial aspects of the cellular decision, depending on how you approach it, was the set-aside of spectrum for the wireline carrier. To the extent that we are talking about policy decisions, Dale, I wonder if I might ask you to lead off on this question. What do you think, as a matter of public policy, about establishing set-asides for particular industries in the allocation of new spectrum?

Ms. Dennis: For PCS?

Mr. Shooshan: In any context.

Mr. Hatfield: Let me go back. Since I was associated somewhat with that original set-aside, I think that part of the problem is that we delayed cellular so long that it seemed like that was one way to move things faster. I think that there was a special situation that led to that decision.

I think what concerns me more is the fact that the telephone company has been able to acquire the other side, in many instances, which I think has discouraged the potential for cellular to compete with the ordinary

local loop. That's a long way of getting to the current situation with personal communications. I hold out some hope that it can be competitive with the local loop. Therefore, you can more comfortably get rid of the line of business restrictions and some of the things that are tied into that monopoly.

So I would hope that PCS could lead to some of that competition. That then leads you to the question, If we allow the Bell companies, for example, local exchange carriers, to have that spectrum, will they then be able to discourage additional competitors? I think that comes back to a whole bunch of things that we talked about this morning, like open network architecture and things like that to make sure that they can't leverage, if you will, their existing wire-line monopoly and dominate this new wireless technology as well. So we need some good protection there.

I probably stopped short of saying that we ought to have an outright ban, but we ought to be darn sure that there is protection so that they don't destroy what could be a potentially new competitive—

Ms. Dennis: Do you really think it's going to be a quick decision, Dale?

Mr. Hatfield: A quick decision?

Ms. Dennis: Yes, of where that spectrum's going to come from? You used that as the underlying reason why there was a wire-line set-aside to get the service up and running in cellular.

Mr. Hatfield: Yes, that was the original intent.

Ms. Dennis: And you don't think that this is going to be a lengthy, drawn-out proceeding either?

Mr. Hatfield: I think it will be.

Ms. Dennis: And you don't think that—

Mr. Hatfield: I think it could help, though. I think there is some chance here. I think that if we allow marketplace forces to work, where existing private microwave workers can be reimbursed for moving, we can facilitate movement into this 2-gigahertz band. Of course, that's the solution that I personally would favor, letting the marketplace work here. If it's

a higher value to have PCS than private microwave, why should the federal government stand in the way of privately beneficial transactions? Let people make the transactions.

Mr. Shooshan: There was a suggestion implicit in your comment about cellular that I just wanted to explore briefly. Do you see the problem in the development of cellular to be the fact that telephone companies have somehow leveraged their switched closed transmission network, so to speak, to the detriment of the development of cellular? You suggested that the telephone companies would somehow stifle the development of PCN. Have they stifled—

Mr. Hatfield: That's clearly the history. The cellular industry fought desperately trying to get Type II interconnection. They've still had problems. Even Peter Huber, author of the "Huber Report," was rather critical of the line of business restrictions. He identified the difficulties that cellular had—and I was involved in some of that—in trying to get efficient forms of interconnection. As a matter of fact—

Mr. Shooshan: There has also been a suggestion made that once the regulators said that the telephone company must give the same type of interconnection to the non-wireline provider as it did to the wireline provider, that problem was resolved, wasn't it?

Mr. Hatfield: No, I don't think so. I think that if you talk to the non-TELCO providers today, you'll see that they still have concerns about interconnection and equality in the sense that saying that I will give you the same thing that I give myself is not adequate because I may want to do something different from what you do. In fact, I may want to compete with you. Therefore, it's not clear to me that the incentive is just to say that equal is enough. I think that you may have to go beyond that. I'm not going to facilitate your competing with my business if I can help it. So I don't think this is quite enough to ensure that we can get to a competitive local loop situation here.

Mr. Shooshan: I'd like to make one last point before we leave set-asides. It seems to me—this is going back to Barry—that NAB is fast moving to, if it isn't there already, a policy of spectrum set-asides for the broadcasting industry. The solution seems to be evolving from the HDTV deliberations of the Commission that we have a set-aside, in effect, of spectrum for each incumbent television station so that each can begin to simulcast in HDTV. Similarly, the digital audio radio entry strategy seems to be to give additional radio spectrum to each incumbent broadcaster so

that each can adapt to digital audio technology. How is that set-aside defensible?

Mr. Umansky: Well, again, it seems to make an awful lot of sense if you try to expedite the introduction of a new technology. We saw the seeds laid in cellular, which of course is not a mass media issue. The FCC, in the AM radio area, as a matter of fact, has decided that the expanded band should be set aside for applicants operating on the existing band to achieve a public policy of reducing the interference on the existing band. With HDTV and DAB (digital audio broadcast) as well, the notion is that you have an in-place setup of locally responsive video and audio outlets providing what the Congress asked for, locally responsive service distributed equitably.

Why not allow these broadcasters to be the ones to get higher technology, to be able to improve their service to the public, and to obtain the spectrum necessary to do that? It makes an awful lot of sense to us, and that's something that we're trying to push at the FCC, both in HDTV and with digital audio broadcasting.

Ms. Dennis: Although I remember people coming to the Commission saying that what that policy essentially did was shut out the likelihood of increasing the number of minorities in broadcasting and women, that's a policy decision that the Commission has to wrestle with.

Now I'm going to give each of you 1 minute to tell us what policy you think should either be changed or implemented on spectrum today.

Dale?

Mr. Hatfield: Pass the Dingell bill.

Ms. Dennis: All right. That's less than 1 minute.

Leonard?

Mr. Kolsky: Can I use his 30 seconds?

[Laughter.]

Mr. Kolsky: I think that the present system has been maligned. I think it needs the increased flexibility that the Commission is now turning to. I don't shy away from auctions, I would just like somebody to tell me how

they're going to work. Basically, what we need is the ability of the government to "fess up" to changing times, changing allocation needs, and be willing to correct it.

Ms. Dennis: Morgan?

Mr. O'Brien: I also think that the existing system is pretty good. I think with more spectrum—and, I think, more spectrum is probably inevitable, politically—and a more flexible approach with the Commission in keeping an eye on how successful the marketplace has been in driving new technologies, really less is more in this area as far as regulation is concerned.

Ms. Dennis: So you wouldn't change any policy currently or put a new one in?

Mr. O'Brien: I think that the Commission should stay the course. The more certainty there is out there, I think, the better it is for industry.

Ms. Dennis: Do you think there is certainty with the current process?

Mr. O'Brien: There is some measure of certainty.

[Laughter.]

Ms. Dennis: Dick?

Mr. Parlow: I think that there is a definite need in the United States to have a more forward-thinking spectrum management process. I think there is an absolute need to have what I would call strategic planning, sort of looking ahead to provide the baseline from which the United States can become more competitive in the world community.

I think, with regard to the distribution of the spectrum—that Leonard hit one of the points on the head. We need to consider the value of spectrum in auctions. I think there has to be flexibility in the allocation process. I think that it would tend to make the process more responsive to our needs, both nationally and internationally.

Ms. Dennis: When you say flexibility, do you mean to allow flexibility by the user or—

Mr. Parlow: By the user in terms of the allocation process because, I think, the process has been very difficult to work with. I think that we have to provide more flexibility if we're going to get the best bang for the buck out of the spectrum.

I also believe that if you look at how we use the spectrum, you'll see that there's certainly a need to have a more open and responsive process. Certainly NTIA is going to be going in that direction.

I think that there is a need for better information in terms of how we use the spectrum in terms of better data bases, because if we're talking about how it's being used, we have to have a better understanding of how it should be used and what the opportunities are. We have to have a better understanding of how it's being used.

Ms. Dennis: How are you going to get the Department of Defense to tell you more openly what it's doing with its spectrum?

Mr. Parlow: We're heading in that direction. I think that there are some things that can be brought out into the open and others that cannot.

Ms. Dennis: When do you think you'll get there?

Mr. Parlow: It will take time.

Ms. Dennis: My lifetime?

[Laughter.]

Mr. Parlow: No, I hope not, unless next week you're going to get hit by a car.

Ms. Dennis: Doctor Stanley, what would you do? If you were a Commissioner, what would you do?

Mr. Stanley: I think that if there were a magic pill to take to make it better, it would be variations of what Dale had mentioned—certainly the Dingell bill suitably modified to take into account some economic mechanisms so that the public exploits the new resource. I think that either auctions or fees are alternative techniques.

But even doing this is still only a couple hundred megahertz. This is a hell of a way to run a railroad. Still, to force spectrum either out of the

broadcasters or the federal government is a very awkward way to modernize and keep up with the rest of the world.

So it's just a pill that the Dingell bill is representing. It will make it better, and I certainly hope it passes, but it's really not the solution for the long-term natural development of the resource.

Ms. Dennis: Do you have any solution for the long term?

Mr. Stanley: Probably a better joint process between the FCC and NTIA. I think that, as Dick mentioned, some openness is certainly a step in the right direction. That alone would help very much, that is, to make information that certainly is available to the FCC available to the public. It would certainly make for better-informed decisions.

Ms. Dennis: Okay.

Barry?

Mr. Umansky: Although we support the Dingell bill, I think that it's important that we not take away any of the spectrum used to make those Patriot missiles work, first off.

[Laughter.]

Mr. Umansky: But as far as the mass media is concerned, we think that the government should take best advantage of the existing setup of over-the-air broadcast stations and make it national policy to allow this equitable distribution of over-the-air, free, universally available facilities to become upgraded with higher technology. We easily can do that, in my view. There is enough spectrum for this to be accomplished and for other techniques and technologies to be accommodated as well.

In the video area, we do not want to see the creation of a system of "haves" and "have nots." We do not want to see video removed from people who can't otherwise afford it or from those who are not being served by fiber, by cable. We want to see continued universality.

And one matter that we really haven't talked about as much today as we probably should have is that we would like to see much more effective technical standardization by the federal government and especially the

imposition of realistic and really stringent interference standards. Interservice interference standards and intraservice interference standards have been woefully lacking in the past.

Mr. Shooshan: A lot of the issues that we've heard about today, in talking about public policy issues in communications, come about as the result of conscious decisions by policymakers at the federal and state levels, sometimes assisted by the courts, and occasionally by the Congress, to open markets to competition that heretofore have been closed.

A real dilemma, it seems to me, in that environment, is that once we've opened a market to competition, what are the ground rules by which all of the participants in that market play? In particular, where we've adopted rules to induce competitive entry by restricting or restraining the incumbent firm, when is it time to remove those restrictions and allow the marketplace to be truly competitive? In other words, when do we move away from protecting competitors to simply allowing for competition? I think particularly the sparks that flew on the first panel this morning indicate that it's not easy to get industries to move away from their basic and often rigid positions. But in any event, we want to try to cover that issue as it stands this afternoon, not only regarding the long-distance market this afternoon, and the local exchange market, but also regarding the mass media arena.

I wonder, just initially on this question of what some have called asymmetrical regulation, regulating like firms in an unlike fashion, if that sparks any general thoughts or comments from our panel.

Let me go to Bob Crandall right now and talk a little, from a policy and an economist's perspective, about the kinds of problems we see with asymmetrical regulation once markets have become competitive.

Mr. Crandall: Well, to start with, it's nice to be on the Chip Donahue Show.

[Laughter.]

Mr. Shooshan: How about the Oprah—

Ms. Dennis: No, don't get into Oprah, Chip. You've made some sort of comment about her diet.

[Laughter.]

Mr. Shooshan: You look like she should look.

Ms. Dennis: All right.

Robert W. Crandall

Mr. Crandall: I should explain that my background is that of an economist, and economists have been studying economic regulation for 40 or 50 years. I think that there's a general conclusion that comes out of this study that regulated competition offers very little to be optimistic about. One of the reasons that we deregulated the transportation industries is precisely because the regulatory authorities were more likely to act as cartelizing authorities rather than those concerned with the economic welfare of the traveling public.

In fact, if you look back at the Interstate Commerce Commission, most of the rate investigations they did were in response to complaints from rivals concerning rate reductions. They rarely examined a rate increase, but were much more likely to examine rate reductions. It seems to me that that's exactly the situation you have right now.

You can perhaps ask someone like Joel Lubin to tell you how this process works out for the incumbent firm. But it seems to me that—and I will recommend it, in fact, to the Canadian government—that if you want to go down the road of opening up competition in industries such as this, you ought to plan to totally deregulate from the outset and very early on. Unfortunately in the U.S. case, we didn't for this competition, and long-distance services sort of just developed. Now here we are, a mere 10 or 15 years later, still regulating the incumbent carrier. I would argue that is a terrible mistake.

Mr. Shooshan: I'm going to take you up on your offer, Bob, and I will go to Joel Lubin next, although I saw John Hoffman's temperature rising as you were speaking.

[Laughter.]

Mr. Fazzone: I was going to say that you don't even have to get that far. I'm right next to him.

[Laughter.]

Mr. Shooshan: Go ahead.

Mr. Fazzone: I think that academically speaking, you've posited the right proposition. I think the rules, from an academic standpoint, are fine.

But I'm looking at where the symmetry is. If you wanted to make a case regarding the long-distance business, we can discuss that. I think that it's fairly clear that from the local exchange carrier standpoint, we don't have symmetry between the local telephone companies except for a fraction of the services they offer and their competitors, whoever they might be. I would just like to say, as we kick off here, that we ought to be looking at whom we're talking about.

Mr. Shooshan: In order to compartmentalize this a bit and get through it, let's deal with the long-distance marketplace first, and then we'll come back and talk about local exchange.

Mr. Fazzone: Sure.

Mr. Shooshan: Is it, as Dick suggested, Joel, simply an academic concern that we have this asymmetrical regulation? From AT&T's perspective, would you say that the different regulatory ground rules under which you must operate promote the public interest?

Joel E. Lubin

Mr. Lubin: From my perspective, I don't see the asymmetry as promoting competition. Is there substantive difference between now and, let's say, 1984 or 1982, when the consent decree was entered? In the interexchange marketplace, we see substantive difference in that customers now have several choices of interexchange carriers. We know that customers understand that they have choices by virtue of surveys that are taken.

We also know that customers are executing their choices by virtue of AT&T's market share going from approximately 100 percent at one point in time in the early 1980s, to roughly 63 percent in aggregate. If you look at the business community, you'll see that our market share is under 50 percent.

Then the next question is, What about new customers? Maybe they (long-distance competitors) have just peaked out and there is just no more capacity out there in the interexchange marketplace to take any additional customers. If you look at that, you'll see sufficient capacity by our competitors in which they can take additional customers. So we see that the marketplace is very different from than what we saw 9 years ago.

Now the question is, In terms of good public policy, is it appropriate to have asymmetric regulation? From our perspective, we say absolutely not. And in fact, it's not a question of whether AT&T wins or whether our competitor wins or of trying to figure out the winner and the loser. The question is, What is good public policy for the customer? In fact, we see asymmetric regulation as harming the customer.

Mr. Shooshan: Let me ask you to be specific for a minute, Joel. When we talk about asymmetrical regulation, what kinds of regulatory tasks or hurdles do you have to deal with that, say, US Sprint doesn't? Where does the asymmetry rise?

Mr. Lubin: First of all, the biggest asymmetry we have is the issue of who files tariffs. As of today, the language is that dominant inter-exchange carriers must file tariffs; therefore, nondominant inter-exchange carriers do not file tariffs. In fact, that one ingredient is a major substantive difference.

Let's assume that you're the customer and I'm the seller. We sign on day 1 to have a contract, and then it takes us 30 days to file a tariff covering the contract. Then normally it is filed on 45 days notice. And then our opposition seeks delay for various reasons. The average delay is approaching 50 days.

Mr. Shooshan: John Hoffman, what's wrong with having AT&T operate under the same ground rules that Sprint does in terms of signing up the large user, for example, as Joel has just described, where two parties make a deal?

Mr. Hoffman: Let me answer that by going back to the first question that was posed on asymmetrical regulation. I think that the reason the rules have to be different is because the positions of the carriers are different.

I agree completely with the way Richard stated it, but I would state it a little differently. I disagree vehemently with Bob, and Joel is a lost cause.

[Laughter.]

Mr. Hoffman: The fact is that you cannot ignore that in the history of the American economic system, we have never deregulated an industry with such a dominant carrier existent in the marketplace.

Mr. Shooshan: Dominant in what sense?

Mr. Hoffman: By almost any measure you want to use, but let's take market share. Bob mentioned the transportation industry—you can look at trucking, busing, or airlines—the largest players when those industries were deregulated had 33- to 38-percent market share. When we embarked upon deregulation in the telecommunications business, AT&T had a 90-percent market share.

You simply cannot ignore that. And I'm not saying that we need to have asymmetrical regulation forever. What I'm saying is that in some circumstances, you have to provide some kind of reasonable transition because with a carrier that dominant in the market, it literally has the power to put its competitors out of business. If you want to have competition, you have to restrain that power.

Mr. Shooshan: Let me be clear. Are you saying, in other words, that for AT&T to lose its dominance, it would have to lose market share? Is that the idea? In other words, to succeed in the regulatory forum, it would have to fail in the marketplace? Is that what you're suggesting?

Mr. Hoffman: No.

Mr. Shooshan: Okay.

Mr. Hoffman: Let me use the reasoning the Commission used in the competitive carrier rulemaking in 1980. The reason that AT&T was found to be dominant is because it had market power. A very practical definition of market power is the ability to harm competition. AT&T has the size, the magnitude, the strength, the depth to put its competitors out of business, literally. AT&T can price against our customers; it can cut its prices in half; it can draw all our customers away from us, MCI, and the other competitors in the business; and it can withstand the losses it would have to suffer in order to predatorily price like that because it has a whole bunch of customers that aren't exposed to that kind of competition or that have other resources.

Mr. Shooshan: Joel, do you want to respond?

Mr. Hoffman: Well, let me finish the point.

Mr. Shooshan: Certainly.

Mr. Hoffman: It has the power to drive competitors out. If Sprint, MCI, or any other carrier tried to do the same thing to AT&T—if we cut our prices in half or if we gave our services away in order to try to attract AT&T customers—we would run ourselves into bankruptcy before we would put a dent in AT&T. That's why it was considered that we do not have market power and they do.

Market share has gotten to be an easy shorthand way to define the relative size of the competitors in the marketplace. That's not the answer. The answer is market power.

Mr. Shooshan: Joel?

Mr. Lubin: I always thought that the dominant firm was an entity that could exercise market power by raising prices and thus exercise its market power by earning exorbitant profits. In this case, what we're trying to do is to lower prices, and our competitors are saying that by virtue of lowering prices, we will exercise our market power that way.

If anybody thinks that we can put MCI or Sprint out of business by effectively lowering our price—and one can argue that's a rational thing to do, but it becomes rational only if over an extended period of time, you can raise your prices to the sky and reflect all the lost earnings—let me tell you that in this marketplace, that simply is not going to happen. MCI is a very large firm. If you look at Fortune 500, they're probably in the top 50 or 60. Sprint is also a large firm. The bottom line is that we're not going to be able to put those entities out of business.

If you also look at MCI's cost structure, you'll see that the Wall Street view is that MCI has the lowest unit cost structure. So here again you're not going to see AT&T putting these parties out of business.

So the real question has to be, Is what they're arguing for in the customer's interest? What they're really trying to do—and legitimately so if I were they, I would do the same thing—is use every regulatory advantage as a competitive advantage that you can do. I don't blame them. Our objective is to try to highlight that to the regulator and ask if the customer is better off, because, we believe, the customer is far worse off.

Mr. Hoffman: I'd suggest to you that the facts do not support what Joel just said. Look at the fact that AT&T now has 85 Tariff 12s in effect, all of which are price cutting. Those Tariff 12s in the aggregate constitute

almost $1.5 billion of revenue a year. Tariff 12 all by itself has become the fourth largest interexchange carrier in the marketplace.

Look at what's happened. All of the carriers have just announced their 1990 financial results. AT&T had record results; MCI's and Sprint's are off. Look at the Commission's own reports on market share that were just issued the end of the year. AT&T—

Mr. Shooshan: Let me ask you a question, though. Where is the public being harmed by all that's going on? It seems to me that the fight is over who can give a better price to a large user?

John R. Hoffman

Mr. Hoffman: Well, I think, you're substituting individual large users that are getting lower prices for the public interest. I would suggest to you that somebody is paying for those lower prices. I suggest to you that if AT&T remonopolizes the marketplace, everybody will pay for it.

Mr. Lubin: Absolutely not.

Mr. Crandall: Let me just point out that there are lots of other industries in which this problem has existed. At the turn of the century, U.S. Steel had about 90 percent of the steel market. When it was prosecuted under section 2 of the Sherman Act, it had somewhere between 50 percent and 60 percent.

It isn't all that long ago, we may remember, that IBM had a very large share of the computer market. However measured, it was in excess of 60 percent. It was prosecuted under the theory that it could behave predatorily and drive little firms like Apple and so forth out of the market.

General Motors, right after World War II, was supposedly constrained by the Alcoa decision to say somewhere around 60 percent of the market. Its share was in the high 50s to 60 percent until little firms, like Honda and Toyota, entered the market.

These were all unregulated firms, and we had nothing to fear from predation from such large firms with market power because it's irrational for them to engage in predation against newcomers that may well be more efficient than they are. The notion that somehow small automobile companies today are afraid of the dominant power of General Motors is palpably absurd. It seems to me that the same thing ought to be true of new efficient entrants into telecommunications.

I would doubt very seriously that the history of AT&T puts it into a position to be such a miraculously efficient company that it could behave any differently than General Motors, United States Steel, or IBM.

Ms. Dennis: But wasn't IBM sued over and over again, and didn't the government fold up its case and go home?

Mr. Hoffman: On the same day on which the divestiture was announced.

Mr. Crandall: There was no case. During the period in which the suit was pending, IBM lost market share everywhere. The fact was that it made absolutely no sense to bring that case to court. The same head of the Antitrust Division who litigated the AT&T case to the eyeballs read through the evidence in the IBM case and decided to drop it. His name was Bill Baxter.

Mr. Lubin: IBM's market share for mainframes is over 60 percent today.

With regard to the large deals that AT&T makes, let's look at our competitors. They have well over 50 to 60 deals, that we know about—in fact, it's very difficult to find out if they exist or not. My guess is that they far exceed our deals. The reason is that they don't have to file tariffs.

So, again, that's what is happening in the marketplace. If there's an unreasonable discrimination issue—and I don't believe there is—but if there is for AT&T, then certainly there is also an unreasonable discrimination issue conducted by the other interexchange carriers who are doing it, and, in fact, started it.

Mr. Hoffman: Those are all very interesting examples, but I don't see the relevance to telecommunications. None of those industries was in a regulated environment, none of them was considered natural monopolies, none of them was—

Mr. Crandall: What does regulation do except make the incumbent inefficient? If you deregulated AT&T totally, why would you expect AT&T to behave predatorily any more than General Motors or IBM behaved predatorily?

Mr. Shooshan: Let me stop on that point—no, not stop on that point, but I want to broaden the discussion here. I think that we can see these issues beginning to play out in our domestic market in another area, the

local exchange market. We're really now beginning to deal with some of the same issues that were dealt with 15 years ago in introducing competition in the long-distance market. Bob Atkinson's presence on this panel is an indication of the fact that there is beginning to be competition in some segments of the local exchange market.

Bob, I wonder if you could start out by talking about the perspective of Teleport Communications, a local competitor at least for some portion of the local exchange market. What do you see the key public policy issues being as we look ahead to the next 10 years? And to what extent can we draw any kind of solace from the way we resolve these issues in the long-distance market?

Mr. Atkinson: I see some interesting parallels between the last 25 years in the history of the long-distance business and the beginnings of some competition in the local area.

First of all, I think that we need to be clear about the definition of the term "local exchange competition." We are not talking about switched services, POTS services, or anything similar. The only area in which there is even a some glimmer of competition is what we call private line, or special access, services. There is no competition, that I'm aware of, anywhere in the country for—

Mr. Shooshan: Long-distance access service. Let's call it there.

Mr. Atkinson: Basically private line services, which, perhaps analogously, was obviously where the long-distance competition began with MCI and companies like that.

I would expect to see the same general evolution in local competition as we've seen over the last 20 years in long-distance service. I think that it will probably take 20 years for that process to get to the stage where they're at least arguing about the issue of whether there is effective local competition or not. You have AT&T and Sprint here today arguing about that in long distance. I think that it's clear that there isn't any effective competition in local services, so the question is, How do you get there from here?

Mr. Shooshan: That's the question.

Mr. Atkinson: Let me respond to your initial question concerning asymmetrical regulation. I guess my general view on that, and what I think

we've seen from the discussion here already, is that asymmetrical circumstances require asymmetrical regulation and that as the circumstances become more symmetrical, then the regulation can become more symmetrical. Therefore, in the local services market, since the circumstances of the respective players are so wildly asymmetrical, perhaps asymmetrical regulation is necessary for today. Perhaps asymmetrical regulation won't be justified 20 years from now and maybe not 10 years from now. But as circumstances change, we should change the regulatory situation.

Mr. Shooshan: Ivan, New England Telephone, at least, is directly competing in New York with Bob's company. From the point of view of the established provider trying to compete, do you want to make some observations on this?

Ivan G. Seidenberg

Mr. Seidenberg: Probably there are two or three points that I would offer. First, let's start with the customer one more time. Think about the marketplace. We're hearing loudly and clearly that customers want absolute choice in local services. You may start out with private line services; you may start out with alternative services, such as disaster recovery or whatever the case might be. But over a period of time, customers have been saying that they want choice.

So the first thing that I would suggest is that we need to straighten out our issue of asymmetrical policy. If the policy is really to focus on competitive choice, then we need a string of policies at both the federal and the state levels that will deal with removing all the barriers to entry. We started that in New York and we started that in New England. I would suggest that there are pockets to that occurring all over the country.

When you see partnerships between cable companies and cellular companies, when you see partnerships between cellular companies and wireline companies, when you see merges of all sorts of different types of exchange carriers, you're beginning to see alternative forms of technology and alternative forms of service beginning to nibble at the edges.

I would agree with something that Bob said in that the issue is not the asymmetrical policy right now, but rather the question of asymmetrical regulation. The problem that I think we all have in the local exchange industry, whether you're a very large company or a very small one, is that the rules of engagement are totally different. There are a lot of lessons to be learned from the divestiture and predivestiture times.

In the 1960s and 1970s, Washington was hell bent on removing barriers to entry and never paid attention to the rate structure questions, or the financial questions, and it let the internal plumbing of the industry go to hell. So here we are in 1991 with Sprint, MCI, and AT&T still arguing over who has market power.

I would suggest when we think of the 1990s, what the issues that we will all have to focus on beginning this year and throughout the next 3 or 4 years are the financial, rate structure, and depreciation issues; the alternative forms of regulations; and all of those asymmetrical regulatory issues that need to be straightened out between the states and the feds. The FCC has been woefully inadequate at dealing with those questions, and the states are just beginning to deal with them. I would hope that over the next 2 or 3 years, the states would begin to really deal with the internal mechanisms that really make the industry what it can be.

Mr. Shooshan: That's a very good point of departure, because I wanted to reflect on the fact that those issues that you've alluded to have, to some extent, been raised around a petition filed by one of the firms that—like Mr. Atkinson's— is competing in the local long-distance access market, MFS (Metropolitan Fiber Systems). MFS has filed a petition with the FCC that, in fact, looks for collocation, but what MFS actually wants is local access.

Mr. Seidenberg: Not to dominate, but I have just one last point. This is kind of an interesting point, and maybe it's curious. Every single one of the RBOCs (regional Bell operating companies), GTE, and probably 15 of the other largest telephone companies all engage in activities like Bob Atkinson offshore. So, I think, we understand the nature of the issue that he faces. The issue is the asymmetrical implementation of incentives to drive the financial restructuring of the industry. That's the issue that has been lacking for probably 15 years.

Mr. Shooshan: What I was getting to is that, I think, there is another set of issues as well, the set of issues raised by the MFS petition about equal access and interconnection. In effect, we went through divestiture in the long-distance market to facilitate equal access for competitors. Do we need to go through that same process in the local exchange market to get there? And what is the relative role of the FCC and the states in dealing with this issue of the introduction of local competition?

Mr. Fazzone: Someone suggested that if you go abroad, you will find tremendous competitive opportunities. I think that that's very much a mistake. If you want to engage in local exchange competition or long-distance service in France, you're going to have a very hard time.

Ms. Dennis: I think that Bob Atkinson can shed a great deal of light on this issue of interconnection that you've raised, Chip, because he's had precisely that difficulty with New York Tel in the past.

Robert C. Atkinson

Mr. Atkinson: Yes, thank you, Patricia. We have been, since 1986, attempting to establish what we would call equal interconnection with local telephone companies. Let me explain. We built a local fiber-optic network in the New York area and in a variety of other cities around the country, and the telephone companies have built a local fiber-optic network, as well.

Now, the telephone companies' fiber-optic networks are far more ubiquitous than ours. In New York City today, I think, New York Tel claims that it serves 450 buildings in Manhattan with fiber, and our network goes to maybe 250 to 300 buildings.

We would like our fiber network to have the same interconnection to the rest of the telephone network as the telephone company's fiber network has. We want equal interconnection to the rest of the monopoly network: the switches, the ubiquitous copper local loop, and those things. If the interconnections aren't the same, then the telephone company's local fiber network has inherent advantages over our local fiber network. The superior interconnection provides major competitive advantages to the telephone company's fiber network.

That is very similar to the situation back before divestiture when AT&T's local operating companies provided AT&T Long Lines with a superior interconnection to the local network compared with MCI's and Sprint's. The ultimate result, obviously, of the unequal interconnection was divestiture.

I guess a major question, for both the federal government and the states is, Is history repeating itself? If there is unequal interconnection for what may be a competitive part of the telephone company's operation compared with the interconnection provided to entrepreneurial networks, this is the same situation that we had before divestiture. So are we really looking at divestiture II?

Mr. Shooshan: Those issues have been posed fairly squarely by the MFS petition before the FCC. I want to get Marta into this discussion.

I think that it's safe to say that one of the reasons the Commission has been reluctant to move ahead with the question of equal interconnection has been a concern about where the states stand in all of this regarding preemption.

Ms. Dennis: You're going to talk about New York.

Mr. Atkinson: Let me quickly talk about our experience in New York.

In late 1986, we filed a New York Public Service Commission (PSC) proceeding seeking the Commission's review of this unequal interconnection issue. Ultimately, in May of 1989, the New York Public Service Commission ordered New York Telephone Company to provide us, and others, with an improved interconnection.

In early 1987, relatively simultaneously with the New York PSC filing, we filed a complaint with the Federal Communications Commission. It is essentially the precursor of the MFS complaint, except that at the time, we were focusing only on New York. The legal theories behind the MFS petition and our 1987 petition are the same.

We filed in March of 1987 and two things happened. All the states came to the FCC and said that it wasn't their issue so butt out, please. Then all the telephone companies came to the FCC and said that it was a terrible idea and not to do it.

Mr. Shooshan: Are you suggesting a certain symmetry here, Bob?

Mr. Atkinson: No, I think—

Mr. Shooshan: I'm determined to get Marta into this discussion. Why don't you—

Ms. Greytok: I feel like I'm in oral argument.

[Laughter.]

Mr. Shooshan: The suggestion has been that—

Ms. Greytok: Really this is great. I like the position of being quiet until you hear where they all are.

[Laughter.]

Mr. Shooshan: Now I'm going to put you on the spot. The suggestion has been here that there is a substantial state interest in resolving these issues of local competition. The states, at least to this point, have said to the FCC, "Thank you, but jurisdictionally we can take care of that." Can you give us some thoughts from the perspective of a state regulator about how we deal with these issues; on the one hand, equal interconnection, as Bob Atkinson talked about, and, on the other, Ivan Seidenberg's concerns about getting the pricing structure realigned so that we're not sending false signals out there in terms of demand and market needs?

Ms. Greytok: Obviously, I feel that I need to go back to the beginning of time here.

Let me just first say that some proceedings of the Texas Commission, which many of you are well aware of, are going to restrict some of the comments that I make. We're going to wade in, and wade in deep, in determining what the definition is of local exchange service, the appropriate definition under today's technologically advancing world, and that is not too far off. As a matter of fact, that determination was just made by the Commission very recently. And there are some outstanding dockets there and some rule-makings that I think will be extremely interesting to go through.

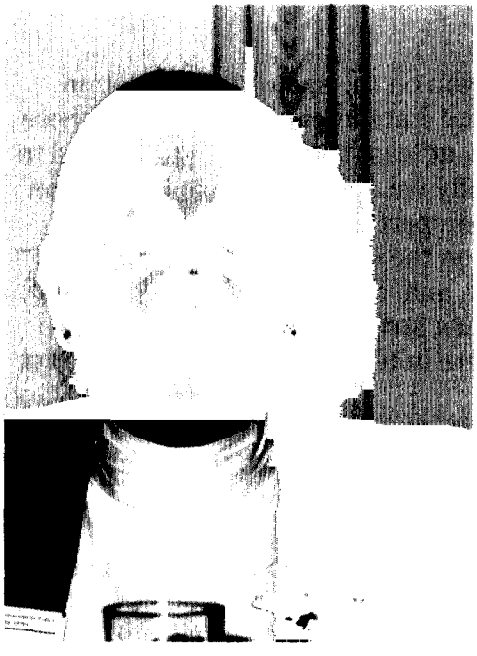
We want to do that to answer many of the questions that have been posed here already today. Certainly, we can go back and point to what has happened in the regulated competitive area with AT&T, which Texas does have with AT&T. You all are flourishing quite nicely. I thought that it was interesting that it was such a bad idea.

But at any rate, I think that at the current time, regarding local exchange service, what you have are all the same concerns that you heard expressed over here earlier. I'm leaving the FCC alone for the moment because I need it badly this afternoon regarding something else.

[Laughter.]

Mr. Pepper: Now that's market power.

[Laughter.]



Marta Greytok

Ms. Greytok: The FCC definitely has market power in this issue. But at any rate, I will say that I am very fond of my friends, including those who have left the FCC and do not wish to get into any sort of contest with them. I think that for the first time, the states and the FCC are indeed communicating well, and we are trying to understand exactly where the line should be drawn.

I don't want to indicate that I've made that decision. I do think that the states have considerable interest here. I don't want to indicate that the FCC has none.

Mr. Shooshan: Outside of the context of any particular rule-making that may be pending, where we obviously don't want you to predispose yourself—

Ms. Greytok: Bob would like that.

Mr. Shooshan: The suggestion was made during one of the panel discussions this morning that in the area of creating local service competition and enhanced services competition, in fact the states—these were not my words but those of another panelist—were really in the position of the states in the late 1950s and early 1960s in trying to hold back the tide of competition.

Give us some idea of how you would like, generically perhaps, to resolve these issues, from the perspective of a state regulator. After all, you're concerned about Aunt Minnie.

Ms. Greytok: From my standpoint—and I've been a very aggressive Commissioner along this line—I don't think that you can ever really feel that you have done the best thing when you substitute regulation for competition. Having said that, that's my far-right approach to things.

On the other hand, I think that there is another side to this issue, and that is, What did I raise my hand to do when I went to the Commission? Those are issues that I have to constantly balance with the statement I just made. When I went to the Commission, I raised my hand to protect the public interest. You have to determine where the public interest does lie. I think that competition is very good for the public interest. I don't

think we can ever find a situation where that tension on the issue does not improve what the public will ultimately end up with in benefits.

To get there, to balance it and to get there, is an extremely difficult job, obviously. I was sitting back there when someone—was it you, Bob?—said, "If I were a state regulator, I'd shoot myself."

[Laughter.]

Ms. Greytok: Well, that's the way you feel many mornings, Bob.

[Laughter.]

Ms. Greytok: But obviously there is a balance here.

Mr. Shooshan: Specifically, how do you balance competition—you said that you have this inherent desire to see it or a feeling that it is a good thing—

Ms. Greytok: It's very difficult.

Mr. Shooshan: In the long-distance market, we've balanced it by saying that AT&T, although it's subject to competition, is still going to have to maintain universal service and is still going to have to maintain average rates. This goes back to—

Ms. Greytok: That was obviously a very difficult thing to do. You have a situation where you have to have a certain amount of contribution in order to provide universal service at a price that allows the penetration rate to rise. In Texas, we still have a lot of difficulty with that. Our penetration rate is one of the lowest, if not the lowest, in the nation. There may be some areas where the situation is worse, but we still have a need to remember that we are not there yet.

We have a lot of rural areas, and we have a lot of disadvantaged areas. What is good—and I always find that this is true when I'm with the NARUC (National Association of Regulatory Utility Commissioners) Commissioners—is that you can identify what part of the world they're from by their position. It is very interesting to watch their perspective on things. Those that have large rural and disadvantaged areas have one particular view of the situation—obviously the view of wanting universal service and protecting it at all costs—and as you move toward more urban areas, you see that pattern change.

Mr. Shooshan: I want to go to Dick. He's been very patient, and, I know, he has some thoughts he wants to inject into this. We have a whole other set of issues we haven't even put on the table regarding mass media. And Doctor Crandall is chomping at the bit. Dick, do you have something to say?

Mr. Fazzone: No.

Mr. Crandall: I just want to say that this notion that one has to maintain these tremendously distorted state and local rates in order to promote universal service has certainly been dealt a very severe blow by what has happened over the last 5 or 10 years in terms of the repricing of telephone service by the FCC. We know a lot about what determines telephone subscription rates, and one does not have to provide huge subsidies from a group defined as urban businessmen—or their customers, of course—to a group called rural residential subscribers in order to maintain universal service.

Competition shouldn't be viewed here as assigning different weights on different players to make sure everybody comes out even, but rather as a mechanism by which prices are pushed toward cost and by which costs are pushed down through the adoption of new technologies and more efficient techniques.

It seems to me that one of the things that you have to do before you begin to admit competition at the local loop is to understand that you're going to have to restructure rates, as Ivan Seidenberg said. You cannot possibly leave him in the position of the 1920s railroad, take all of his manufacturing traffic away from him, and leave him only with coal and natural resources. That's a prescription for bankruptcy.

Competition is a mechanism that will show us where the rates should be. I think that it's incumbent upon those who would argue otherwise that we ought to have this horribly distorted set of local and state rates that we now have.

Ms. Greytok: But, Robert, what do you do about the time in between? That's a wonderful statement, but have you ever been to the Rio Grande Valley?

Mr. Crandall: But you don't have to—

Ms. Greytok: Have you ever been to Farwell, Texas, and looked at what's there and said, "Who is going to go there?"

[Laughter.]

Mr. Crandall: You don't have to subsidize the King Ranch while you do it.

Ms. Greytok: Believe me, I don't think that that's the issue.

Mr. Crandall: But that, in fact, is the issue, because a very large percentage of those people that you're pretending to keep on the network by keeping their rates low would not fall off the network no matter what.

Ms. Greytok: They will fall off.

Mr. Crandall: Well—

Ms. Greytok: They are already off.

Mr. Crandall: There's a lot of evidence to the contrary, and you just cannot fall back on religious beliefs to justify these distortions.

[Laughter.]

Ms. Greytok: I admire the position that you're coming from, but I will tell you that not only will they fall off, but that they are not on. They are not on because they simply have been unable to afford to put in a phone and unable to keep it. Part of what has happened in Texas is the fault of the Texas Commission. We take our hits where we should. The connection charges were too high, the mileage charges, the extended area service—many things that we have been working on. We still however, have had to put in a lifeline rate in order to provide people with an opportunity to get a job, hold a job, and be able to communicate with their bosses—things that maybe, in other parts of the world, are not a problem. But it's still a problem there.

Mr. Crandall: Lifeline rates are a far better solution than keeping business rates in large cities high so that you set up a struggle between Atkinson—

Mr. Seidenberg: May I just respond to something?

Mr. Shooshan: Go ahead, Ivan.

Mr. Seidenberg: I don't want any local exchange carrier's position to be taken out of context. I think that we recognize that there is probably a higher standard. Rather than the intellectual argument over who should be the supplier of last resort—you're not hearing any local exchange company arguing seriously that it doesn't want that responsibility. I wouldn't want to take this discussion and exaggerate it to a point where our position was not credible.

In New York, in the South Bronx, and in Boston and Roxbury, we are providing a $1 lifeline rate, and we're more than happy to provide that. In New York state, a $7 billion company, lifeline service is subsidized at $35 million. So that's not a hardship to New York Telephone Company to do that. Sure it's an intellectual and academic argument to suggest that you can't perpetuate certain things forever.

The important thing that I would like to offer to the group is that you need a symmetrical policy. You can tolerate asymmetrical regulation for only a short period of time. And you really need greater cooperation between the states and the feds in order to extend this transition period over a period of 3 to 5 years so that we can restructure not only an open network, interconnection, and open standards, but also open financial arrangements so that you can create the incentives and enable the business to continue to grow.

Mr. Shooshan: When Tom Herwitz and I were talking about his role on this panel, the first thing he said to me was, "What am I doing here with all these telephone people?"

[Laughter.]

Mr. Shooshan: I assured him that we were going to get to the mass media issues, and we are because, I think, there are some similar issues lurking there, too. We alluded to some of them in the first panel discussion this morning. There again, in the mass media area of communications, we have seen a lot of change, a lot of competitive entry. But similarly, we have seen the established players—in this case, the broadcasters—being regulated in a fashion that is very different—asymmetrical, if you will—from the regulation of the new entrants—in this case, cable television.

Tom, from the perspective of someone who has been in both a policy position in the FCC and is out now in the business of running a television station, looking ahead, tell us what kinds of concerns you have about the asymmetrical regulation that exists in the mass media market.

Mr. Herwitz: Let me just start by saying that before I came here this afternoon, I had spent the better part of the afternoon trying to decide whether to move Woody Woodpecker and the Flintstones.

[Laughter.]

Mr. Herwitz: So you can imagine what a headache I have right now.

[Laughter.]

Mr. Shooshan: What did you decide?

[Laughter.]

Mr. Herwitz: It's much too complicated. It involves the Muppet Babies.

[Laughter.]

Mr. Seidenberg: It's the states' fault.

[Laughter.]

Mr. Herwitz: I'm not going to say which side that came from.

In a much simpler fashion, a lot of these same kinds of issues arise in what's happened in mass media. Our company, which is trying to develop another network to provide free over-the-air television, is in the position of trying to deal with a structure for mass media that was developed in the 1950s to accommodate only three television networks. So all these "weak UHF stations" that are affiliates and partners in this—

[Laughter.]

Ms. Dennis: Tom, this is being taped.

[Laughter.]

Thomas R. Herwitz

Mr. Herwitz: But the issue is that you cannot create an equal-access scheme or anything else in over-the-air broadcasting. So the question becomes, Do new entrants, at least in the mass media area, create enough competition by their very existence, because they go out and do it on their own, to allow for fundamental deregulation and elimination of the kinds of concerns that we had early on in the 1960s and 1970s about the dominance of the three television networks? It's a different situation because there are three television networks, even though they've always been lumped together.

At the same time, when the FCC, the Congress, or any of us try to decide about broadcasting and the things that should happen in broadcasting, are we taking just a sliver of an overall issue? Who cares whether the Fox Broadcasting Company and the three networks are competitive with each other? There's another group out there, the cable industry, that have total and final control over all programming that goes to cable houses because they maintain the final gateway between anybody who's trying to broadcast and the viewer. How is it fair that that group of people are regulated in a fashion different from that in which broadcasters are?

Then, of course, over the next few years, we're going to deal with the issue of yet another entrant, possible entrant, in cabling the country—whether telephone companies or somebody else comes in—and what kind of scheme is it going to be subject to? There has been lots of talk about their being subject to regulation that keeps the provider of this service away from the programmer, the distributor and the programmer away.

In the mass media area, in effect, you have this scheme where there is this group that developed in the 1970s, the cable industry, which really may end up being treated more favorably, asymmetrically, than everybody else, whether it came before or after, due to nothing more than the chronology of history.

So it is a continuing problem. I guess that my thoughts at this moment are that in my role of operating a television station, we're sort of in the butt end of it no matter what happens with the regulation and probably will, for a long time, remain in that position.

Mr. Shooshan: One of the interesting things is that in the last several months, the FCC has embarked on a look at the structural regulations that have been imposed on broadcasting. I was hoping that Bob Pepper

would tell us a little bit about where that stands and enumerate for us the kinds of regulation that constrain broadcasting, but that don't apply to some of the new competitors.

Mr. Pepper: Well, first I would like to make a point about your definition of "asymmetric regulation." You talked about regulating like firms in different ways. Tom's company has argued that it's also a problem when you regulate unlike firms in the same way. That's something that, I think, you have to look at as well, on the telephone side as well as on the mass media side.

What we have done is to undertake an inquiry essentially into the economics and current market structure of the television industry. You've characterized it as a study of the future of broadcast television in the United States. It asked a very basic question, What is the future going to look like for a broadcast television station, your local broadcast television station, that is a single channel outlet, that is supported by advertising dollars, and that is trying to compete in a multichannel world of many channels in which most of its competitors have more than the advertising revenue stream?

What I mean by that is that channel 5 in Washington, D.C., is competing not just with the over-the-air channels here in Washington but that when it's on a cable system, it's competing in the District with 45 channels, in Fairfax County with 50 channels, in Montgomery County, in Prince Georges County, and so on. Most of the channels that it's competing with have multiple revenue streams, both from some advertising dollars that are coming into those cable networks, and from direct subscriber fees.

So the buying power of cable networks, in terms of bidding on programming, is beginning to approach that of the television networks. Certainly, when you take a look at some of the deals—regional deals and local deals—that have been cut for sports and special events, you'll see that the direct payment revenue stream to cable operators and other subscription services give them the ability to outbid over-the-air television.

You might ask, Who cares? So what? Historically, broadcast television and radio have had a special place in the regulatory world because we have granted a unique privilege to the licensees to use this public resource called the air waves, which we talked about in the last panel

discussion. We've extracted just part of the grant of this privilege, certain public interest responsibilities, and they're supposed to act in certain ways.

Congress is very interested in this, by the way, because one of those responsibilities turns out to be equal time for political candidates in order to get out to the voters with their messages and get reelected.

The question is, What is going to happen to over-the-air television in this new marketplace? We have rules that are very different.

Mr. Shooshan: Would you enumerate some of those rules? Why, for example, can't Fox go out and start a second channel here in Washington? Why can't it get into the cable business itself?

Mr. Pepper: We have cross-ownership rules. We have rules that were intended—rules that actually go back to the network case in 1938 to 1941—to increase diversity of voices in the market. Those rules are premised on the fact—or they work out to be that a company may not have more than one television station in a market; may not have more than one AM or FM station in a market—it can have two radio stations but only one of each kind—it may not have more than one television network; you may not, as a television broadcaster, own the local cable system; and if you are the television broadcaster, you may not be coowned with the local newspaper. We have all these rules that are designed to increased diversity of content, but they are designed as structural rules.

The question then is, When you have a cable operator in Washington, D.C., that essentially controls which channels get on and how they're placed—and we're talking about a 54-channel system, of which 45 or 48 are on the basic tier—how do these rules compare with the rules imposed on Tom's company?

Beyond that, in terms of the asymmetric or perhaps unfair treatment of broadcasters vis-a-vis treatment of other industries, again in the first panel discussion this morning, there was discussion of the compulsory license. I wasn't here for the panel discussion this morning, but the way it was described to me was that the Supreme Court said that cable could take those broadcast signals and not pay for them. That may be the case, but don't forget that the Congress defines the copyright liability and establishes the rules under which copyright operates.

The fact is that today we have a very different situation in which cable operators are able to carry, without charge, local broadcast signals. At the same time, unlike in the early days when that merely extended the coverage of those local broadcast signals and when cable did not compete with those local broadcast signals, today cable is beginning to compete in a significant way for advertising dollars with those local television stations in two respects.

First is selling local advertising. But that's fairly small. That's only about $700 million or $800 million a year. Local advertising revenue for television are $8 billion a year. In a more significant way, however, there is a little over $2 billion a year that is actually part of what advertisers call their national spot business. That very simply means that when Coca-Cola wants to buy ads on each local station, instead of buying time on CBS or Fox, it has a separate budget. That's money that usually goes to local stations. That money is about $2 billion a year. But that money is now going to cable networks.

So you can see a direct effect here where the cable networks are really beginning to compete with local broadcasters. That's good because you now have viable program services that are competing and providing choices to viewers. That's bad if you're not allowing broadcasters in some way to be able to correct the imbalance where the cable operator can take their programming and put it on the cable system without permission and without payment.

Mr. Shooshan: Tom, let me ask you a specific question. We've heard the broadcasters today and previously suggest that the entry strategy into HDTV, on the one hand for television and for digital radio on the radio side, was going to be, in effect, setting aside frequencies for each incumbent broadcaster to have a second station in the market to do HDTV or digital radio. Can that happen without the Commission's repealing its duopoly and its one-to-a-market rules?

Mr. Pepper: I think the legal analysis is that it can be. There is a question whether or not you can go ahead and grant a license without holding a hearing.

Mr. Shooshan: That's my second question.

Mr. Pepper: But they're related. The Commission rule established the chain broadcasting rule. The Commission, for example, permits ownership of two radio stations in a market, albeit an AM and an FM. The Commission also—

Mr. Shooshan: Yes, but the suggestion has been that to get into digital radio, companies would be allowed to own two FMs and that for HDTV, FCC is going to give a second license to channel 5 so that it can operate in the interim on HDTV. I'm just asking the question, Can you do that with a rule that says that a broadcaster can own only one station in a local market?

Robert Pepper

Mr. Pepper: In fact, the Commission had done that already in the city of New York. We're talking about simulcasting as a transitional mechanism to move from NTSC, our existing television system, to this HDTV system. We did it for several years in the city of New York, when it built the World Trade Center and there were people who could not receive signals when the transmitters were at the Empire State Building. Every television station in the city of New York received a second frequency in the UHF band so that people in the shadow of the World Trade Center could receive the other signal as a transitional mechanism. Sure they can do that.

Mr. Shooshan: But then they gave up the previous assignment.

Mr. Pepper: That's correct.

Mr. Shooshan: I don't think that's what the broadcasters have in mind.

[Laughter.]

Mr. Pepper: That's not what the broadcasters have in mind, but I think that it may be different from what we end up with.

Mr. Shooshan: Bob Crandall, do you have any comments on the way this imbalance exists and affects the development of the mass media in the marketplace?

Mr. Crandall: It strikes me as somewhat incongruent to start talking about how the growth of competition now changes the backdrop against which you regulate broadcasters therefore, and how, a lot of these rules

are no longer required, when, in fact, the only reason that you had concentration of broadcasting in the first place was regulation. The spectrum could have been allocated quite differently.

I'm not sure that those regulations were ever there for that purpose; therefore, I'm not sure that the analysis saying that now that we have less concentration we can do away with them is either persuasive or likely to work anyway.

Mr. Shooshan: Are there any other—

Mr. Pepper: In terms of things like the compulsory license and retransmission consent—I don't follow.

Mr. Crandall: I'm simply saying that these derive from a notion that somehow you have to constrain powerful actors in a marketplace when, in fact, the power was initially granted by the Commission against strong recommendations that an alternative course be taken, which could have very early on transformed the U.S. broadcasting industry into something like the Italian system.

Mr. Shooshan: But you're not necessarily disagreeing, just saying that you question whether the rules ever made sense in the first place?

Mr. Crandall: That's right.

Ms. Dennis: But you're making an assumption that the underlying reason was to constrain power when, in fact, as Bob said, it was to increase diversity so that information was not disseminated by a few, but by many. I think that is a different spin from just concentration as such. We get our information and news from many sources, at least on the local level—nationally there is a different issue altogether—and that's why the local rules mandating duopoly and one-to-a-market and so forth were put into effect. There are many who believe that if you can ensure that there is one iconoclastic voice that appears in a particular local market, the rule will have served its purpose.

Mr. Shooshan: The question, I guess, gets back to whether, in a competitive market, if you allow, as Bob said, one cable operator to control what goes out over 40 channels, you really need to be too concerned about constraining a broadcaster to having a single outlet in that market?

Mr. Herwitz: The other thing that you should know is that in Washington, D.C., for example, the nonbroadcast viewership in the market is somewhere between 40 percent and 48 percent of all viewers during the course of the day. So it's not an insignificant amount. You have one person in each of these local areas controlling close to 50 percent of the viewership, and you have everybody else sort of in this theoretical market that is made up only of broadcast stations fighting for what's left.

Mr. Pepper: There's another point here, Chip, as well. Inertia goes a long way. Old habits are very hard to break. It took Western Union—

Mr. Shooshan: Regulatory protection is a hard thing to give up.

[Laughter.]

Mr. Pepper: That's right. Western Union, 2 months ago, finally got out of the communications business 100 years after it realized that it had made a mistake by not buying the Bell patent.

Often what happens is that you have watershed events, things that break habits, and we may be seeing those today in terms of what has been occurring in the television marketplace. We won't know if these are the watershed events, but they might be.

First, we're in a recession. What you've seen is that the advertising revenue flowing to the three major television networks—and I'm not sure about the case of Fox, I assume it's similar—is way down. Dollars are not flowing. The prices are down. Indeed, adjusted for inflation, the three major television networks' gross total advertising revenue is less today than it was in 1984.

The cable networks and local stations are down also, but not as much. That's because advertisers are beginning to target, to focus more on where they place their advertising dollars. That's being exacerbated by the recession. When the economy recovers, are the big advertisers ever going to go back to the old spending habits where they just threw money at the major mass market audiences, at the networks? Or will they stay with the more-targeted, more-efficient approach?

The second event is what has been happening in terms of coverage, viewership, and viewing patterns as a result of the war in the Gulf. CNN still has substantial viewership even at day 25 of the war or whatever it

is. In fact, it was even a week ago that the 24-hour day average rating for CNN was approaching that of CBS.

So the question is, Are we now in the period of several major events that are going to change viewer habits, advertiser habits, and programmer and producer habits? We may be seeing that happen.

Mr. Shooshan: Those are cosmic questions that are important, but they are beyond the scope certainly of GAO's (General Accounting Office) review at this point right now, which is to look at the public policy issues. But I think that Bob raises some very good points about the changes in this environment.

What I want to do now—and you'll have to help me by cooperating here—is for each of you to do what we've asked every other panelist today to do: to take 1 minute each to sum up by suggesting one—and I repeat, one—policy that you would change or that you would seek to have adopted if you could write this report for GAO. So, Bob Atkinson—

Mr. Atkinson: Start over there.

Mr. Shooshan: No, I'm going to start with you.

Mr. Atkinson: One policy change?

Mr. Shooshan: One policy change in 1 minute.

Mr. Atkinson: That's a tough one.

Mr. Shooshan: Do you want to pass and come back?

Mr. Atkinson: I'd like to pass and come back. Yes, please.

Mr. Shooshan: You can't all opt to do that, though.

[Laughter.]

Mr. Shooshan: Tom?

Mr. Herwitz: For the few that care, the financial interest and syndication rules would be our concern in order to allow a company like ours to continue to grow and bring the diversity that was intended in the first place. You have a set of rules that do the exact opposite of what they're

intended to do. They stifle new entrants, rather than the other way around.

Next to that, "The Simpsons" Thursday night at 8:00. That's all.

[Laughter.]

Mr. Shooshan: Ivan?

Mr. Seidenberg: He's a tough act to follow.

I think that building on everything that everybody has said before, the only new thing that I could add here is that I would like to see a reordering of federal and state regulatory priorities so that the federal side focused mostly on the interconnection, the network planning, and that whole aspect of development of the nation's network and that the state side really focused on the issue of incentive regulation, alternative forms of regulation, and everything that goes with that.

I think right now we're right in the middle of a gridlock in which local exchange companies are really squeezed by all these poor players at the table that you can see here.

Mr. Shooshan: I'm going to skip over our two public policymakers, because they ultimately have to deal with all these things, and go to John Hoffman.

Mr. Hoffman: I'm going to steal some of the words that Ivan said earlier. He said it twice. The first time I didn't understand what he was saying, and the second time the light came on. It was his notion that asymmetrical regulation isn't the problem in and of itself, but that what is more important is a symmetrical policy. My interpretation of what he's saying I think is exactly correct.

What we need—and I'm amazed at the parallels between the broadcast industry and the telecommunications industry—in both is a consensus of where it is we want to go and then some transition rules that everybody should follow in order to get there. I think that's been sorely lacking, particularly in the telecommunications industry, for at least the last decade. The FCC has started three times to address that issue. The first two times, it closed the record and put the case on the shelf without deciding it, and the third one is the AT&T dominance proceeding that's pending before the Commission now.

I think that that's an opportunity to decide where we're going to go in this business and how we're going to get there. Then once we've done that, if the FCC requires all the players to follow the rules, I think, we will make great progress.

Mr. Shooshan: Joel?

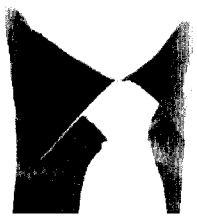
Mr. Lubin: In terms of the interexchange marketplace, I think that the consensus is that the FCC wants to have a competitive marketplace. Approximately 11 years ago, in the competitive carrier docket, when AT&T was declared dominant, at that point in time, we actually owned the access facilities. I cited the reasons earlier as to how the environment 11 years later is very different from what it was in 1980, when we were declared dominant.

In fact, if you look at the proceeding that is now underway at the FCC—the docket on how to regulate interexchange carriers, in particular AT&T—what you'll find is that the FCC is not even asking the question of whether AT&T is dominant or not, even though AT&T, in its comments and reply, tried to raise that question. They only have what I would call phase I in the evolutionary process of regulating interexchange carriers.

So I think that the Commission can act and implement phase I and allow the benefits of competition to go to the customers.

One other point that John raised earlier was the point of who would pay if this form of regulation were allowed to go forward. In fact, the interesting point of what the FCC has done is that it has basically retained the price cap mechanism for basket one. That jargon simply means that you retain the cap mechanism for residential customers and for small business customers. So, effectively, customers aren't going to be harmed because there's a cap still in place, and you'll allow the competitive marketplace to work, and ultimately customers will be better off.

Mr. Shooshan: Dick?



Richard A. Fazzone

Mr. Fazzone: Looking back at the entire day today, I would like to suggest where we ought to go policy-wise very briefly. On one hand, from a macro level, we're doing extraordinarily well. Public policy-making at both the federal and state levels and internationally from the U.S. perspective is all going in the right direction. That has been to shrink the role of monopoly and expand the role of competition. It's been extraordinarily successful, whatever you might have heard in terms of the United States falling behind. It's a very long way away.

As a matter of fact, if you go to Europe, and do a little traveling, you'll see what Europe is doing now. Their initiatives really are to copy us. That's the success.

There is one area, the symmetry area, that is the local exchange, the most significant part of the telecommunications, and perhaps communications, issue. I think that there is a way of extending where we've been in the competitive environment. We've pushed competition in this one last area to open up the local network. There are proceedings, several, at the FCC right now. It's a technical, nitty-gritty type of work.

But there is the opportunity to open the public switched network up to allow the new network that's coming along, the intelligent network that's being installed right now, equal access to program the network. That capability is going to, I think, free the local exchange carriers to be in other businesses. But the FCC has to allow that. That's the next step at the Commission right now.

Mr. Shooshan: Thank you. Bob?

Mr. Crandall: That's a good lead-in to what I was going to say, too. I quite agree with that perspective. I think, however, given our earlier discussion, that what is preventing all that from happening is the enormous distortions in rate levels at the state and local levels. As long as regulators continue to maintain those distortions, they will always be defensive about competition.

The only recommendation I can make to do anything about it, given our federal system of government, is that the FCC at the federal level keep the pressure on by trying to force more and more competition on the local loop, thereby putting pressure, unfortunately in the interim, on NYNEX and other operating companies because such a policy will erode their high margin business by putting pressure also on the regulators to bring rates into conformance with cost.

I think that the only way to get there is pressure from the federal government. Virtually any reform at the state level has had almost an inconsequential effect on rates thus far.

Mr. Shooshan: Let's go back to Bob.

Mr. Atkinson: The reason that I had a problem when we first started is that your question was, How would I change a policy? I think that the problem I was having, from the local competition point of view, was that there is no policy at this stage.

Mr. Shooshan: I also asked what new policy you would come up with.

Mr. Atkinson: A new policy would be, in fact, a policy that said, as a vision, "Let's try to get as much competition into the local business as possible." That would be a broad policy, not micromanagement, because micromanagement would be a real prescription for disaster. We want to promote competition as much as possible. I would encourage the regulators to either lead and, at times, follow and then to get out of the way eventually. But the long-term policy should be to have a policy.

Mr. Shooshan: I'd like to give an opportunity now for a last comment from our two policymakers on the panel, Bob Pepper and Marta Greytok. Does either of you have anything you would like to add?

Ms. Greytok: You can go ahead, Bob.

Mr. Pepper: I just want to know whether you moved Woody Woodpecker.

[Laughter.]

Mr. Shooshan: We always knew that the Commission was more interested in mass media issues than in telecommunications.

[Laughter.]

Mr. Crandall: You still watch "The Simpsons."

Mr. Pepper: The only thing I would add—because I think what I've heard makes a lot of sense, especially talking about policies that are going to move toward competitive answers here—would be to create a framework where technology can be adopted and deployed by service

providers—whether on the common carrier side, the mass media side, or the private radio side—in a way in which the technology can be used to meet the needs of customers with as little gaming of the process as possible.

One of the problems is that in the name of fairness we provide a total elasticity of process, and that becomes dysfunctional. I think that what we need to do is to create a framework for the appropriate adoption of technology by multiple providers of services, in the radio area especially.

Mr. Shooshan: Marta?

Ms. Greytok: I'm just going to wrap up by addressing a couple of things that I heard very early this morning; then I was out of the room when states were attacked, so I'll pick up my equal time.

First of all, for those of you who are not aware, I was born and raised on a ranch down in south Texas, where everything either poked, bit, or stung.

[Laughter.]

Ms. Greytok: So, as a result, regulation has not been anything new.

[Laughter.]

Ms. Greytok: Sometimes it is a little more of the same. We also had a lot of rattlesnakes down there, and you had to learn how to step very carefully and listen carefully. They were definitely dominant rattlesnakes.

[Laughter.]

Ms. Greytok: Let me just say that one of the comments that came out loud and strong this morning was that the regulators and the States—and I guess, you all also, Bob—were supposed to come up with some sort of policy statements. The Public Utility Regulatory Act several years ago did just that. Section 18, I think, does a good job of at least setting out the framework where we begin. In several places, it actually directs us. Local exchange is one of those areas, so you can't wander too far to one side.

But it definitely says that telecommunications has been, will become, and will continue to be a growing competitive industry that does not lend itself to traditional public utility regulatory rules, policies, and principles and that therefore, the public interest requires new rules, policies, and so forth.

The act goes on to direct us to look at market dominance, which we did, and we have quite an extensive report out on that that we submitted to the legislature. The act directs us to do that every other year. You'll notice, also, it doesn't just say in the long distance market. It also says to do so in the local telecommunications market.

I think that we have made a start. If you're asking what I would like to see in the way of something new, let me say that first of all, I would like to see the lawyers out of it.

[Laughter.]

Ms. Greytok: Once we get rid of all of them, we can get some broad policymakers in there and maybe we can get to the bottom of the issues. But, unfortunately, so much of the issues end up in oral arguments, and you don't go much further.

I think that obviously the incentive regulation and rate caps are good starts. I want to specifically address rate caps versus rate freeze. I think that the commissions, if they feel that certain parts of the agreement are not being kept, have the opportunity to go in and adjust the rates downward.

Concerns that people like me wake up in the middle of the night with are still predatory pricing. They very definitely are cross-subsidies. How long can a dominant carrier hold out against someone who is not so powerful? Are we going to get into price wars on local exchange applications? So as a result of these concerns, people like me don't get a lot of sleep.

I think that it's extremely fine to know, Robert, that you're going to see that we have 20 years to play this out. I was worried that I was going to have to do something in the next 2 1/2 years while I was on the Commission. So I won't worry about that anymore.

Mr. Pepper: Okay.

Ms. Greytok: I think that the States are obviously the ones to deal with these issues. They know their companies better, they know what the structure is in their particular areas, and they know how much tension and impact the ratepayers can take. They have to make their decisions based on that balance. Sometimes however, as I do, you have a strong urge to say, "Cut the traces and let them run." Unfortunately, there are some folks in the way that may get run over. Maybe in the long term, that might not look so bad, but in the short term, it's going to be pretty bloody. So as a result, we have to hold back a little bit and say, "All things considered, boys and girls, let's see if we can work this out together."

In Texas, I have really pushed for stronger policy-making and for rule-making because I think that most of the participants down there can deal with just about anything so long as there's some stability in it. Unfortunately, we have been known for our instability.

I think that if we can come to that and become more and more of an administrative agency instead of a regulatory agency, it will benefit everyone.

And quite honestly, last but not least, AT&T is doing very well under our regulated competitive Section. It hasn't suffered too badly.

Mr. Shooshan: You have all been very patient this afternoon. We haven't had a chance, because of the large panel and the complex subject matter, to go back and forth as much as we would have liked, but I'm told that there is at least one question that we want to end up with.

Ms. Lalena: My name is Anne LaLena.

I have a question for the Commissioner. I'd like to stretch this a bit and look toward international issues. The FCC, of course, has a section 310 restriction on foreign ownership of radio licenses. I think that since so many Bell companies have invested abroad, it's a matter of time until some foreign companies, particularly the British will want to invest in the United States in a much bigger way than they already have. So from the states' perspective, how do you feel about foreign ownership of common carriers?

Mr. Atkinson: I thought that in Texas, a foreign owner was someone from Arkansas.

Ms. Greytok: That's about it.

Mr. Shooshan: Does anybody want to give a quick answer to that question?

Mr. Seidenberg: The question is, Should there be? Or is it, Will there be?

Mr. Hoffman: It seems to me there already is significantly.

Ms. Lalena: As you know, John, there is a foreign ownership limit of 25 percent, and Bell companies very often own more than that in Europe. So I'm wondering if the states' commissions are concerned about, for example, British Telecom's buying into Southwestern Bell or—

Ms. Greytok: This issue has never been addressed in Texas. We have so many other irons in the fire that we haven't gotten to that one.

Mr. Shooshan: Okay.

Ms. Lalena: So does that mean that Texas is not opposed to having local services opened up to foreign competition?

Ms. Greytok: No, I wouldn't go so far as to say that. We're pretty provincial down there, and we probably don't yet realize that the rest of the world is out there. It's probably as basic as that.

Mr. Shooshan: Okay. I want to make sure that we close this off as close to time as we possibly can. At this point, I want to thank the panel for providing a good end to a full day. Let's give them a round of applause.

Speaker:

Representative Edward J. Markey

Congressman Markey: The Congress is very much preoccupied with other issues right now, from the savings and loan crisis to the budget issues and the Persian Gulf, but, I think, long-term thinking would require us to look at this telecommunications policy.

As many of you are aware, last week the Congress started the process of reorganizing itself into committees and subcommittees, placing new Members, and working out agendas and jurisdictions. Now that the Subcommittee on Telecommunications and Finance has been officially reorganized, we can begin to plan and lay the groundwork for this session of Congress.

As many of you can understand, for the past few weeks, we have been going about our business with one eye cast on the Persian Gulf. Nevertheless, I am hopeful that, not withstanding our concern and attention to the war, we will move forward on a number of challenging fronts in the area of telecommunications policy.

Even as we watch the war in the Gulf, Americans intuitively understand the importance of high technology and modern telecommunications in our world today. In addition to the barrage of peculiar new words that have entered our lexicon during the war—such as Scud, collateral damage, and ordinance—we have also witnessed dramatic footage of attacks by smart bombs, laser-guided missiles, and Patriots, all of which make use of the radio spectrum and sophisticated software to home in on their targets. This underscores for all of us, in a painfully graphic way, the role high technology plays in today's military.

The kaleidoscope of words and images from the Gulf is brought home to us courtesy of modern telecommunications. All of us will long remember the satellite-transmitted images of bombs and antiaircraft fire over Baghdad, of Israeli citizens donning their gas masks in Tel Aviv, and of Patriots streaming up to intercept incoming Scuds. CNN has provided us with instantaneous coverage watched by everyone from Saddam himself to analysts in the Pentagon.

While we are at war in the Gulf to reestablish the independence of Kuwait, we are also fighting because of our interdependence upon Kuwait, our need for oil, and hence stability in that part of the world. This war provides recognition to the entire world community of our interdependence upon each other. The broad-based coalition of 28 nations with troops arrayed in the sands of Saudi Arabia is a vivid indication of this newly understood interdependence.

This dichotomy between the yearning for independence and de facto interdependence mirrors what is occurring on a microcosmic scale in telecommunications. Indeed, many have said that telecommunications will be the oil of the 21st century. So there is more than one parallel.

Since the divestiture of AT&T, America has witnessed the establishment of the independent Bell operating companies, along with hundreds of new telecommunications manufacturers and service providers. The independent service providers were given an opportunity, and their emergence has resulted in the development of specialized communications products and services. The advent of wireless communications, high-speed data networks, on-line data services, and a host of other specialized providers and services are the end products of this trend.

This increased specialization is now leading to greater interdependence amongst the various providers as the industry sees incredible competitive opportunities awaiting those people that can enable diverse products to work together. For this reason, interoperability and interconnectivity will be critical prerequisites for the future development and growth of our nation's telecommunications infrastructure.

Telecommunications in the 1990s will embody a robust era of competition in which we will see the concrescence, or growing together of what we will often think of as diverse technologies and high-tech products. In other words, the television will talk to a computer, which will interact with telephone equipment, which in turns depends on fiber and the ability to speak digitally.

Will these interconnections and hybrids of existing technologies be computer televisions or television computers? Will we have a phone fax or a fax phone? Nobody knows for sure, but an educated guess tells us that we will have some interesting permutations amongst phones, faxes, computers, and televisions.

The reason for this is quite simple. When we finally reach the time when all electronic signals for computers, phones, televisions, and other information services are transmitted in digital form, they will become, for all practical purposes, identical. The only difference between the bursts of zeroes and ones that bring you a phone call from the office, a Motown tune on a compact disc, or a Boston Celtics play-off game on television will be whether the digital code represents sounds, pictures, words, or a combination.

In essence, we will have achieved technological Esperanto, a universal digital language. The logical end result will be a flowering of interconnected information appliances which can interpret and convert these zeroes and ones into various applications for our empowerment and enjoyment. All machines will be able to talk with each other.

The future will also see the merging of competition, and the handwriting is already on the wall. We have newspapers and cable companies interested in providing localized phone service through the use of personal communications networks. Citicorp Bank has offered an enhanced phone service to facilitate home banking transactions, while AT&T has introduced a universal credit card. Our ubiquitous local telephone companies seek approval to offer video programming, and everyone is aware of the giant multimedia merges between Sony and Columbia, Matsushita and MCA, as well as AT&T's pending takeover of NCR (National Cash Register), the nation's fifth largest computer company.

In the very near future, we will no longer be able to speak in terms of phone companies or computer manufacturers or cable companies. They will all become part of a larger information industry. Businesses will integrate in this megainfo industry.

From today's standpoint, the emerging industry has three discernable parts: one, making the hardware info-appliances, such as television sets, PCs, telephones, and faxes; two, developing the software or programming for the info-appliances, including creating everything from new shows, movies, music, and databases; and three, building and operating the telecommunications infrastructure. The networks need to carry the information and distribute it to wires, satellites, and switches.

If nothing else, the stunning performance of the Tomahawks, the Patriots, and the Stealths have demonstrated that America is second to none in technological prowess. But as economist Bob Kuttner recently noted, the perverse reality is that most of us watched this display of high-tech firepower on Japanese television sets, a tribute to skewed technology priorities in our own country over the last two decades. While our pilots successfully drop bombs down elevator shafts at speeds exceeding Mach I, the Japanese and the Europeans continue to chip away at our once proud lead in critical commercial technologies like telecommunications, semiconductors, and supercomputers.

Not long ago, the Japanese telecommunications industry couldn't compete with the United States. Today the Japanese have a $200 billion

plan to bring fiber optics to every major city in their country by the year 2000. The Japanese have spent more than $1 billion on the development of high-definition television and have already put HDTV sets on the market. In the United States, the Federal Communications Commission is just beginning this spring to test HDTV systems in the hopes of setting a technical standard for American advanced television by 1992.

And as I mentioned a moment ago, the Japanese have two giant consumer electronic companies, Sony and Matsushita, running two of our movie studios, seeking to marry their expertise and consumer hardware with our entertainment software and thus achieve a corporate synergy they hope will lead to dominance in HDTV and consumer electronics into the next century.

No American company is similarly positioned to bring electronic hardware and entertainment software together in such a manner. Part of the reason why this is so is because we still talk of phone service, computer hardware, movies, televisions, and radios as if they were totally distinct entities and as if their manufacturers and providers are different corporate animals.

The evolution of the megainfo industry is toward convergence of both products and competition. If information is indeed the oil of the 21st century, we must begin to plan now both in research and development and in policy decisions to foster the most advantageous environment in which this industry can prosper.

For far too long, the United States has focused its resources on the military industrial complex. It has had no telecommunications strategy, no coherent plan to bring fiber-optic technology to our homes or to promote the integration of products and services, hardware, and software. Right now the FCC, the courts, and the Congress are addressing the critical issues affecting the future of the industry. Proceedings on financial syndication rules, effective competition in the cable industry, MFJ line of business restrictions on the Bell companies, and spectrum reallocation will have a significant impact on the future success of our telecommunications infrastructure and competitive markets.

But these proceedings are all done in piecemeal fashion in separate jurisdictions. It is incumbent upon those of us in the Congress and other policymakers to bring these issues together so as to ensure that we enact the proper regulatory framework and safeguards that allow competition to take root and new technologies to flourish. The brave new worlds of

interdependent integrated technologies and new field of competition, however, must exist to empower and serve individuals.

The riches and benefits of advanced telecommunications are evident everywhere. Technological developments in communications spurred the establishment of democracy in Eastern Europe and enhance our ability to get news from the Persian Gulf.

Technological developments can have negative as well as positive consequences. The awesome power and pervasiveness of advanced telecommunications may mean that in the future, personal privacy will be threatened in fundamental ways. Even today, companies are seemingly able to utilize advanced telecommunications to compile, use, and sell personal information without restriction. Today our long-held values regarding personal privacy may be threatened by technological advances in the private sector.

Americans have come to expect and insist on exerting some influence over information gathered about them. New technologies from caller I.D. automatic number identification to disc and advanced software applications mean that a great deal of information—transactions, habits, movements, even information about hobbies—is easily gathered over the phone lines and is subsequently manipulated by computers to produce highly sophisticated and possibly intrusive personal socioeconomic data.

In the final analysis, advanced telecommunications technologies can be used for smart bombs or for even smarter phones. And new technological advances can be utilized for improved communications or in ways that compromise personal privacy.

Thomas Jefferson once said that information is the currency of democracy. Today we stand on the threshold of seeing the fruition of the dreams of many social planners. Our ability to communicate through various forms of media can enhance and improve our lives. It has a liberating effect. We can communicate on the move, work at home, and have access to the information that we need at our fingertips. Let us begin to harness the awesome power offered by this vision, that of a brave new world order where everyone can communicate instantaneously with anyone anywhere.

Over the next 2 years I hope to create a forum in which we can work with the people in this room and others concerned about our telecommunications future so that we can have an orderly and coherent policy that

is articulated and as a result, much more likely to be implemented. I think when we ignore issues, whether it be nonproliferation, energy, or human rights, we can see quite clearly the results of that ignorance produced in the Middle East today.

I don't think we should replicate that in telecommunications, because we can be pretty well sure of the consequences for our country if we continue to ignore such a central part of the world economy and the potential role that America can play in shaping it. Otherwise we will have to react rather than have others react to us.

So I think the lessons of the last 6 months in several other major policy areas that were ignored should not be lost here. The fact that we have not had a telecommunications policy in the past, or that this administration has not understood that we should have a telecommunications policy, does not mean that we cannot shape one now. I think the lessons we're learning—hard ones in energy, nonproliferation, and human rights, which will now be implemented, I'm quite sure, by this administration, but 10 years too late—do not have to be replicated over in the telecommunications area.

My hope is that we can work in a bipartisan fashion with Democrats and Republicans, liberals and conservatives, administration and Congress, and private interests and public sector interests to shape that policy. I'm very fortunate to have Matty Rinaldo as the Ranking Minority Member. We've tried to construct the debate within our Committee in a way that reflects that desire to work out the differences and to shape policy. With John Dingell as the full Committee Chairman, I absolutely promise you that we will be working extremely aggressively over the next two years to achieve that goal.

Again, I appreciate very much the GAO's invitation to address you. I hope to do so many times in the future. I similarly expect to avail myself of the superior services that GAO offers in exploring various troublesome areas of American public policy so that we can be enlightened and move forward with the benefit of the work that GAO does.

Speaker's Biography

Representative
Edward J. Markey

A graduate of Boston College School of Law, Edward J. Markey was elected to the Congress in 1976 from the seventh district of Massachusetts. He has risen steadily in the ranks of Congress' committee structure. From 1981 to 1984, he was Chairman of the Oversight and Investigations Subcommittee of the Interior Committee, which has principal oversight responsibility of the Nuclear Regulatory Commission. In this position and later as Chairman of the Energy Conservation and Power Subcommittee of the Committee on Energy and Commerce, Congressman Markey served as a watchdog over nuclear safety issues, including nuclear waste disposal.

In 1987 Congressman Markey took over the chairmanship of the Telecommunications and Finance Subcommittee of the Energy and Commerce Committee. This post holds particular interest for him because of Boston's growing financial sector and Massachusett's role as a leader in the high-technology community. As subcommittee chairman, Congressman Markey presides over interstate and foreign telecommunications, including all telecommunications and information transmission by wire, microwave, satellite, and other mode. Congressman Markey's recent activities include overhauling the regulation of securities laws to prevent a recurrence of the stock market crash of 1987.

Congressman Markey has received many awards for his leadership in the areas of foreign affairs, energy policy, and broadcasting, including the Outstanding Energy Legislator award from the Union of Concerned Scientists, the award for Outstanding Leadership in Communications from the National Association of Black-Owned Broadcasters, the Arms Control Leadership Award from a coalition of major peace groups, and the Environmental Leadership Award for outstanding contributions to New England from the New England Environmental Network.

Moderators' Biographies

Patricia Diaz Dennis

Mrs. Dennis is a Partner and Chair of the Communications Section of the international law firm of Jones, Day, Reavis & Pogue, in its Washington, D.C., office. Until September 30, 1989, she served as Commissioner of the Federal Communications Commission, starting in June 1986, when she was sworn in by then Vice President Bush. Before President Reagan appointed her to the Commission, he named her to the National Labor Relations Board where she served from May 1983 until June 1986.

From 1978 to 1983, Mrs. Dennis was an attorney with the American Broadcasting Company in Hollywood, California. She started her law practice with the firm of Paul, Hastings, Janofsky & Walker and then, starting in 1976, worked at Pacific Lighting Corporation, both in Los Angeles.

Mrs. Dennis received her J.D. degree from Loyola University in Los Angeles in 1973, and an A.B. degree from the University of California at Los Angeles. She was Executive Editor of the Loyola Law Review and on the Dean's List at both universities.

Mrs. Dennis is a member of the bars of California and the District of Columbia and admitted to practice before the U.S. Supreme Court. She chairs the Communications Committee of the Section of Administrative Law & Regulatory Practice of the American Bar Association and is co-chair of the Common Carrier Practice Committee of the Federal Communications Bar Association. She is a member of the Hispanic Bar Association and member and former Trustee and Secretary of the Mexican Bar Association. She serves on the Pepperdine University School of Law Board of Visitors and on the Board of Directors of the National Network of Hispanic Women.

Among her other activities, Mrs. Dennis was a member of several U.S. international delegations, including the 1985 World Conference, United Nations Decade for Women held in Nairobi, Kenya. She chaired the American delegation to a 1988 international broadcasting conference in Rio de Janeiro. She is currently a member of the Board of Directors, Foundation for Women's Resources and a member of New Mexico State University's Advisory Council for the Center for Public Utilities.

Mrs. Dennis has received many awards, including the 1989 Woman of the Year Award from the Hispanic Women's Council and Hispanic Business Magazine selected her for its "100 Influentials" list in 1987, 1988 and 1990.

Harry M. (Chip) Shooshan III

Mr. Shooshan is a vice president of National Economic Research Associates, Inc. in its Washington, D.C., office.

A veteran of 11 years on Capitol Hill, Mr. Shooshan was active in congressional efforts to reform the nation's communications laws. As a private attorney, he participated in the settlement of the Justice Department's antitrust suit against AT&T, and edited a book on the impact of the AT&T divestiture.

Since 1976, Mr. Shooshan has served as an adjunct professor at the Georgetown University Law Center, where he teaches communications law. He has written extensively on topics dealing with communications policy, deregulation, new technology, and the legislative process.

Admitted to practice before the U.S. District Court, the U.S. Court of Appeals, and the U.S. Supreme Court, Mr. Shooshan is a member of the D.C. Bar and an active member in the D.C. Bar Association. He is also a member of the American Bar Association and its sections on antitrust law and administrative law. He is a member of the Forum Committee on Communications Law. In addition, Mr. Shooshan is a member of the Federal Communications Bar Association.

Mr. Shooshan received a J.D. degree from Georgetown University Law Center and an A.B. from Harvard College.

Panelists' Biographies

Robert C. Atkinson

Mr. Atkinson is Senior Vice President, Regulatory and External Affairs of the Teleport Communications Group. Since 1972, he has spent his entire business career in the telecommunications industry working for both international and domestic common carriers. He has served as Manager, Business Planning at International Telephone and Telegraph (ITT) World Communications, Inc.; Manager, International Service Development with GTE Sprint; and Director, New Services Planning Development at RCA Global Communications, Inc. He served on U.S. government delegations to the international negotiations that created the International Maritime Satellite Organization.

In the regulatory and public policy area, Mr. Atkinson served as Government Relations Representative for ITT's Communications Operations Group and Counsel for Government and International Matters at Satellite Business Systems. He was a founder of the Ad Hoc Committee for Competitive Telecommunications, and, more recently, the Association for Local Telecommunications Services.

Mr. Atkinson received a B.A. degree in government and foreign affairs from the University of Virginia, and a law degree from Georgetown University Law Center. While at Georgetown, he was a member of the Law Review, and is presently admitted to the bar in New Jersey.

Kenneth W. Bleakley

Mr. Bleakley is a Senior Foreign Service Officer, now serving as Senior Deputy Coordinator and Director for International Communications and Information Policy. Previously, he has been Deputy Assistant Secretary of State for International Refugee Assistance and Deputy Director of the Secretary's Policy Planning Staff. He was Deputy Chief of Mission at the U.S. Embassy in San Salvador from 1981 to 1984.

Holding a bachelor of foreign service degree from Georgetown University and a masters of public administration from American University, Mr. Bleakley pursued advanced studies in Spanish at the University of Madrid and in economics at the University of Oklahoma. He is a graduate of the State Department's Senior Seminar and of the National Defense University's Capstone Program for General Officers. Mr. Bleakley is a former president of the American Foreign Service Association. He received the Secretary of Defense Meritorious Civilian Service Medal in 1977, the State Department's Superior Honor Award in 1979 and 1984, and its Meritorious Honor Award in 1988. Mr. Bleakley was the State Department's 1987 Speaker of the Year.

Carl F. Cargill

Mr. Cargill is currently a Senior Staff Consultant to the Manager of Corporate Standards at Digital Equipment Corporation. His area of concentration is the theory, business rationale, and economic/industry impact of standards. He is the author of Information Technology and Standardization: Theory, Process, and Organization (Digital Press), the seminal work on information technology standards theory and organizations; he has also written many articles on standards planning, theory, and management, especially in the information technology arena. He is one of the contributors to the American National Standards Institute's standards handbook, Standards Management. Mr. Cargill also writes a quarterly column on standards for Auerbach's Journal of Data and Computer Communications, and speaks extensively on standards and standardization to both the public and private sectors. He holds several memberships in both domestic and international standards organizations, including the Vice-Chairmanship of ASC X3's Strategic Planning Committee.

Mr. Cargill holds a masters degree in management engineering from the George Washington University, and also serves as an adjunct professor of history, psychology, organizational management, and marketing.

Diane J. Cornell

Ms. Cornell serves as Legal Assistant for common carrier issues to FCC Commissioner Sherrie Marshall. She served in the same capacity for Commissioner Patricia Diaz Dennis. Prior to that she worked in the Policy and Program Planning Division of the Common Carrier Bureau since joining the Commission in October 1987. Before coming to the FCC, Ms. Cornell was a senior associate with the law firm of Squire, Sanders & Dempsey in Washington, D.C.

Ms. Cornell received her B.A. from Wesleyan University in Middletown, CT, and a J.D. from the University of Pennsylvania in 1981.

Robert W. Crandall

Dr. Crandall is a Senior Fellow in the Economics Studies Program at the Brookings Institution. He has specialized in industrial organization, antitrust policy and regulation. His current research deals with the effects of the divestiture of AT&T, the effects of trade policy in the steel and automobile industries, and the changing regional structure of the U.S. economy.

A member of the American Economic Association and Phi Beta Kappa, Dr. Crandall has written for numerous professional journals, including The Journal of Industrial Economics, The Bell Journal of Economics and Management Science, and Public Policy. He is also the author of several Brookings books, including After the Breakup: The U.S. Telecommunications Industry in a More Competitive Era, and Up from the Ashes: The U.S. Minimill Steel Industry.

Dr. Crandall was a Johnson Research Fellow at the Brookings Institution and has taught at Northwestern University, MIT, the University of Maryland, and George Washington University. He has also done extensive consulting work in both the public and private sectors, and was a Member of the Reagan Campaign Task Force on Regulatory Policy. He holds M.S. and Ph.D. degrees in economics from Northwestern University.

William H. Davidson

Dr. Davidson is a professor of business administration at the University of Southern California, a position he has held since 1986. Between 1980 and 1990, he was a Visiting Professor at several universities, including INSEAD (France) and the International University of Japan. Since 1984 Dr. Davidson has been Chairman of Management Education Services Association, a consulting organization he founded that specializes in policy studies, international business projects, and executive development.

Dr. Davidson is a member of several domestic and international business and management organizations, as well as a member of the editorial board of seven academic journals. He has written many publications in the international business and management arena. His most recent book is 2020 Vision: Winning in the Information Economy, with Stanley Davis (New York, New York: Simon and Schuster, 1991).

Dr. Davidson received both his masters and doctorate degrees in business administration from Harvard Business School, and an A.B. in economics from Harvard College. He was the recipient of the Academy of International Business award for the Outstanding Dissertation of 1979.

Irwin Dorros

Dr. Dorros is Executive Vice President, Technical Services of Bell Communications Research (Bellcore). In this role, he is responsible for all technical activities, comprising applied research, system engineering, and software development, on behalf of the seven Regional Bell companies.

Prior to divestiture, Dr. Dorros was Assistant Vice President, Network Planning, at AT&T, where he led the planning evolution of the then Bell System nationwide network. He also served as the technical leader of many aspects of AT&T's defense in the government antitrust action that led to the break-up of AT&T. Prior to joining AT&T, Dr. Dorros led programs at Bell Telephone Laboratories on electronic switching, data communications, PCM digital transmission systems development, cellular radio, microwave radio, satellite, network digitalization, Picturephone, and data communications.

Dr. Dorros received a B.S. and M.S. in electrical engineering from the Massachusetts Institute of Technology. In 1962 he was awarded a doctorate of engineering science from Columbia University.

Richard A. Fazzone

Mr. Fazzone is responsible for public policy that affects General Electric Company on a worldwide basis, both as a provider of information services and as a large user of telecommunications services. As a result, he covers public policymaking in regulatory, legislative, and judicial forums, both domestic-state and federal-international. He often works through outside organizations including the International Communications Association (ICA), the Ad Hoc Telecommunications Users Committee, the Coalition of Open Network Architecture Parties, and the National Association of Manufacturers (NAM). He is currently on the ICA Board of Directors and chairs the NAM Telecommunications Subcommittee. Mr. Fazzone is an attorney and licensed to practice in the state of New Jersey.

Kent B. Foster

Mr. Foster is President of GTE Telephone Operations. Previously, he served as Group Vice President of GTE Telephone Operations. Mr. Foster joined General Telephone Company of the Southeast as a supervising engineer. He was named Vice President, Operations Staff in 1976 and Vice President, Network Engineering and Construction in 1977. In 1978 he was named Regional Vice President, Network Planning, Engineering, and Construction for GTE's Southern Regional Telephone Operating Group. Mr. Foster was named Vice President, Planning and Analysis in the Corporate Planning and Development Department in 1980, and was subsequently appointed Vice President, Marketing and Business Planning for the Stamford-based Telephone Operations in 1981. In 1983 he was named President of General Telephone Company of the Northwest and became Group Vice President, Headquarters Staff, GTE Telephone Operations in March 1985.

Mr. Foster serves on the GTE Policy Committee as well as the Executive Committee and Board of Directors of the U.S. Telephone Association. He also sits on the Board of Directors of British Columbia Telephone Company, Quebec Telephone Company, and NCNB Texas. He received his bachelor's degree in electrical engineering from North Carolina State University and a masters degree in management from the University of Southern California.

Henry Geller

Mr. Geller is a Communications Fellow with the Markle Foundation and in that capacity focuses on telecommunications policy issues and research. He is also a professor (of practice) at Duke University and an adjunct professor at the George Washington University.

From 1981 through 1989, Mr. Geller was Director of the Washington Center for Public Policy Research. The Center was part of Duke University's Institute of Policy Sciences and Public Affairs, and dealt with communications policy issues.

From 1978 to January 1981, Mr. Geller was Assistant Secretary for Communications and Information and the Administrator of NTIA in the U.S. Department of Commerce.

Most of his career was spent at the FCC. In May 1964 he was appointed General Counsel, a position he held until September 1970, when he became Special Assistant to the Chairman of the FCC.

Marta Greytok

Ms. Greytok serves as a member of the Public Utilities Commission of Texas, a three-member panel that regulates the rates and services of 160 electric and telephone utilities. She served as Chairman from August 1988 to November 1989.

Commissioner Greytok is active in the National Association of Regulatory Utility Commissioners (NARUC), serving on the Executive Committee, the Committee on Communications, and in the Mid-America Regulatory Conference where she is Second Vice President. She also serves on the Federal/State Joint Conference on Open Network Architecture, NARUC Cable Television Cross-Ownership Task Force, the steering committee of the University of Texas Regulatory Institute, and the advisory council of the Center for the Public Utilities at New Mexico State University.

Prior to her appointment to the Commission, Ms. Greytok served as chairman of the Harris County Central Appraisal District. She also served three two-year terms as mayor of Taylor Lake Village. Ms. Greytok is a graduate of the University of Texas School of Nursing.

Dale N. Hatfield

Mr. Hatfield is President of Hatfield Associates, Inc., a consulting firm specializing in engineering, economic, and policy studies in the telecommunications field. Clients include firms in terrestrial and satellite long-haul communications, cellular mobile radio, cable television, and international communications fields.

Mr. Hatfield is a former Deputy Assistant Secretary of Commerce for Communications and Information. During the 1970s, he served as Chief of the Office of Plans and Policy at the FCC, and subsequently as Deputy Administrator of NTIA.

Mr. Hatfield frequently speaks before industry groups and has testified before both houses of Congress. He is currently an adjunct professor in the masters program in telecommunications at the University of Colorado in Boulder and is co-director of the telecommunications program at the University College of the University of Denver. Mr. Hatfield is also a Senior Fellow of Northwestern University's Annenberg Washington Program. In 1973 he received a Department of Commerce Silver Medal for contributions to domestic communications satellite policy. He holds a B.S.E.E. degree from Case Institute of Technology and an M.S. degree in industrial management from Purdue University.

Thomas R. Herwitz

Mr. Herwitz is Vice President and General Manager of WTTG in Washington, D.C. He joined Fox Television Stations, Inc., in 1986 and served as Vice President, Corporate and Legal Affairs. He has been Executive in Charge of Fox's highly successful crime-fighting program, "America's Most Wanted," since it was first developed in 1987. In addition, he was responsible for developing a new political talk show, "Off the Record," which has been called "the next generation of political insight."

Prior to joining Fox, Mr. Herwitz served, from 1983 to 1986, as Legal Assistant to Mark S. Fowler, Chairman of the FCC. He previously practiced communications law with the Washington, D.C., firm of Hogan & Hartson from 1981 to 1983.

Mr. Herwitz received a B.A. degree from Williams College, and a J.D. degree from the University of Pennsylvania Law School.

John R. Hoffman

Mr. Hoffman is Senior Vice President for External Affairs at US Sprint, a position he has held since 1986. He was Senior Vice President for Legal and External Affairs of U.S. Telecom, Inc., from 1984 to 1986, and Vice President, General Counsel, and Secretary of United Telephone System, Inc., in Kansas City from 1980 to 1984.

Mr. Hoffman holds several directorships including: United Telephone Company of the Northwest; Center for Public Utilities, New Mexico State University College for Business Administration and Economics; Independent Telephone Pioneers Association, Paul H. Henson Club; and American Royal Association, Board of Governors.

Mr. Hoffman received a B.A. degree in history and political science from Washburn University. He also studied at the University of Copenhagen, Denmark. He received his J.D. degree from the University of Missouri School of Law.

Stanley S. Hubbard

Mr. Hubbard is President and Chief Executive Officer of Hubbard Broadcasting, Inc. Hubbard Broadcasting has five stations in Minnesota, three in New Mexico, and one in St. Petersburg, Florida.

Mr. Hubbard is also President of Conus Communications and United States Satellite Broadcasting Company (USSB). Conus is the world's first satellite news-gathering organization, and has 151 affiliated member stations worldwide. It uses Ku-band technology to provide local, regional, national, and international news coverage as well as specialized services, including event coordination and two-way interactive and special programming. USSB is currently proposing to launch a direct broadcast satellite system that would serve the entire nation.

Active in community and broadcasting affairs, Mr. Hubbard sits on the following boards: University of Minnesota Foundation, University of St. Thomas, Fingerhut, Minnesota Business Partnership and the Science Museum of Minnesota. He is also a member of various local and national organizations. Mr. Hubbard received his B.A. degree from the University of Minnesota.

Leland L. Johnson

Dr. Johnson is a senior economist with the RAND Corporation in Santa Monica, California. He has dealt extensively with issues of monopoly and competition in the telephone industry, focusing on the economic effects of the AT&T divestiture and the increasing competitive pressures in international telecommunications markets. He recently completed a study of the potential consequences of lifting the cross-ownership ban to permit telephone companies to deliver video programming in competition with cable operators. He currently is assessing the prospects for direct broadcast satellites to compete with cable.

From 1978 to 1979 Dr. Johnson was Associate Administrator for Policy Analysis and Development in NTIA, and from 1968 to 1978 he was manager of RAND's Communications Policy Program in Santa Monica. Under his direction, the program concentrated on questions of regulatory policy relating to cable television and the broadcasting industries, potential uses of broadband technologies, and the effects of television on human behavior. During 1967-1968, Dr. Johnson was Director of Research for the President's Task Force on Communications Policy.

Dr. Johnson holds a Ph.D. in economics, conferred in 1957 by Yale University.

Leonard S. Kolsky

Mr. Kolsky is Vice President and Director of Regulatory Affairs for the Government Relations Office of Motorola, Inc. He is a member of the Board of Directors of several associations devoted to the advancement of land mobile radio, including the American Specialized Mobile Radio Network Association and the National Association of Business and Educational Radio, Inc. Mr. Kolsky also serves as the Electronic Industries Association's representative on the Land Mobile Communications Council.

Before joining Motorola, Inc. in 1964, Mr. Kolsky worked as an attorney in the Private Radio Bureau of the FCC.

Mr. Kolsky is a graduate of Amherst College (B.A.), Boston University Law School (L.L.B.), and Georgetown Law School (L.L.M.).

Joel E. Lubin

Mr. Lubin is Director of Regulatory Policy in the Federal Affairs Department at AT&T. He is responsible for the coordination of the AT&T efforts to achieve regulatory reform at the federal level. He is also responsible for coordinating AT&T's efforts to formulate regulatory policy associated with access issues.

Prior to his present assignment, Mr. Lubin held various positions in Federal Regulatory, Marketing, Service Costs and Rates, Long Lines, and Bell Telephone Laboratories.

Mr. Lubin received a B.A. degree in mathematics from Wilkes College in 1969, an M.S. degree in operations research from Columbia University in 1972, and an M.B.A. degree from Fordham University in 1976.

Vincent Mosco

Dr. Mosco is professor of Journalism at Carleton University in Ottawa, Canada and Director of the Carleton Media and Communication Research Center. He is the author or editor of nine books on communication policy, mass media, computers and information technology, and popular culture. His most recent books are The Political Economy of Information (University of Wisconsin Press, 1988) and The Pay-per Society (Ablex, 1989). Dr. Mosco has authored over 50 papers appearing in a wide range of publications including the Columbia Journalism Review; Le Monde Diplomatique; Media, Culture, and Society; and the Journal of Communication.

Dr. Mosco has been a research fellow in the United States for the Executive Office of the President, the National Research Council, and the Office of Technology Assessment; and in Canada for the Departments of Communication, Labour, and Finance. He is currently President of the Political Economy Section of the International Association for Mass Communication Research and a member of the editorial boards of several scholarly journals. His major current interests are the political economy of communications and culture, telecommunications policy, and the social impact of information technology. Dr. Mosco received his Ph.D. degree from Harvard in 1975.

Michael R. Nelson

For the last three years, Dr. Nelson has been a professional staff member of the Senate Committee on Commerce, Science, and Transportation, chaired by Senator Ernest Hollings (D-SC). Dr. Nelson is assigned to the Subcommittee on Science, Technology, and Space, which is chaired by Senator Albert Gore (D-Tenn), and has jurisdiction over NASA, the National Science Foundation (NSF), the National Institute of Standards and Technology, and the Office of Science and Technology Policy. He advises Democratic senators on the Commerce Committee on such issues as global change research, advanced computing and networking technology, earthquakes, and the NSF and NASA budgets.

One of the few scientists on Capitol Hill, Dr. Nelson received a B.S. degree in geology from the California Institute of Technology and a Ph.D. degree in geophysics from MIT. He is a member of the American Geophysical Union and the American Association for the Advancement of Science.

Morgan E. O'Brien

Mr. O'Brien serves as Chairman of the Board, General Counsel and Director of Fleet Call, Inc., positions he has held since he co-founded the company in 1987. He is also a senior consultant to Jones, Day, Reavis & Pogue, an international law firm, where he was a partner and in charge of the firm's telecommunications section until Fleet Call, Inc., was formed.

Mr. O'Brien has extensive experience in mobile radio and is a leader in the Specialized Mobile Radio (SMR) industry. He began his career as a lawyer with the Mobile Services Division of FCC's Common Carrier Bureau. In 1972 he served as legal advisor for the FCC's Chicago regional experiment in spectrum management for land mobile services, and subsequently was named Assistant Bureau Chief for Spectrum Management of the FCC's Private Radio Bureau.

In private legal practice beginning in 1979, Mr. O'Brien represented major SMR operators in proceedings before the FCC, and in 1982 became counsel to several large applicants for cellular radio licenses. He presently serves as Vice-Chairman and Director of the American SMR Network Association. He is a frequent speaker at industry gatherings and is a recognized authority on all aspects of the SMR industry, including its regulatory environment.

Charles M. Oliver

Mr. Oliver is the Senior Policy Advisor to Janice Obuchowski, the Assistant Secretary of Commerce for Communications and Information. Between 1980 and 1986 he worked for CBS as its Director of Legislative and Regulatory Policy, successfully managing the company's efforts to obtain government permission to provide direct broadcast satellite and multichannel multipoint distribution service. In 1987 he joined the FCC Common Carrier Bureau, where he dealt with Computer III/Open Network Architecture, local exchange carrier price caps, intercarrier billing, and federal preemption issues. He moved to his present position in the Commerce Department in November 1989.

Mr. Oliver graduated with honors from Yale College, earned a master's degree in communications from the University of Pennsylvania, and a law degree from the University of Virginia.

Richard D. Parlow

Mr. Parlow is currently Associate Administrator for the Office of Spectrum Management of NTIA where he manages the radio spectrum used by over 50 federal agencies. He is responsible for the development of national telecommunications policy, the investigation and analysis of spectrum-efficient technologies, and national and international spectrum planning. Mr. Parlow is also involved in the preparation and policy development for the international radio conferences of the International Telecommunications Union and other international organizations.

Mr. Parlow is the NTIA principal to the National Communications System and is involved in national security emergency preparedness and continuity of government activities.

Mr. Parlow has a B.S. degree in electrical engineering from the University of Wisconsin and a masters degree in engineering administration from the George Washington University.

Robert Pepper

Chief of the Office of Plans and Policy at the FCC, Mr. Pepper has been at the FCC since 1986 when he became Senior Adviser to then-FCC Commissioner Patricia Diaz Dennis. Before 1986, he was Director of the Annenberg Washington Program in Communications Policy Studies. He has also held several other communications policy positions in Washington, including Acting Associate Administrator for Policy Analysis and Development, and Director of Domestic Policies of NTIA. In between assignments at NTIA, he served as policy analyst for the NSF's Division of Policy Research and Analysis.

Before moving to Washington, Mr. Pepper was a research affiliate of Harvard University's program on information resources policy and a professor of communication and program head at the University of Iowa. He has published and lectured widely on telecommunications policy issues and has served as a consultant and adviser to industry and government. He is a graduate of the University of Wisconsin-Madison, where he also received his doctorate.

Kenneth L. Phillips

Dr. Phillips is Vice President for Telecommunications Policy at Citicorp. He coordinates technology advances in telecommunications with regulatory, legislative, and legal initiatives before Congress, the FCC, and state regulatory commissions. In addition, he has been a professor at New York University's Tisch School of the Arts for nine years, and along with Richard Soloman, directs the telecommunications policy unit at the MIT Media Lab.

Dr. Phillips has published over 30 articles on topics surrounding telecommunications technology and policy. He is chairperson of the Committee of Corporate Telecommunications Users, a not-for-profit corporation representing large telecommunications users. He was recently named by Communications Week and Network World as one of the five most influential figures in telecommunications policy.

Dr. Phillips attended Brandeis University as an undergraduate, and holds graduate degrees in physics and psychology from the City University of New York, and the Graduate Faculty of the New School for Social Research and Columbia Universities, respectively.

Ivan G. Seidenberg

Mr. Seidenberg was appointed Executive Vice President of NYNEX Corporation and President of NYNEX Worldwide Information and Cellular Services Group on May 1, 1990. Prior to his appointment, he served as Senior Vice President of NYNEX Corporation. In that capacity, he was responsible for overseeing the NYNEX Business Information Systems Company and NYNEX International Company, and was responsible for NYNEX's corporate communications activities.

Mr. Seidenberg joined NYNEX in 1983 as an assistant vice president. From 1974 to 1983, he held a variety of positions at AT&T. In 1982 he was assigned to AT&T's divestiture transition team to plan and implement the pending reorganization of the Bell System. A year later, he moved to NYNEX as Vice President of Government Affairs in Washington, D.C., a responsibility he still retains.

Mr. Seidenberg is a member of the board of directors of New York Telephone, and also serves on the board of the United States Telephone Association. He earned a B.S. degree in mathematics from City University of New York and received a masters degree in business administration from Pace University.

John J. Sie

Mr. Sie joined Tele-Communications, Inc. (TCI) in 1984 as Senior Vice President. In this position, he is responsible for coordinating all of TCI's strategic issues in business, programming, technology and public policy, focusing on the areas of high definition television, fiber optics, TELCO, cable, and DBS, and manages many of TCI's programming investments and new business development.

Mr Sie came to TCI after six years with Showtime/The Movie Channel, Inc., where he served as Senior Vice President of Sales and Planning. Prior to Showtime, Mr. Sie spent five years at Jerrold Electronics, first as Division General Manager of the Terminal Products and Services Division, and later as Vice President of CATV Division. Prior to Jerrold, he spent 10 years as a founder, and later the President of Micro State Electronics, and aerospace subsidiary of Raytheon.

Mr. Sie received his B.E.E. degree in 1957 from Manhattan College and his M.E.E. degree in electro physics from Polytechnic Institute of Brooklyn in 1958. He was the recipient of RCA's David Sarnoff Research Fellowship in 1960, and in 1982, he was awarded the prestigious Robert H. Beisswenger Memorial Award by the National Cable Television Association.

Thomas P. Stanley

Dr. Stanley has served as Chief Engineer of the FCC since February 1986. He has served in a number of other positions in the Office of Engineering and Technology since joining the FCC in 1981. Those positions included Acting Chief Scientist, Deputy Chief Scientist for Operations, and the Chief of the Office of Science and Technology, Technical Planning Staff. From October 1982 until June 1983, Dr. Stanley also served the FCC as Assistant for National Security Telecommunications, assisting the designated Defense Commissioner and the Managing Director.

Prior to his work with the FCC, Dr. Stanley was also affiliated with the Institute for Defense Analyses, the U.S. Army Signal Corps, and the Bell Telephone company.

Dr. Stanley received his Ph.D. and M.A. degrees in electrical engineering from Princeton University and his B.E.S. degree in electrical engineering from Johns Hopkins University.

Jan H. Suwinski

Mr. Suwinski is executive vice president of Corning's Opto-Electronics Group. He joined Corning in 1965, holding positions in industrial products sales and marketing. In 1970, Mr. Suwinski joined Corning's ceramics group, helping to develop a business for extruded ceramic substrates used in today's automobile catalytic converters. Later as marketing manager for optical products, he helped develop and commercialize several of Corning's photochromic lenses for prescription eyewear and sunglasses.

In 1981, Mr. Suwinski was appointed a vice-president of Corning Latin America/Asia Pacific, Inc., and named area manager for Asia in 1983. He was elected a vice president of Corning Glass Works and appointed general manager of the Telecommunications Products Division in September 1985. In December 1986, he was named senior vice president and general manager, and served in that position until December 1990 when he assumed his current responsibilities.

Mr. Suwinski currently is on the Board of the Telecommunications Industry Association and chairman of its Fiber Optics Division. From 1987 to 1990, he served on the Alumni Executive Council of the Johnson School of Management at Cornell University. He serves on the Engineering College Advisory Council at Cornell University, and is a member of ASME, AICHE and the Cornell Society of Engineers.

He holds B.M.E. and M.B.A. degrees from Cornell University.

Barry D. Umansky

Mr. Umansky is Deputy General Counsel of the National Association of Broadcasters (NAB). He joined NAB in February, 1979, following six years as an attorney at the Federal Communications Commission. While at the FCC, Mr. Umansky specialized in broadcast and cable television regulation and policymaking. Prior to his FCC employment, he worked at television and radio stations in Kansas and Missouri, where he worked as a reporter, news writer, and news photographer.

At the NAB, Mr. Umansky is the attorney chiefly responsible for radio allocation issues, radio and television "deregulation," broadcast license renewal, environmental issues, and a variety of other radio and television matters.

Mr. Umansky is a graduate of Carleton College, Northfield, Minnesota, and the Washington University School of Law, St. Louis, Missouri.

George Vradenburg III

Mr. Vradenburg is currently Executive Vice President, Fox, Inc. At the time of the conference he was Senior Vice President, General Counsel and Secretary, CBS, Inc, a position he assumed in 1989. He had been Vice President and General Counsel, CBS, Inc., since January 1985, and was elected Secretary of the company in August 1988.

Mr. Vradenburg joined CBS in 1980 as Associate General Counsel. He was appointed Deputy General Counsel in November 1981 and Vice President and General Counsel in December 1982. Previously, he was associated with the law firm of Cravath, Swaine & Moore. From 1967 to 1969, he served in the United States Navy as a Legal and Discipline Officer.

Mr. Vradenburg holds an A.B. degree, magna cum laude, from Oberlin College, where he was elected to Phi Beta Kappa. He received an LL.B. degree, cum laude, from Harvard Law School.

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