

DEPARTMENT OF COMMERCE  
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION

**STRATEGIC PLAN**

**1999 TO 2004**

JANUARY 1999

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APPRECIATION

The National Telecommunications and Information Administration (NTIA) appreciates the contributions of employees, customers, stakeholders, and external experts during the continuing development of the

agency's strategic plan. Employees at all levels have had opportunities to participate and contribute to this process. These contributions continue to stimulate thinking about the future of telecommunications and information and the efforts and value of NTIA activities. As the agency continues to advance its strategic planning efforts, additional contributions from these individuals and others will be solicited on an on-going basis.

## NTIA INFORMATION

The National Telecommunications and Information Administration (NTIA) is the Executive Branch agency principally responsible for domestic and international telecommunications and information policy issues. With roughly \$73 million available for 1999 activities, NTIA's workforce of approximately 290 full-time equivalent (FTE) employees works to promote the efficient and effective use of telecommunications and information resources in a manner that creates job opportunities, enhances U.S. competitiveness, and raises the standard of living. NTIA is physically located in the Herbert C. Hoover Building at 1401 Constitution Avenue, Washington, DC 20230 and its laboratory -- the Institute for Telecommunication Sciences -- is located in the Commerce Laboratory Complex at 325 South Broadway, Boulder, CO 80303.

Additional information concerning NTIA's activities is available through the agency's home page on the Internet, <http://www.ntia.doc.gov> or from NTIA's Office of Public Affairs (202-482-7002).

## SUMMARY OF CHANGES

### FROM THE NTIA 1997 -- 2002 STRATEGIC PLAN

NTIA released its first formal strategic plan in October 1997. The updated 1999 -- 2004 Strategic Plan includes several major changes:

- Streamlined Agency Goals and Objectives. Most importantly, the agency's goals have been condensed to four fundamental goals from the initial seven goals. This was not done lightly; many senior NTIA managers met over several months to discuss and finally reach consensus on the goals that truly capture NTIA's agenda.
- Major new area of work added: The President issued Presidential Decision Directive 63 (PDD-63) in May 1998. As a result of PDD-63, the Critical Infrastructure Protection (CIP) Program was formally initiated. In addition to the telecommunications research activities NTIA will pursue under this program, the Secretary has now delegated the lead agency functions for CIP in the communications and information sector to NTIA. This is a major new body of work that may grow substantially in future years. Organizationally, this work will be done through NTIA's Office of Spectrum Management and Institute for Telecommunication Sciences.
- Recognition of the key role the use of information technology plays within NTIA. This plan reflects a merger of NTIA's programmatic strategic planning process and the information technology strategic planning process required by the Department. In recognition of the size and type of information technology investments NTIA makes, it is appropriate to address these needs through one planning process. This also mirrors the organizational responsibilities within NTIA, since the primary support for strategic planning is provided by the Chief of the Policy Coordination Division, and this same individual serves as NTIA's Chief Information Officer.

## LEADERSHIP STATEMENT

The Vision and Mission Statements shown below, supported by the goals and objectives identified in the Strategic Plan, provide a unifying force for the agency and will guide NTIA in fulfilling its unique role in the telecommunications and information policy arena. NTIA's leaders have continued to actively participate in the agency's strategic planning process and will ensure the strategic plan is used to manage the agency at all levels.

### Vision:

NTIA envisions a world where telecommunications and information technologies are used to protect and improve the global quality of life.

**Mission:**

NTIA's mission is to promote the efficient and effective use of telecommunications and information resources in a manner that creates job opportunities, enhances U.S. competitiveness, and raises the standard of living.

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Bernadette McGuire-Rivera Kelly Levy

Telecommunications and Policy Analysis and Development

Information Applications

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International Affairs Spectrum Management

Val O'Day Kathy Smith

Telecommunication Sciences Chief Counsel

**Foreword**

The National Telecommunications and Information Administration (NTIA) is the President's principal adviser on telecommunications and information policy issues and, in this role, frequently works with other Executive Branch agencies to develop and present the Administration's position on these issues. In addition to representing the Executive Branch in both domestic and international telecommunications and information policy activities, NTIA also manages the Federal use of the spectrum; administers infrastructure grants to support the development of a national information infrastructure accessible to all Americans; manages public telecommunications facilities and digital broadcasting grants designed to maintain, extend, and improve the public broadcasting infrastructure; and performs cutting-edge telecommunications research and engineering, including resolving technical telecommunications issues for the Federal government and private sector.

NTIA is unique among Federal government agencies in that the work of the agency is focused exclusively on telecommunications and information. The agency's expertise encompasses every aspect of telecommunications, including community network applications, domestic policy, international policy, spectrum management, and telecommunications research and engineering. Using the resources available to the agency, NTIA addresses the highest priority issues in telecommunications and information today and maximizes the return on those resources by utilizing this expertise throughout its programs. Our analysts bring to their work an appreciation of the complexities of developing national policies, as well as the ability to draw on technical expertise to understand how those policies will facilitate or hinder development, and application expertise to gauge the impact on communities and individuals. This internal synergy is critical to NTIA's credibility and respect in the community; the agency's influence and advocacy record is a direct result of this synergy. NTIA's unique talents as an agency are readily apparent in the current Administration's record of accomplishments on a wide range of telecommunications issues, including universal service, the Telecommunications Act of 1996, global

electronic commerce, Internet development, and digital broadcasting.

The Government Performance and Results Act (Public Law 103-62 of August 3, 1993), commonly referred to as GPRA, provided a guideline for the development of NTIA's strategic plan. As an active participant in the Department of Commerce's strategic planning efforts, NTIA senior managers became convinced that implementing an agency strategic planning process would allow them to improve the management and effectiveness of the agency.

NTIA's strategic planning process complements and extends the strategic plan of the U.S. Department of Commerce (DOC). The Department's mission statement contains three strategic themes:

**The Department of Commerce promotes job creation, economic growth, sustainable development, and improved living standards for all Americans, by working in partnership with business, universities, communities, and workers to:**

- 1. Build for the future and promote U.S. competitiveness in the global marketplace, by strengthening and safeguarding the nation's economic infrastructure;**
- 2. Keep America competitive with cutting-edge science and technology and an unrivaled information base; and,**
- 3. Provide effective management and stewardship of our nation's resources and assets to ensure sustainable economic opportunities.**

NTIA is one of the few Commerce bureaus that contributes to all three of the Commerce strategic themes. The integration of NTIA's work into all aspects of the Department's themes demonstrates the critical importance of telecommunications and information policy and infrastructure development to the continued economic success of the Nation. NTIA enjoys a synergistic and complementary relationship with many of the Commerce agencies; for example, NTIA frequently provides telecommunications expertise to trade delegations supported by the International Trade Administration; works with the National Institute of Standards and Technology on the development of national telecommunications standards which are then presented to the international standards bodies by NTIA; collaborates with the Patent and Trademark Office on the application of copyright and intellectual property protections to data transmitted and disseminated by the use of evolving telecommunications and information technologies and services; and consults with the National Oceanic and Atmospheric Administration on the use of weather satellite capabilities and services.

The strategic plan promotes a strong NTIA, willing and able to work constructively with the many other organizations that depend upon telecommunications and/or spectrum to fulfill their missions. These organizations include, but are not limited to, the Federal Communications Commission (FCC), the U.S. Trade Representative (USTR), the U.S. Department of State (DOS), and the other Federal departments and agencies that use the spectrum for national defense, public safety, air traffic control, and other such endeavors.

In formulating the strategic plan, NTIA managers and senior staff solicited input from all employees and a limited number of stakeholders and customers. As our planning process continues, NTIA openly invites comments, suggestions, and criticisms regarding the plan and current activities. The plan will continue to be distributed to all employees and available to the public through NTIA's Internet home page ([www.ntia.doc.gov](http://www.ntia.doc.gov)). Comments will be accepted and addressed at any time.

The NTIA plan sets forth our vision for the future, defines our mission, and establishes goals and objectives. NTIA published its first Strategic Plan, covering 1997-2002, in October 1997. At that time, formal strategic planning represented a management change for NTIA -- a change that helped to create a more effective agency, one capable of assisting consumers and industry to benefit from the emergence of the telecommunications and information industries as the fastest growing and most productive sectors of our economy.

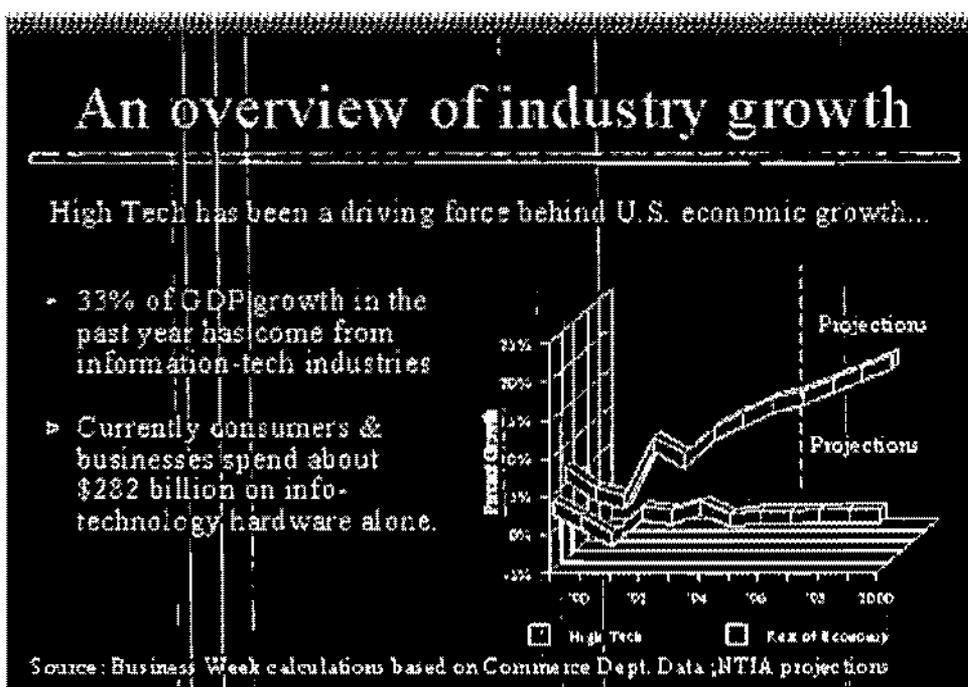
Since development of the October 1997 Plan, NTIA has reassessed the agency

goals and objectives. Initially, the agency established seven goals with supporting objectives. In working with these goals, it became clear that unnecessary duplication interfered with understanding what the agency is really trying to accomplish. In reviewing our activities and performance, we were able to streamline the presentation of NTIA's priorities and agree on four goals with necessary objectives.

**Telecommunications and Information Environment.**

The telecommunications and information revolution is bringing dramatic growth and change to the nation's economic, social, and political life. These exciting developments affect every American to some extent because nearly everyone uses telephones, televisions, computers, radio, and related technology. Citizens receive public services and protections that rely upon telecommunications technology. Communication is fundamental to the very organization of society and to life as it is lived today. Affordable access to telecommunications technology is becoming a basic necessity for a successful and productive life in all sectors of our society, including business, academia, industry, banking and government.

The rapid growth and critical importance of the telecommunications and information industries will continue for at least the next decade, domestically and internationally. The following charts --*An Overview of Industry Growth* and *The Global Telecom Industry* --attest to the industry's growth and its impact on our future.

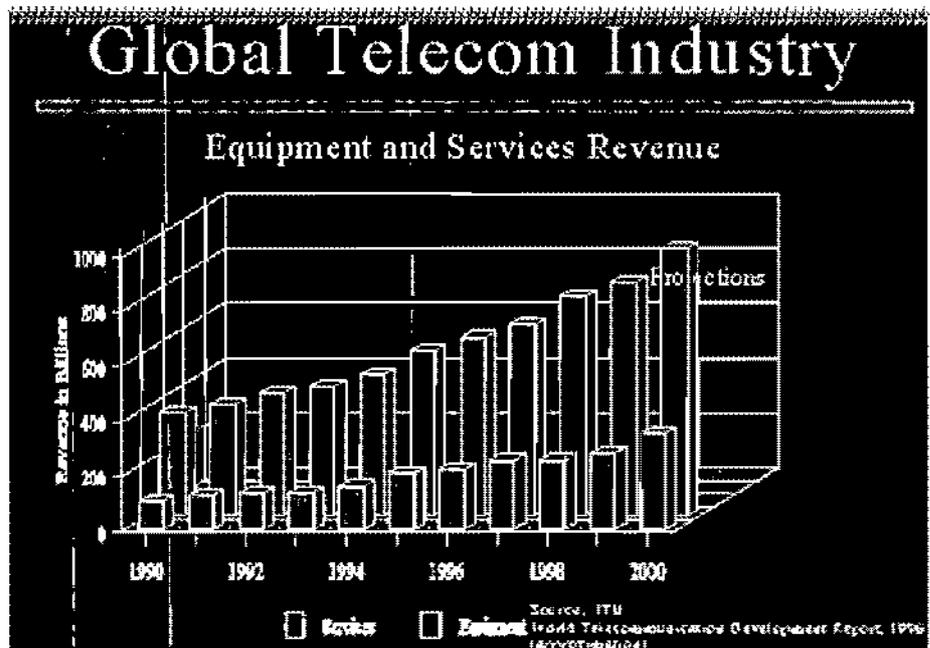


The growth of technology is defining our economy today and for tomorrow.

Globally the industry is positioned for continuing growth. Any indicator associated with telecommunications and information provides a similar growth projection for the future.

Over the next decade, new equipment and services will be purchased and deployed on an unprecedented scale. The pace of commerce is expected to continue to accelerate as the global community increases its participation in new business opportunities and advantages made possible by the evolving global information infrastructure. In addition, the use of electronic commerce is growing tremendously --

electronic commerce among businesses alone will total well over \$300 billion by early in the next decade (First Annual Report, U.S. Government Working Group on Electronic Commerce, November 1998; page 2.)



The rapid advancement of these technologies and the magnitude of their impact on individuals, society, and international affairs is hard to imagine but we see inklings of what is to come every day. The Internet, practically unheard of just a few years ago, is now a major economic force, with over 140 million users worldwide --- and traffic on the Internet is more than doubling each year. (First Annual Report, U.S. Government Working Group on Electronic Commerce, November 1998; page 6.)

### *Present and Future Issues*

The increasing convergence of telecommunications and information technologies is offering consumers --- both individuals and businesses --- new services at reasonable prices; in fact, it is resulting in explosive growth in services at competitive prices. As the telephone network increasingly is used to transmit data and the television provides viewers access to the World Wide Web, varied and unique combinations of previously discrete technologies are being created. The convergence of technologies is also blurring industry boundaries -- previously clearly defined industries that have been regulated by disparate authorities -- and the convergence of service offerings. The impact of this convergence on regulatory issues presents major challenges to the existing regulatory infrastructure.

The issues for today and tomorrow require NTIA to provide expertise-based leadership and a visionary view of what lies ahead in telecommunications and information. NTIA's experts are at the leading edge of policy analysis regarding the ideas and issues confronting and shaping the telecommunications and information sectors today and for the future. A sampling of these issues includes:

The Secretary has recently assigned NTIA to fulfill the lead agency responsibilities for the information and communications sector under the Critical Infrastructure Protection Program (CIP). CIP was formally initiated when the President issued Presidential Decision Directive 63 (PDD-63) in May 1998. In addition to the lead agency responsibilities NTIA is assigned, NTIA will also be performing telecommunications research activities specifically designed to further CIP objectives. Both the CIP lead agency and research form a major new body of work that may grow substantially in future years. Organizationally, this work will be done through NTIA's Office of Spectrum Management and Institute for Telecommunication Sciences.

As the diffusion of new technologies into the marketplace accelerates, the need to effectively and

efficiently manage spectrum -- a precious, finite resource -- is critical. Although NTIA represents the Federal users of the spectrum and must ensure spectrum is available to accomplish Federal missions -- including air traffic control and national defense, the scarcity of this resource requires NTIA to function as an honest broker on behalf of the public interest, working constructively and cooperatively with the private sector and government spectrum users. At the same time, NTIA is uniquely positioned and has the expertise necessary to formulate a spectrum management vision for the future and policies for today that encompass the entire range of spectrum applications and users.

Many wired telecommunications services will be augmented by additional wireless services; the accompanying escalating demands for spectrum require increasingly efficient and effective management of this finite resource. Wired and wireless solutions will coexist, creating unprecedented options for individuals and organizations. These transformations not only will require rapid policy response, but also clear-eyed analysis and forecasts. As an example, personal communications services (PCS) are becoming available to the public, establishing communications available anytime and anywhere for many Americans. These new services raise new issues that will need to be addressed, including competition and universal service, privacy and security. Continued growth of wireless services requires new policy approaches and adaptation of existing ones.

The push to connect schools, libraries, and other community access centers to electronic information sources continues. NTIA today is helping to design models to ensure fulfillment of our national commitment to universal service, which now includes the connection of schools, libraries, and other public institutions to the emerging telecommunications infrastructure. NTIA in the future will contribute to assessments of how well universal service is working, how to ensure that public institutions are current with technology, how technologies are used in public institutions, and whether and how universal service should be redefined.

Electronic commerce will proliferate over the next five years, creating and expanding business opportunities and consumer choice globally. NTIA supports a predictable, minimalist, consistent and simple legal environment that will facilitate the growth of electronic commerce, and is helping to resolve privacy, content regulation, copyright protection, Internet governance, domain name management, and other similar issues. Market access and infrastructure issues are becoming more pronounced, accompanied by public impatience for rapid resolution so that commerce will not be impeded.

Based on NTIA's efforts in 1998 and 1999, the Department has now entered into a Memorandum of Understanding (MOU) with the Internet Corporation for Assigned Names and Numbers (ICANN) to collaborate on the orderly transition of certain management functions of the Internet Domain Names Service to the private sector. With the explosive growth of the Internet expected to continue and its increasing use for electronic commerce, domain name management will be an active NTIA issue for several years.

In the World Trade Organization (WTO) Agreement on basic telecommunications services entered in March 1997, almost 70 countries, representing approximately 95% of the world's telecommunications revenues, agreed to liberalize their telecommunications markets. NTIA is working to ensure that the signatories understand the regulatory principles and enforcement mechanisms needed to make liberalization happen in their countries and assist them to the maximum extent possible with implementation of the WTO Agreement.

The FCC is requiring television broadcasters to convert to digital technology by 2006 (although there may be an extension determined by consumer preferences). NTIA is contributing to the debate on the appropriate public interest obligations of digital broadcasters. With NTIA's support, the President's Advisory Committee on the Public Interest Obligations of Digital Broadcasters recently provided recommendations to the Vice President.

In addition, public broadcasters alone will require at least \$1 billion to cover their conversion to digital. The survival of public broadcasting in light of this conversion is not guaranteed; this issue could be prominent throughout the next decade. Through its Public Telecommunications Facilities Program (PTFP), NTIA has developed significant expertise and on-going relationships with the public

broadcasting community and is uniquely qualified to contribute to the debate on public broadcasting's conversion to digital. The FY 1999 appropriation bill provides language and funds to allow some of the digital needs of public broadcasters to be met through this grant program.

Public safety and law enforcement increasingly relies on the use of telecommunications and information technologies to support their missions. NTIA is working with the FCC to assist Federal, state and local public safety offices to utilize such technologies effectively and efficiently.

Ownership concentration in telecommunications and media industries appears to be increasing rapidly. This raises serious policy and legal questions regarding the choices that the American public will have for receiving news and information. It is also affecting the opportunities available for minority ownership -- NTIA and the Federal Communications Commission are both examining possible initiatives in this area.

It is impossible to predict with any certainty the pace of change in the telecommunications and information industries. The future is exciting and challenging. As President Clinton has said: "The new promise of the global economy, the information age, unimagined new work, life-enhancing technology: All these are ours to seize. That is our honor and our challenge. **We must be shapers of events, not observers**, for if we do not act, the moment will pass and we will lose the best possibilities of our future." NTIA's role is to help the Nation facilitate the development and evaluation of this technology and to promote its use to improve the quality of life.

### *The NTIA Role*

The new digital era requires a public policy environment that embraces innovation, encourages competition, and empowers consumers. In fulfillment of its role as the President's principal adviser on telecommunications and information policy issues, NTIA must keep pace with these issues and cultivate synergy with the FCC, the State Department and the USTR, as well as with the full range of Federal agencies such as the Department of Defense, Department of Justice, Department of Transportation, and others that use telecommunications in discharging their responsibilities for the nation's safety and well-being. It is critical that NTIA continue to fulfill a leadership role on telecommunication and information policies.

At NTIA, the admonition "Lead, follow, or get out of the way" is particularly appropriate. The Federal government has a critical responsibility to assist in shaping the global telecommunications and information policy debate. A key NTIA role is to ensure that government does not obstruct private sector innovation and the rapid deployment of telecommunications technology. Today, and even more urgently in the future, NTIA must exercise a blend of leadership and collegiality that promotes synergy within a complex network of federal, state, local, and international entities.

NTIA's vision, mission and the strategic goals and objectives that follow will guide the National Telecommunications and Information Administration in its unique role against the backdrop of an exciting, demanding, and promising future.

### **Vision:**

NTIA envisions a world where telecommunications  
and information technologies are used to protect and  
improve the global quality of life.

### **Mission:**

NTIA's mission is to promote the efficient and effective use of telecommunications and

information resources in a manner that creates job opportunities, enhances U.S. competitiveness, and raises the standard of living.

## GOALS AND OBJECTIVES 1999 -- 2004

The following agency goals and objectives define NTIA's priority efforts. The goals are not listed in any relative priority order and the agency does not plan to prioritize these goals against each other at this time.

A summary table illustrates the relationship of NTIA's four goals to the Commerce Department's three strategic themes:

NTIA GOAL	DOC THEME	Promote U.S. Competitiveness	Science and Technology	Resource Management
1. Promote Open Markets and Encourage Competition				
2. Ensure Spectrum provides the greatest benefit to all people.				
3. Advance the Public Interest in telecommunications, mass media, and information.				
4. Promote the Availability and Sources of Advanced Telecommunications and Information Services.				

## NTIA GOALS & OBJECTIVES

### GOAL 1: Promote open markets and encourage competition.

- Open markets to competition leading to lower prices, increased innovation, and more options for consumers.

1.2 Increase competitive choices for telecommunications and information services for all consumers.

1.3 Advocate a more procompetitive international satellite services market.

1.4 Advance U.S. policy and commercial interests in bilateral, regional and international fora.

1.5 Assist developing countries in strengthening their telecommunications and information infrastructures.

### GOAL 2: Ensure spectrum provides the greatest benefit to all people.

2.1 Develop and implement spectrum plans and policies for both government and private sector users.

2.2 Satisfy the spectrum needs of Federal government agencies.

2.3 Advance development of spectrally efficient technologies.

2.4 Improve the management of Federal and non-Federal spectrum to maximize the value of spectrum to society.

### GOAL 3: Advance the public interest in telecommunications, mass media, and information.

3.1 Promote universal service and access.

3.2 Assist in maintaining and extending the services of public broadcasting and telecommunications

facilities, including digital broadcasting applications in the public interest.

3.3 Promote a diversity of choices and programming sources in the mass media.

3.4 Encourage private sector initiatives to give citizens the ability to protect their children from indecent material.

3.5 Facilitate private sector determination of the public interest obligations of broadcasters.

3.6 Establish principles for the protection of personal privacy.

3.7 Work to maintain the U.S. telecommunications and information infrastructure in time of crisis.

**GOAL 4: Promote the availability and sources of advanced telecommunications and information services.**

4.1 Demonstrate advanced, innovative applications of telecommunications and information technology in the non-profit and public sectors.

4.2 Promote the growth of electronic commerce and Internet use domestically and internationally.

4.3 Meet the compelling telecommunications research needs of other Federal agencies and industry through cooperative research and development.

4.4 Promote international acceptance of U.S. spectrum proposals.

4.5 Participate in ITU and domestic standards development to benefit U.S. industry and user interests.

***Possible Limits on Plan Implementation***

Implementation of NTIA's strategic plan and fulfillment of its goals and objectives assumes that a supportive external environment will exist. The development of the plan has been accomplished in a positive and confident manner and in the genuine belief that the outcomes and outputs that it promotes and promises will be available to its customers and stakeholders.

With this basic understanding, there are a few constraints that could limit the agency's ability to implement the plan. These limitations include, but are not necessarily limited to, those that are itemized below:

Other directives from Congress, the Executive Branch or other sources that require immediate attention may also require adjustments to the planned progress on fulfilling the agency's goals and objectives. Unfunded directives will directly impact the resources available to apply to advancing NTIA's goals and objectives.

Continued legal challenges to full implementation of the Telecommunications Act will force NTIA to work harder to overcome these obstacles, particularly as they relate to Goals No. 1 and 3.

Shifts in emphasis or relationships among agencies that focus on telecommunications and information matters could affect the implementation of the plan.

Funding for NTIA's activities and initiatives will determine the speed with which the agency's agenda can be pursued.

Significant restructuring of the Department of Commerce or NTIA could divert resources, attention, and momentum from the performance of mission-oriented tasks to administrative efforts. These would also be accompanied by negative impacts to morale, productivity and the essential customer/stakeholder

relationships on which NTIA relies to perform its mission.

NTIA depends upon the Department of Commerce for many centralized administrative functions, such as payroll, timekeeping, human resources support, and procurement -- these services form the underlying support for our strategic plan and make its fulfillment possible. Increases in administrative burdens unaccompanied by resources could divert agency momentum from critical goals and objectives.

The following Appendices support NTIA's strategic plan:

- NTIA's Strategic Planning Process
- Program/Organizational Summary
- Key Infrastructure: Information Technology
- Summary of NTIA's Goals, Objectives and Performance Measures (Exhibit #3A from the FY 2000 Congressional Budget Request)
- Supporting Infrastructure: Future Issues to be Addressed

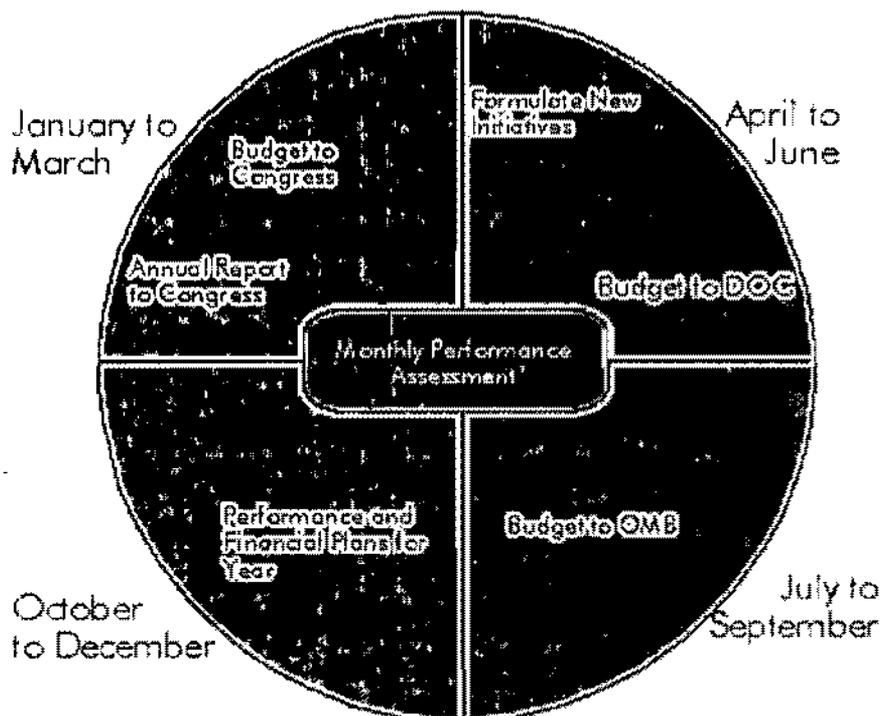
Appendix A

***NTIA's Strategic Planning Process***

TODAY...

NTIA manages its strategic planning process through the Executive Committee supported by the Chief of the Policy Coordination Division in the Office of Policy Coordination and Management. The Executive Committee consists of the Deputy Assistant Secretary and Office Heads as well as the Policy Coordination Division Chief and Budget Officer.

The process itself is a continuing spiral of activity, focused on using the plan and goals and objectives to manage the work of the agency and ensure that we are moving forward. The following diagram illustrates the highlights of the formal planning process.



<sup>1</sup> Weekly executive staff meetings, policy forums, monthly program performance certification

Constant communication is key to the implementation of the strategic plan. All NTIA senior staff attend staff meetings with the Assistant Secretary and/or Deputy Assistant Secretary weekly. In addition, weekly Policy Forums are scheduled for Tuesday afternoons to discuss substantive issues. These issues can include policy deliberations on agency positions, administrative requirements, changes in the agency's information technology infrastructure, significant changes in programmatic directions, etc. These meetings encourage open communication and result in a common agency perspective on proposals/issues and general consensus on what is right for the agency.

Over the past year, the Executive Committee has focused on redefining NTIA's goals and objectives and succeeded in reducing the agency goals from seven to four. The emphasis has also been placed on measuring performance and NTIA will be experimenting with quarterly assessments of performance against the measures established at the beginning of the year. As a result of this emphasis, NTIA is developing a Fox Pro data base system to use in tracking and monitoring agency performance measures. This system is in place and will be generating monthly reports for certification by each office head beginning in March 1999.

Also as a result of Policy Forum discussions and designed to improve communication, the Deputy Assistant Secretary has instituted a standard clearance form and checklist for all agency products. All staff are encouraged to use these standard forms to ensure all views and positions have been taken into account prior to public release.

#### IN THE BEGINNING...

NTIA initiated its 1997 -- 2002 strategic planning process in January 1997. The agency began to prepare for implementation in the Fall of 1996 by providing senior executives with general planning information, briefings from other agencies -- including the National Oceanic and Atmospheric Administration -- who shared their perspectives on strategic planning, and demonstrations of support for strategic planning by the Deputy Assistant Secretary and Assistant Secretary at employee events. The Deputy Assistant Secretary led the strategic planning efforts and continues to use the plan to manage the agency. NTIA is determined to use strategic planning, as envisioned by the Government and Performance Results Act, to improve agency management and maximize the return to the American public from the tax dollars required to operate.

NTIA worked closely with Strategic Futures, a small business frequently used by the Department for executive development, strategic planning, and related activities. Working at the direction of agency staff, Ron Gunn, of Strategic Futures, facilitated NTIA's strategic planning activities. He developed and presented training materials to familiarize NTIA senior managers with the basic concepts of strategic planning while supporting the collection of agency data that might contribute to the plan. Key components of the strategic planning process included:

Strategic Planning Participants -- a designated working group of approximately 25 senior people within the agency who worked through six structured seminars to produce the basic information necessary to build the strategic plan.

Executive Committee -- consisting of the Deputy Assistant Secretary and Office Heads as well as the Planning Coordinator and Budget Officer, the Executive Committee monitored progress, assigned tasks, and approved the work of the strategic planning participants.

Opportunities for Input -- in addition to the representation of all agency activities in the planning participant and executive committee, two sessions were held specifically to discuss the planning activities with all NTIA employees and accept any input or comments.

Stakeholder Input -- Limited stakeholder and customer input was obtained for the initial plan. This information was primarily obtained through personal contacts by staff members. Stakeholder and customer input will become an integral part of NTIA's strategic planning process.

## Appendix B

### *Program Summary*

NTIA pursues its goals and objectives through five major program areas, including:

- Telecommunications and Information Infrastructure Assistance Program;
- Domestic Telecommunications Policies;
- International Telecommunications Policies;
- Spectrum Management for the U.S. Government;
- Telecommunications Research and
- Public Telecommunications Facilities Program.

The following summaries provide an overview of each of these program areas and may be helpful as background material in evaluating NTIA's activities. Program activities are also supported by management and administrative offices, including the Office of the Assistant Secretary, Office of the Chief Counsel, Office of Congressional Affairs, Office of Public Affairs, and the Office of Policy Coordination and Management.

The management and administrative offices are supported by funding from the program offices. The Telecommunications Information Infrastructure Assistance Program and Public Telecommunications Facilities Program receive direct, separate appropriations annually; Domestic and International Policies, Spectrum Management, and Telecommunications Research are funded through the Salaries and Expenses appropriation. In addition, Spectrum Management activities are supported at the 80% level by other Federal agencies.

### **TELECOMMUNICATIONS AND INFORMATION INFRASTRUCTURE ASSISTANCE PROGRAM**

#### **Budget**

FY 1999 Operating Level: \$15.0 million grants, \$3.0 million administration

FY 2000 Budget Request: \$17.0 million grants, \$3.1 million administration

#### **Program Description**

The National Information Infrastructure (NII) is intended to use advanced telecommunications and information technologies to connect Americans to one another, to services, and to information. NTIA continues to demonstrate leadership and promote innovation in the development of the NII through its management of the Telecommunications and Information Infrastructure Assistance Program (TIIAP), a matching grants program that promotes the expansion and effective use of the NII by public and nonprofit entities at the community level. Since 1994, the program has awarded 378 projects with \$118 million which was matched by more than \$180 million in non-Federal funds. The program will conduct a sixth grant competition in 1999.

TIIAP relies heavily on an internally developed grants management system to process, review and track a large number of applications and funded projects. This system was completely re-written in FY 1998 to be Year-2000 compliant. The new system will run on either Windows 95 or NT clients, have a graphical user interface and may incorporate the ability to accept both scanned and electronically submitted applications.

Internet access has become increasingly important. Much of the communications between TIIAP staff and their grantees and potential applicants rely heavily on Internet Email, ListServers and the TIIAP Web page. Substantial resources are required to fully implement these capabilities.

## DOMESTIC POLICY

### Budget

FY 1999 Operating Level: \$2.0 million

FY 2000 Budget Request: \$2.0 million

### Program Description

NTIA serves as the principal Executive branch adviser to the President on domestic and international communications and information policies. To fulfill this responsibility, NTIA develops and articulates Administration policies on domestic telecommunications policy issues; analyzes and proposes Administration positions on legislation and regulations; and represents the Administration in policy forums, conferences, and symposia. To promote the Administration's priorities in the implementation of the Telecommunications Act of 1996 for example, NTIA has prepared major filings to be submitted to the Federal Communications Commission (FCC) on a wide range of topics. Current topics include universal access to telecommunications for all Americans, especially the "E-Rate" (a discounted education rate for schools and libraries); interconnection requirements; Bell Operating Company entry into the long distance market; universal service high cost issues; deployment of broadband services; Children's Television; Advanced Digital Television, including public interest obligations and digital must carry; Closed Captioning for Video Programming; wireless services regulatory treatment; and concentration of ownership in the broadcast industry.

The Domestic Policy program increasingly relies on internet-accessible search tools to gather the data needed for their policy analyses. The program provides reports formatted for publication using WordPerfect, and slides using Presentation Graphics. Public meetings and forums are "webcast" over the Internet using freeze-frame video for slides and pictures of participants and RealAudio for sound. All reports and public comments are posted and searchable on the NTIA Web site. Analyses of spectrum use and availability are provided, as needed, by Office of Spectrum Management and Institute for Telecommunication Sciences.

## INTERNATIONAL POLICY

### Budget

FY 1999 Operating Level: \$2.3 million

FY 2000 Budget Request: \$2.3 million

### Program Description

NTIA leads or participates in bilateral and/or multilateral [e.g., International Telecommunications Union (ITU), World Trade Organization's Group on Basic Telecommunications (GBT), and Information Society and Development Conference (G-7/ISAD)] discussions and fora to secure market access for U.S. firms, and to enhance the Global Information Infrastructure (GII); and promote an appropriate regulatory environment in which electronic commerce and telecommunications can flourish. NTIA serves, with State and FCC, as an "instructional" agency on international satellite communications policy. A major issue is the restructuring of Intelsat and Inmarsat, where a successful outcome will enhance competitive opportunities for a large number of U.S. firms who are seeking fair market access to provide service, and who generally also frequently use U.S. equipment provider.

The International Policy Program increasingly relies on Internet-accessible search tools to gather the

data needed for their policy analyses. Also, the international policy staff travel extensively and rely heavily on Internet Email and remote access to stay in contact with the home office. The International Policy Office has employed advanced telecommunications technology, including especially the Internet and the World Wide Web (www) to communicate information policy objectives, to gather public opinion and facilitate public comment, and to build public support for policy approaches.

## **SPECTRUM MANAGEMENT**

### **Budget**

FY 1999 Operating Level: Direct \$4.0 million; Reimbursable \$12.9 million

FY 2000 Budget Request: Direct \$7.2\* million; Reimbursable \$14.5 million

\*Includes \$3.5 million requested for the Critical Infrastructure Protection Program, specifically to support the lead agency for the Communications and Information Sector responsibilities. Additional funding is also expected to be transferred in FY 1999 for this new program.

### **Program Description**

NTIA coordinates Federal Government use of the electromagnetic spectrum. Additionally, NTIA coordinates Federal Government policies regarding spectrum use, planning, emergency operations and international coordination of government satellite systems; manages the Federal radio spectrum necessary for national defense, public safety, air traffic control, national resource management and other critical government functions; and prepares and coordinates Federal Government proposals for ITU World Radio Conferences and related technical meetings. Major issues include spectrum management reform, negotiations regarding the integration and interference protection for satellite systems (GPS and GLONASS) that will support the evolving Global Navigation Satellite system for air traffic control, and addressing the public safety spectrum requirements through the year 2010 through the joint FCC/NTIA Public Safety Wireless Advisory Committee. The Critical Infrastructure Protection (CIP) Program, specifically the lead agency responsibilities for the Communications and Information Sector, is a new activity under Spectrum Management. CIP was initiated based on the authority of Presidential Decision Directive 63, signed in May 1998.

The Office of Spectrum Management is wholly reliant on information technology to perform its mission of assigning government spectrum. Central to its capability is a large database that keeps track of who is using what spectrum in what geographical area and for how long. Computer-based models are used to determine whether a proposed frequency assignment will conflict or interfere with either existing assignments or other proposed assignments. Computer models are also used to assist in preparing policy positions on both domestic and international spectrum issues. OSM's IT equipment presently includes a mix of networked PCs, HP Unix-based workstations and a UNISYS mainframe. The mainframe is being phased out and will be disconnected by April 1999. This year OSM is planning to establish a hot backup facility and will also convert many of its archival documents to a digital format.

## **TELECOMMUNICATIONS RESEARCH**

### **Budget**

FY 1999 Operating Level: Direct \$3.5 million; Reimbursable \$8.5 million

FY 2000 Budget Request: Direct \$5.7\* million; Reimbursable \$7.0 million

\*Includes \$1.2 million requested for Broadband Network Development and \$.8 million requested for Critical Infrastructure Protection Research.

### **Program Description**

NTIA's laboratory, the Institute for Telecommunication Sciences (ITS) in Boulder, Colorado, performs state-of-the-art telecommunications research to support NTIA and Department of Commerce goals as well as specific research under reimbursable agreements with other Federal agencies and under cooperative research agreements with private sector partners. ITS is an active contributor to many agency endeavors, including quality of service issues, advanced television standards, Internet issues and roles, etc. ITS is an active contributor to many agency endeavors, including those dealing with spectrum efficiency and sharing issues, broadband wireless technology and convergence issues, advanced video and voice performance testing and standards development, Internet technology issues, and critical information and communication infrastructure research and development.

NTIA's Institute for Telecommunication Sciences uses computer technology in support of its telecommunications research and engineering services as well as to support work performed on a reimbursable basis for other Government agencies. Research equipment is primarily paid for by, and belongs to, the contracting agency. Equipment consists mainly of PCs and Unix workstations networked together.

## **PUBLIC TELECOMMUNICATIONS FACILITIES PROGRAM**

### **Budget**

FY 1999 Operating Level: \$19.2 million grants; \$1.8 million administrative

FY 2000 Budget Request: \$31.2\* million grants; \$3.9\* million administrative

\*An additional \$12.0 million in grants and \$2.0 million in administrative funds is included to fund Digital Broadcasting Applications.

### **Program Description**

PTFP annually awards grants to public broadcasting and to other noncommercial entities to extend and improve the educational and cultural services of public telecommunications facilities. PTFP grants activate new stations and extend the coverage of existing stations, replace equipment at public radio and television stations, and assist in the construction of distance learning systems. Since 1963, the Federal Government has invested nearly a half billion dollars through PTFP in the public broadcasting infrastructure. The program's 1997 grant awards will extend a public radio signal to approximately 1.1 million presently-unserved persons and a public television signal to approximately 50,000 unserved persons.

PTFP relies heavily on an internally developed grants management system to process, review and track a large number of applications and funded projects. This system has now been re-written to be year-2000 compliant. The new system will run on either windows 95 or NT clients, have a graphical user interface and may incorporate the ability to accept both scanned and electronically submitted applications.

Internet access has become increasingly important. Much of the communications between PTFP staff and their grantees and potential applicants rely heavily on Internet Email, Listserves and the PTFP Web page.

### Appendix C

#### ***Key Infrastructure: Information Technology***

Information technology and the use of advanced telecommunications technology is essential to allow NTIA to continue to advance the vision, mission, goals and objectives of the agency. As the available technology changes, our concepts of how we work, how we gather information and how we initiate the transactions necessary to perform our daily functions are undergoing rapid change. The combination of computers and rapid low-cost transportation of information and goods is causing a redefinition of terms such as "workplace" and "expert". The notions of work being performed at a fixed place and information

relating to a particular subject (knowledge) being localized in an expert are being called into question.

In the '80s and '90s the combinations of computers, transportation and communications made "just in time" manufacturing a possibility. The same trends are continuing and will soon revolutionize service sector jobs as well. Government is a service and information business. Largely influenced by these factors, NTIA's business -- telecommunications and information policy -- is continuing to exhibit dramatic growth rates that, based on straight-line projections, ensure that this sector will continue to be a dominate force in the world's economy. Within this context, NTIA's use of information technology must enable the agency to respond to and thrive in this environment.

NTIA's planning process, and the communication vehicles established within the agency, must address the steps we need to take to equip our staff with the tools and skills to operate in an environment where "workplace" becomes "work context" and where knowledge of tools becomes more important than knowledge of a particular subject.

### ***Information Technology Decision Making Process***

The agency CIO is located in the Office of Policy Coordination and Management and responsible for oversight of all NTIA IT activities. The Office of Policy Coordination and Management (OPCM) continues to be responsible for agency-wide information technology issues and coordination. In November 1994, NTIA established an Information Technology (IT) Committee, with representatives from all program areas, to provide advice and assistance in this area. This committee is chaired by the CIO and convened when necessary.

The CIO also meets monthly with IT managers representing NTIA's program areas. A wide range of operational IT issues are addressed through this group, with the CIO ultimately determining issues which should be brought to the attention of other senior agency managers, either through a Policy Forum or Executive Staff Meeting discussion. The CIO also ensures that the Deputy Assistant Secretary and/or Assistant Secretary are aware of agency IT initiatives and have opportunities for further discussion when necessary.

NTIA experimented with the idea of establishing an agency Investment Review Board. As a small agency, all members of the possible Board are already involved in the Policy Forums, Executive Staff Meetings, and regular briefings on the status of agency affairs. Considering the size of the agency and the limited resources available for investment, NTIA has elected to continue to focus on the strategic planning process and incorporate IT in that process rather than establish and maintain separate planning and review processes. Should the need arise, these decisions will be reexamined.

### ***Information Technology Mission***

Information technology must provide the infrastructure to support the accomplishment of the Agency's goals and objectives. There are three primary components of the mission. First, to ensure that all NTIA employees have the tools (hardware, software, and training) and access to the internal and external information resources necessary to perform their responsibilities. Second, to ensure that NTIA's work products and appropriate information concerning NTIA's activities are readily available to NTIA customers and the general public. Third, to satisfy NTIA's mission-oriented data processing requirements in a timely and cost-effective manner.

The members of NTIA's Information Technology Committee earned the Vice President's Hammer Award for Customer Service for their early focus on the use of electronic information dissemination strategies to meet customer needs. NTIA was among the first Government agencies to establish a Web site on the Internet. The organization and presentation of NTIA's Web site is under constant review and maintenance procedures have been established. Since so much of NTIA's work product is information--whether it be a report, grant award, frequency assignment, congressional testimony, filings before the Federal Communications Commission (FCC), studies, or compilation of public comments--we benefit from distributing that information in the most effective and useful way possible. Today, in many cases, the most effective way to distribute that information is electronically. Agency

guidelines have been developed and each NTIA office is now disseminating information and products to the public and to government customers via the Internet as well as through other electronic modalities as appropriate.

### ***Strategic Issues and Strategies***

As more and more people adopt technology in their everyday lives, the demand for information assistance and leading edge technology increases.

NTIA's senior managers have identified three primary strategic IT issues for the agency and DOC has identified two Department-wide issues. Following each strategic issue are the strategies NTIA will employ.

#### **1. Provide NTIA with an integrated and extensible information technology infrastructure:**

- •Monitor changes to the information architecture of each of NTIA's Offices to maintain compatibility of basic infrastructure, Email and productivity applications.
- Plan for new capacity and configuration requirements for the integration of video and voice into the network infrastructure.
- At the Agency level, evaluate current Email, productivity and mission-specific applications for potential to conform to a "standard" web-browser interfaces
- Enable NTIA staff to perform their duties independent of their location.
- Ensure funding for equipment upgrades and additional software

#### **2. Information Dissemination and Exchange:**

- Continue to emphasize electronic modalities such as the NTIA Web site, list servers and Email as the primary conduits for providing information to NTIA's government customers and to the general public, for soliciting public comment in NTIA policy initiatives, and for developing consensus among diverse stakeholders affected by policy initiatives or changing technology.
- Emphasize electronic modalities such as Email, the NTIA Web site, list servers as the primary conduits for receiving information from NTIA's government customers and to the general public.
- Enhance the NTIA Intranet to provide "one-stop-shopping" for all internal NTIA information.

#### **3. Modernizing Spectrum Management IT capabilities:**

- Move from the present mainframe environment to a workstation-based client server environment.
- Automate processing of requests for spectrum certification.
- Develop desktop spectrum management capability.
  - •Provide NTIA's government customers with on-line access to spectrum management information

Security and Year-2000 compliance have been identified by the Office of the Secretary as DOC-wide strategic issues: and are covered in more detail later in this document.

NTIA is dependent upon either the Department of Commerce or other Commerce agencies for most administrative support services, including procurement, payments, financial reports, and audits. As NTIA continues to increase its dependence on electronic communications and processes, we will be focusing on Departmental systems, specifically the Commerce Administrative Management System

(CAMS), and ensuring that internal agency processes and systems are capable of electronically interfacing with little or no disruption to the user.

Following are additional strategies that NTIA will follow as we continue to enhance the role of information technology in our day-to-day business:

- Continuous monitoring and needs assessment of NTIA staff and customer requirements that can be met electronically. These needs will be identified through meetings with NTIA staff, customer satisfaction surveys, and reviews of how information technology contributes to the mission accomplishment of other organizations.
- Identify the potential problems that could limit our dependence on information technology, including reliability, privacy and security considerations, effect on clients without access to information infrastructure or computers, and future funding constraints.

### **Objectives and Current Status**

As a lead agency in the Administration's efforts to promote development of the National Information Infrastructure (NII), NTIA intends to continue to incorporate the principles of information technology in its daily work activities. In addition, NTIA is providing direct support to the Secretary in fulfilling the Department's electronic commerce responsibilities.

NTIA has been among the earliest of the Government Agencies to provide its staff with personal computers, local area networks and Email. We also had leadership roles in providing information to our customers via CD-ROMs, bulletin board systems and Web servers accessible over the Internet.

Specific objectives undertaken in support of the above strategies are detailed below:

- Continuing to enhance the ability of NTIA staff to access their Email, Calendar and documents over the Internet from remote locations. [*Email and Calendar are now available over the Internet, full secure network access over the Internet is planned by Dec 2000*]
- Continuing to place a high priority on providing electronic information dissemination through our Internet Web and list servers. In March 1995, NTIA established an information dissemination policy to ensure that all NTIA public releases--whether it is a spectrum report, an advisory committee report, or even an FCC filing--be made available electronically no later than the time that the information is available in hard copy. Items that will appear in the Federal Register can be made available electronically the day they appear in the Register. [*NTIA reports and filings are now available in electronic format before or at the same time as the print version. Additionally, we have been using Internet "broadcast" technology to make real-time audio and video of NTIA public meetings, forums and summits available to a wider audience. The remote audience also can submit questions to speakers or panelists via Email*]
- Using automated systems, including list servers, advanced email response techniques and voice auto-attendant/fax-back systems, to provide more rapid response to customer inquiries and reduce staff resources required to respond to routine inquiries. [*List servers are in daily use for disseminating information to the public and for NTIA-chaired working groups. An automated Fax system has been installed in OTIA.*]
- Using automated systems and world wide web technology to solicit and process public input into policy development. [*Since July of 1997, NTIA has sought public comment, via Internet, on policy initiatives related to development of domain name and Internet privacy policy. Over 1200 comments have been received by the agency and made publically available to others via the Internet.*]
- Disseminating internal information through a web-based intranet [*NTIA set up a restricted-access internal Web site for its employees in 1995. The "NTIA Resources" web page is automatically loaded upon login to the NTIA network and provides access to phone and resource lists, personnel and*

***human resources information and collections of NTIA documents and reports.]***

- Transitioning all employees to a single graphical user interface allowing access to both internal and external resources [***Document viewers have been incorporated into our internet browsers and Microsoft, as well as other software vendors, are reformatting their user interfaces to be web-browser compatible. Our Email and calendaring/scheduling applications are now available through Web browsers]***]
- Modernizing the IT capabilities used to support spectrum management. This modernization effort has a number of elements. These elements include: replacing mainframe computer systems with workstations, replacing COBOL and FORTRAN software with client/server software using SQL commands and a database management system, developing a desktop spectrum management system for use by other Federal agencies, developing a data dictionary to define spectrum management data requirements, and developing a new automated system to process requests for spectrum certification. [***The transition of the Spectrum Management System from our UNISYS main frame to HP workstations and a Sybase database will be completed by April 1999. The desktop spectrum management system has been deployed and the data dictionary will be completed by December 1999.***]
- Using imaging techniques to reduce data entry requirements and for improved document management, storage, indexing, searching and retrieval [***Much of the initial data entry for new grant applications for OTIA is now being done by a combination of scanning and optical character recognition. OSM is procuring contractor services to scan and digitize a large number of historical frequency management documents.***]

These efforts will make communicating with the government easier and faster and provide our customers, the American people, with current and timely government information and methods that allow them to provide their input on our activities.

### **Security**

Security planning is an important addition to NTIA's planning requirements. Plans for implementing the new Department policies and directives for a security program are currently under development. Significantly, the effects will impact every NTIA employee. Every IT system currently in place, and all planned acquisitions and expansions must be examined and incorporated into the security planning process. Expenses for a broader range of IT security activities must also be incorporated into the budget planning process for both the Strategic and Operational IT planning processes.

Policy requirements for the NTIA IT Security Program are provided by the Department of Commerce Information Technology Management Handbook, Chapter 10. Some of the critical elements include the following:

- Appointment of an IT Security Officer (ITSO) and alternate
- Identification of all sensitive and classified IT systems
- Appointment of System Owners and IT System Security Officers for each sensitive or classified IT system
- Development and annual updating of IT security plans for all sensitive and classified systems
- Preparation of risk analyses for all for all sensitive and classified IT systems
- Development and annual updating of contingency and disaster recovery plans for all sensitive and classified IT systems with annual tests of those plans
- Certification and accreditation of all sensitive and classified IT systems, every three years

- Provision of security awareness training for all new employees within 60 days of entry
- Annual provision of security awareness training for all agency employees and contractors

These new agency planning, tracking, testing and reporting responsibilities will be a heavy burden on the shrinking personnel resources of NTIA. As a result, these IT security requirements will be met through a phased-in approach, emphasizing priority on the most critical tasks, and on what can be reasonably accomplished by the agency.

Progress on the requirements has already been accomplished in several areas. An ITSO for NTIA has already been appointed, along with an alternate ITSO. The ITSO has the responsibility to develop and implement the IT Security Program for the agency. Development of the overarching security plan is currently underway and expected to be completed in 1999. The ITSO will also develop the contingency and disaster recovery plans in coordination with the NTIA Continuity of Operations Plan (COOP).

NTIA has already made substantial efforts in identifying all sensitive and classified IT systems in the agency, and performed some preliminary, informal risk analyses for these systems. In addition, security awareness training for all NTIA employees should be accomplished during FY 1999.

Informal but detailed security plans, including risk analysis for sensitive systems are planned for FY 1999, following the completion of the overall IT Security Program plans. Formalized security plans for classified systems (currently only one in NTIA), which must include formal risk analyses, are anticipated during FY 2000. Additional funding for this activity and for the accreditation that must follow should be included in future budgets.

Concurrent to the development of formal security plans, existing plans for operational security improvements are being implemented. This includes a test bed firewall system for Internet access security under development at the Institute for Telecommunication Sciences.

### **Year 2000**

NTIA has made significant progress in ensuring that our computer systems and proprietary software will be operational after the turn of the century. NTIA has two mission critical systems, the first is used by OSM in managing government spectrum and the second by OTIA in managing our grants process. NTIA's computing platforms are primarily PCs and HP workstations. Software can be categorized as commercial productivity (WP, Lotus etc.); operating systems (Windows, Novell, Unix); Models (propagation, interference) and Management (spectrum and grants management) All new PCs are required to be Year-2000 compliant when purchased.

**Platforms:** Most of NTIA's PCs have been tested for Year-2000 compliance. Testing of PCs and servers will be completed by August '99. NTIA is requiring that all new PCs be certified to be Year-2000 compliant.

OSM's HP 9000 workstations will be using a year-2000 compliant operating system by the end of FY 1998.

**Operating Systems:** Hewlett Packard has stated that the 10.30 version of HPUX is year-2000 compliant. Microsoft maintains that Windows 95 is year-2000 compliant.

Current versions of Novell Netware 3.12 and above are now Y2000 compliant.

**Commercial Productivity Software:** All of the vendors of our "industry standard" off-the-shelf hardware and software (Novell, Corel, Microsoft, HP) are now, or are planning to be, year 2000 compatible in their next upgrade. There are other larger users of the same hardware and software within DOC that are more able to expend the resources needed to exhaustively test the above software and hardware. We will maintain close contact with these organizations (NOAA, ITA, Census) to benefit

from the results of their tests.

**Management Software:** Our main area of concern is in-house software used for the frequency management process by OSM and for grants management by OTIA.

OTIA's grants management software for its TIIAP and PTFP programs is now year 2000 compatible. A contractor has re-written its grants management software for the TIIAP program. As part of the contract, the new TIIAP grants management system and the existing PTFP system are now year 2000 compatible. These systems are now being tested.

OSM uses three dates for GMF authorizations and two dates for applications. They have tested for and already corrected year 2000 problems using logic correction with a pivot year of 50. They are already processing data with dates into the new century and have certified that their software is year 2000 compliant.

### *Impact of Program Growth on IT Strategies*

NTIA anticipates minimal program growth in the near future. Two initiatives in the spectrum management area will, if approved, require a few new desktop PCs. In addition, NTIA is continuing initial efforts to establish the Critical Infrastructure Protection (CIP) Program, as directed by Presidential Decision Directive 63 (signed by the President in May 1998.) Currently the IT requirements anticipated are for personal computers and related equipment for staff. OTIA is examining a proposal to accept quarterly and annual reports via the NTIA Web server. The system would be developed under contract. This minimal projected program growth will not require any change in our IT strategies or architecture.

### *New Initiatives - Project Selection*

NTIA utilizes its goals and objectives framework and the Executive Committee to develop and approve all new initiatives, including programmatic, information technology, and administrative initiatives. All new initiatives are evaluated against standard criteria and decisions to pursue them are recommended by Executive Committee to the Assistant Secretary. The Assistant Secretary makes the final approval decisions and ranks new initiatives for the budget submission.

Predetermined thresholds and authority levels are in place for small procurements. Due to the small size of NTIA, any project falling outside those limits is reviewed by the CIO and can be referred to other management officials, as appropriate.

### *Systems Under Development - Project Control*

NTIA systems are regularly reviewed by the appropriate IT program manager. Significant progress, issues, and anything else of interest is noted to the CIO through regular IT manager meetings.

### *Evaluation of Operational Systems*

NTIA will periodically review selected systems. The reviews will focus on identifying the cause of changes in anticipated vs actual results and will make decisions relating to continuing, adjusting, or investigation of alternatives to the current system. "Lessons learned" will be documented. Some of these reviews may be done through existing operational processes, such as management control reviews, vulnerability assessments, and/or in conjunction with audits by the General Accounting Office or Inspector General.

### *Information Architecture*

NTIA's information architecture provides support for mission-specific and specialized administrative activities as well as a standard basic infrastructure. Mission-specific support is provided through

workstations, a mainframe, and proprietary databases, tools and models. Basic infrastructure is comprised of off-the-shelf PCs, networks, internet access, and Email, calendar and word processing software. *NTIA's information architecture has been recently upgraded. The only significant changes anticipated are removal of the Mainframe by March 1999, installation of a firewall/router (Dec 1998), virtual private network capability and upgrading of 10 Mbit ethernet links to 100Mbit as demand requires.* Further information on NTIA's information architecture and network diagrams will be included in the IT Operational Plan released in June 1999.

## Appendix C

### ***The Supporting Infrastructure: Future Challenges***

There are several overarching concerns that were discovered through open discussions during the strategic planning seminars and are not specifically related to individual goals and objectives. The challenges shown below reflect items that may be considered by the Executive Committee for future action.

#### **Challenge No. 1: Prioritize agency efforts to create maximum impact.**

Conduct more public forums to create a community of knowledge and dialogue that actively transmits and receives information concerning emerging issues

**[Note: Domestic Policy forums were initiated in September 1997, and continued through 1998.]**

Make a proactive identification of agendas for communicating messages and managing issue visibility and development.

Eliminate information that does not add value and expand the development and dissemination of useful information.

Conduct open workshops on key issues (e.g., privacy)

Call for papers and publish collections that disseminate knowledge broadly and productively

Create and implement an Agenda Communications Plan that leverages cross-functional resources to identify:

Audience(s)

Message(s)

Media to be used

Specification of follow-through and timing requirements

Draft Staff Green Paper

#### **Challenge No. 2: Increase stakeholder influence and support.**

Research stakeholder and constituent interests and understandings

Develop and maintain trust-based relationships with all stakeholders and customers

Inform and seek input from Congress to ensure early and active involvement

Develop and implement an outreach plan to ensure early involvement of stakeholders

**Challenge No. 3: Resolve Human Resource Management concerns.**

Improve cross-functional teamwork. Identify cross-functional work requirements and opportunities to optimize resource utilization. Team development training and consultation will further the development and use of cross-functional teams to avoid organizational limitations.

Expedite the staff hiring process. The National Performance Review (NPR)--driven reduction of administrative resources to perform functions such as human resource management needs to be accompanied by streamlined processes and assistance to line managers that equips them with the skills and knowledge needed to use the staff hiring process efficiently and effectively.

**Challenge No. 4: Address aging research facilities and improve agency wide utilization of research capabilities.**

Identify and prioritize specific laboratory equipment upgrade and acquisition requirements, spelling out the adverse consequences of not doing so with objective accuracy. Over the next five years, continued fulfillment of the organization's mission and pursuit of its strategic goals and objectives will require upgrade of its ever-aging equipment. This is particularly true for an organization that is focused on technology and which must retain its technological savvy if it is to be effective for the public good. Requirements over the next half-decade will most certainly outstrip our current complement of equipment with negative consequences to our response capabilities in the areas of:

Spectrum efficiency

Advanced Internet

Video/audio signal quality

Ensure that ITS research and outputs achieve broad positive outcomes that extend beyond a narrow technical audience. Leverage resources to trace technical materials development to broader policy and other non-technical objectives.

**Challenge No. 5: Improve agency use of information technology tools.**

Expand the use of the NTIA Intranet. NTIA strives to use technology to broadly communicate its activities and developments. Increased emphasis on web technology and adaptation for both internal and external information dissemination will be required to support NTIA's objectives.

Implement computer training which is more flexible toward the needs of NTIA staff. While the quality of post training has been adequate, consideration should be given to training formats which go beyond the standard full- or half-day standard classroom approach. Such considerations would present training material in a shorter period of time to accommodate tighter work scheduling requirements.

Use the Internet internally and externally to increase feedback and discussion. To avoid perceptions of launch-and-abandon issue research and resolution, the Internet will be used to open, process, and close loops of investigation, discussion, consultation, and resolution.

**The Honorable Gregory L. Rohde  
Assistant Secretary for Communications and Information  
U.S. Department of Commerce**

**Before the Subcommittee on Telecommunications, Trade, and Consumer Protection  
Committee on Commerce  
House of Representatives**

**July 19, 2000**

## **SUMMARY**

The National Telecommunications and Information Administration (NTIA) intends over the next year to devote much of its time and energy to fulfilling the promise of the World Radiocommunications Conference (WRC) 2000. The development of 3<sup>rd</sup> Generation wireless services is important to extend wireless high-speed Internet access, which will make this a top policy priority.

At that conference, the U.S. delegation, made up from the government and the private sector, won a major victory in persuading the delegates from more than 150 countries to adopt a plan that will give U.S. industry a great deal of flexibility in determining how to bring wireless Internet and other advanced services to the public. Rather than set aside only one band for what were called IMT-2000 services, the WRC approved our proposal for multiple bands to be used around the world.

Having done that, however, the real work now begins. About 160 MHz of spectrum needs to be found within the three designated bands that will work to the greatest benefit for new services while providing the least anxiety for Federal incumbents who may be in those bands.

As the manager of the Federal spectrum, and as the agency with some of the leading authorities in the world in spectrum issues, NTIA is well equipped to undertake those tasks. We have to take a close look at how existing spectrum is allocated and used. Some of the uses in the bands chosen for future use by advanced wireless services are used now for data communications, satellite links and telemetry.

At the same time, we will have to look at the possible future uses of the bands, what their potential availability might be, and what it will cost, and how long will it take, to move incumbent users from their current bands into new ones in order to accommodate the new services that will be offered as a result of the WRC agreements. If the United States is to be competitive in the market place for succeeding generations of wireless services, we will have to make the appropriate decisions that will make the necessary spectrum available while minimizing the effects and costs to those who may have to be displaced.

Addressing all the issues in selecting a band and potential relocation of those displaced will require cooperation between the Federal government agencies, the NTIA, industry, and the FCC. U.S. spectrum regulators (FCC and NTIA) and major stakeholders should agree to a schedule of events that will result in spectrum for IMT-2000 be designated for use by September 30, 2002, which coincides with Congressional direction that the FCC auction the 1710-1755 and 2110-2160 MHz bands.

NTIA is committed to fostering spectrum-related innovation, within the agency and within the private sector. We want to reduce the amount of time it takes for a routine frequency assignment to mere minutes, and a complex assignment to at most three days, for a process that can now take as long as 15 or more days. We also want to have more efficient electronic access to technical data needed by government experts in the spectrum process.

In addition, I have started the Wireless Innovation Communications Initiative (WICI), which brings together spectrum users from the Federal government with the private sector. Two days ago, I hosted a roundtable discussion how more technologies, including wireless, can be used to warn people of severe weather or other hazards.

**The Honorable Gregory L. Rohde  
Assistant Secretary for Communications and Information  
U.S. Department of Commerce**

**Before the Subcommittee on Telecommunications, Trade, and Consumer Protection  
Committee on Commerce  
House of Representatives**

July 19, 2000

### **Opening Remarks**

Mr. Chairman, Ranking Member and other members of this subcommittee, I want to thank you for inviting me to testify today on spectrum management policies and the results of the World Radiocommunications Conference. I am Gregory Rohde, Assistant Secretary for Communications and Information and Administrator of the National Telecommunications and Information Administration (NTIA) within the Department of Commerce. I would like to begin my remarks today by giving a brief overview of NTIA's spectrum management responsibilities, accomplishments and planned improvements; our spectrum outreach to the public safety community; the promotion of new technologies including a new initiative; an assessment of the World Radiocommunication Conference (WRC) which was recently held in Istanbul; and the implementation of future third generation personnel communication systems.

## **I. SPECTRUM MANAGEMENT**

One of NTIA's responsibilities is to serve as the President's primary advisor on telecommunication information policies. The other primary responsibility on behalf of the President is to manage the radio frequency spectrum used by Federal agencies in satisfying their legislatively assigned missions. In this role, NTIA processes the Federal agencies' request for frequency assignments; provides Executive Branch leadership in coordinating both current and future spectrum requirements among the Federal agencies and with the Federal Communications Commission (FCC); develops and promotes positions at Treaty Conferences and other technical and management fora of the International Telecommunication Union (ITU) regarding United States spectrum management interests; and supports specialized administration initiatives that are designed to achieve specific improvements in areas such as air traffic safety, Federal spectrum management procedures, protection of critical infrastructures, and public safety.

A fundamental goal of spectrum management at NTIA, as it is worldwide, is to ensure that there is compatible operation with other radiocommunication systems, validate compliance with spectrum management rules and regulations, and to ensure that spectrum is available for future needs. NTIA's spectrum coordination role is therefore critical to the success of air traffic control, national defense, national resource management, and other vital government functions. Another fundamental goal is to manage this public resource in an efficient manner as to create an environment that encourages private sector innovation. To that end, NTIA's spectrum management function can help advance our broader policy goals to expand access to telecommunications and Internet services to all Americans.

### **Satisfying Spectrum Needs**

NTIA continues to coordinate the spectrum needs of the Federal Government by processing frequency assignment requests by some 53 Federal agencies. NTIA processes approximately 300 to 400 such requests daily through an automated screening process to correct errors in the data and ensure conformity of rules and regulations and through a coordination process with Federal spectrum-using agencies via the Interdepartment Radio Advisory Committee (IRAC) to ensure compatible operation of radiocommunication systems. In addition, NTIA also certifies spectrum availability of approximately 60 to 70 new major radiocommunications annually.

NTIA also provides leadership for and manages the activities of the IRAC, a body of representatives from twenty Federal agencies that are major users of the spectrum. The IRAC has provided valuable advice to the Executive Branch on numerous spectrum policies and issues for the past 78 years. NTIA has maintained a constant relationship with the FCC both through the IRAC and directly to ensure compatible operations of our radiocommunication systems. This is especially important today since the vast majority of the spectrum is no longer divided into exclusive private-sector and Federal-sector bands, but is shared by all users in the United States.

### **Spectrum Efficiency**

The Federal Government constantly seeks to modernize its radiocommunications, increase the amount of information transmitted per unit bandwidth, and expand the use of more efficient digital technology and the use of private sector radiocommunications. In order to improve Federal spectrum use, NTIA uses the following management tools. First, NTIA based on the Office of Management and Budget (OMB) regulations requires that every Federal Government user requesting a frequency assignment determine whether its need can be met by a private or commercially available service provider. This policy has helped encourage consideration of commercial services by many Federal Government agencies, including the Department of Defense.

Second, we promote the use of new spectrum efficient technologies. The Federal Government is a leader in developing new spectrum-efficient techniques such as narrowbanding, digital modulation, and spectrum sharing as well as in the use of the highest quality spectrum-efficient equipment. An example of using these techniques can be shown in the land mobile communications area.

The use of mobile communications is a critical and expanding need for most Federal agencies in the accomplishment of their missions. However, the needs of the private sector for mobile communications in fee-for-service offerings, commercial business uses and public safety operations, which are also expanding, have placed great pressure on NTIA to allow wider access to the portions of the spectrum used by the government mobile services. NTIA has taken the initiative to make sure that all Federal uses are as efficient as possible so that Federal land mobile communications needs can continue to be met in the bands available. The agencies we regulate generally agree with this effort, however, funding is difficult to obtain because it is so costly to completely replace the current systems, which seem to work adequately. Moreover, the agencies are very concerned about control security and emergency response issues when the most efficient solutions require several agencies to share one network.

Government applications of mobile radios include communications for building security, law enforcement by Federal Bureau of Investigation, Drug Enforcement Agency, Treasury, U.S. Coast Guard, U.S. Park Police and military police, and for communications with vessels and aircraft. As the technology has advanced, the sophistication of services provided has advanced at the same time and the amount of spectrum needed for each individual communication has decreased. However, since mobile radios used in cars and by pedestrians are engineered for long life and durability, they are very expensive and funding for replacement radios are hard for government agencies to obtain; the FBI has asserted it will cost them approximately \$4-billion to replace their aging networks with modern technology.

To help solve this problem, NTIA has issued regulations halving the channel widths of all Federal land mobile radios. All new systems are now expected to operate at the narrower 12.5 kHz bandwidth and all existing systems are expected to transition to the narrower widths by 2005 or 2008 depending on the frequency band being used. We picked long transition periods to allow the users to maximize the service they could obtain from existing assets. NTIA has also restructured the way in which the 406.1-420 MHz band will be used to allow for more efficient operations maximizing user density. Although it has taken several years to complete planning to do this, all Federal agencies support with the resultant assignment efficiencies and are working on a plan to transition to this plan.

NTIA has authorized vendor-operated fee-for-service mobile systems in Boston, New York, Philadelphia, Baltimore, Washington and Norfolk. These have been very successful in Washington, moderately successful in New York and Philadelphia and largely unsuccessful in Boston, Baltimore, and

Norfolk. We intend to further encourage the use of these efficient shared networks by encouraging and supporting the use of locally designed and controlled networks wherever possible.

## **II. SPECTRUM MANAGEMENT PROCESS IMPROVEMENTS**

NTIA is also making progress to more efficiently conduct its management of Federal spectrum. To this end, we are increasing automation and reducing bureaucratic red tape in spectrum management.

### **Spectrum Management Processes**

Federal government spectrum management involves three essential, closely-linked processes: (1) development of spectrum policy leading to rules and regulations that govern the use of spectrum and resolve spectrum management issues; (2) certification that spectrum will be available for planned radiocommunications; and (3) authorization of frequencies to satisfy current Federal agency operational needs. These are traditionally paper-intensive activities, and we are working hard to automate our processes, to make information more readily available and to make our frequency assignments more quickly. We want to reduce the amount of time it takes for a routine frequency assignment to mere minutes, and a complex assignment to at most three days, for a process that now can take as long as 15 or more days.

### **Frequency Authorization Process**

NTIA processes between 6,000 and 10,000 frequency assignment actions monthly. These actions, applications from Federal agencies for new frequency assignments or revisions of existing assignments, must be coordinated with other Federal agencies, and in many cases with FCC and the Government of Canada, to ensure compatible operations with other radiocommunication systems. In addition, these actions include several hundred new assignment proposals each month submitted by the FCC on behalf of non-Federal activities, and by Canada, or coordination with Federal agencies, again to assure compatible operation between radiocommunication systems. NTIA processes all of these action requests via its Frequency Management Records System (FMRS) using computer workstations. This includes the use of over 720 automated procedures to process the actions, to validate information quality, to ensure compliance with spectrum allocation and assignment rules and regulations, and to verify international coordination requirements.

The processing of each day's actions submitted by the various Federal agencies, FCC and Canada, results in the compilation of an assignment action agenda which is sent to the 21 Frequency Assignment Subcommittee (FAS) for their review and coordination. Each member must provide their agency's position on each action (acceptance or table for cause) to NTIA electronically within 15 working days (essentially voting). NTIA tabulates all votes on each action, and approves it or keeps it tabled depending on the tabulation of votes and NTIA's position.

The complexity of, and time requirements for, this processing and coordination procedure are increasing due to not only the constant growth in the number of stations authorized by NTIA (doubled since 1980), but also the number of non-Government stations in shared Government/non-Government bands being authorized by the FCC, as well the number of new stations being authorized by Canada that must be coordinated.

Records for NTIA-approved actions are placed in the NTIA-maintained Government Master File (GMF) of frequency assignments (or removed in the case of deletions). The updated GMF is provided to the Federal agencies monthly on CDROM.

The GMF data on the CDROM can be searched, selected, sorted, and printed on paper or exported to files through the use of a desktop or laptop computer. There are approximately 426,000 approved frequency authorizations in the GMF.

Within the last five years, NTIA, in partnership with the Department of Defense, developed the Spectrum XXI software capability for Federal agencies to: (1) prepare their applications for frequency assignment actions, (2) assess the action's compliance with NTIA rules and regulations, and (3) determine if the action would result in interference to other spectrum users. Over 250 persons within the Federal government have completed a one-week training course on Spectrum XXI. NTIA has also overhauled its frequency management records system by developing and implementing new software on state of the art work stations.

NTIA's goal for improvement is to provide a completely automated and electronically accessible (domestically and ultimately globally) central capability (E-commerce at the Federal level on a global basis) for the frequency management community to obtain approval of frequency assignment action requests within minutes for routine requests, to a maximum of 3 days for more complex requests.

### **Spectrum Policy Development and Issue Resolution Process**

Federal radiocommunication policy development and spectrum issue resolution are largely based on the efforts of NTIA's Office of Spectrum Management with a very heavy reliance on the advice of the 20-member IRAC, which represents Federal spectrum users. The IRAC meets more than 200 times each year, and its subcommittees involve the exchange, reproduction, and distribution of over 100,000 pages of documents relating to Federal spectrum management and assignment of frequencies. We are working to reduce the massive paper load that accompanies such activity, and we recently awarded a contract to transfer IRAC documents from the past 78 years over to CD-ROM and onto computer servers.

Our goal in this area is to provide a completely computer automated and electronically- accessible capability (in essence, E-government) for the Federal spectrum management community to obtain information from the official IRAC policy development and spectrum issue resolution documentation.

### **Spectrum Certification Process**

Both OMB Circular A-11 and the NTIA Manual require that every Federal agency developing a major radiocommunications system obtain NTIA certification that the spectrum required by the system will be available when the system is ready to be deployed. NTIA currently assesses spectrum availability for approximately 62 major, new Federal radiocommunications systems each year. For the most part, these systems are reviewed manually using document-based information processing techniques. This process takes an average of approximately 4 to 6 months to complete for each system.

NTIA's goal in this area is to develop an automated, electronically-accessible (domestically and ultimately globally) capability for the spectrum certification community to obtain, use, and provide all the necessary information to obtain approval of their system certification requests within the time frame of two months.

### **Overall Process Improvement Summary**

If the Federal government can gain the efficiencies I described, it may be possible for these same type of improvements to be made on a national basis with the result of providing the needed spectrum for use by both the Federal government and private sector very quickly without bureaucratic delays of months and years and to share more spectrum based on sound technical grounds. This could essentially enable management of spectrum largely through the use of E-commerce techniques

The President's budget for FY 2001 requested \$1 million (\$200,000 via appropriations and \$800,000 from reimbursement from the Federal agencies) for these improvements. This was the first leg of a four-year program to meet these goals. If the United States is to maintain its competitiveness in the marketplace and to make strides in closing the digital divide gap, the United States must improve its spectrum management processes and cut out the red tape and bureaucratic road blocks that inhibit timely distribution and sharing of spectrum for radiocommunications.

### III. SPECTRUM OUTREACH

Now I would like to describe NTIA's activities in extending a helping hand to the public safety community.

#### All Hazards Roundtable

On July 17, 2000, NTIA, in cooperation with an inter-agency working group that works on public safety issues, hosted the All-Hazard Warning Roundtable. Dr. Jim Baker, administrator of the National Oceanic and Atmospheric Administration (NOAA), was a co-host at the event. The purpose of the roundtable was to bring together representatives of existing systems, such as NOAA with its weather radio, with representatives of new and emerging technologies, including the Internet and wireless products, as well as reverse 9-1-1 systems, to see how our already excellent warning system can be improved. I viewed the roundtable as the start of a process that will bring government and industry together to talk about creating a more comprehensive warning network.

The event was an overwhelming success as all the panelists agreed that more needs to be done in order to provide effective and immediate warnings. Follow-up meetings will take place so that substantive and technical issues can be discussed so that hazard warnings may be widely available to the public through various existing and emerging telecommunications technologies. The roundtable is the latest activity of the informal inter-agency group that was organized last year until Vice President Gore's National Partnership for Reinventing Government. The working group published a report, "Saving Lives With An All-Hazard Warning Network" that found NOAA Weather Radios forms the backbone of an all-hazard system. However, we found that we must improve access to warnings and make warnings themselves better.

#### Federal & State Joint Project

One of the more pressing needs of all radio services in terms of radio spectrum is for the public safety services. The inability of agencies from the Federal Government to talk to state and local counterparts in times of emergencies and natural disasters is a paramount concern. NTIA has recently put forth plans to designate certain federally allocated radio frequencies for use by Federal, state and local law enforcement and incident response entities to improve their communications during emergencies and help them to better respond to threats to public safety. This new plan is the first step towards ensuring that sufficient radio spectrum is available when and where an emergency or public safety need may arise. The plan was developed in cooperation with the IRAC and the Federal Law Enforcement Wireless Users' Group (FLEWUG). It provides a total of 40 radio frequencies, under the control of the Federal Government, to be used for intermittent law enforcement and incident response requirements during emergencies relating to public safety.

In another example of Federal-state cooperation, NTIA, working with the Department of Defense, authorized the state of Wisconsin to use Federal radio frequencies to test a shared land mobile communications system that will greatly ease communication during emergencies as well as during day-to-day communications. There are a number of land mobile systems currently operated by Federal agencies or by State and local governments around the country that provide communications during emergency operations to all levels of government. To further promote this capability, the NTIA, working with the Departments of the Treasury and Justice jointly sponsored Public Safety Wireless Network (PSWN) Program, have initiated a number of pilots throughout the country to test and evaluate various interoperable solutions among all levels of government. Although there are many emergency land mobile systems, the Wisconsin Pilot project is the first system providing shared services on a day-to-day basis. However, with the continued efforts of the NTIA and the FCC, working with the PSWN Program, it is anticipated that future shared systems and programs will be more readily available.

#### National Coordination Committee (NCC)

The National Coordination Committee (NCC) was established by the FCC to solicit input from the

public safety community in the further development of rules governing the new 700 MHz public safety band, particularly in regard to interoperability. NTIA actively participates in the NCC by offering advice and subject matter expertise on issues directly related to the NCC. NTIA, together with the U.S. Department of Justice (DOJ), the Federal Emergency Management Agency (FEMA) and the U.S. Department of Treasury co-sponsor the NCC. Participation is vital to ensure that interoperability between Federal, State and local responders is achieved.

## IV. PROMOTION OF NEW TECHNOLOGIES

The Federal government uses a minimum amount of spectrum as possible to perform its existing and planned mission needs. Every Federal agency must determine if its radiocommunication requirements can be satisfied by the private sector before they develop their own radiocommunications. It is critical that the Federal government have sufficient spectrum to meet all its obligations to the American people including national defense, law enforcement, resource management control, air traffic control, and any other safety-of-life services. The Federal government has been very successful in using new technology in developing its radiocommunications and conserving spectrum.

In my judgement, one of the most important things I can do in my capacity at NTIA, is to get the Federal agencies and the private sector to engage in a constructive dialogue. It is imperative - as a nation as a whole and from the individual perspectives of Federal agencies and the private sector - that a cooperative relationship exist between the government and private sectors be realized.

### WICI

One initiative I started at NTIA earlier this year is to establish the "Wireless Innovations in Communications Initiative" to promote spectrum efficiency and innovation and to create a dialogue between the Federal government agencies and the private sector. The Federal agencies, considered collectively, are a large user of communication services in the United States. Although many of these services are provided by commercial providers through government contracts, the Federal government continues to own and operate significant communications facilities that perform certain mission-critical functions. Federal agencies use the radio spectrum to operate the wireless portions of these Government-operated communications facilities. Because of the growing public and private sector requirements for spectrum, there is an urgent need to ensure that this limited national resource is used effectively and efficiently.

One of the objectives of the WICI is to promote innovative developments in communications technologies and facilitate their timely application to satisfy actual communication needs by both the Federal agencies and the private sector. The scope of this initiative extends across the full range of wireless communications technologies, including fixed, mobile, radar, navigation, and satellite communications. The approach planned for conducting WICI was to establish a committee (WICI Committee) within the Interdepartment Radio Advisory Committee (IRAC) comprised of senior experts in the Federal government who understand their agency's radiocommunication requirements and can envision the potential applicability of new technologies. The WICI Committee has scheduled a series of meetings in which representatives from Federal agencies discuss their communications requirements. In addition, private sector developers of communication innovations present their ideas on how to satisfy the Federal agencies' requirements. WICI is intended to promote the development of innovations in wireless communications and systematically examine their applicability to actual communications requirements.

Six meetings of the WICI have taken place since the initiative was begun in March of this year. The focus of these first meetings have been on land mobile communications, specifically software defined radios and public safety communications. Following the presentations by Federal agencies, 8 major private sector developers have come forward and have explained their new technologies that address the requirements described in the Federal briefings. Other areas such as satellites and radar will be addressed in the future. The spectrum management process will also be discussed with the private sector as well.

I hope that over time, this initiative will foster better cooperation between government and private sector in spectrum management. I believe that we can do more to assist Federal agencies to more efficiently meet their communications needs and to promote continued innovation of wireless technologies. The purpose of the WICI is to point us in a new direction with respect to spectrum management.

### **New Technologies**

NTIA is very interested in helping advance the development of new wireless technologies that will create efficiency and opportunity. One example is ultrawide band (UWB).

UWB transmits very low power radio signals with very short pulses, often in the picosecond (1/1000th of a nanosecond) range using very wide signal bandwidths. Because of that combination of characteristics, UWB has shown promise for many commercial applications, including wireless communications within buildings and the locations of objects on the other side of walls or other barriers. UWB will be using the same spectrum that is presently being used by conventional radiocommunication devices, including emergency services. As a result, it will be important to ensure that there are no adverse effects from UWB to these critical services.

The FCC, in coordination with NTIA, has granted waivers for three UWB manufacturers. This has enabled limited production of these devices until more permanent rules can be established and appropriate measurements and analysis can be made to determine the technical feasibility of sharing spectrum.

NTIA has begun a comprehensive test and analysis program that will be carried out jointly by NTIA's Office of Spectrum Management in Washington and our Institute for Telecommunication Sciences in Boulder, Colorado. This program will determine from a technical and engineering point of view, the conditions under which UWB technology can be integrated in the spectrum environment ensure compatible operation with existing safety-of-life systems including those used or planned for air traffic control with special attention to the Global Positioning System (GPS). NTIA will be spending approximately \$1 million for this effort which is to be completed in the fall of this year. This testing program will also help the FCC, which recently proposed new rules allowing UWB systems on an unlicensed basis.

## **V. WRC-2000**

### **THE WRC - General**

I would like discuss briefly the results of the World Radiocommunication Conference 2000 (WRC-2000) which was held in May in Istanbul, Turkey. The National Telecommunications and Information Administration (NTIA), along with the Federal Communications Commission (FCC) and other Federal agencies provide the main technical support for the United States delegation at World Radiocommunication Conferences. Given the gravity of the issues involved at WRC-2000, NTIA considered this year's conference among the top priorities of the agency this year. The outcome of this past conference, as with previous conferences, affect significantly on spectrum management and the development of wireless communications services in the United States, and the competitive position of U.S. manufacturers. Therefore, conference preparation and follow-up is a responsibility that NTIA takes very seriously.

I spent a week and a half in Istanbul with the 157 member U.S. delegation (including 59 representatives from companies) to the WRC-2000. There were over 2000 delegates from over 150 countries - each working to ensure that their existing uses of the spectrum for their radiocommunications would be protected and that their future requirements for the spectrum would be satisfied. Countries were also attempting to agree on new rules or modifications to existing regulations and procedures required to ensure compatible operation. I had the opportunity to talk to members of many delegations to promote the U.S. views and to listen to their views on the many issues being addressed at the WRC. It was apparent that both developed and developing countries had definite views on: (1) obtaining additional

spectrum for implementing International Mobile Telecommunications 2000 (IMT-2000) and future generations of advance communications; (2) allocating sufficient spectrum for GPS and the European Galileo satellite-based worldwide navigation systems; and (3) ensuring appropriate distribution of spectrum for broadcast satellite services.

Developing countries were particularly interested in obtaining guaranteed future access to satellite spectrum which the developed countries have almost fully occupied over the last 30 years. The developing countries were very concerned that as technology opened the doors for broadband communications, they would fall in the shadows of this economic boom and communications expansion -- exacerbating the economic and digital divide that currently exists between developing and developed countries. They expressed concern that both the economic gap and the digital divide would continue to grow. Moreover, they feared being forced to set aside spectrum for new broadband systems and to transition equipment infrastructure when their first generation cellular was still developing. Many developing countries still appear to be slow to adopt regulatory reform needed to facilitate communications investment. Developing countries are also as concerned as we are in the Administration about the digital divide. It is safe to say, that wireless communications technologies are taking on a greater importance in most nations, including our own, and are viewed as a critical means to expanding economic opportunity.

It was a privilege and an honor to work with Ambassador Gail Schoettler and members of the U.S. delegation. Her outstanding leadership, along with the outstanding effort by the delegation members, was paramount to the success of the United States. I would also like to express my admiration for the cooperation between NTIA, FCC, State Department, and the industry members of the delegation. In my estimation and based on discussions with others that attended previous conferences, this was one of the most productive. I would also like to bring to the attention of the subcommittee, Ambassador Schoettler's report, in which a number of recommendations were made to improve future conferences. Among other things, she points to the importance of WRC preparations starting early and maintaining continuity of leadership and organization from conference to conference and that communications between industry and government and within the delegation, with the press and with Congress, should be open and timely. Finally, she recommends that a strong and continuous international outreach program should be undertaken - something that Ambassador Schoettler did well prior to the WRC and which we need to be certain to follow up on. As a nation, the United States needs to take these conferences very seriously in order to continue the United States' leadership role in the ITU and subsequent WRCs, and maintain an open and free market place.

### **WRC - Major Issues for Federal Government**

The major issues at the WRC included: (1) Broadcasting Satellite Service (BSS) re-planning, technical and procedural matters; (2) International Mobile Telecommunications 2000 (IMT-2000); (3) Non-Geostationary Orbit and Geostationary Orbit (NGSO/GSO) spectrum sharing; (4) Radionavigation Satellite Service (RNSS) issues including GPS sharing with Mobile-Satellite Service (MSS); and (5) high density fixed systems (HDFS). The United States met all its objectives in these major areas including sufficient spectrum for IMT-2000, protection of U.S. communication and radionavigation systems, agreement that mobile satellite service cannot share with GPS, and sufficient spectrum for GPS and other planned satellite navigation systems.

I would like to focus my remarks with respect to WRC-2000 on implementation of IMT-2000 since NTIA will be playing a pivotal role in this process. And, I would say at the outset that, in my judgement, the development of advanced wireless services is one of the most important communications policy issues facing our nation. The Internet revolution will take yet another dramatic leap when we, hopefully, have widespread availability to mobile Internet access. I consider the development of wireless Internet critical to achieving important policy goals such as closing the digital divide.

## **VI. DEVELOPMENT OF WIRELESS TECHNOLOGIES AND**

## SERVICES

### Transition to IMT-2000

Over the past decade, there has been enormous worldwide growth in the use of cellular-type wireless communications systems. Many countries initially introduced analog systems and have now transitioned to digital systems. Studies in the International Telecommunication Union (ITU) and elsewhere indicate that this growth in personal communications is likely to continue. Third generation (3G) wireless communications systems will provide mobile and satellite-based broadband capabilities, and represent a path for the evolution of existing cellular and personal communications services (PCS). Annual service and infrastructure revenue for 3G is estimated to approach \$100 billion by 2007, of which two-thirds is predicted to come from data and other non-voice services. It has also been estimated that wireless subscribers are projected to grow from 469 million in 1999, \$1 billion in 2002, and 1.26 billion in 2005 or an average penetration rate of nearly 20 percent. The United States cannot afford to get left behind in this technological leap forward.

The member administrations of the ITU have identified the technical characteristics of a third generation system, and have termed it International Mobile Telecommunications-2000 (IMT-2000). Key features include a high degree of commonality of design world-wide; compatibility of services within IMT-2000 and other fixed networks; and high-quality world-wide use and roaming capability for multi-media applications (e.g. video-teleconferencing and high-speed Internet access). The ITU established an agenda item for WRC-2000 which considered the review of spectrum and regulatory issues for advanced mobile applications in the context of IMT-2000, noting that there is an urgent need to provide more spectrum, particularly for the terrestrial component of such applications and to make adjustments to the Table of Frequency Allocations as necessary.

Let me briefly review the IMT-2000 WRC-2000 results.

### IMT-2000 - U.S. WRC Results

In accordance with U.S. goals and the concerns of the developing world, the outcome of the conference provides direction to facilitate technology development but also emphasizes flexibility for administrations. The conference adopted various types of regulatory text for implementation of IMT-2000 in a number of bands. These include bands for the terrestrial component of IMT-2000: 806-960 MHz (some countries noted that spectrum was available in their countries as low as 698 MHz, but most felt uneasy about including existing broadcast bands), 1710-1885 and 2500-2690 MHz. For the satellite component the bands included 1525-1544, 1545-1559, 1610-1626.5, 1626.5-1645.5, 1646.5-1660.5, 2483.5-2500, 2500-2520, and 2670-2690 MHz. The Conference also approved High Altitude Platform Stations (HAPS) operations in portions of the bands 1885-2025 and 2110-2200 MHz. The language in the various regulatory texts is different, however the meaning is the same, maximum flexibility for implementation. This regulatory identification for IMT-2000 does not preclude the use of these bands for any applications of the services to which they are allocated and does not establish priority in the Radio Regulations. For the new bands above 1 GHz, a significant amount of language was accepted by the Conference that makes it clear that administrations can implement any of the bands in any time frame, for any service or technology, and may use any portion of the bands that they deem appropriate based on national requirements.

In summary, the WRC-2000 identified 519 MHz of additional spectrum for terrestrial (plus 230 MHz from WARC-92), totaling 749 MHz of spectrum for IMT-2000. It should be noted that the International Telecommunication Union (ITU) Radiocommunications Bureau only forecasted a need of 160 MHz of additional global spectrum for terrestrial by 2010, exclusive of frequency bands already used for first and second generation systems. It is up to each nation to decide which bands will be adopted for IMT-2000 in their country. Administrations can implement any bands in any time frame, for any service or technology, and may use any portion of the bands that they deem appropriate based on national requirements.

The United States won a very significant victory at WRC-2000 in that the conference adopted our plan to utilize a multi-band approach and provide administrations with flexibility to develop 3G technology. This approach provides enough guidance with respect to which band will be 3-G bands while permitting marketplace flexibility.

### **IMT-2000 - The Domestic Scene**

The real work is about to begin domestically. The United States must now decide what bands or portions thereof will be allocated or reallocated for IMT-2000 use domestically. The possibilities for terrestrial include 698-960, 1710-2025, 2110-2200, and 2500-2690 MHz. NTIA and the FCC agreed before the WRC-2000 to perform studies for the 1755-1850 MHz band (NTIA) and for the 2500-2690 MHz band (FCC). The studies are to examine, among other things: existing spectrum allocations; existing use; existing investment; future use; potential availability of alternate spectrum for potentially displaced users, changes in the domestic allocation table, cost and time frame to move existing users; sharing potential of existing users with IMT-2000 services and the possibility of existing users in 2500-2690 MHz band providing IMT-2000 services. The satellite component possibilities include the use of 1525-1559, 1610-1660.5, 2483.5-2500, 2500-2520 and 2670-2690 MHz bands. Bands are not as congested in most other countries. Most European countries and Japan are licensing 3G operators now, who will begin services in 2002.

The 1755-1850 MHz band supports four main Federal functions: space telemetry, tracking and control (TT&C); medium capacity fixed microwave; tactical radio relay training; and aeronautical mobile applications such as telemetry, video and target scoring systems. This band is allocated on an exclusive basis to the Federal Government for fixed and mobile, space operation (Earth-to-space) and space research (Earth-to-space) services, and in the 1761-1842 MHz portion, used for space tracking, telemetry and command. Fixed links are operated by Federal agencies for voice, data, and/or video communications where commercial service is unavailable, excessively expensive, or unable to meet required reliability. Applications include law enforcement, emergency preparedness, support for the National air space system, military command and control networks, and control links for various power, land, water, and electric-power management systems. Other specified fixed links include video relay, data relay, and timing distribution signals. Probably the most critical system in the band is the USAF Space Ground Link Subsystem (SGLS). This system, via Earth-to-space uplinks in the 1761-1842 MHz band, controls the U.S. military satellites, including telecommunications satellites, intelligence gathering satellites, the Global Positioning System (GPS) satellite constellation, and satellites of other Federal government agencies and U.S. allies.

The two major services in the 2500-2690 MHz band are the Multichannel Multipoint Distribution System (MMDS), and the Instructional Television Fixed Service (ITFS).

MMDS is a public radio service transmitting from one or more fixed stations, and received by multiple receivers at various locations. There are over 2500 licenses for MMDS in the band, nation-wide. Licenses are granted on the basis of Basic Trading Areas (BTAs). MMDS is a technology for delivering fixed wireless high-speed access. Until recently, the incumbent local telephone companies and local cable systems-both wired services-have offered the only options for mass market high-speed access. The MMDS frequencies, located in the 2.1 and 2.5 - 2.7 GHz bands, are suited for the delivery of broadband access to data, voice and Internet service. The channels allocated to MMDS have traditionally been used to provide a multichannel video programming service, so-called "wireless cable," that is similar to cable television. Rather than being hardwired, MMDS uses microwave frequencies. Like broadcast television, MMDS is transmitted from a broadcast tower, usually located on a mountain or tall building, to special antennas on residences or businesses throughout a local market. The technology is, however, undergoing rapid changes. In September 1998, the FCC announced new rules which allow two-way service via MMDS frequencies. When MMDS can be used for two-way service, it will become a viable broadband service delivery option. The two-way capability allows a return channel, so MMDS can be effectively used as a wireless option for interactive applications and two-way data service. The new rules still contemplate fixed service, even for two-way operations.

The other major service in the band is the ITFS, and is regulated under Part 74, Subpart I of the

Commission's Rules. ITFS is used for television transmission of academic subject matter to remote classrooms, or other locations. ITFS channels are from 2500 to 2596 MHz, and interleaved with MDS channels above 2644 MHz. Of the 31, six-megahertz channels in the MMDS/ITFS spectrum band, the FCC licenses twenty of these channels to non-profit educational entities. The channels are used by educators for instructional programming, and unused channels may be leased to MMDS operators, and can be used for the same kind of broadband services discussed above. Partnerships have developed between ITFS spectrum holders and MMDS companies that provide expertise, revenue, and access to hardware and software to ITFS partners, to better enable them to build their distance learning programs.

All of the above bands are used at present. Incumbent users in these bands have objected to having their operations moved, because of cost, effects on mission/business plans, and the interruption of day-to-day activities. However, if the United States is to be competitive in the marketplace for succeeding generations of wireless communications, the United States will have to make the appropriate decisions that will make the necessary spectrum available while minimizing the effects and costs to those who may have to be displaced. For those who may be required to relocate, additional spectrum may have to be found or other accommodations will have to be made to continue their operations.

Addressing all the issues in selecting a band or bands and potential relocation of those displaced will require cooperation and collaboration between the Federal government agencies, the NTIA, industry, and the FCC. To this end, the Administration believes it imperative that the U.S. spectrum regulators (FCC and NTIA) and major stakeholders agree to a schedule of events that will result in spectrum for IMT-2000 being designated for use by September 30, 2002, which coincides with Congressional direction that the FCC auction the 1710-1755 and 2110-2160 MHz. The major ingredients to meet this goal will be completion of the spectrum studies by the FCC and NTIA as discussed above, timely coordination between the FCC and NTIA including the Federal agencies and industry stakeholders affected, and the expediency of the FCC rule-making process.

The United States also has to focus on of what other countries are doing. For example, most PCS users in the United States cannot take their phones to Europe and use them since PCS systems in the United States use incompatible technologies. U.S. GSM users can roam to Europe. Therefore, other countries planned use of spectrum for IMT-2000 could have an effect on frequency bands the United States may choose or on the need for manufacturers to expand the use of multi-band, multi-technology equipment. However, industry is very concerned about the impact this will have on the affordability, features, and size of equipment, particularly if the United States is unable to harmonize frequencies with the rest of the world. The United States has stood firmly behind the concept of technology innovation and flexibility in the past, while Europe has been very successful in promoting single bands and single technologies.

Another aspect of this decision, is the impact the spectrum selection will have on the digital divide, the gap between those individuals and communities that have access to these Information Age tools and those who don't. NTIA's "Falling Through The Net" report in July 1999 indicated that better-educated Americans are more likely to be connected to the Internet, whites are more likely to be connected than African-Americans and Hispanics, wealthier schools are more likely to be connected than poorer schools, and people with disabilities are less likely to have access to technology. The United States will have to evaluate the impact of decision options on the gap and hopefully make decisions that will close the gap.

The Administration intends to engage in a serious inter-agency process, working cooperatively with the private sector, to identify aggressively particular spectrum and develop 3G wireless services. NTIA will lead this process on behalf of the Administration and we will regularly inform the Congress on the progress of our efforts.

## **Conclusion**

Thank you for this opportunity. I will be happy to answer your questions.

TESTIMONY OF GREGORY L. ROHDE  
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U.S. DEPARTMENT OF COMMERCE

ON THE "DIGITAL DIVIDE" IN RURAL AMERICA AND  
LOAN GUARANTEES AND RURAL TELEVISION SERVICE

BEFORE THE COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY  
U.S. SENATE

FEBRUARY 3, 2000

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Thank you Mr. Chairman for inviting me to testify before this Committee regarding the "Digital Divide" that exists in rural America and efforts to ensure that viewers in small and rural markets have access to local broadcast programming. Both of these issues are deserving of Congressional attention to prevent rural Americans from becoming increasingly part of the "information have-nots."

The "Digital Divide"

With respect to the Digital Divide, the Administration recognizes that despite incredible growth in personal computer ownership and Internet access in this country, there remains distinct disparities in such access, especially in rural areas. Last July, President Clinton and Secretary of Commerce William M. Daley released *Falling Through the Net: Defining the Digital Divide*. This is the third report authored by the National Telecommunications and Information Administration (NTIA) documenting household access to telephones, computers, and the Internet. This *Falling through the Net* report, which expands upon the previous two reports, is a key component of the Department of Commerce's efforts to understand, measure, and explain how the information revolution is affecting this nation. This study provides valuable new information on how people are gaining access to the Internet, how Americans choose to spend their time online, and why some people are not connected.

Access to new technologies, such as the computer and the Internet, will be crucial to the economic success of American businesses, communities, and individuals. The Internet is becoming an invaluable tool for personal success and professional advancement. Increasingly, Americans are using it to find jobs, contact colleagues, locate public information or take courses online. Familiarity with new technologies will also prepare more Americans for the high-tech workplace of the 21<sup>st</sup> century.

In the *Falling through the Net* report, we present some good news, which is that more Americans are connected today than ever before. Computer ownership has nearly doubled in four years, and Internet access has increased more than 40 percent in the last year alone. More than one-quarter of American households have Internet access at home and approximately one-third of Americans are going online from some point. Additionally, those traditionally less likely to have telephones, primarily young and minority households in rural areas, are now more likely to have phones at home.

Unfortunately, this report also presents some very troubling news. Data from this report reveals that Americans living in rural areas are lagging behind the national average in computer and Internet access, regardless of income level. This new data revealed growing disparities, including the following:

- At almost every income level, those households in rural areas are less likely to own computers than households in urban or central city areas.
- At almost every income level, households in rural areas are significantly less likely - sometimes half as likely - to have home Internet access than those in urban or central city areas.
- Black households in rural areas are more than 1/5th less likely to own a computer than the national average U.S. black household, and are almost 2/5ths less likely to access the Internet than the

average U.S. Black household.

- Also for rural areas, the Kindergarten-12th grade school is a popular point of Internet access: 30 percent of rural persons use school for Internet access outside the home, as compared to the national average of 21.8 percent.

These statistics illustrate that a "digital divide" clearly exists among different demographic groups, and that rural areas are falling on the wrong side of this divide. The Administration is committed to working to closing this gap between the information "haves" and "have nots" and also recognizes that such an effort requires creative partnerships between government, industry, and non-profit organizations.

Government programs, such as NTIA's Technology Opportunities Program (TOP), (formerly known as the Telecommunications and Information Infrastructure Assistance Program (TIIAP)), are already working to expand access to technological resources in under served areas. TOP promotes the widespread use of advanced telecommunications and information technologies in the public and non-profit sectors. The program provides matching demonstration grants to state and local governments, health care providers, school districts, libraries, social service organizations, public safety services, and other non-profit entities to help them develop information infrastructures and services that are accessible to all citizens, in rural as well as urban areas. TOP has provided support to such programs as the Mountain Area Information Network in North Carolina, the Lincoln Trail TELEVILLAGE Project in Kentucky, the Telecommunications Solutions for Rural Revitalizations project in South Dakota, and the Vermont Telecommunications Application Center, all of which promote the development and deployment of technology resources to address the needs of rural residents in those states.

The assistance of non-profit organizations and private industries is also a necessary component in expanding access to new technologies. Companies are supporting the creation of community technology centers, helping schools through "NetDays," and donating computers and software to schools and neighborhood centers. The private sector's contribution is essential because these companies know what kind of skills Americans will need in order to find jobs in the future.

Community-based organizations can also help provide access to computers and the Internet where communities need it most. Each community knows best how to reach and connect residents, whether through traditional community centers, churches, senior centers, fire and police stations, or other centers.

In addition, as the President's principle adviser on telecommunications and information policy matters, NTIA will continue to advocate policies that advance the goals of promoting competition and advancing universal service, consistent with the objectives of the Telecommunications Act of 1996. In particular, the Administration remains committed to the preservation and advancement of universal service reforms that will ensure that consumers living in rural and high cost areas can fully participate in the digital economy. To this end, we will work with the Federal Communications Commission and the states to implement universal service reforms that achieve the goals of the Telecommunications Act that "access to advanced telecommunications and information services should be provided in all regions of the Nation" and that rural consumers have comparable services at comparable rates.

All of these efforts are necessary if we hope to close the digital divide that exists between urban and rural America. I look forward, in my capacity as Administrator of NTIA, to promoting public and private programs designed to ensure that all Americans are able to fully participate and benefit from new technology.

#### Loan Guarantees and Rural Television Service

I also appreciate the opportunity to testify before this Committee on providing loan guarantees to providers to carry local broadcast signals to residents of small, rural local broadcast markets. The Administration believes that the question of how consumers in small and rural markets receive local news and information is very important and deserving of Congressional attention.

I can recall well the night that the Senate passed the Omnibus Appropriations Act and the Senate discussed a proposal to provide loan guarantees for carriers to provide local-into-local broadcast coverage to small and rural markets. I was struck by the fact that when this Administration took office in 1993, there were no operational direct broadcast satellites (DBS) providing service to viewers. In 1993, there never could have been a debate like that which embroiled the Senate last November over the question as to how small and rural markets would get local-into-local service over satellite systems. Today, there are more than 11 million DBS subscribers. DBS companies are providing local-into-local service in 24 markets and are currently negotiating for the rights to deliver local-into-local broadcasting in 20 more. The question remains, however, as to how viewers in the remaining 200 or more television markets obtain access to local-into-local service.

The Administration strongly supported the provisions in the Satellite Home Viewer Improvement Act (SHVIA) that provided authorization to satellite providers to carry local-into-local broadcast programming. The Administration believes that authorizing local-into-local service not only promotes greater access to local television signals for all Americans, but also strengthens DBS providers' ability to provide meaningful competition to cable with comparable program offerings. Unfortunately, markets in which local-into-local broadcasting over satellite systems is not offered will be less likely to enjoy the same competitive benefits. Moreover, in some rural areas, there is no multichannel video programming supplier offering local broadcast signals and many of these communities lay outside of the signal coverage area of their local broadcast stations.

For these reasons, the Administration believes that it is important to find ways to ensure that consumers in rural and small markets have access to local broadcast programming. The Administration is prepared to work closely with the Congress on any proposal to address this issue, including a loan guarantee proposal. We believe that these three principles should guide such legislation. First, the Administration believes that any new program should be technology neutral in recognition of the fact that different technologies may best be suited to deliver local broadcasting services to unserved areas in different parts of the country. Technology neutrality can spur innovation and the application of new technologies to address this problem. Second, the program should be crafted to ensure that it promotes competition in the multichannel video programming market and encourages future private investment in infrastructure. Third, the program should demonstrate fiscal responsibility by conforming to Federal credit program policies, which minimize Federal exposure to loss and ensure the least expensive, most efficient financing of Federally guaranteed loans.

The Administration also believes that the discussion over ensuring local-into-local broadcast programming in the digital era should not be limited to the loan guarantee approach. Thus, NTIA recently announced that it will publish a Federal Register Notice to solicit public comments and suggestions as to how viewers in small and rural markets can receive local broadcast signals. All comments will be posted on NTIA's web site (<http://www.ntia.doc.gov>). As part of this effort, I intend to host a roundtable discussion in early March with various stakeholders: consumers, industry representatives, policy makers, and technology experts, to explore ways in which small and rural markets can have access to local programming via satellite and other technologies. Our efforts in this area are intended to complement the Congressional action and efforts by the Federal Communications Commission to examine this question as required under SHVIA. Our intent is to help raise visibility on this issue and contribute to the debate.

Extending the reach of local broadcasting and its vital news and information has been a longstanding goal of NTIA. The agency administers the Public Telecommunications Facilities Program (PTFP), which provides grants to establish and extend the reach of local public television and radio stations into unserved areas. Since 1962, the program has been a major factor in the nation's success in bringing local public television stations to rural areas -- through the establishment of full power stations, as well as the construction of television translators and repeaters. PTFP estimates that approximately 94 percent of all Americans can receive at least one free, over-the-air public television signal from a local PBS member-station.

The preservation of local broadcasting in the digital era is vitally important and ensuring that viewers in small and rural markets are included in this new age is critical. The Administration pledges its support to

advance the goal of extending the reach of local broadcasting to all Americans and looks forward to working with Congress on the loan guarantee proposal as well as exploring other approaches to this issue. We would appreciate the opportunity to provide comments on any specific legislative proposal.

Thank you for the opportunity to testify and I would be happy to respond to your questions.

Remarks by Assistant Secretary Gregory L. Rohde  
3<sup>rd</sup> Annual International Symposium on Advanced Radio Technologies  
Boulder, Colorado  
September 6, 2000

### "Brought To You By The Letter 'M'..."

I am pleased to be back here in Boulder this morning. Twenty years ago, almost to the day, I arrived on the Colorado University campus as a student athlete. Like many of young runners who grew up in the after glow of Frank Shorter's Olympic gold and silver medals in the marathon, I came to Boulder, the running Mecca, to train with him. One day when Frank and I were running intervals on the practice field across from the football stadium, I asked him why he moved to Boulder to train for the 1972 Olympics. He said "because of the altitude." When I asked why he thought altitude training was so important, he said: "because Lasse Verin does it." Verin won gold medals in the 5,000 and 10,000 meters in both the 1972 and 1976 Olympics. I had expected a much more complicated answer from an Olympic champion. I guess one of the qualities that made him the great runner he was is that he knew how to follow a successful example.

I am not as fast as I was on my first trip to Boulder, but I still run. This morning I was reminded why Frank Shorter and so many other runners came to Boulder in the first place: the challenge of the altitude. I am still catching my breath from my short run up the canyon this morning.

So we should all take a moment of silence - not just so I can catch my breath but to mourn last weekend's loss to Colorado State. It is a rough start for the Buffs for a tough season. This year, CU has a one of the tougher schedules in the country. Their first six games are against teams that were in bowl games last year, and their last game is against Nebraska, everyone's preseason pick to be No. 1.

That's some obstacle course the team will have to negotiate between now and Thanksgiving. In fact, there's only one team I can think of that has an even tougher set of obstacles to overcome between now and Thanksgiving -- that's the team headed by Coach Val O'Day. Playing that Big 12 schedule is nothing compared to getting through all the people who want to have their way on the GPS/ultra wide band testing. But I have faith -- both in the Buffs and our team -- will come through in fine shape.

College football is a lot different today than when I attended C.U. Like many other aspects of our society, football is utilizing information technologies. I read the other day that one of the CU coaches has his own Web site for teaching pass receivers. The team is also interested in buying a new Interactive Play book that will be CD-ROM based, and later hosted on the Internet, that will allow players to look at game films in the comfort of their own laptop PCs.

It's also fitting for this discussion that the bowl game the Buffs won last year was sponsored by **Insight.com**. Insight sells computers and software online, so it's part of what has come to be known as electronic commerce. In Internet speed, that description of course was shortened to e-commerce, and is now known as e-tailing and is part of the larger category of e-business, which wasn't shortened from anything but was born that

way. Those terms, of course, spring from e-mail, which came from electronic mail, which dates back to 1977. It wasn't until 1982 that e-mail made its appearance and until 1993 that the term appeared in a dictionary.

## "E-Talk"

Now it seems that every other word now has an "e" in front of it. People talk about e-services, e-page, e-government, e-books, e-greetings, e-campus, e-communities, e-prizes, and the list goes on. While it's nice that the field is exploding like this, in a way, it's also very confusing. Kids today don't know that the word "emotion" isn't pronounced "e-motion" and has nothing to do with virtual race cars.

Luckily for those words starting with "e", we are in the midst of a new technological transition that is also changing the lexicon. If nothing else, this transition will bring back sanity to words beginning with the letter "e." That's because it's being replaced in the jargon by the letter "m," as in "mobile." M-business and m-Commerce are already starting to worm their way into our jargon. It won't be long before people think the TV show "Mad About You" was about a new mobile advertisements -- the m-ad.

Don't laugh too hard. Here in Boulder, a California company, SkyGo, will start a test next month with 1,000 people who will receive free cell phones and 4 months of wireless Internet service in return for getting m-ads -- coupons, discounts, rebates and other items from the two dozen or so local merchants who will participate. The "e" is giving way to "m" as what is hip in the IT sector.

## The Next Internet Revolution

It should be obvious by now that the Internet is dramatically impacting the economy and many aspects of our lives. To call it revolutionary is an understatement. It is turning our world upside down and inside out.

The Internet is pushing us out of the industrial age and throwing us into a whole new economy which demands different skills, resources, and tools. Those in our society that have access to communications infrastructure and possess computer and information technology skills are the ones poised to capitalize on the tremendous growth of the new economy. The Internet revolution is creating opportunities and breaking down the geographic, racial, age, and income barriers of the past. The Internet is transforming small school houses into sophisticated places of learning and turning main street businesses into global marketplaces.

When the Internet revolution converges with the wireless revolution, however, the dramatic changes we see today only reveal only a glimpse of things to come.

Today we have Blackberry -- a wireless e-mail device.

And, we have Bluetooth, a wireless protocol for connecting devices.

There are many more early examples of the wireless web:

- The U.S. Open tennis tournament is going on this week in New York City. People with Internet-capable mobile phones and PDAs can get real time scores and news transmitted through the official WAP site -- wireless application protocol -- for the tournament.
- Nokia has licensed about 300 songs from EMI that can be used as ring tones on cell phones. Instead of the musical notes you hear now; you will hear Janet Jackson or the Spice Girls. The good news is, this service at the moment is only available in Europe.
- The Bank of America is starting to offer wireless banking and brokerage services, an M-Bank if you will. Customers will be able to view account balances and transfer funds between accounts while also checking stock quotes and news headlines. Taking it one step further, the Infrared Data Association conducted the first successful test of sending financial data between a Palm device and a point-of-sale terminal, one step toward portable, wireless purchasing.
- In San Francisco bus passengers will soon be able to use their wireless phones to get arrival information for specific stops -- not just a general schedule.
- Finally, there is the Web-elevator. A Massachusetts company installs flat-panel Internet displays in office buildings around the country. Information is updated every 20 minutes through a wireless local area network. The Net is everywhere.

Some reports suggests that Web-enabled phones are selling "at an astounding rate," with almost half of the cell phones sold earlier this June equipped to receive Web or Web-like service. Just a year ago, only 5% of the phones purchased were Web-enabled.

Within three years, one in 3 mobile phones will be able to access the Web. Within 5 years, 500 million people worldwide could have access to the Internet through wireless devices.

Analysts predict a range of growth, with the wireless data business growing from three million customers this year to more than 50 million in just two years, and 200 million five years from now. M-commerce is expected to grow into a billion-dollar market in just five years. One analyst has predicted that European wireless phones will become more common than landline phones, which is probably why the German auction for 3G spectrum brought in more than \$46 billion. We all know of the tremendous success of i-mode in Japan, which is driven in large part because most Japanese people don't have wireline access. The most significant i-mode development recently isn't the rumor that DoCoMo may do a U.S. deal -- it's that Disney will create content for i-mode's 3G service next year.

### **The Wireless Future and NTIA**

In the next few years, wireless technologies will surpass the desktop as the main method by which people will access the Web. Fixed and mobile wireless technologies will not only help bring the Internet to more and more of the world's citizens, but they will also bring the Internet and other information technologies into many more aspects of our

lives.

Because the wireless area is so crucial to many aspects of our national telecommunications policy, the development of wireless technologies are central to the mission of NTIA. We need to view our mission to develop technology and policy as an essential part of our mission to manage the federal spectrum.

**WICI.** An example of this is reflected in a new initiative I established when I joined NTIA. It is the Wireless Innovations in Communications Initiative (WICI) to create a new channel for government users and industry to talk with one another. WICI has two goals. The first is for government users and industry to become more aware of each other's spectrum needs and to work in a cooperative environment. The second, equally as important, is to foster innovation. By having these meetings and hearing each other's requirements, I hope to create an institutional means by which those with the newest and the best ideas can get them heard by the managers of federal spectrum and private industry. The WICI process is just getting started and is showing great progress and promise.

**WRC-2000 and 3<sup>rd</sup> Generation Wireless Services.** The development of 3<sup>rd</sup> generation wireless services poses both a challenge and an opportunity for NTIA to provide leadership in this area. I went to the World Radio Conference in Istanbul, and have been deeply involved in the post-WRC discussions, because the third generation of wireless systems offers so much promise for this nation.

3<sup>rd</sup> Generation wireless services will bring a new dimension to the Internet, ones we can only dream of now. The beauty of seeing the first iterations, like i-mode and the WAP-based services, is that I know, and you know, that the applications and technology can only get better. Today's web phones are like Henry Ford's Model T - they only provide a glimpse of the potential of mobility in the information age.

3G services can play a large role in moving from the digital divide to a policy of digital inclusion - to use the words of our new Commerce Secretary Norm Mineta . Wireless technologies can help to bring affordable access to more and more consumers as the cost of service continues to drop. Along with that reduction will be the accompanying increases in the number of people able to access the Net.

In addition, 3G also holds out tremendous promise as a fixed technology. It can be used to link devices on wireless networks, perhaps even in the home. And more significantly, it can be used by competitive service providers as an alternative to the arduous processes, time and expense that go with building wireline plant. According to the Cahners, In-Stat group, it's possible that 3G will even allow for an expansion of high-speed data to the residential market -- an area long overdue for the choices that business customers now have.

**Other New Technologies.** The ITS lab plays a critically important function in developing new innovative technologies that will have life transforming impact. One example is the testing functions that only this lab can perform and the excellent reputation that this lab has for its professionalism and objectivity.

Recently, NTIA has asked many of ITS engineers to conduct critically important testing

on ultra wide band devices. With the skillful, objective testing that only the ITS lab can do, promising new technologies like ultra wide band would have less chance of moving forward. Ultra wide band technologies could create a paradigm shift in spectrum functionality. However, before moving ahead, we must determine that such devices will not impose any harmful interference on life saving services such as GPS.

NTIA is up to the challenge of navigating through the politically tough decisions like harmonizing ultra wide band technologies and GPS because of the unique role that the ITS lab can play. Finding consensus on this issue is about as difficult as the Buffs sweeping past 7 bowl teams in one season. A challenge certainly, but a surmountable one.

We can't forget, and I can't stress enough, that none of these great and good things from 3G and the other technologies could happen without the people in this room and on this campus. I realize what a national treasure the Boulder labs are, and how indispensable Val and the rest of the staff ITS are to the formulation of national and international policy. I am so pleased to be with you in person today to say "thank you" for the tremendous contribution you are making to NTIA, the Commerce Department, and the Nation. The work of ITS is essential if our nation is to make our mobile system the equal of those overseas. When you lift the hood of the wireless engine, it's the ITS mechanics who do the service.

But their contributions don't stop there. ITS staff was invaluable in putting together a report on the state of rural broadband deployment that was released by President Clinton in April. ITS recently signed a cooperative agreement with Intel that could lead to better quality streaming video. They work on critical infrastructure programs for the Defense Department, interference questions for the Federal Aviation Administration, GPS analysis for the Federal Highway Administration.

ITS staff work with leading companies, like Intel and Lucent technologies, on cooperative research agreements that will benefit all Americans.

In short, the "m" word to describe the work done here at the labs is "magnificent." We should all be proud of their work.

Thank you for inviting me here today. I wish you the best of luck with your conference. I know the result will be a better life for us all.

**Remarks of Gregory L. Rohde**  
**Assistant Secretary of Commerce for Communications and Information**  
**European American Business Council**  
**Washington, D.C.**  
**August 3, 2000**

## **"How do we know where we are going if we do not know where we are?"**

### **Introduction**

How do we know where we are going if we do not know where we are? That phrase has been on my mind lately as I have heard some political pundits turn the digital divide debate into a political football. It is also characteristic of the debate over Internet charging arrangements which is emerging as one of the major telecommunications issues in several different international fora.

Today, I'm going as a starting point to take a minute to outline the digital divide problem as we define it in the U.S., to look at some of the solutions we're trying to implement as we move from Digital Divide to Digital Inclusion, as our new Commerce Secretary, Norman Mineta, likes to say. Then, I'd like to broaden the discussion to show that the Digital Divide isn't only a U.S. problem, and Digital Inclusion is a policy that ought to be applied everywhere.

### **From Digital Divide to Digital Inclusion**

Most of the emphasis we have at the Commerce Department has been on ways we can work within the United States to help those who don't have access to the best of information technology, or in some cases, even to adequate information technology. That's because this Administration recognizes that the key to participation in the new economy, as worker and as consumer, lies with having the right skills and access to the right tools - the tools of the information age. The digital divide is a real problem, but a solvable one.

We can take as our base the third Falling Through the Net report, which NTIA published last year. That report, using data collected by the Census Bureau, found that Americans from low-income families, those living in rural areas and racial minorities have less access to the tools of the new economy - computers and Internet access. We found, for example, that urban households with incomes of \$75,000 or more are more than 20 times as likely to have access to the Internet than rural households at the lowest income levels. That's the kind of statistic we use when talking about the Digital Divide.

NTIA also conducted a joint study with the Rural Utility Service (.pdf format) on the deployment of broadband technologies. In that study we found that another digital divide is emerging where DSL and cable modem services are being deployed largely in urban areas and rural communities are falling behind. Low population density and geographic distances render some broadband services such as DSL and cable modem service either uneconomical or technically infeasible.

Despite these studies, some Washington pundits have dismissed the notion that a divide exists and suggest that the Administration should not waste its time and energy on it because the market will resolve any deficiencies that may or may not exist. That might be a comfortable view perched in a Washington think tank where one can see the streets being torn up with telecommunications carriers laying facilities in the business districts of major cities and wealthy suburbs. But most of America knows better.

We really do not need to rely upon studies to see that there is a digital divide in this country. Just visit the Sioux and Crow Indian people of the Great Plains where only a small percentage have access to basic telephone service and there are no cell towers or fiber optic cables coming their way. Or visit the housing projects in Brooklyn, New York where large diverse populations living in poverty have no access to computers and have no visible means to see where they can obtain the skills needed to succeed in the information age.

We know that some progress has been made in closing the Divide since the time our report came out last year. To measure the changes, we are having another survey done by the Census Bureau this month. Our Falling Through The Net 4 report should be out some time this fall. In the meantime, there has been a lot of debate trying to measure Internet access and whether the Divide is truly closing. There are some analysts and studies who contend that the market will take care of the problem, and some who contend that there is no Digital Divide at all, given the increased availability of Internet access. There are also studies that show that the Divide still exists.

We will never to a digital inclusion unless we know where the digital divide exists.

In this Administration, we believe there's a legitimate role for government to make sure no one is left behind. Our experience tells us that market forces won't solve every problem. The interstate highway system wouldn't have been built by the market, or allowed us to get to the point that 95% of American homes have access to a telephone.

To work on the problem domestically, we're pursuing the Digital Inclusion philosophy, as Secretary Mineta so aptly named it. There are several elements. We make people aware of the problem through our reports and public statements. I find it amusing that many of the commentators who say the Digital Divide problem has been solved somehow never stumbled onto it in the first place - until the President, the Vice President, and the Commerce Department began highlighting it and by proposing programs in the Federal budget to deal with the issue. The vice president, in particular, has long been a leader on technology issues, going back to his days in the House of Representatives when he founded the Congressional Future Caucus to look at issues and ideas that would eventually evolve into much of what today's Internet has become. His vision of the little girl in Carthage, Tennessee looking at material in the Library of Congress seemed pretty far-fetched in the late 1970s and early 1980s. It's reality today. Even before the President and Vice President took office, they held an economic summit meeting in Little Rock in December, 1992, and one of the was on the national information infrastructure.

The President has elevated this issue as a matter of national priority. I was with him on two stops of his New Markets tour, in southeast Washington and in Whiteville, North

Carolina at which he also said we must take action to make sure everyone is included in the Information Age. It was at Whiteville in April that the President released a report we at NTIA compiled along with our friends in the Agriculture Department which showed that the rural areas will lag behind other parts of the country in being wired for the next stage of development - the high-speed broadband services that will do so much to help businesses expand and create new markets, and improve the Internet services we know today.

The Administration's budget for FY 2001 reflects a targeted approach to create digital inclusion. Our Technology Opportunities Program and proposed Connecting American Families program for home Internet access reflect our concerns that there is a role for the Federal government in providing grant funding to local groups, in coming up with local solutions for non-profits, local governments and other organizations. And then we pass on the information on what those grantees learn to others. We have also asked for money to spur broadband deployment and to fund community technology centers. We are meeting with mixed reviews so far in the appropriations process.

### **Digital Divide As An International Issue**

As the G-8 summit last month in Okinawa showed, the Administration views the Digital Divide, and Digital Inclusion, as more than a domestic issue. Again, this is not new. The vice president has talked about the need for a Global Information Infrastructure since 1994 - the next logical step after the National Information Infrastructure policy base that the Administration has advocated since it took office.

Statistics show that Internet penetration is happening unevenly around the world, unevenly even throughout Europe. According to statistics from May, there are about 108 million Internet users in Europe, for a penetration rate of 34%. That figure varies from 65.2% in Sweden to 45.6% in the U.K., 31.6% in France and 11.4% in Portugal. Worldwide, we see even greater disparities. According to the Computer Industry Almanac report from last November, there were 57.5 Internet users per 1,000 people on a worldwide average. That ranged from a high of 492 Internet users per 1,000 people in North America, to 7.88 users per 1,000 people in the Middle East and Africa. This is the global Digital Divide.

President Clinton and the other leaders dedicated themselves to help remedy the situation. There will be a Digital Opportunity Task Force to help coordinate government efforts. The Overseas Private Investment Corporation will have a new \$200 million line of credit for e-commerce and Digital Divide projects. The private sector, including America Online and Cisco, will contribute as well through new projects.

Equally as important, and in keeping with our philosophy of local solutions for local problems, each area of the world is working on its solutions. For the part of the world in which you do business, that means the eEurope initiative, and Europe 99 - policy guidelines that will point the countries in the European Union toward the goal of a "faster, cheaper, more secure Internet," through rolling out new infrastructure and lifting old regulatory barriers. We support the eEurope initiative and objectives, and we particularly agree with the goal of lessening regulation on electronic commerce. Individual countries have their policies also. U.K. Prime Minister Tony Blair put forward

an ambitious plan in March of this year which has the goal of making the Internet accessible to all, and promoting usage on a regular basis by at least 70% of the people in the next 3 years. This is, he said, "an achievable target."

There are two very profound trends that are affecting the Internet revolution which we must keep in mind:

- Most of the projected Internet growth in future years will begin overshadow the current U.S. dominance. While the U.S. is perhaps has the highest proportion of Internet users in the world, that picture is changing fast. Within 3 years, the developing world will represent more than 50% of the Web. And, within 6 years Chinese will likely be the most widely used language on the Internet.
- The wireless revolution will push the Internet revolution to an entirely new level. By years end one in five cell phones worldwide will be capable of Internet access and within five years, a half a billion people worldwide will access the Internet through a wireless device. Wireless Internet access will not only mean that more people will have access, but it also means that the reach of the Internet into many more aspects of our lives - e.g., into our cameras and cars.

That is why the development of 3<sup>rd</sup> generation wireless services - or otherwise known as IMT-2000 - is so important for administrations around the world. The U.S. is pleased that the World Radio Conference adopted a flexible, multi-band approach for IMT-2000. This approach will permit swifter allocation of additional spectrum and advance the prospect of global roaming for Internet access.

### **Internet Charging Arrangements:**

Before closing, I wanted to address the issue of Internet charging arrangements. Some regions of the world have recently been attempting to seek global acceptance of a plan to have governments regulate the Internet charging arrangements to address perceived inequities. Because of the fact that the Internet grew up first in the U.S., we have served as the surrogate host for much of the world's Internet activity. Some are mistakenly drawing the conclusion that the Internet charging arrangements between commercial carriers are the cause of the current distribution of Internet hub sites.

In my judgement, the asymmetry in Internet traffic between the U.S. and Asia for example will be rectified through closing domestic digital divides. As native applications develop, then it's likely that a good portion of the Internet traffic that is currently coming to the U.S. will stay home, and that the current imbalance of Internet traffic between there and here will work itself out, much as it did in Europe as telecom regulation was liberalized and more native content developed. The current imbalance in traffic, which has prompted some to call for a regulatory solution, could have the effect of freezing the current imbalance into a tariff structure, rather than alter it.

This is less a regulation issue and more of a development issue. In order to get from divide to inclusion we need to know how to define the issue to avoid going down the wrong road.

As we saw in Okinawa, the U.S. Administration is dedicated to closing the digital divide worldwide. With the same dedication of effort that we in the U.S. are applying to move from Digital Divide to Digital Inclusion, we expect that other countries will do the same. The result will be a better system for all of us.

Thank you.

Gregory L. Rohde  
National Telephone Cooperative Association  
2000 Annual Meeting & Expo  
February 16, 2000

## From POTS to PANs With Universal Service

### I. Introduction

Kathleen Norris, in her book *Dakota*, said: "The High Plains...often act as a crucible for those who inhabit them. Like Jacob's angel, the region requires that you wrestle with it before it bestow's a blessing." Like many of you, I grew up in rural America. I know from my background that the ability of rural citizens to reach our promise and potential often means that we must overcome obstacles. Traditionally, areas like my home state of North Dakota have had to overcome the obstacles of distance and lack of economies of scale to access markets.

But today, there are new opportunities in the era of e-commerce and high speed Internet access. The telecommunications revolution provides us with an opportunity to change our historic disadvantages of distance. But, if rural America is going to be a full participant in the new economy, we still must overcome the challenges inherent in serving sparsely populated areas of the country.

My family is from the Great Plains. My father was born and raised in Nebraska and my mother grew up in a small farm house 14 miles north of Havre, Montana. That farm house did not have a telephone or electricity until she was in high school - which was shortly after World War II. It was powered by a windmill and lighted by kerosene lamps.

The town of Havre, Montana had telephone and electricity service for several years prior to the 1940's. But it was not until a local cooperative received government financing through the Rural Electrification Administration (REA) that a wire was strung outside of town to connect the small farm houses like my mother's with basic telephone service. My mother's history taught me an important lesson: our Nation made a decision a generation ago that everyone in America should have access to basic telephone service. As a result, telephone service is almost universal - 94% of American homes have basic phone service.

Universal phone service has occurred, in part, because of REA finance programs and, in part, because of a universal system that has helped to incentivize investment and maintain affordable rates in high cost areas. This commitment has allowed our Nation to have a network in which any of us can call nearly anyone, anywhere. It has made us the envy of the world.

We cannot forget what we have learned from the past. We cannot forget that all of America benefits when telecommunications services are ubiquitous.

As this generation moves into the era of advanced telecommunications and information services, we must maintain our commitment to a universal service system that will, in the President's words, "make access to the computers as universal as telephones."

### II. Status of the Telecommunications Act of 1996

There is an annual ritual this time of year. It is not Mardi Gras or Valentine's Day. It is the time of year that many people who work in the area of telecommunications assess the status of the Telecommunications Act of 1996. Most people ask: Is it working? Has it failed? Should it be changed?

I propose a different standard of judgment: Aristotle's concept of virtue. According to Aristotle, something is good to the extent that it is fulfilling its function or nature. The Act, in my judgment,

should be judged a success or failure in relation to its conformity to the vision behind its creation.

What was envisioned under the Act?

First, the Act was about letting loose the forces of competition.

Second, and equally important, the Act was also about ensuring that all Americans would share in the benefits of the telecommunication revolution and it established a promise of universal access and a promise that all Americans would have comparable services at comparable rates.

Let's look at the area of competition and whether or not it is fulfilling the Act's vision:

- In 1995, there were fewer than a dozen CLECs - today, there are hundreds.
- The streets of many major cities are being constantly dug up and filled in again by telecommunications companies laying facilities to provide competitive services.
- The competition has spurred growth. Since 1995 the telecommunications and information industries have grown 23% and 41% respectively. Equipment and services in these sectors has grown more than \$180 billion since 1995.
- The annual growth rate of the telecommunications and information sector revenues is twice the rate of the overall economy. And, the IT sector accounts for a third of the economic growth during this time of record economic expansion.

By any measure, competition is growing and in some areas, it is thriving. It is, as envisioned, a driving force for investment. Therefore, the Act's vision of competition is being fulfilled in many of the larger markets in this country.

But the Act was not just about competition - it is also about ensuring universal access. The Act established 2 equally important engines: competition and "an evolving level of universal service" that would drive investment to take us to a whole new world of advanced telecommunications services.

The engine of competition is running well and accelerating. But, the engine of universal service has yet to get started.

Now that the FCC and the states have done a good job in advancing competition, it is time to focus on fulfilling the Act's vision to "preserve and advance" universal service.

The Act promised:

- Access to advanced telecommunications and information services for consumers all regions of the Nation;
- Comparable services at comparable rates;
- Access to advanced services for schools, libraries, and rural health facilities.

We have had a universal services system for years - a system that has been largely successful in ensuring near-universal phone service. However, before the Telecommunications Act, rural America did not have an assurance that:

- Access to advanced services would be available in all regions of the nation;
- "Comparable services at comparable rates";
- Universal service support would be forward looking and tied to an "evolving level" of technology;

- Universal service support would be "specific, predictable, and sufficient" and required to "preserve and advance" universal service; and
- The FCC would do all it can to encourage the deployment of advanced capability for all Americans.

The Telecommunications Act of 1996 did not say to rural America: "Don't worry, one day you will be able to catch up to the rest of the country when it comes to telecommunications services." Rather, the Act said: Rural America will keep pace. It will not fall behind.

The Act did not simply say: "Maintain universal service" - or just "stay the course." Rather, the Act said that universal service must be "preserved and advanced" and be sufficient to support an "evolving level of service" provided through new technologies.

Universal service is meant to be a driving force for investment in the new generation of service - not a constrained system looking backward on yesterday's technology.

Universal service must move us from POTS to PANs - from "Plain Old Telephone Service" to the "Provisioning of Advanced Networks." Universal service needs to be forward looking to help build the broadband networks of the future in a manner that fulfills the vision of the Telecommunications Act.

When the Federal government deregulated the airline and railroad industries in the 1980's, it did not provide an assurance that rural citizens would have "comparable service at comparable rates." There is no protection or safety net for rural consumers in the aviation and railroad statutes of this country. As a result, rural consumers have often found themselves paying a higher price for less service.

But when Congress developed the Telecommunications Act, it consciously decided not to make that same mistake. Consequently, rural America received a significant victory in the assurances provided under the Telecommunications Act. The question today is: How do we ensure that universal service is revised in a manner that fulfills these promises.

The existing universal service regime will not sustain the new competitive, changing environment. One must ask, under the current rules:

- Is there sufficient support today to fulfill the Act's vision that consumers in all regions of the Nation have access to advanced telecommunications and information services?
- Will the present system ensure that consumers living in high cost areas will have access to comparable services at comparable rates when broadband is being deployed in urban centers?
- Will the present system stimulate the deployment of advanced services across the country as the Act envisioned?

In my judgment, the answer is no. The present system needs reform to fulfill the Act's vision. And, the time to reform is now.

If we fail to implement a universal service system consistent with the Act's vision, we will have institutionalized a digital divide that rural America may never overcome. We cannot allow this to happen.

### **III. Closing the Digital Divide**

A top goal of the Administration is to close the digital divide - i.e., ensuring that all Americans can share in the benefits of the telecommunications revolution. To achieve this goal, we must remain faithful to the pro-competitive principles of the Act and successfully reform universal service consistent with the

## Act's vision.

Under the Aristotlean standard that something is good to the extent it is fulfilling its function, the Act is developing in the right direction in my judgment. It is fulfilling its competition function. But, we have to now focus on it fulfilling its universal service function.

Steve Case, the CEO of AOL said: "The Internet is big enough to matter, yet young enough to shape." As the Internet and other advanced services become more and more central to our telecommunications system, we must take the steps now to ensure that all Americans can share in the revolution. Now is the time to develop the universal service mechanisms to fulfill the Act's vision for ubiquitous access to broadband networks.

As we all know, Louisiana was once the name given to a much larger parcel of land than this lovely state where the Mississippi River meets the Gulf of Mexico. Louisiana was the vast new territory purchased by President Jefferson from the French nearly two centuries ago that stretched from where we stand today through the Dakotas to Montana. To Jefferson, the Louisiana Territory was not merely a good land deal. It was the fulfillment of the American destiny to grow and expand - not only in geographic terms but in the fullest sense of creating opportunity for a young Nation.

In 1803, President Jefferson instructed Meriwether Lewis and William Clark to explore this great new territory. He specifically asked them to "explore the rivers of commerce" that would open up new doors of opportunity for a young nation. Imagine the excitement, the fear, and dreams of the Corps of Discovery as they rowed up the Mississippi and Missouri rivers on their mission to chart new pathways of commerce.

Today, our Nation is on a metaphorically similar journey; exploring the new rivers of commerce in the area of telecommunications. Many of you are the pioneers, the explorers, and the leaders who are building the rivers of wires, cable, and radio waves that will deliver our citizens to great new economic, social, and cultural opportunities that we never before possible.

This indeed is a very exciting moment to be in the telecommunications business. It is a bit like looking out on the unexplored West and seeing only the limits of human imagination.

I know that for cooperatives, it is not just a business. It is a community service. Many of you who have worked in the cooperative movement for a number of years know that if it had not been for the commitment of a local small town cooperative, your neighbors and relatives would not have telephone service. I know this because I have lived in communities where only the coops made it happen. Without the coops, many rural Americans would be disconnected and in the dark.

Now, because of the tremendous changes in technology, you have the opportunity to take that service to a whole new level. When the Telecommunications Act of 1996 was signed into law on February 8, 1996, Vice President Gore said that this law was not simply a "mid-course correction" on the way to the moon but "a new path to an entirely new world." This is a new world and you are fortunate to be a part of it.

Thank you very much.

Remarks of Assistant Secretary Gregory L. Rohde  
Department of Commerce Industry Outreach Meeting  
Advanced Wireless Communications Systems  
January 17, 2001

### **Announcement of Proposed Rules on Mandatory Reimbursement**

Since President Clinton signed the historic Executive Memorandum in October 2000 directing the Commerce Department to lead an inter-agency coordination process and industry outreach effort, the Secretary has issued a Third Generation (3G) spectrum development plan that charts out an aggressive schedule to promote the development of broadband wireless communications systems. In accordance with that plan, NTIA and the Federal Communications Commission (FCC) have issued interim reports on two candidate spectrum bands which are subject to potential reallocation for 3G services.

Also, the FCC, after coordination with NTIA, issued an NPRM on 3G wireless services earlier this month. In addition, NTIA has held several public meetings which have provided beneficial input to each of the government agencies involved in the Administration's initiative to develop advanced wireless services. This gathering is the latest in that series.

Before we get started with today's agenda, I want to announce a Notice of Proposed Rulemaking (NPRM) which suggests procedures under which Federal agencies will be reimbursed for the costs of moving out of spectrum reallocated for private sector use. NTIA will soon publish the notice in the Federal Register, possibly as early as tomorrow (Thursday).

The rules are obviously important in the 3G context because one of the spectrum bands designated for study is occupied by Federal users. The reimbursement rules will come into play if that band, 1755-1850 MHz is reallocated for 3G and if Federal users are required to modify their systems as a result. The rules are not limited to 3G. They will apply whenever Federal users must leave or modify their systems as a result of having their spectrum assigned to the private sector.

These proposed rules touch on a number of important subjects. They propose definitions for which costs are eligible for reimbursement, and suggest a dispute resolution system that includes negotiation, mediation and arbitration. They propose a means for determining how to define a facility that will be comparable to what Federal users would have to give up. The text of the proposed rule will be posted at [www.ntia.doc.gov](http://www.ntia.doc.gov) later today. The NPRM is modeled after the FCC's reimbursement procedures, so many of the procedures will resemble the procedures used in the PCS auctions.

Although this rule making was required under legislation enacted in 1999, these procedures will play a role in the 3G initiative should this process result in any reallocation of Federal spectrum. Congress wrote into the Defense Department authorization law of 1999 the requirement that the government must be compensated for the cost of relocating as a result of reallocation. These rules implement that requirement.

Frequencies reallocated under the budget bills of 1993 and 1997, when Congress required spectrum to be transferred from Federal users to the FCC for auction to the private sector will also be subject to the reimbursement rules. Some of that spectrum has not yet been auctioned.

The bands designed in this proposed rule for reimbursement are: the 1710-1755 MHz band from the 1993 law, and the 216-220, 1432-1435 and 2395-2390 bands from the 1997 law. On November 20, 2000, the FCC released a Notice of Proposed Rule making for the 27 MHz in those bands.

The NPRM establishes a 60-day comment period, and a 30-day reply-comment period. NTIA will issue a final rule later this year. Although the spectrum plan published pursuant to the Executive Memorandum did not include discussion of this mandatory reimbursement rule making, it is important that industry work with NTIA and provide comments on the reimbursement procedures outlined in this NPRM, since these rules may play a major role in the fruition of the process.

The development of 3<sup>rd</sup> Generation Wireless is one of the most critical communications and e-commerce issues facing the United States the next couple of decades. At stake are our international competitiveness and our ability to lead the world in the communications systems of the future. The only way that we will continue to make progress in achieving our goals to develop 3G and to meet the deadlines specified in the spectrum plan is for the private sector to work closely with NTIA and other Federal agencies.

I am very grateful for your dedication and participation in this process to date and I hope that we can continue moving ahead.

Thank you.

**Remarks by Larry Irving**  
**Assistant Secretary for Communications and Information**  
**National Telecommunications and Information Administration**  
**U.S. Department of Commerce**

at the

**Asia-Pacific Information Technology Summit**  
**"21<sup>st</sup> Century Strategies for IT-Driven Growth"**

November 19, 1998

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Good morning. It's a pleasure to be here with the distinguished delegates gathered here today to discuss strategies for the growth of the information technology (IT) sector in the next century.

As a representative of the Clinton Administration and a former resident of Santa Clara County, I'd like to welcome you here. In the United States, and increasingly across the globe, Santa Clara County - the home of Silicon Valley -- has become synonymous with information technology. More manufactured goods are now exported from this County than from any other area in America - including our traditional industrial and commercial centers such as New York, Detroit, or Chicago. In point of fact, Silicon Valley has become central to the continued growth and strength of the U.S. economy.

For those of us gathered here this morning, the question we must address is how we can promote the continued growth of our IT industries and our information infrastructure so that *all* countries and *all* segments of our societies can share the benefits of the Information Age. This is particularly crucial in the Asia Pacific context, where many citizens still are not connected by telephone or computer.

### ***Economic Contribution of IT***

The IT sector has already demonstrated tremendous growth, spurred by new technologies such as the Internet and wireless technologies. In the United States, we are rapidly shifting from a heavy industrial to a high-tech economy. The IT sector contributed roughly 30% of the growth in our gross domestic product, adding more than \$1.1 trillion to the national output in the last three years. The high-tech industry has also become the largest manufacturing employer in the U.S., employing more than even the automotive, textile, or apparel industries.

The transition to a high-tech economy is occurring, not just domestically, but also globally. Currently, 6% of the global GDP now stems from high-tech industries. Minister Mah Bow Tan and I were just discussing that, five years ago, no-one would have believed that today we would have streaming technologies, IP telephony, a wireless revolution, or electronic books. Who would have imagined that there might be 1 billion wireless users worldwide by year 2000, or that half of all U.S. banks would be offering on-line services today?

These new technologies and applications contribute significantly to our economic growth. Even in the face of recent economic turmoil, the Asia-Pacific region has experienced impressive growth in its IT sector. Korea's IT sector, for example, just posted a trade surplus of \$8.6 billion in the last three quarters, due to a significant increase in sales of satellite broadcast receiving equipment, mobile phone handsets, and PCs. Earlier this month, *Business Week* issued a list of the top 100 IT companies worldwide. A number of Asian companies ranked high, including Taiwan's Austek Computer, Inc., which showed a recent 85% surge in sales. These findings indicate that IT industries are contributing, and will continue to contribute, to the economies of the APEC region.

### ***Equitable Growth of the GII***

Roberto Romulo, Chairman of the Pacific Economic Cooperation Council, opened this session this morning by talking about the opportune roles of the State (or government) and the private sector in the development of IT industries. Coincidentally, last week I appeared on a panel discussing precisely that question. There was unanimity of opinion with regard to the role of industry, or the private sector. All of us agreed that the private sector provides the energy, the initiative, the entrepreneurial spirit, the innovation, and the investment that is fueling this economic, technological, cultural, and social revolution.

It would be an understatement to say, however, that we disagreed about the role of government. One of my fellow panelists indicated that all he needed from government were highways and a post office. I was in the distinct minority in asserting that government can contribute positively to the development of IT industries. Over the past several weeks, I have been trying to articulate the role that governments should and must play in "realizing the visions" for the new information economies. Among those key roles, governments should ensure equitable access to new technologies; provide a framework for investment, growth, and competition; open markets to international competition; and create an educated workforce that is able to meet the job demands of a digital economy.

First, it is essential that governments commit themselves to the goal of developing a truly inclusive and equitable national and global infrastructure. Expanding our global information infrastructure is critical, not only because of business imperatives, but also because it will help us meet basic societal needs. New technologies are connecting those who previously had no link to the global economy or to other societies. Remote regions that are not yet wired for telephone service, for example, can now be reached through satellite and wireless technologies. Families in India can sell their homemade goods to consumers in Iowa through the Net.

These technologies are also bringing medical, educational, and economic services within the reach of people who never before had access to such information. A new project in Malaysia, for example, is connecting seven hospitals so they can engage in joint consultation, diagnosis, and treatment. A small hospital in a rural village, which lacks specialized expertise can now contact medical specialists in Kuala Lumpur. New technologies are even helping farmers improve their crop yields through new precision farming techniques, combining the Internet, computers, and the Global Positioning System.

We have all heard about the explosive growth of the Net, and we have every reason to believe that its growth will continue. Today, according to NUA Surveys, there are roughly 150 million people using the Internet, 24 million of whom live in the Asia/Pacific region. Those figures are expected to grow exponentially; in fact, some are estimating that 320 million people will be online worldwide by 2002. On-line commercial transactions are also anticipated to reach somewhere between \$350 billion and \$1 trillion by 2002.

Industry and government must work together to ensure that such growth is equitable. The global infrastructure must reach rural people as well as urban, poor as well as wealthy, and those in developing as well as developed nations. Remember, right now in 1998, 65% of the world's households lack a telephone, and roughly half of the world's population has never made a phone call. In the Asia-Pacific region, those figures are even higher.

The gap between developing and developed countries is even greater when we look at those on-line. In the United States, about one out of four households has access to the Internet; on the African continent, only one out of 5,000 has on-line access. The same gaps are visible in the Asia Pacific region: in Australia, nearly one out of five people are connected, while some estimate that fewer than one in 10,000 are connected in India or the Philippines. Even if our most optimistic projections are realized and we have 400 million using the Net by year 2002, there will still be 6.5 billion people that are not on-line.

The Clinton-Gore Administration has made it a priority to maximize access to the Internet and other new technologies. This past month, the International Telecommunication Union (ITU) held its 15<sup>th</sup> Plenipotentiary Conference in Minneapolis at which 147 countries discussed the need for international cooperation to build out the global infrastructure. Vice President Gore challenged these countries to fulfill the promises of a new initiative, called the Digital Declaration of Interdependence (or DD1). This

declaration posed five challenges to use information technology to forge a stronger global community:

- First, we should improve access to technology so that every person is within walking distance of voice and data telecommunications services within the next decade.
- Second, we should develop real-time digital translation to enable persons of all languages to talk to each other.
- Third, we must create a Global Knowledge Network so that education, health care, agricultural resources, and public safety resources can be shared worldwide.
- Fourth, we must use communications technology to ensure the free-flow of ideas and support democracy and free speech.
- And fifth, we must expand economic opportunity to all families and communities around the world through information technologies.

### *Private Investment and Competition*

We believe that the promises of the DDI can be fulfilled if citizens have affordable access to new technologies. And that leads to the second important role for governments: providing a framework suitable for investment, growth, and competition. We believe that affordable access will be possible only through competition and a regulatory environment that supports users and consumers, not national champions. In the telecommunications sector, we have already seen the fruits of this approach. Fourteen years ago, the U.S. Department of Justice broke up the long-distance monopoly held by AT&T. Once the long-distance sector became competitive, prices for long-distance phone calls fell by more than 50 percent. Having just celebrated the "1000<sup>th</sup> day" of the 1996 Telecommunications Act, we are gradually seeing signs of competition and greater consumer choice in the local telephone and cable markets, as well.

Internet telephony is now also providing an even cheaper, third option for making telephone calls. Had the U.S. government decided to regulate IP telephony, as some telephone representatives have requested, companies might not have been willing to make the millions of dollars of investments to improve voice service over the Net. By permitting companies to experiment in an unfettered, unregulated environment, we are now reaping the fruits of their technological innovation.

This market-oriented approach is also essential to the expansion of the Internet and electronic commerce. In July 1997, President Clinton unveiled *A Framework for Global Electronic Commerce*, setting forth guidelines to promote the growth of the information infrastructure and electronic commerce worldwide. Again, we believe that private investment and innovation will flourish only in a market-driven, unregulated arena. To the extent government plays a role at all, its role should be focused on establishing a transparent and predictable legal environment to support global e-commerce.

Increasingly, there is a regional consensus on this approach. The OECD Conference in Ottawa was extremely helpful in generating multinational agreement on the need for telecommunications liberalization to further expand electronic commerce. Many Asian-Pacific countries are also working towards improving access. India recently ended the monopoly of its government-run ISP provider, with the expectation that competition among private entrants will lower prices and increase Internet users. India currently has only 500,000 Internet users; it anticipates that this number will quadruple as a result of competition. The Vietnamese government is also reducing access rates to make Internet access more affordable. And a number of other countries, including China, Singapore, and Korea, are building international high-tech complexes to attract foreign investors and promote domestic investment. Competition among these private entities should continue to improve services and lower prices for Asian/Pacific countries.

### *APEC's Initiatives*

I am particularly pleased by the progress made by the APEC member economies in this regard. At the June 1998 APEC Telecommunications Ministerial, the ministers reaffirmed their commitment to develop the Asia Pacific Information Infrastructure (APII) and to promote electronic commerce. Member nations hope to accomplish these objectives by identifying barriers to access and improving market access, among other steps.

Just this past weekend, the APEC Ministerial and Leaders' meetings endorsed an APEC Blueprint for Action on Electronic Commerce, which sets forth principles to promote e-commerce. Among other things, the Blueprint establishes a leading role for the private sector in developing e-commerce technology, applications, practices, and services. It also calls for industry self-regulation wherever possible, and seeks government assistance in developing predictable, transparent, and consistent regulations. This Blueprint is an important development and it is gratifying that the Ministers and Leaders have approved this document.

APEC's efforts will help promote the development of an infrastructure that is truly global - encompassing all nations and all peoples. We hope to continue to work with APEC to promote market-driven policies that will encourage the development of a global infrastructure through which electronic commerce, telemedicine, and distance learning can thrive.

I would also like to commend Secretary Suto for raising another critical issue - the Year 2000 (or Y2K) problem. The Year 2000 problem, otherwise known as the "millennium bug," refers to potential disruptions in our computer systems when the clock strikes January 1, 2000. Failure to address this issue could result in disruptions to our computer systems, which may have grave consequences for commerce, government services, emergency services, and national defense. No matter how extensive our infrastructure may be, it is worthless if it cannot function in the next century. Our nations must work together to address this problem.

If we protect our global infrastructure in the next year, there is no limit to the miracles it will help us achieve in the next century. As Vice President Gore stated at the ITU Plenipot: "Today, on the eve of a new century and a new millennium, we have an unprecedented opportunity to use these powerful new forces of technology to advance our oldest and most cherished values. . . . Today, we are more connected than ever before. Now, let us use our new tools and technology to build on that interdependence - to build a stronger global community, and to make real our common values."

Thank you.

TESTIMONY OF LARRY IRVING  
ASSISTANT SECRETARY FOR COMMUNICATIONS AND INFORMATION  
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION (NTIA)  
U.S. DEPARTMENT OF COMMERCE  
ON  
THE DIGITAL DIVIDE: BRIDGING THE TECHNOLOGICAL GAP  
BEFORE THE SUBCOMMITTEE ON EMPOWERMENT  
COMMITTEE ON SMALL BUSINESS  
U.S. HOUSE OF REPRESENTATIVES  
JULY 27, 1999

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Mr. Chairman and Members of the Subcommittee:

Thank you for this opportunity to testify today on the findings of *Falling Through the Net: Defining the Digital Divide* ("*Falling Through the Net*"), the study on the "digital divide" authored by the Department of Commerce's National Telecommunications and Information Administration (NTIA). Today, I would like to describe the key findings of this new study. I have also attached to my testimony copies of slides that I will be presenting in my oral testimony before the Subcommittee.

President Clinton and Secretary of Commerce William M. Daley released *Falling Through the Net* on July 8, 1999, during the Administration's New Markets tour through the United States. During this tour, the President and Secretary Daley discussed the fact that, even though information technology underlies much of our nation's economic growth, too many Americans are left out of the digital economy. As a result, the digital divide -- that is, the divide between the so-called information "haves" and "have nots" -- has become one of the critical economic and civil rights issue of this decade.

Access to new technologies, such as the computer and the Internet, will be key to the future economic success of American businesses, communities, and individuals. To begin with, the Internet is becoming an important tool for personal success and professional advancement. Increasingly, Americans are using it to find jobs, contact colleagues, locate public information, or take courses online. Familiarity with new technologies will also prepare more Americans for the high-tech workplace of the 21<sup>st</sup> century.

Equally important, access to new technologies has become critical to the success of small businesses. Electronic commerce is increasingly helping small companies and entrepreneurs in rural, remote, and traditionally underserved areas. It is enabling small businesses to connect with a global market, find cheaper products, and sell to buyers worldwide. In addition, new technologies, such as the Internet and high-speed telecommunications networks, are allowing many companies to expand to new regions, supporting the development of new businesses and creating new jobs in many economically depressed areas.

Because of the increasingly important role of new technologies, Secretary Daley has concluded that "[e]nsuring access to the fundamental tools of the digital economy is one of the most significant investments our nation can make." As we enter the 21<sup>st</sup> century, it will become even more essential to ensure that *all* Americans -- whether rich or poor, urban or rural, Hispanic or Black -- can reap the

benefits of these new technologies.

### ***Falling Through the Net: Defining the Problem***

*Falling Through the Net: Defining the Digital Divide* provides a key starting point in bridging the gap between the nation's information rich and poor. It serves as an important diagnostic tool to help determine which Americans have access to new technologies, and which do not. The report therefore provides an important factual basis for policymakers and the private sector to formulate ways to provide greater access for more Americans.

This is NTIA's third report documenting household access to telephones, computers, and the Internet. The first report, released in July 1995, was a landmark subscribership study of U.S. households. The study received much attention and provided important empirical findings for the Administration and other policymakers seeking to assure that no Americans are being left behind in the emerging Information Age. A successor study, released in July 1998, documented the rapid growth of PC penetration and online activity in US households, and underscored the widening "digital divide" between the so-called information "haves" and "have nots."

The new study, *Falling Through the Net: Defining the Digital Divide*, expands on the previous two reports. In addition to documenting connectivity among households, the study includes valuable new information on how people are gaining access to the Internet; how Americans choose to spend their time online; and why some people are not connected.

As with the previous two reports, NTIA utilized data from the U.S. Department of Commerce Census Bureau. NTIA contracted with the Census Bureau to add questions to its December 1998 "Current Population Survey" ("CPS") on household penetration, specifically to formulate a Computer and Internet Use Supplement survey. The Census Bureau obtained data on these surveys by interviewing 48,000 sample households across all fifty states. This survey asked additional questions regarding points of Internet access, methods of access, types of use, and reasons for discontinuing use, among other topics.

### **Key Findings from *Falling Through the Net***

Overall, the study presents much good news: more Americans are connected today than ever before. Computer ownership has nearly doubled in four years, and Internet access has increased more than 40 percent in the last year. More than one-quarter of American households have Internet access at home and approximately one-third of Americans are going online from some point. Additionally, those who were less likely to have telephones (chiefly, young and minority households in rural areas) are now more likely to have phones at home.

### **The Growing Disparities**

Nevertheless, there is also some very troubling news. To begin with, there is a persisting "digital divide" between the information rich (such as Whites, Asians/Pacific Islanders, those with higher incomes, those more educated, and dual-parent households) and the information poor (such as those who are younger, those with lower incomes and education levels, certain minorities, and those in rural areas or central cities).

The new data reveal significant disparities, including the following:

- Households with incomes of \$75,000 and higher are more than *twenty times* more likely to have access to the Internet than those at the lowest income levels, and more than *nine times* as likely to have a computer at home.
- College graduates are nearly *sixteen times* more likely to have home Internet access than those with an elementary school education level, and more than eight times as likely to have a computer. In rural areas, college-educated households are more than *twenty-six times* more likely to have Internet access.

- Black and Hispanic households are approximately *one-third* as likely to have home Internet access as households of Asian/Pacific Islander descent, and roughly *two-fifths* as likely as White households. Significantly, Whites are more likely to have access to the Internet from home than Blacks or Hispanics have from *any* location.
- Those in rural areas, across all income levels, are less likely to have Internet access than households of similar incomes in urban areas and central cities. A low-income household in a rural area has a less than *one in thirty* chance of having Internet access at home. A rural Black household has less than a *one in thirteen* chance of having home Internet access.
- Northeast central cities and the rural South are lagging behind all other areas in household access to new technologies. For computer ownership, Northeast central cities (30.4%) and the rural South (34.6%) are well behind the national average (42.1%). The same is true for home Internet access: 18.7% for Northeast central cities and 19.0% for the rural South, compared to the national average of 26.2%.

Perhaps even more troubling, the digital divide has *widened* in the last year as the information "haves" outpace the "have nots" in gaining access to electronic resources. The following gaps with regard to home Internet access are representative:

- The gaps between White and Hispanic households, and between White and Black households, are now more than six percentage points larger than they were in 1997.
- The digital divides based on education and income level have also increased in the last year alone. Between 1997 and 1998, the divide between those at the highest and lowest education levels increased 25 percent, and the divide between those at the highest and lowest income levels grew 29 percent.

Nevertheless, the news is not all bleak. For Americans with incomes of \$75,000 and higher, the divide between Whites and Blacks has actually narrowed considerably in the last year. This finding suggests that the most affluent American families, irrespective of race, are connecting to the Net. If prices of computers and the Internet decline further, the divide between the information "haves" and "have nots" may continue to narrow.

### **The Importance of Public Access Points**

Until every household can afford access to information resources, it will be important to provide access to computers and the Internet outside the home through public access points. The data in *Falling Through the Net* demonstrate that schools, libraries, and community centers are particularly well used by groups that lack access to new technologies at home and at work. The following examples are illustrative:

- Blacks who use the Internet outside the home are nearly twice as likely to use a public library or a community center for access than Whites.
- Americans earning less than \$20,000 are more than twice as likely to get Internet access through a public library or a community center.
- People without college degrees are also significantly (1.4 times) more likely to use these access points than those with college degrees.

Promoting public access points and training programs are, therefore, essential steps to connecting American communities. The data also demonstrate that people who use libraries and other access points are also proportionately more likely than other groups to use the Internet to take courses and find jobs. An investment in such programs is therefore an investment in the economic, professional, and personal growth of hundreds of thousands, if not millions, of Americans.

Solving the digital divide will involve both government and private sector efforts. Government programs, such as NTIA's Telecommunications and Information Infrastructure Assistance Program (TIIAP), are already expanding access to technological resources to underserved areas. TIIAP provides matching grants to non-profits and public entities serving underserved populations through new technologies. The program has helped support such programs as the Mountain Association for Community Economic Development, which is providing technological resources to promote entrepreneurship in rural communities in Kentucky.

The assistance of non-profit organizations and private industries is also necessary a necessary component in expanding access to new technologies. Industry has already come forward with significant assistance. Companies are supporting the creation of community technology centers, helping connect schools through "NetDays," and donating computers and software to schools and neighborhood centers. The private sector's contribution is essential because these companies know what kinds of skills Americans will need in order to find jobs in the future.

Additionally, community-based organizations can help provide access to computers and the Internet where communities need it most. Each community knows best how to reach and connect its residents, whether it is through traditional community centers, churches, housing projects, senior centers, museums, fire and police stations, Boys and Girls Clubs, or other centers.

These efforts - on the part of industry, community organizations, and government -- are all necessary to providing additional access points for those without Internet access at home. They will provide Americans with the skills they need to compete in the high-tech workplace and to find new business opportunities. Only with through these continued, combined efforts can we reach our goal of enabling all Americans to participate in the digital economy.