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ABSTRACT

This document summarizes the vision of the United States Advisory Council on the National Information Infrastructure for widespread connectivity to the information superhighway. It identifies key areas of American life that will be affected by the digital age, including electronic commerce, increased motivation and capacity for lifelong learning, better emergency management and public safety, and wider and easier dissemination of health and government information. The vision also seeks to ensure universal access and awareness of intellectual property concerns. Success in widespread connectivity and universal access will come as control continues to lie in the hands of the private sector and as planning catalysts emerge at the individual, community, and government levels. Appendices include a history of the advisory council, biographies of its members, details on council meetings and research, acknowledgments, and letters to the administration. (BEW)

United States Advisory Council on the National Information Infrastructure

A NATION OF OPPORTUNITY

Realizing the Promise of the Information Superhighway

National Telecommunications and Information Administration
United States Department of Commerce

Washington, D.C.

Second Printing

A Nation of Opportunity

Realizing the Promise of the Information Superhighway

January 1996

United States Advisory Council on the National Information Infrastructure

Through Executive Order No. 12864, President Clinton established the United States Advisory Council on the National Information Infrastructure (NII) to advise the Secretary of Commerce, Ronald H. Brown, on matters related to the development of the NII. Secretary Brown appointed 37 Council members, representing the many different stakeholders in the NII, including industry, labor, academia, public interest groups, and state and local governments.

The National Telecommunications and Information Administration (NTIA) of the Department of Commerce provided support for the Advisory Council and is providing a second printing of the two primary Council publications:

KickStart Initiative: Connecting America's Communities to the Information Superhighway;

and

A Nation of Opportunity: Realizing the Promise of the Information Superhighway.

The Benton Foundation will continue the Council's work to bring the Information Superhighway to schools, libraries, and community centers. As heir to the Council's legacy, Benton will distribute and build on the NIIAC's documents, *KickStart Initiative* and *A Nation of Opportunity*. In addition to promoting these resources, Benton will create new information services and forums to help schools, libraries, and community centers share their successes and challenges.

The Benton Foundation, founded in 1981, works with nonprofit organizations, government agencies, and industry to promote the effective use of communications technologies to serve and connect America's communities. Benton has equipped a constituency to advocate for public interest principles in the digital age, advancing the public policy debate on equity and access through research, policy analysis, and print, video, and online publishing. In addition, Benton serves as a convener for nonprofits, government agencies, and the communications industry to discuss how to protect the public interest in the digital age.

To access *KickStart Initiative* and *A Nation of Opportunity* on the Internet, use Benton's World Wide Web site: **http://www.benton.org**. To receive descriptions of *KickStart Initiative, A Nation of Opportunity,* and *The National Information Infrastructure and You!* video, information on other Benton resources, or instructions on downloading the documents via gopher or ftp, email **kickstart@benton.org** or call Benton's fax-on-demand service at 1-800-622-9013.

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UNITED STATES ADVISORY COUNCIL ON THE NATIONAL INFORMATION INFRASTRUCTURE

January 30, 1996

The Honorable William J. Clinton
President of the United States
The White House
Washington, D.C.

The Honorable Al Gore
Vice President of the United States
United States Senate
Washington, D.C.

The Honorable Ronald H. Brown
Secretary of Commerce
U.S. Department of Commerce
Washington, D.C.

Dear Mr. President, Mr. Vice President, and Mr. Secretary:

We have the pleasure of informing you that the United States Advisory Council on the National Information Infrastructure has completed its work and reports herewith to you and the American people.

Formation of this Advisory Council was timely and well directed, for the United States stands today in the midst of a technological revolution that is changing how the economy works and how society functions. Just how the United States and its people will respond to this revolution is a matter of great importance to everyone in this country. The terrain over which the Information Superhighway will be built is not yet mapped, and the President tasked the Advisory Council to put down benchmarks that might guide the builders.

The Council members compliment you, Mr. President, on your leadership in identifying the Information Superhighway as a matter of prime importance to the American people. Mr. Vice President, you have successfully placed the Information Age high on the agenda of the American people, helped mobilized the resources of the Federal Government and the Nation to implement the Superhighway, and wisely counseled that education should be a primary focus of implementation. Mr. Secretary, you have rightly seen the economic benefits that will flow from the Superhighway, and you have worked tirelessly to ensure that those benefits are shared by all people in this country—regardless of geographic location or financial advantage. The Council strongly endorses these Administration initiatives.

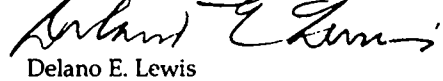
Service on this Council constituted a challenge for every member, but it also brought numerous rewards. Council members represent a wide spectrum of interests, many of them closely allied with the Information Age. We met, talked with individuals of various backgrounds all over the country, gathered information, sometimes disagreed, and finally reasoned together over the large issues in our mandate from you. In the final outcome, we produced what we believe is a body of work that complements your vision—the next steps in the Nation's pathway to full implementation of the Information Superhighway.

We believe that our work is important and useful because the realization of the full potential of the Information Superhighway can be reached only if the toughest policy issues are addressed early and thoughtfully. We commend you for starting that process, and we hope that our policy recommendations in this report are an important contribution to that effort. In addition, our KickStart Initiative points the way for communities to achieve full access for everybody to the Information Superhighway.

We thank you for the opportunity to serve the Nation in developing the next steps in building the Information Superhighway. All people in this country, and ultimately throughout the world, can anticipate extraordinary benefits from the new Information Revolution, which promises to broaden education, generate economic benefits, and improve the quality of life for all mankind.

On behalf of the Council, we have the honor to transmit to you the final report of the United States Advisory Council on the National Information Infrastructure, pursuant to Section 2(b) of Executive Order No. 12864 of September 15, 1993.

Respectfully submitted,



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United States Advisory Council on the National Information Infrastructure

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Executive Summary

I. THE COUNCIL'S VISION

The United States stands today in the midst of one of the great revolutions in recorded history: the Information Age. The Information Superhighway provides the infrastructure that enables enormous benefits in education, economic well-being, and quality of life.

The Council urges that the Nation adopt the following five fundamental goals.

First, let us find ways to make information technology work for us, the people of this country, by ensuring that these wondrous new resources advance American constitutional precepts, our diverse cultural values, and our sense of equity.

Second, let us ensure, too, that getting America online results in stronger communities, and a stronger sense of national community.

Third, let us extend to every person in every community the opportunity to participate in building the Information Superhighway. The Information Superhighway must be a tool that is available to all individuals—people of all ages, those from a wide range of economic, social, and cultural backgrounds, and those with a wide range of functional abilities and limitations—not just a select few. It must be affordable, easy to use, and accessible from even the most disadvantaged or remote neighborhood.

Fourth, let us ensure that we Americans take responsiblity for the building of the Superhighway—private sector, government at all levels, and individuals.

And, fifth, let us maintain our world leadership in developing the services, products, and an open and competitive market that lead to deployment of the Information Superhighway. Research and development will be an essential component of its sustained evolution.

In charting a course to meet these goals for the Information Superhighway, the Advisory Council identified what it believes are four critical issues that must be addressed and must be addressed early:

- What are the key areas of American life and work that will be impacted?
- What is the role of universal access in the digital age?
- What are the rules of the road regarding intellectual property, privacy, and security?
- Who are the key stakeholders, and what are their roles?

The following recommendations reflect the Council's major proposals for addressing those issues.

II. RECOMMENDATIONS

A. Impact on Key Areas of American Life and Work

1. **Electronic Commerce.** The Federal Government, in conjunction with others, should take steps to identify and resolve, wherever possible, legal, regulatory, and policy issues that restrict the development of electronic commerce on the Information Superhighway.

2. **Education and Lifelong Learning.** Create targeted Federal, State, and local initiatives, in full cooperation with the private sector, to accelerate access to the Information Superhighway and to facilitate the effective integration of Information Superhighway technologies and resources into all lifelong learning environments. Such initiatives should encourage the development and wide availability of quality Information Superhighway learning resources and stimulate the development of a viable market for Information Superhighway-related educational products and services.

3. **Emergency Management and Public Safety.** The Federal Government should convene a broad-based committee composed of those entities involved in standard setting, those involved with the development of new technology, and relevant State, local, and Tribal agencies to meet the needs of the emergency management, public safety, and criminal justice communities. The Federal Government also should involve local governments in regional planning and review to ensure the best possible coordination of resources within a region and involve community-based organizations for more effective gathering and dissemination of public information.

4. **Health.** The Federal Government, in conjunction with Tribal, State, regional, and local governments, should take steps to resolve, wherever possible, conflicting legal or regulatory barriers to the delivery and reimbursement of health information and health care across State borders. Such efforts should be accompanied by government funding of evaluation of telemedicine applications in the areas of cost, access, and quality.

   Since protection of health information is a primary concern to everyone, the Council's recommendations on privacy and security should apply to the area of health information and should ensure both that information can be protected, and that it is available in properly authorized treatment situations.

5. **Government Information and Services.** All levels of government should use information infrastructure technologies to provide basic pointers* to government information and services, thus simplifying public access to

* The term "pointers" in this context refers to information sources that would enable individuals and organizations in both the public and private sectors to identify and access government information and services. The pointers are not the sought-after information and services themselves. Rather, they provide direct pathways to the desired government information and services. Current examples include the *Federal Register*, the Government Information Locator Services, and legislative calendars.

relevant government information; improving delivery of government services and the management and use of government information; and enabling the private sector to develop and provide enhanced and expanded value-added information products and services

B. Ensuring Access for All

1. **Information Superhighway deployment.** Commercial and competitive forces should drive the development of the Information Superhighway. Regulatory disincentives to Information Superhighway development should be removed. All subsidies should be made explicit and applied in a competitively neutral manner.
2. **Universal access and service.** The definition of universal service should evolve to accommodate converging technologies. All individuals should have affordable, ubiquitous, convenient, and functional access to Information Superhighway services. All individuals should be able to be both consumers and producers of information. Design of its components should accommodate the needs of disabled individuals.
3. **Government's role.** Government should act when commercial and competitive forces are failing to achieve the goals of universal access and universal service. Government should lead by example in the use of the Information Superhighway for offering and using information and services.

C. Rules of the Road

1. **Intellectual Property**
   - All levels of government should promote ongoing public education about the meaning and importance of intellectual property, including copyright and the fair use doctrine.
   - The Federal Government should strive to have other countries implement consistent, effective, and appropriate policies and protections for intellectual property in the digital environment.
2. **Privacy**
   - The Federal Government should follow through on privacy policy issues with the initial task of reviewing existing laws and practices to implement the Council's privacy principles and the recommendations of the IITF Privacy Working Group.
3. **Security**
   - The Federal Government should encourage private sector awareness of security issues, initiate a public-private security consultation process, and foster mechanisms to promote private accountability for proper use of security measures.
   - The Federal Government should not inhibit the development and deployment of encryption by the private sector.

4. **Free Speech**

   - The government should not be in the business of regulating content on the Information Superhighway. It should defer to the use of privately provided filtering, reviewing, and rating mechanisms and parental supervision as the best means of preventing access by minors to inappropriate materials.

D. Key Roles

1. **The Private Sector Must Be the Builder.** The private sector—defined broadly to include an array of nongovernmental entities—must have the primary responsibility for the continued design, deployment, and operation of the Information Superhighway.

2. **Communities Are Key to Access and Learning.** As demonstrated in the Council's companion volume, *KickStart Initiative: Connecting America's Communities to the Information Superhighway*, it is the access at local institutions, especially schools, libraries, and community centers, that will continue to facilitate the Superhighway at the neighborhood level and open new opportunities to young students, working people, and older persons alike.

3. **Government Has a Critical Role as Catalyst.** Although not the primary builders of the Information Superhighway, all levels of government have a significant role to play in ensuring its effective development and deployment.

4. **Individuals Must Take Charge.** To realize the benefits of the Information Superhighway, individuals must be its champions at the local level, learn about and seize its opportunities, and respect the rights of others.

part 1
America on the Information Superhighway

The United States stands today in the midst of one of the great revolutions in recorded history: the Information Age. This revolution is changing fundamentally the ways in which people work, learn, communicate, care for their own health, and create their home lives.

The revolution is already bringing about fundamental structural changes in the pivotal institutions of contemporary life. The revolution is affecting how business manufactures and distributes goods and services, how government serves the public, how health care institutions care for their patients, how schools educate young people and adults, and ultimately how we participate in our democratic society.

But is this amazing new development altogether a good thing? Certainly, the Council believes that it has the potential to improve substantially the quality of life.

BENEFITS OF THE INFORMATION SUPERHIGHWAY

The Information Superhighway is more than the Internet. It is a series of components, including the collection of public and private high-speed, interactive, narrow, and broadband networks that exist today and will emerge tomorrow.

- It is the satellite, terrestrial, and wireless technologies that deliver content to homes, businesses, and other public and private institutions.
- It is the information and content that flow over the infrastructure, whether in the form of databases, the written word, a film, a piece of music, a sound recording, a picture, or computer software.
- It is the computers, televisions, telephones, radios, and other products that people will employ to access the infrastructure.
- It is the people who will provide, manage, and generate new information, and those who will help others to do the same.
- And it is the individual Americans who will use and benefit from the Information Superhighway.

The Information Superhighway is a term that encompasses all these components and captures the vision of a nationwide, invisible, seamless, dynamic web of transmission mechanisms, information, appliances, content, and people.

The U.S. economy has long been among the most competitive in the world. As information increasingly becomes the currency of economic strength, the Information Superhighway promises enormous economic benefits, in terms of productivity and our ability to compete in the new global marketplace. In 1995,

and for the second year running, the United States was ranked the world's most competitive economy—due in no small part to our unique ability to use computers and telecommunications to make our information work harder and travel faster.

At home, this translates into unprecedented opportunities to advance our social progress and improve the living standards and quality of life for all Americans. These benefits, however, will depend more than ever before on educational achievement. The Information Superhighway is already helping prepare Americans for this future by both improving the quality of our educational system and making educational opportunities more accessible to people of all ages and in all geographic locations.

Education and Lifelong Learning

In our Nation's classrooms, the Information Superhighway is being used to substantially improve the quality of general and technical education that our children receive. Real-time interactive video, audio, and data networks are now supplementing classroom resources and allowing students to draw on the knowledge of myriad, geographically dispersed educators and experts.

Further, students are increasingly able to interact electronically with their peers at schools in other regions of the country—exchanging knowledge, values, and cultures. Demonstration projects that currently employ this technology in some of our Nation's most economically disadvantaged classrooms reveal dramatic improvements in learning.

Using the Information Superhighway of the 21st century, all our schoolchildren—whatever their geographic location or socioeconomic background—also will have electronic access to the educational resources of our most prestigious libraries. They will be digital libraries, featuring the next generation of online multimedia databases that will allow a bulky Sunday newspaper to be downloaded in just seconds.

Similar access to education is transforming the workplace, where the desktop PC enables workers to draw on such diverse resources as online multimedia networks and live, interactive video conferences. From earning a master's degree or doctorate to receiving new product training, employees will increasingly come to rely on the Information Superhighway to further their career goals.

Economic Growth

Beyond these essentials—enhanced economic, educational, and employment benefits—the Information Superhighway already offers dozens of new products and services that will greatly improve the overall quality and convenience of our everyday lives.

Already through today's existing telecommunication infrastructure, we can catch a glimpse of the many benefits that await us. Automated teller machines (ATMs)

give us instant access to cash—anytime and almost anywhere. Cable TV and today's newest, small-dish satellite TV antennas put a virtual entertainment cornucopia in our living rooms. Cellular phones keep us in touch—whenever, wherever we want to be. Electronic networks, including the World Wide Web, provide access to a broad variety of information and resources.

Through the Information Superhighway, the nature of work process is changing dramatically, becoming more inclusive and more collaborative. Workers will be able to draw upon the diverse ideas and expertise of geographically and culturally disparate participants. If people are tied to the home by family commitments, personal preference, or other reasons, "telecommuting" will give them full access to the workplace.

Small businesses are actively contributing to development of the Information Superhighway. They are in turn likely to benefit significantly from the electronic expansion of market and other opportunities.

In conclusion, the Information Superhighway we envision holds vast potential to offer this Nation and its people unlimited opportunities for economic growth, social progress, and cultural understanding. Moreover, by facilitating universal participation in every aspect of American society, the Information Superhighway will enable us to maximize the value of all our human resources, revitalize our Nation's social and economic fabric, and reaffirm our country's sense of community.

THE COUNCIL'S VISION

As we Americans continue the challenging and exciting task of designing and implementing the Information Superhighway for the next millennium, the Council urges that the Nation adopt the following five fundamental goals.

First, let us find ways to make information technology work for us, the people of this country, by ensuring that these wondrous new resources advance American constitutional precepts, our diverse cultural values, and our sense of equity.

Second, let us ensure, too, that getting America online results in stronger communities, and a stronger sense of national community.

Third, let us extend to every person in every community the opportunity to participate in building the Information Superhighway. The Information Superhighway must be a tool that is available to all Americans—people of all ages, those from a wide range of economic, social, and cultural backgrounds, and those with a wide range of functional abilities and limitations—not just a select few. It must be affordable, easy to use, and accessible from even the most disadvantaged neighborhood or remote dwelling.

Fourth, let us ensure that we Americans take responsibility for the building of the Superhighway—private sector, government at all levels, and individuals.

And, **fifth,** let us maintain our world leadership in developing the services, products, and an open and competitive market that lead to deployment of the Information Superhighway. Research and development will be an essential component of its sustained evolution.

Importantly, the enhanced Information Superhighway we construct also will serve as our on-ramp to the Global Information Superhighway—the fast-emerging international marketplace of commerce, information, and ideas. By invoking the energies and ingenuity of the private sector, this country can greatly improve the levels of education, standard of living, and economic future of its people—and become a supplier to the world as other countries mount their own efforts to join the Global Information Superhighway.

KEY POLICY ISSUES

As we strive to attain these goals as a Nation, we must address key policy issues. What are the appropriate roles for the private sector and government? How can individual community leaders work to ensure maximum benefits for their communities?

Other questions involve the social implications of the revolution. How is the revolution affecting fundamental constitutional rights and freedoms, including the rights of free speech and privacy? How can those rights balance with the need to protect intellectual property and prevent online criminal activity? To what extent is the revolution improving the lives of people without financial resources to gain access to the Superhighway early on? How successfully is the revolution preserving the sense of community in this Nation?

In sum, in attempting to answer these questions, the Advisory Council identified what it believes are four critical issues that must be addressed and must be addressed early:

- What are the key areas of American life and work that will be impacted?
- What is the role of universal access in the digital age?
- What are the rules of the road regarding intellectual property, privacy, and security?
- Who are the key stakeholders, and what are their roles?

This report contains the Council's proposals for addressing those issues.

part 2
Impact on Key Areas of American Life and Work

Questions of enormous importance surround the deployment and implementation of the Information Superhighway, questions that the Council has sought to address and for which it provides a framework for answers. These questions include:

- Who will use it and for what purposes?
- How can policy at all levels of government ensure that important social and economic goals are achieved by the use of the Information Superhighway?

In Part 2, the Council reports on its work in the key areas of uses to which the Superhighway will be put. In addressing these issues, the Council identified five areas where it believes the Information Superhighway will have the most dramatic effect in terms of changing the way Americans live and work.

- Electronic Commerce;
- Education and Lifelong Learning;
- Emergency Management and Public Safety;
- Health; and
- Government Information and Services.

These are by no means the only areas that will be touched and changed by the Information Superhighway. The Council believes that information technologies are tools that can transform and enhance almost every facet of American life.

In Part 2, brief descriptions of each area are followed by the key Council messages relevant to each area, and then by Principles and Action Recommendations that the Council developed to guide policymakers.

ELECTRONIC COMMERCE

Domestic and international commerce is increasingly dependent on technology. The capabilities of the Information Superhighway, and ultimately the Global Information Superhighway, will dramatically enhance the frequency, facility, and accuracy of electronic commerce—transactions between businesses, individuals, and government, using information infrastructure capabilities.

Widely using information infrastructure capabilities for electronic commerce will enhance the lives of individuals, create new jobs, make available more and different products and services, lower costs for many products and services, and add convenience to everyday living.

Similarly, widespread use of electronic commerce should positively impact the health of American businesses and the overall economy by creating new markets, expanding existing markets, and increasing productivity and efficiency.

Electronic commerce provides benefits in a number of areas:

- Easier entry into new markets, especially those that are geographically remote;
- Lower costs for buyers because of increased competition in an electronically open marketplace;
- Lower costs for suppliers through electronic bidding and contracting procedures;
- Shorter time to complete business transactions;
- Faster time to market as business processes are linked in ways that eliminate time delays between engineering and market-ready products; and
- Greater choice and lower prices for consumers.

Electronic commerce is expected to enable U.S. companies to reengineer their business processes, then use the Information Superhighway to conduct their business activities more efficiently, and inexpensively, and in a more geographically diverse area.

Therefore, businesses, individuals, and all levels of government should work toward the widespread use of electronic commerce over the Information Superhighway based on the principles presented below.

Principles of Electronic Commerce

1. As the Information Superhighway is developed and deployed, workplaces will be transformed. Worker training, education, and adaptation to mechanisms, both for existing workers and for those who will be entering the workforce of the future, are necessary to facilitate the transition to the new environment and to enable the maximum participation of all users.
2. A vigorous competitive environment, led by the private sector, will accelerate the deployment of the information infrastructure and the development of a wide range of products and services for electronic commerce.
3. Protection of intellectual property, transaction security, integrity of data, consumer protection, and privacy are essential to widespread use of electronic commerce applications over the information infrastructure. Such protection should be balanced with the rights and privileges of users and providers, consistent with current law.
4. The primary role of all levels of government in the utilization of electronic commerce capabilities is to ensure consumer protection, vigorous competition, intellectual property protection, and harmonization of laws and regulations. All levels of government should work with the private sector and other stakeholders to ensure the development and use of security and privacy standards.

5. All levels of government should stimulate the development and use of the information infrastructure through electronic procurement of goods and services, offering government services to the public electronically, and through consumer awareness campaigns to promote widespread use of the information infrastructure.
6. The private sector should take the lead in the research and development of electronic commerce applications. Government funding for electronic commerce should be primarily through support of precompetitive research and government procurement processes.

Action Recommendations for Electronic Commerce

1. The private sector, relying on consumer action in the marketplace, should continue to develop technical standards and innovative mechanisms in electronic commerce for the Global Information Infrastructure.
2. Retraining the U.S. workforce for the 21st century economy should start immediately. While the private sector should take the lead, governments should provide incentives in this critical area.
3. The Federal Government, in conjunction with others, should take steps to identify and resolve, wherever possible, legal, regulatory, and policy issues that restrict the development of electronic commerce on the Information Superhighway in areas such as:
   - Encryption policy; and
   - Inconsistencies in State and local regulations impacting electronic commerce.
4. Governments should encourage the development and deployment of the Information Superhighway by procuring goods and services electronically, based on commercially available technology, wherever possible.

EDUCATION AND LIFELONG LEARNING

By providing access to geographically distributed information sources and to remote sources of instruction, the Information Superhighway can enhance the quality of our educational institutions and libraries. It may also be that the greatest promise of technology lies in the power it has to enable more fundamental improvement in formal educational systems and in empowering new models of lifelong learning.

Workplaces will, like schools, libraries, and community centers, become locales of lifelong learning, helping workers to continue to be ready for high-skill, high-paying jobs. The Information Superhighway will provide the vehicle for a lifelong learning society that will contain the most skilled, most adaptable, and most financially rewarded workforce in the world.

Lifelong learning will be essential, and even entertaining, in the Information Age. Lifelong learning means several things:

- The opportunity to learn at home or work from the vast array of source material available on the Information Superhighway, ranging from books and music provided by the neighborhood library to priceless collections in the great museums of the world; and
- The necessity to maintain proficiency in using new computers and software as the technology advances, in order to maintain job skills and remain hirable.

The Council's principles provide guidance on how the Information Superhighway can best bring substantial benefits in the area of education and lifelong learning.

Principles of Education and Lifelong Learning

1. By providing people of all ages with opportunities for lifelong learning and workplace skills development, the Information Superhighway should enhance each individual's ability to create and share knowledge and to participate in electronic communities of learning.
2. By the year 2000, all communities and all people should have convenient access to information and learning resources available through the Information Superhighway in their schools, colleges, universities, libraries, and other community-oriented institutions.
3. Education, training, and lifelong learning resources, important parts of the Information Superhighway, should be of world-class quality and the diversity of these resources should be broad enough to meet the full spectrum of society's interests.
4. The capabilities of the Information Superhighway should be available as a tool to enhance education, training, and lifelong learning. This will facilitate the reconstruction of our educational institutions and the redefinition of the roles of everyone involved with them—educators, administrators, librarians, parents, students, employers, and other members of society.
5. Individuals and their communities should be empowered to help shape the evolution of the Information Superhighway and to decide how information resources available through the Information Superhighway can best meet their learning needs.
6. A knowledge-based global economy will stimulate the creation of jobs that demand new information-intensive workplace skills. Learning resources available on the Information Superhighway should equip individuals of all ages with these skills and enable them to thrive and contribute in this new information society.

Action Recommendations for Education and Lifelong Learning

Create targeted Federal, State, and local initiatives, in full cooperation with the private sector, to accelerate access to the Information Superhighway and to facilitate the effective integration of Information Superhighway technologies and resources into all lifelong learning environments. Such initiatives should encourage the development and wide availability of quality Information Super-

highway learning resources and stimulate the development of a viable market for Information Superhighway-related educational products and services. These initiatives should:

1. Stipulate that funds distributed via educational grant programs support projects that incorporate and/or facilitate access to and use of the Information Superhighway in K-12 schools, libraries, and community centers and emphasize exploring new types of teaching/learning and evaluation models that information infrastructures enable or enhance.
2. Create incentives that encourage and enable the private sector to 1) play a larger role in making Information Superhighway resources available in schools, libraries, and community centers; 2) generate funding for research and development of Information Superhighway/education-related products and services; and 3) use Information Superhighway technologies to enhance their own workforce training and development programs.
3. Change the way teachers/librarians are educated so that the use of Information Superhighway technologies and resources is fully integrated into the initial training and certification process and the ongoing professional development of current teachers/librarians. Accreditation standards should require that teacher education programs integrate the use of Information Superhighway technologies throughout the course of study. All educators should be able not only to guide students in the use of the Information Superhighway, but, more importantly, to effectively integrate Information Superhighway technologies into the design and implementation of their curriculum plans. Require that a portion of any government funds granted to support Information Superhighway educational projects are used to implement substantive, ongoing professional development programs for all educators/librarians who will be expected to utilize Information Superhighway technologies and resources.
4. Actively encourage business, governments, communities, and parents to create partnerships that will encourage/assist schools, libraries, and community centers to refocus their mission on becoming centers for lifelong learning and to use the Information Superhighway to facilitate their evolution. Such partnerships should include an Information Superhighway/Education "clearinghouse" to ensure that relevant information about how to access and use Information Superhighway technologies is broadly disseminated among all lifelong learning constituencies.
5. The Department of Education, and other Federal agencies as appropriate, through direct support as well as pooling and sharing of information, should continue to facilitate and stimulate the use of Information Superhighway technologies to advance instructional goals.
6. Federal departments and agencies, such as NASA, NIST, NTIA, the National Science Foundation, and the Department of Energy, should continue their creative efforts to apply their resources and technologies for educational purposes.

EMERGENCY MANAGEMENT AND PUBLIC SAFETY

The Information Superhighway will create new and expanded opportunities for communication among people, law enforcement agencies, and the criminal justice system. This, in turn, will enhance timely, efficient, and cost-effective delivery of services from law enforcement agencies and the criminal justice systems in communities large and small—helping to make our communities safer and making more effective detection, apprehension, and prosecution, where deterrence fails. Information Superhighway applications for public safety also will increase the opportunity for feedback and the exchange of critical information during all conditions including disasters and emergencies. The "emergency lane of the information highway," as some have called it, will dramatically enable information to get through when needed. Also, information gathered from remote locations may be quickly responded to and resources effectively dispatched, speeding the allocation of aid, mutual aid, and, ultimately, recovery. Moreover, use of technology may enable new and cost-effective alternatives for adjudication, prosecution, and corrections. Ultimately, these new and expanded opportunities can effectively occur only in concert with a keen sensitivity and respect for civil liberties including individual privacy rights.

The following principles can best bring substantial benefits in the areas of emergency management, public safety, and criminal justice.

Principles for Emergency Management and Public Safety

1. Privacy and security are critical to the integrity of the emergency management, public safety, and criminal justice applications of the Information Superhighway. It is critical that privacy and security be respected and accomplished in a manner that does not compromise the civil liberties and constitutional rights of the people or the integrity of the network. Increased communications and information sharing among public safety agencies and criminal justice systems should occur without compromising personal rights. Lawful and proper use of encryption, validation, and verification methods to ensure accuracy, and procedures to ensure lawful purpose must be integral to emergency management, public safety, and criminal justice applications. Aggressive remedial measures, and if necessary, punitive measures, should be taken where abuses occur.
2. Emergency management, public safety, and criminal justice agencies should have sufficient capacity and resources to collect and exchange information that promotes the protection and well-being of the people and enables the deterrence of crime and appropriate detection, apprehension, and prosecution where deterrence may fail. National policies instituted for the allocation of resources of the Information Superhighway should ensure that small, rural, and local governments are able to obtain and provide communications capabilities for emergency management, public safety, and criminal justice purposes.
3. Consistent with the Principles for Universal Access and Universal Service, connectivity to emergency management and essential public safety information over the information infrastructure should be ensured. Furthermore, continued and expanded efforts should be made to enable the news media

to deliver emergency management and public safety information to the public.

4. Emergency management, public safety, and criminal justice information should be developed cooperatively by Federal, State, and local public safety agencies and criminal justice systems. To that end, Federal, State, and local entities should communicate with the private sector to ensure that technological solutions meet the needs of the emergency management, law enforcement, and criminal justice community for information collection, dissemination, and interoperability. Standards to ensure compatibility and interoperability should be based on the goals of open architecture, consistent with applicable privacy and security laws, and avoidance of proprietary solutions that impede the exchange of information among members of the emergency management, law enforcement, and criminal justice community.
5. Local, regional, and State government should take the lead in regional frequency coordination planning and policy development, particularly to ensure interoperability, increased effectiveness, and the promotion of mutual aid; such plans may be subject to Federal approval prior to implementation.
6. The Information Superhighway represents an opportunity for vital information to be exchanged under diverse circumstances. Community-based, in-home, and voluntary support services, done in cooperation with recognized authorities, that may help save lives and property and promote prompt and effective recovery, particularly during emergencies or disasters, should be supported.

Action Recommendations for Emergency Management and Public Safety

1. The Federal Government should convene a broad-based committee composed of those entities involved in standard setting, those involved with the development of new technology, and relevant State and local agencies to confer on standard setting and technological developments that will meet the needs of the emergency management, public safety, and criminal justice communities.
2. The Federal Government should work with those involved in the standard-setting community to define which standards can and should be adapted to achieve common protocol and standards for interoperability for emergency management, public safety, and criminal justice users.
3. The Federal Government should create regional boards composed of public and private sector representatives, that may review and provide recommendations on frequency needs within a region, similar to the model of the FBI's Criminal Justice Information System (CJIS) Advisory Board and regional working groups.
4. The Federal Government should take individual requests for frequency use and spectrum allocation and refer them to the appropriate regional board for comment and recommendation, to ensure the best possible coordination of resources within a region.
5. The Federal Government, in collaboration with State and local governments, should promote the establishment of a standardized emergency manage-

ment system within each region and in particular, encourage the development of common terminology, common interfaces, common logistics, and standardized information flow, to ensure coordination and effective deployment of resources and mutual aid, in the case of a disaster or emergency.

6. The Federal Government should continue to promote the creation of active local emergency committees under the emergency alert system, that include participants from local and State governments involved in the operation of public safety and emergency management, as well as other members of the new media (such as cable, telephone, and the Internet).
7. The Federal Government should encourage the development of local and State emergency models that expand the involvement of duly recognized community-based organizations for more effective public information gathering and dissemination.
8. State and local governments should identify their community needs for information and identify community organizations that may be duly authorized to collect and disseminate information in cooperation with emergency management and public safety agencies.
9. The Federal Government should encourage the inclusion of effective methods to collect and disseminate public information and involve communities to assist in these efforts, in command and emergency management training.

HEALTH

As American society prepares to enter the 21st century, availability and quality of health information and services pose significant challenges to consumers, industry, all levels of government, and to the providers of health services themselves. Health costs will reach $1 trillion early in the next decade, yet quality and access to care remain highly variable across the country. Market pressures are forcing a top-to-bottom reexamination of health services. Improved access to information at all levels is a fundamental requirement to improved decisionmaking about both the quality and effectiveness of health services for patients, for the provider, and for the administrator. The need for change is apparent.

The current health delivery, planning, and management system is fragmented and relies on the patient to carry information from caregiver to caregiver. Much patient information/data needed to improve decisionmaking in diagnosis and care is still not gathered in digital form. Highly trained professionals rely on handwritten notes. Doctors and nurses spend up to 40 percent of their time on paperwork, much of it spent looking for a critical piece of information. Most decisions are made without benefit of real-time access to critical information. However, there is already an information revolution underway, involving significant shifts and changes in many areas of health management and delivery. For instance, new uses of information technologies and communications are emerging, as well as the ability to move the caregiver and information to where the patient is rather than moving the patient to centralized places to deliver health services and information. Today's telemedicine model is already evolving to "teleconsultation," where a physician consults with other specialists or a

patient, using high-quality video conferencing, with that consultation enabled by online information access. The evolving infrastructure is a critical foundation to ensuring that the significant changes in health access and improved information access can develop.

The Council envisions a health information infrastructure that is thoroughly integrated into the overall Information Superhighway. This infrastructure can link people, homes, schools, libraries, community centers, medical offices, clinics and hospitals, businesses, and government offices. It provides access to an amazing variety of public and private information resources, bringing new and valuable information to guide the decision of not only the caregiver, but also of the patient and their family, or of the consumer in their home before they become involved in any treatment.

The availability and use of the Information Superhighway to provide that kind of information access can support the paradigm shift in how people participate in their own wellness as individual consumers and purchasers of health, enabling improved quality of life and significant economic benefits. A healthier society consumes less treatment, lowering the cost of delivery, and is also better able to fully participate in the global economic marketplace. As the Nation faces increasing global competition, improving the ability to compete on all fronts must be a national goal if this country is to continue to provide the high quality of life and standard of living that its people deserve.

To change from an "incident treatment" model to a "wellness" model requires a change in how information is provided, both within the health delivery system, and to everybody in their daily lives—and a move to an environment where every person in this country has access to the kind of information that helps them to make informed decisions and to participate in their own wellness.

The following principles can best bring substantial benefits in the area of health care:

Principles of Health

1. Using the information infrastructure, all providers of health services and users and consumers of health services, should have access to the kind of information resources that guide improved decisionmaking.
2. Effective technological and managerial controls to protect the confidentiality and integrity of personal and confidential health information should be available throughout the health care information infrastructure.
3. Government at all levels should encourage the availability and dissemination of public health information to all persons in a wide diversity of formats and sources, using a variety of information infrastructures. ("Public health information" refers to aggregated information about diseases or health conditions provided to the public for primarily educational or informational purposes.)
4. The private sector should continue to take the lead in developing value-added information applications in support of health decisionmaking for

caregivers and consumers and in providing those services over competitively provided information infrastructures.

5. Public policies should support commercially available, open systems, standards-based, interconnected, and interoperable applications and networks.
6. As the Information Superhighway evolves, laws and policies governing ownership and use of individual patient medical records, medical licensure, privacy and confidentiality, liability, and reimbursement should evolve to be technology and location neutral.
7. Schools of nursing education, medicine, and professional development programs for all caregivers and health administrators should integrate access and utilization of the Information Superhighway in current and ongoing medical education programs.
8. Governmental systems that utilize or deliver health services should, wherever possible, procure commercially available, competitively developed solutions and technologies.
9. Funding for information infrastructure technology research and development should continue to receive government support in those areas of precompetitive, high-risk, or long-term research where barriers exist to the near-term availability and application of critical technologies.

Action Recommendations for Health

The potential for the role of the Information Superhighway in health delivery and management is tremendous. This infrastructure can link people, homes, schools, libraries, hospitals, businesses, and government offices. It provides access to an amazing variety of public and private information resources, bringing new and valuable information to guide the decision of not only the caregiver, but of the patient and their family, or of the consumer in their home before they become involved in any treatment.

Government and industry working at all levels should cooperate in the following action items:

1. Ensure the private sector leads in the identification of priorities for an action plan for government, private sector, schools of medicine/health education in the role of the Information Superhighway in health care delivery and management.
2. Establish widespread adoption of private sector development standards and standardized protocols in the following areas:
   - Nomenclature, coding, and structure;
   - Content of specific data sets or pieces of information;
   - Electronic data interchange of patient care and other health information;
   - Electronic signatures;
   - Personal identification methods; and
   - Security and protection of digitized data.

3. Confidentiality and privacy and liability laws that could supersede the disparate State laws should be developed and proposed by a cross sector private sector panel, drawing on the existing work that has been done by industry.
4. States should be encouraged to adopt these models through Federal initiatives and preferential funding/reimbursement procedures for early adoption.
5. Government, through its purchasing power and its role as a regulator, should, wherever possible, purchase from commercially available providers and services. Any R&D funding from government should be targeted toward collaborative, precompetitive, industry-led initiatives that can accelerate near-term availability and application of information technology.

GOVERNMENT INFORMATION AND SERVICES

Democracy requires public access to government information and services. The Information Superhighway provides the opportunity to enhance the public's participation in government by promoting an informed and knowledgeable populace through increased access to government information. Information infrastructure technologies will also transform the effectiveness and efficiency of government services and their delivery.

The free flow of information between the government and the public enables the public to meet their civic responsibilities, protect their rights, and provide for their consent. Government information belongs to the people, is owned by them, and should be accessible to them. These principles have been fundamental tenets of this Nation since its inception.

The Information Superhighway will provide all levels of government—Federal, State, local, and Tribal—with the opportunity to contribute to information infrastructure development. It must be recognized that different levels of government operate within differing jurisdictions, however, each with its own requirements, assumptions, and practices. Different jurisdictions often have differing interpretations regarding creation, use, ownership, dissemination, disposition of, and charges for government information. Despite these differences, cooperation and partnering among all levels of government are essential to efficient management, use, and delivery of government information and services.

The Information Superhighway will fundamentally transform the public's interactions with their governments, providing new opportunities for enhanced accountability, access, and service.

The Advisory Council recognizes that there are categories of government information that may be withheld to protect a legitimate public or private interest, and the principles below should be interpreted consistently with applicable law.

Information and information technologies have also begun to transform the way the American people receive government information and services and relate to their elected officials, offering an unprecedented opportunity to enhance participatory democracy in the United States. Some States have put public kiosks in places that offer "one-stop shopping" for government information and services. These interactive, multilingual, touchscreen kiosks, located in places such as shopping malls, libraries, and supermarkets, are making it easier for the public to obtain important government information and handle routine tasks such as applying for government jobs, renewing automobile licenses, ordering birth certificates, and learning about job-training programs.

All levels of government have entered the Information Age, using information and information technologies to improve communication with constituents, enhance delivery of government information and services, and increase public safety. For example, the White House has developed its own "Homepage," a user-friendly menu of information available from the White House. Congress, too, has created an online service called "Thomas." Like the White House Homepage, Thomas is accessible through the Internet and provides legislative information such as the text of bills, the Congressional Record, and Congressional Research Service summaries of legislation. Some States use broadband systems to improve their criminal justice systems, enabling video arraignments, depositions, and first appearances. The system saves costs and protects the public by reducing the need to transport prisoners from one location to another. The current uses of technology as a means to improve the efficiency and effectiveness of government are just the beginning. An enhanced Information Superhighway would prompt more widespread use of the types of services now available and prompt the development of new and better services. Development of the Information Superhighway to deliver these benefits should be based on the following Council principles.

Principles of Government Information and Services

1. Government information, including records of the actions of government, should be conveniently accessible to all persons, utilizing information infrastructure capabilities whenever feasible and appropriate.
2. Government services should be accessible to all persons eligible for such services, utilizing information infrastructure capabilities wherever feasible and appropriate.
3. The Federal Government should not charge for making its information available on the Information Superhighway nor charge for access to that information. Hard copy material, when available, should continue to be distributed under existing practices.
4. Government should encourage the widest possible cost-effective dissemination of government information in a wide diversity of formats and sources.
5. Government should encourage the private sector to take the lead in providing value-added information and services over information infrastructures.
6. Government entities must ensure and protect the quality, integrity, and security of government information and services over information infra-

structures and provide appropriate preservation and archiving of government information to ensure continued useability and availability.

7. Government should safeguard the privacy of persons about whom information exists in government records, as well as persons who use or request government information.
8. Government employees, and ideally all individuals, should be educated and trained regarding their rights and responsibilities under existing information laws.
9. The public should be given an opportunity to contribute meaningfully to decisions affecting government information and services over information infrastructures.

Action Recommendation for Government Information and Services

All levels of government should use information infrastructure technologies to provide basic pointers' to government information and services, thus simplifying public access to relevant government information; improving delivery of government services and the management and use of government information; and enabling the private sector to develop and provide enhanced and expanded value-added information products and services.

Definitions

Government information means information, regardless of format, which is created, collected, processed, disseminated, or disposed of by or for a government entity, at either the Federal, State, local, or Tribal level, according to the applicable laws of the relevant jurisdiction.

Government services are services provided by government entities as required by legislative mandates, including, for example, provision of social services, public safety, and criminal justice.

Government records are documentary materials, regardless of format, made or received by a government entity under law or in connection with the transaction of public business and preserved or appropriate for preservation by that entity or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of a government entity or because of the informational value of the data in them.

Private sector includes, for the purposes of these principles, for-profit, not-for-profit, and nonprofit entities.

' The term "pointers" in this context refers to information sources that would enable individuals and organizations in both the public and private sectors to identify and access government information and services. The pointers are not the sought-after information and services themselves. Rather, they provide direct pathways to the desired government information and services. Current examples include the *Federal Register*, the Government Information Locator Services, and legislative calendars.

part 3
Ensuring Access for All

UNIVERSAL ACCESS AND SERVICES

Over 60 years ago, this Nation set a goal of making available "to all people of the United States . . . communications service with adequate facilities at reasonable charges. . . ." That goal, articulated in the Communications Act of 1934, has become known as "universal service." Today, the goal of universal service has been generally achieved: more than 94 percent of all American households have basic telephone service (the highest ratio in the world), and 98 percent have at least one television set. Yet disparities remain. There are groups within our society whose rate of access to communications services are significantly lower. For example, only 50 percent of rural Native American homes have basic telephone service.

Historically, universal service has been characterized in terms of "plain old telephone service," the standard voice services with which we are all familiar. Today, however, voice services are rapidly converging with video and data technologies to form a new Information Age. As a result, this Nation once again faces the challenge of providing all Americans access to basic communication and information services. The United States, indeed the world, now stands in the midst of the information revolution. This Nation must ensure that the enormous empowering capabilities these new information and communications services afford will be available to all Americans and not create a society of information "haves" and "have nots." Only if all Americans are able to be both consumers and producers of information in all forms can this country fully realize the benefits of this information revolution.

In the face of this Information Age, traditional concepts that have existed within the communications industry for decades must be reevaluated. In addition, new paradigms must be created if the public is to understand more fully what this information revolution can bring to every American. The traditional concept of universal service must be redefined to encompass a concept more in line with the Information Superhighway of the future. Universal service will take on a different meaning to include the evolving array of basic communications and information services ubiquitously available on the Information Superhighway. Furthermore, the concept known as universal access must be formally introduced into the lexicon of the communications and information industries. There have been several informal definitions of universal access used within the industry, but going forward, universal access should be defined as affordable, ubiquitous, convenient, and functional connection to the Information Superhighway. These definitions for universal service and universal access, while relating to two distinct concepts, are closely interrelated.

Based on these themes, the Council proposes universal access and universal services principles.

Principles of Universal Access and Service

1. A national goal should be set to enable every individual to have access to the Information Superhighway by the year 2005. This goal would include defining basic levels of access and service capabilities and the deployment of an interactive, multimedia infrastructure.
2. A short-term national goal should be set to deploy Information Superhighway access and service capabilities to all community-based institutions that serve the public such as schools and libraries by the year 2000. This effort would involve technologies available today and access to publicly available networks.
3. Commercial and competitive initiatives should be the driving force behind the Information Superhighway and regulatory disincentives should be removed. The role of all levels of government is to ensure fair access regardless of geography; to ensure basic levels of service; to ensure interoperability of the Information Superhighway; and to encourage women- and minority-owned business, as well as small businesses and not-for-profit organizations, to participate in the Information Superhighway.
4. All individuals should be able to be both consumers and producers of information and services on the Information Superhighway.
5. Individuals with disabilities should have access to the Information Superhighway, and, therefore, design issues should be addressed as the infrastructure is developed to ensure access for all individuals with disabilities.
6. Consistent with existing laws, information from all levels of government should be readily accessible over the Information Superhighway.
7. If commercial and competitive forces do not achieve the goal of universal access and service, support mechanisms such as incentives and subsidies should be evaluated and implemented as appropriate to meet the goal. Any support mechanism should apply equally in a competitively neutral manner to all market participants.

Action Recommendations for Universal Access and Services

Principles 1 and 2 underscore the universal access goals of the Council, with specific timeframes for the near and long term. Principles 3 through 7 identify the manner in which those goals can be achieved, with an emphasis on the criteria that would allow all Americans to enjoy full access to the benefits of the Information Superhighway. As such, the following action recommendations detail the specific actions required to achieve universal access and service by the year 2005.

Action Recommendations to Implement Principle 3

1. The deployment of the Information Superhighway is based on offerings from a variety of suppliers of products, services, and infrastructures in a competitive marketplace. Federal, State, and local governments should be participants in these markets and promote these markets, providing content and services over the Information Superhighway.

2. Government should continue to offer research and development tax credits to stimulate the growth of the Information Superhighway.
3. Government in concert with business should continue co-funding small-scale pilot projects to stimulate new technology and capabilities associated with the Information Superhighway.
4. Government should continue grant programs directed at stimulation of Information Superhighway projects associated with schools, libraries, and community centers.
5. Government should aggressively initiate cost-effective purchasing policies encouraging stimulation of Information Superhighway leading-edge architecture and development.
6. Government should accelerate the declassification of military technology that could be applicable to accelerate development and implementation of the Information Superhighway without compromising national security considerations.
7. Government should accelerate efforts to make more efficient use of its own spectrum and to reallocate government spectrum for non-government uses, such as for commercial uses and not-for-profit organizations, taking into consideration the requirements of all levels of government (e.g., local governments' usage of frequency for public safety).
8. Government should work with the private sector to establish a national mechanism for gathering and sharing the experiences gained in the deployment and applications of the Information Superhighway.
9. In order to ensure the efficient introduction of new information technologies, government and business should devote adequate resources to prepare America's workforce to meet the needs of the Information Superhighway for properly trained personnel. All who work with the new technology must be educated to understand how to access the Information Superhighway, what resources are available on the Information Superhighway, and how to productively use the Information Superhighway.
10. So that their employees can make an optimum contribution to the development of the Information Superhighway, government and business should institute programs to train, retrain, counsel, and financially assist workers as they make the transition from using old technologies to utilizing new information technologies.

Action Recommendations to Implement Principle 4

1. Both government and business should encourage an architecture that is open and interoperable. The Internet is a helpful starting point for these issues and should continue to serve as a way to gain experience for future developments.
2. Open and interoperable systems are key ingredients to consumers and producers as the Information Superhighway evolves. The government should give priority in granting research and development money to efforts that promote open systems.

Action Recommendations to Implement Principle 5

1. The Federal Government should facilitate the development of the Information Superhighway architecture and system design for access for persons with disabilities through R&D funding and R&D tax credits to corporations that take on development efforts in this area.
2. The Federal Government, under the guidance of the National Institute of Standards and Technology (NIST), should promote industry standards and heighten awareness in this area by taking the lead in convening meetings that facilitate the development of "UL type standards" or "seal of approval" type criteria for software and hardware that meet agreed-to criteria in design and implementation.
3. All levels of government should ensure that their procurement and equipment solicitations be consistent with the requirements under section 508 of the Rehabilitation Act of 1986[1] and that procurement waivers not be granted without scrutiny, justification, and documentation.[2]
4. The private sector should be encouraged to take the affirmative responsibility to promote policies and to develop products and technologies that are accessible and usable by people with disabilities.

Action Recommendations to Implement Principle 6

1. No later than January 1, 1998, Federal Government agencies should have the capability to provide government-produced information in electronic format readily accessible initially through the Internet. As the Information Superhighway capability evolves, either as an evolution of the Internet and/or separately, the government should ensure continued accessibility of information.
2. The Federal Government should be encouraged to convert historical information into electronic format. The scope of this endeavor should be left to the discretion of the agency and should be guided by public demand and prioritized based on the nonavailability of information from other sources.
3. As a means of funding the capability to provide Federal Government information in electronic format for accessibility via the Information Superhighway, a percentage of the Information Technology Budget currently allocated annually to each Federal Government agency should be designated solely for the development and implementation of electronic information systems within each agency. The specific percentage should be decided on

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[1]cit. 29 U.S.C. 794d.

[2]Section 506 requires GSA to promulgate guidelines, now in place, to ensure that purchases and leases of information technologies of the Federal Government will be governed by a need to ensure that Federal employees and other users with disabilities will be able to use the technology, either with accessibility features built into the product or system, or through the use of adaptive peripherals. The principle is that the Federal Government, as a major purchaser, has a great deal of market power to influence the design and practices of large vendors (29 U.S.C. 794(d)).

an agency-by-agency basis. This process should be implemented no later than the next government fiscal year and incorporated into the current fiscal cycle where possible.

4. Each Federal agency should be encouraged to establish an index of publicly available published and electronically disseminated information, via the current Government Information Locator Service (GILS), which is updated and made available in a timely manner. This index should be electronically available via the Information Superhighway.
5. The Federal Government should refrain from asserting intellectual property protection, contractual restrictions, or any other restrictions that would impede free and open access to all government information that is publicly disclosable under existing law, for all users on the Information Superhighway.
6. The Federal Government should encourage the private sector to take the lead in providing value-added information and services over the Information Superhighway.
7. State and local government should strive to provide government-produced information in electronic format and convert historical information into electronic format.
8. State and local government should strive to adhere to the implementation strategies identified in numbers 1 through 7 above to the degree feasible and appropriate and consistent with existing laws.

Action Recommendations to Implement Principle 7

1. Support mechanisms including, but not limited to, subsidies and incentives, should be made explicit and as understandable as possible. The government should evaluate the need to provide support or incentives when the marketplace falls short of enabling universal service and access at reasonable prices. The government, not industry, should continue to be responsible for making the determination of who should receive a subsidy, the timing of when the subsidy should be initiated and how the subsidy should be administered.
2. Funding to low-income support mechanisms should be competitively neutral among all market participants.
3. The government should provide support mechanisms to provide universal service and access for individuals in geographic areas where the Information Superhighway does not reach as a result of commercial and competitive forces.
4. People with disabilities should not have to pay more than others to have access to basic and advanced Information Superhighway services. If a user with a disability requires adaptive technology to have access to the Information Superhighway, support should be available to defray the cost of such disability-related needs. Support mechanisms should be explicit and cost-effective as technically feasible. Such mechanisms may include but not be limited to supplier tax incentives, vouchers, access line charges, or various discounts.

5. Under all circumstances, direct assistance will strive to be neutral with regard to technological options, transmission medium, and with regard to supplier choice.
6. When the adoption of common protocols and other architectural standards is required to enable or accelerate the deployment of the Information Superhighway, the government will explore appropriate means to facilitate agreements on such standards between suppliers.
7. Subsidies are intended to be directed to the enduser. There will be circumstances where it will be appropriate for the subsidy to go to an entity other than the enduser to ensure the most cost-effective means of access.

part 4
Rules of the Road

Rules of the road are needed to protect intellectual property, privacy, and security. As many more people join electronic networks, privacy and security will need to improve. The content and communication that move over the Superhighway are created, stored, and used in vast quantities.

INTELLECTUAL PROPERTY

The evolving Information Superhighway presents valuable new opportunities both for creators and copyright owners and for the general public. Creators and copyright owners will be able to authorize the marketing and dissemination of their works to a broader audience, thereby potentially increasing the financial and other incentives for future creation. The public will have more convenient access to an increased number and variety of works. At the same time, however, the use of the Information Superhighway poses new legal and practical challenges in balancing the interests of owners and users of copyrighted works in a changing technological environment, ensuring an adequate level of protection to encourage owners to make their works available on the Information Superhighway while permitting appropriate access to those works. Any changes to the copyright laws should be made carefully to preserve this balance.

The Council's fundamental intellectual property principles pertaining to copyright law and related rights are intended to provide guidance in enhancing these opportunities and meeting these challenges.

Principles of Intellectual Property

1. The ultimate purpose of intellectual property protection in the Information Superhighway, as elsewhere, is to expand the pool of information and knowledge available to society as a whole by rewarding creators with exclusive rights to their works. Therefore, adequate and effective protection of intellectual property is essential in order for the Information Superhighway to develop successfully.
2. The importance to society of both copyright and patent protection was recognized by the framers of the United States Constitution. The guiding principle of U.S. copyright law is "to promote the progress of science and useful arts, by securing for limited times to authors . . . the exclusive right to their . . . writings." Copyright law is an important means by which this public policy goal is achieved, spurring creativity in a free market economy while encouraging the interchange of ideas and information.
3. Existing U.S. copyright law applies to uses of works on the Information Superhighway and will cover most of the issues that can currently be anticipated. However, some amendments and clarification may be advisable

in order to ensure adequate and effective protection in light of changing technologies. Such legislative changes should not be made precipitously, without a full and fair airing of issues.

4. Copyright laws should be forward-looking and flexible enough to adapt to incremental changes in technology without the need for frequent statutory amendment.

5. Intellectual property laws, and effective legal means of enforcing those laws, must keep pace with technological developments.

6. Existing rights of creators and copyright owners whose works are used on the Information Superhighway should not be diminished or weakened. The law should seek to preserve and promote the ability of creators and copyright owners to exercise all of the rights in the group of rights that make up a copyright, whether separately or in combination.

7. The doctrine of fair use, as incorporated in the Copyright Act and developed by the courts, should apply in the Information Superhighway environment. The context of the new technology should not diminish or weaken the ability to make fair use of copyrighted works.

8. Exemptions and limitations on copyright rights, such as those under current law for the benefit of nonprofit and educational uses, should also apply to the extent appropriate in the evolving Information Superhighway environment.

9. The Information Superhighway must provide the opportunity, through reasonable technological means, for owners of rights to control, identify, monitor, and be compensated for uses, and for users of works easily to seek permission and make payments.

10. The basic principle of copyright licensing should be free market transactions, involving negotiation between rightsholders and users of works. The role of the government should be to establish a legal framework in which private parties can operate to license and enforce rights. The law should allow flexibility in the development of appropriate forms of voluntary licensing.

11. Public education about the meaning and importance of intellectual property, including the fair use doctrine, is critical to successful implementation of the Information Superhighway.

12. Domestic intellectual property law should be consistent with U.S. treaty obligations.

13. It is essential to provide meaningful incentives for the creation and dissemination of works in the Global Information Infrastructure (GII), while ensuring adequate access to those works. Accordingly, the U.S. must strive to have other countries accept similar fundamental principles.

14. The U.S. should seek harmonization of national intellectual property laws and regulations applicable to the GII environment to the extent consistent with U.S. interests, and should support the principle of national treatment for all rights granted by such laws.

Action Recommendations for Intellectual Property

1. All levels of government should promote ongoing public education about the meaning and importance of intellectual property, including copyrights and the fair use doctrine.
2. The Federal Government should strive to have other countries implement consistent, effective, and appropriate policies and protections for intellectual property in the digital environment.

PRIVACY AND SECURITY

Privacy is a cherished American value. In designing the technological infrastructure and the policy environment for the Information Superhighway, the United States is establishing the framework for individual, social, economic, and political life in the 21st century. It is important that fundamental American values—including protection of privacy, freedom of speech and association, freedom from discrimination, and protection of property rights—be comprehensively and consistently considered in the Information Superhighway. These values are not absolute, and need to be addressed in the context of the public interest. The application of privacy principles may differ according to the type of information being considered and the nature of the relationship between providers and users.

Definitions

Throughout this report, personally identifiable information refers to any information that could be readily associated with the individual to whom it pertains. **Personally identifiable information** for the purposes of these principles does not include information that is maintained as a public record, or that an individual publicly releases, intends for public dissemination, or should reasonably understand may become public.

In policy discussions, privacy is frequently coupled with confidentiality and security. Although the terms are interrelated, it is important that the meaning of each be understood independently. **Information privacy** is the ability of an individual to control the use and dissemination of information that relates to himself or herself. **Confidentiality** is a tool for protecting privacy. Sensitive information is accorded a confidential status that mandates specific controls, including strict limitations on access and disclosure, that must be adhered to by those handling the information. **Security** is the totality of safeguards in a computer-based information system. Security protects both the system and the information contained within it from unauthorized access and misuse, and accidental damage. Security consists of hardware, software, personnel policies, information management policies, and disaster preparedness.

Informed consent has two components. First, it requires that the individual be provided full information on the uses and disclosures of personally identifiable information. Second, it requires that individuals be provided a mechanism through which they can choose whether or not to agree to unrelated uses and additional disclosures of personally identifiable information. **Unrelated use**, for

the purpose of these principles, means use or dissemination that is either not incident to the ordinary and acknowledged course of business of the recordkeeper or not compatible with the relationship in which the information was obtained. A variety of mechanisms for effecting this choice may be employed within different relationships between individuals and public and private entities. Informed consent is a broad term that can be implemented in a number of ways; it does not demand that the consent be express, rather it requires that the individual be given, in advance, the information necessary to decide whether or not to agree to subsequent disclosures and additional uses of personally identifiable information. In some instances, if the individual has not exercised an option to object, then consent can be inferred.

Developing and deploying an effective Information Superhighway requires adhering to the Council's privacy- and security-related principles.

Principles of Privacy and Security

1. For the potential of the Information Superhighway to be realized, personal privacy—including information, transactions, and communications—must be protected in the design, management, and use of the Information Superhighway. Autonomy and individual choice are fostered by ensuring privacy and by requiring informed consent prior to the use of personally identifiable information on the Information Superhighway.
2. Protection of privacy is crucial to encouraging free speech and free association on the Information Superhighway; however, such protections are not absolute and must continue to be balanced, where appropriate, by concepts of legal accountability and First Amendment rights.
3. To achieve its full potential, the Information Superhighway must incorporate technical, legal, and self-regulatory means to protect personal privacy. The privacy of communications, information, and transactions must be protected to engender public confidence in the use of the Information Superhighway. For instance, people should be able to encrypt all lawful communications, information, and transactions on the Information Superhighway. Networkwide and system-specific security systems that ensure confidentiality, integrity, and privacy should be incorporated into the design of the Information Superhighway. In an interactive electronic environment, transactional information should be afforded a high level of protection.
4. Existing constitutional and statutory limitations on access to information, communications, and transactions such as requirements for warrants and subpoenas, should not be diminished or weakened and should keep pace with technological developments. Privacy protections should be consistent across technologies, and should be technology neutral.
5. At a minimum, existing rights to review personally identifiable information and the means to challenge and correct inaccurate information should be extended into the Information Superhighway.
6. Individuals should be informed, in advance, of other uses and disclosures of personally identifiable information provided by the individual or generated by transactions, to which that person is a party, on the Information Super-

highway. Personally identifiable information about an individual provided or generated for one purpose should not be used for an unrelated purpose or disclosed to another party without the informed consent of the individual except as provided under existing law.

7. Data integrity—including accuracy, relevance, and timeliness of personally identifiable information—must be paramount on the Information Superhighway. Users of the Information Superhighway, including providers of services and products on the Information Superhighway, should establish ways of ensuring data integrity, such as audit trails and means of providing authentication.
8. The use of a personal identification system administered by any government should not be developed as a condition for participation in the Information Superhighway.
9. Subject to public policies intended to secure and maintain the integrity and enforceability of rights and protections under U.S. laws—such as those concerning intellectual property, defamation, child pornography, harassment, and mail fraud—spheres for anonymous communication should be permitted on the Information Superhighway. Those who operate, facilitate, or are otherwise responsible for such spheres must adequately address the sometimes conflicting demands and values of anonymity, on the one hand, and accountability, on the other.
10. Collectors and users of personally identifiable information on the Information Superhighway should provide timely and effective notice of their privacy and related security practices.
11. Public education about the Information Superhighway and its potential effect on individual privacy is critical to the success of the Information Superhighway and should be provided.
12. Aggrieved individuals should have available to them effective remedies to ensure that privacy and related security rights and laws are enforced on the Information Superhighway, and those who use the remedies should not be subject to retaliatory actions.
13. The content and enforcement of privacy policy on the Information Superhighway should be consistent. A process for overseeing the development, implementation, and enforcement of privacy policy on the Information Superhighway should be established. Such process should receive input from all levels of government and the private sector.

Action Recommendations for Privacy, Security, and Free Speech

Privacy

1. The government should follow through on privacy policy issues with the initial task of reviewing existing laws and practices to implement the Council's privacy principles and the recommendations of the IITF Privacy Working Group.

Security

1. The Federal Government should encourage private sector awareness of security issues, initiate a public-private security consultation process, and foster mechanisms to promote private accountability for proper use of security measures.
2. The Federal Government should not inhibit the development and deployment of encryption by the private sector.

Free Speech

1. The government should not be in the business of regulating content on the Information Superhighway. It should defer to the use of privately provided filtering, reviewing, and rating mechanisms and parental supervision as the best means of preventing access by minors to inappropriate materials.

part 5
Key Roles

INTRODUCTION

When the Information Superhighway is deployed to every school, library, and community center in America by the year 2000, the Nation will have accomplished a great feat. The accomplishment will be achieved through the hard work and vision of thousands of men and women all over the country who have decided to "make it happen" in their communities. It will also be achieved because many people in key positions have made the tough decisions to go forward.

The Council has discussed implementation of the Superhighway with knowledgeable people all over the United States, and concludes that the key players in this effort will be:

- Private sector leaders, both nationally and locally, and in imstitutions of learning;
- Leaders in all levels of government;
- Community partnerships and coalitions, often with wide public involvement; and
- Individuals who decide to step forward and champion Superhighway activity for themselves and their communities.

Each of these key players has a distinct role to play, and those roles may on occasion overlap. Each player also has the responsibility to partner and cooperate with other players in pursuit of common successful outcomes.

Diversity of representation in partnerships and coalitions will, the Council has found, contribute importantly to success. By diversity in this instance, the Council means a broad range of stakeholders at the national, State, or community level, as the case may be. The Council also means ensuring that all elements of a community are represented in political organizations formed to support KickStart Initiative programs, as presented in the Council's publication of that name. The Information Superhighway should serve everybody, and it must be designed for that objective.

In Part 5, the Council answers the questions: Who will make the Superhighway happen? How does the Nation get the job done? Who should act now to get things started? The Council examines key roles played in each of several important sectors:

- Builder: The private sector must be the builder;
- Access and Learning: Communities are the key;

- Catalyst: Government plays this critical role; and
- Taking Charge: Individuals must do this, or progress will falter.

THE PRIVATE SECTOR MUST BE THE BUILDER

The Council defines the private sector to include a broad array of nongovernmental entities. Thus, the private sector includes corporations and other private industry entities, labor unions, nonprofit organizations, grantmaking foundations, colleges and universities, religious institutions, and consumer activist and public interest groups.

The private sector must have primary responsibility for the continued design, deployment, and operation of the Information Superhighway. The Information Superhighway can enhance and improve business opportunities by sparking a new wave of entrepreneurship and innovation. This wave will also create and transform products, industries, and jobs. The Information Superhighway also will provide increased opportunities for creativity and cultural development. Vigorous competition in private industry is essential for continued investment in the technologies and applications that will make the vision for the Information Superhighway a reality. The private sector, in collaboration with a variety of user groups, should continue to design the Information Superhighway, as well as develop the high-quality products and innovative services for the Information Superhighway that will create opportunities for new markets and for improvement in the lives of all individuals.

Where appropriate, the private sector should take a leadership role in working with the government in the continued development of innovative uses for the Information Superhighway in socially beneficial areas such as education and lifelong learning, cultural enrichment, public safety, and health care. The private sector should also do all it can to foster equitable, informed, and convenient access to information, services, and products.

COMMUNITIES ARE KEY TO ACCESS AND LEARNING

Development, deployment, and use of the Information Superhighway are not really national undertakings, although national policy can help achieve them, and the Nation as a whole will benefit from a successful outcome. Rather, the Information Superhighway will first be built and used and will generate its greatest effect at the community level.

It is the connections from local institutions, especially schools, libraries, and community centers, that will introduce the Superhighway at the neighborhood level, that will open the first opportunities to young students, working people, and older persons alike. In recognition of that reality, the Council has published a volume, *KickStart Initiative*, intended to spur connection of every school, library, and community center to the Information Superhighway by the year 2000.

The Council presented the following messages in the *KickStart* publication:

1. The Information Superhighway should be designed to enhance lifelong learning, job skills, and community building.
2. Training teachers, librarians, and community service providers is critical—the country is now very far from having every teacher or librarian ready to train and help others to use the Superhighway for learning and skill building.
3. Software and other kinds of creative content are critical to providing the real benefits of the Superhighway.
4. Everyone is both a consumer and creator of intellectual property. The rights of creators and owners of intellectual property must be observed and respected.
5. Costs are manageable and sources of funds are available to the committed and persistent.
6. There are many diverse and varied stakeholders in every community who can and should be counted on to be part of KickStart Initiatives.
7. A large body of useful information, both in print and online, can serve as a good starting point for KickStart Initiatives.

In another dimension, the effect of the Information Superhighway on communities is likely to be extraordinary—and highly beneficial. The Council believes that dispersed communities, such as those in rural areas, will be brought together; that distressed communities, such as those in the inner cities of many metropolitan areas, will be joined in helpful communication; that neighbors will be better able to help neighbors online; that family members will keep in touch via e-mail; and that many people will join "virtual communities" of like-minded individuals wherever they may be. Similarly, the Information Superhighway will invite disabled persons to reenter the workplace, to enjoy entertainment with others, and to become full-fledged members of the emerging electronic community.

GOVERNMENT HAS A SIGNIFICANT ROLE AS CATALYST

While the Information Superhighway is primarily a private sector initiative, all **levels of government have significant roles to play in ensuring the effective development and deployment of the Information Superhighway**. The role of all levels of government is to ensure fair access regardless of geography, to make sure people with disabilities can use information services and technologies, to ensure basic levels of service, to encourage interoperability of the Information Superhighway, and to encourage women- and minority-owned businesses and not-for-profit organizations to participate in the Information Superhighway.

For example, all levels of government must work together to create a public policy and regulatory climate that allows the Information Superhighway to thrive. They should stimulate the development and use of the Information Superhighway by working with the private sector to promote the vision of the Information Superhighway and the benefits it will bring to all Americans.

All levels of government should also work together to ensure vigorous competition, to encourage private investment, to foster flexible and responsive governmental action including the harmonization of laws and regulations, and to provide privacy and security protection to Information Superhighway users—both consumers and producers. Open market competition should not be displaced where it exists, but appropriate government policies may be necessary to ensure open and competitive markets. Government also plays an important role as a user of the Information Superhighway to improve delivery of its services.

The Federal Government has a vital role in sustaining a strong research and development base in information technology through university and corporate programs.

Government R&D support for the Superhighway is essential for a broad variety of reasons, including:

- The ideas may be so speculative and the likelihood of breakthroughs sufficiently risky as to be outside of reasonable return-on-investment expectations of commercial interests;
- The results (information or technology produced) may be such that no single party could expect to benefit from making the investment on its own; and
- The expected breakthroughs may pertain to technologies that are so inherently expensive or special-purpose that no market may ever exist for generating commercial returns, but the technologies may otherwise be critical to progress in the field.

The Federal Government's role for the Information Superhighway is to:

- Provide visionary leadership (publish best practices, give awards to technically competent schools ("CyberSchools"));
- Provide support and funds for appropriate projects, including retraining, enhancement, and enrichment.
- Provide funds for precompetitive research and development;
- Promote partnerships and dialogue with the private sector (joint setting of standards, precompetitive research, pilot projects, etc.);
- Protect rights by clarifying and enforcing laws on intellectual property, security, and privacy and providing dispute-resolution mechanisms for the protection of rights;
- Promote public understanding through copyright awareness and similar campaigns;
- Encourage the private sector to take the lead in providing value-added information and services over the Information Superhighway;
- Stimulate Superhighway activity in its role as purchaser and user;
- Provide services where the services are not available in the private sector (such as public safety); and

- Protect and promote the country's interests internationally.

While the Council's focus on the roles of State and local governments has been primarily to emphasize the importance of connecting local communities to the Information Superhighway, it also recognizes that they are key partners in:

- Funding new levels of electronic services in such areas as education and lifelong learning, emergency and public safety, or government information and services;
- Stimulating private sector efforts to develop the Information Superhighway, partly through State/local governments' roles as purchasers and users;
- Enforcing State laws regarding intellectual property, privacy, and security;
- Promoting public-private partnerships;
- Leveraging existing resources to maximize the educational value of the Information Superhighway; and
- Promoting and ensuring universal service and access.

INDIVIDUALS MUST TAKE CHARGE

Achievement of the Council's five fundamental goals for the Information Superhighway may not be as spectacular as the Apollo Lunar Landing, but it is likely to have more far-reaching effects for individuals. The purpose of the Superhighway is, after all, to improve the lives of individuals, and to do so by opening opportunities to them in family life, work, entertainment, retirement, and other aspects of living. The benefits to individuals are limited only by their own imaginations.

With those benefits come responsibilities, however. The Council believes that individuals have responsibilities to:

- Champion: Become advocates of the Superhighway for their local school and library systems and community centers, and generally throughout the community;
- Learn: Educate themselves about the Superhighway to ensure that they and their families enjoy the benefits and avoid the downside risks, which can include job displacement. Individuals should make this matter a challenge that they will meet; and
- Respect: Respect the rights of others, including privacy and intellectual property rights.

As individuals all over the country rise to the occasion, the Superhighway will be built, deployed, and put to use. Individuals can help bring the Superhighway to their neighborhoods, can work to ensure universal access, and can personally reap the benefits.

ADDITIONAL IDEAS FOR MOVING FORWARD

The Council here proposes four ideas that could help to implement the Information Superhighway and help communities to share their learning with their counterparts around the country, and motivate school administrators, teachers, and students to excel through use of the new technologies. All levels of government and all community leaders play a key role in making these ideas a reality. Therefore, reallocation of resources for training and many other purposes may be necessary.

KickStart Homepage

Participants in KickStart activities in their local communities would benefit from having an "online place to go" to share success stories and allow communities to see and replicate successful models from around the country. A KickStart Homepage would enable a dialogue and permit schools, libraries, and community centers to share ideas and information and to "link up" with one another. The Council's *KickStart Initiative* includes examples of existing homepages where educators and librarians are having ongoing dialogues on "best practices."

The Greenhouse Projects

In developing its recommendations on the Information Superhighway, the Council has identified a need for and formulated the idea for a national network of nonprofit resource centers, or "Greenhouses," whose mission would be to improve the quality of education and lifelong learning in this country by facilitating the use of Information Superhighway technologies. The goals of The Greenhouse project are 1) to provide a structure for more systematic sharing of information, ideas, and models about effective uses of instructional technology; 2) to link educators who want to initiate particular types of Information Superhighway projects with comparable groups across the country who already have developed similar, quality programs; and 3) thus to help all members of society to have access to richer learning opportunities through Information Superhighway technologies.

The Greenhouse centers for learning and technology would accomplish these goals by 1) collecting and generating critical information on the use of Information Superhighway technologies in educational environments; 2) developing and delivering innovative support services such as forums for professional networking and technology consulting services; and 3) proactively reaching out to people and communities who need assistance. The Greenhouses would focus their efforts on educators who currently have little access to information infrastructures and thus are cut off from online sources of information and expertise and on groups that are at risk in educational outcomes or that seem unlikely to realize the full learning benefits of the Information Superhighway without proactive assistance.

Incentives for Students

State and local governments and school boards should seriously consider the creation of programs that will reward students for:

- Displaying technical competence in the use of the Information Superhighway; and
- Displaying an understanding of the rules of the road, including their rights and responsibilities as participants on the Information Superhighway.

Some communities have established "Information Superhighway Driver's Licenses" that require students to pass a test on rights, responsibilities, and technical competence.

CyberSchool Certification

The Federal Government should work with private industry to create a nonprofit foundation that would establish and make awards for schools that achieve their standards for effective use of technology and learning. Criteria for such awards need to be created and should include both capabilities and student achievement. Such criteria might include:

- Multiple measures of student achievement;
- Incentives for students;
- Teacher training in use of technology for instructional goals;
- Adequate connection, networking, and equipment;
- Sufficient integration of technology in coursework; and
- Access solutions for students/faculty with disabilities.

This proposal is intended to create momentum among *all* schools to meet the criteria necessary to be designated as a "CyberSchool."

It is the States' responsibility to ensure that the initial certification and continuing education requirements for teachers include specific mandates for preparation on how to utilize technology for instructional purposes. Teacher education institution accreditation requirements should include preparation of all incoming teachers on use of technology as an instructional vehicle regardless of their areas of teaching expertise.

Appendixes

appendix A
History of the Council and Executive Order

In January 1994, President Clinton asked a group of distinguished Americans to undertake a 2-year effort to develop a national strategy on the development of the Information Superhighway, technically known as the National Information Infrastructure. The President formed the Council, Vice President Al Gore guided it, and Secretary of Commerce Ron Brown appointed the members of the United States Advisory Council on the National Information Infrastructure.

President Clinton formally established the Advisory Council in Executive Order No. 12864, dated September 15, 1993, which he later amended to increase the number of members and to extend the tenure of the Council. The text of this Order follows. Pursuant to that Order, Secretary Brown appointed the Council members.

Secretary Brown chose the Council members from among America's most accomplished individuals in telecommunications, electronics and computer software and hardware, entertainment, broadcasting, labor, as well as educators, public leaders at the State and local levels, and leaders of the disabled and other interested communities. The Council represents the builders and managers of the Information Superhighway, the suppliers of the content that will flow over it, and the people who will be the ultimate users and beneficiaries of the Superhighway. A full list of the members appears on page 7 and brief biographies of the members appear in Appendix B.

The Council decided to address a basic set of critical issues that the Nation faces in developing the Information Superhighway. In April 1994, the Council organized its members into three MegaProject working groups to explore three areas: Vision and Goals for the Information Superhighway; Access to the Superhighway; and Intellectual Property, Privacy, and Security issues. The purpose of the MegaProjects was to frame discussion and to draft recommendations that would facilitate the full Council's ability to reach consensus and to make recommendations to the Secretary of Commerce.

During its tenure, the Council set out to learn from Americans what they wanted from the Information Superhighway, what they were doing to build and use the Superhighway, and what the Council might recommend that would be useful in speeding development of the Superhighway. Between February 1994 and December 1995, the Council met more than a dozen times in numerous places across the country, heard from many individuals representing a wide diversity of interests, and obtained voluminous public comment in the form of letters, calls, faxes, e-mail, and other correspondence. A summary of the Council's outreach efforts and its meetings appears in Appendix C.

As work of the MegaProjects took form, the Council assembled its early thinking into an articulation of basic principles for the development, deployment, and

operation of the Superhighway: it published, in March 1995, *Common Ground: Fundamental Principles for the National Information Infrastructure*. This publication presented the emerging framework within which the Council could find consensus and make recommendations on many issues critical to development and deployment of the Superhighway. The first of those principles addressed five areas:

- Universal Access and Services;
- Privacy and Security;
- Intellectual Property;
- Education and Lifelong Learning; and
- Electronic Commerce.

Throughout its tenure, the Council initiated correspondence with members of the Administration about several key issues, including intellectual property, the Global Information Infrastructure, and progress of the Administration's National Information Infrastructure activities. The Council developed carefully reasoned letters analyzing issues and recommending courses of action on those issues. Copies of the Council's letters appear in Appendix E.

The Council concluded that the quickest and most efficient way to develop and deploy the Information Superhighway was through efforts in thousands of communities across the country. The first step should be to provide universal access to the Superhighway by connecting all schools, libraries, and community centers to the Superhighway. To assist in those efforts, the Council developed *KickStart Initiative: Connecting America's Communities to the Information Superhighway*. This richly detailed book is intended to serve as a guide to community leaders who are interested in starting to connect their schools, libraries, and community centers. The Council issued an advance edition of this publication in December 1995 and the permanent edition in January 1996.

Finally, the Council focused its effort on this publication, *A Nation of Opportunity*, to present its policy recommendations to the President, Vice President, and Secretary of Commerce. The Council ensured that its work products were made available over the Information Superhighway as well as in print.

Executive Order 12864

Executive Order 12864 of September 15, 1993

United States Advisory Council on the National Information Infrastructure

58 F.R. 48773

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the Federal Advisory Committee Act, as amended (5 U.S.C. App. 2) ("Act"), and section 301 of title 3, United States Code, it is hereby ordered as follows:

Section 1. *Establishment.* (a) There is established in the Commerce Department the "United States Advisory Council on the National Information Infrastructure" ("Council"). The Council shall consist of not more than 25 members to be appointed by the Secretary of Commerce ("Secretary").

(b) The Secretary shall appoint from among the members of the Council officials to serve as chairperson(s) or vice-chairperson(s) of the Council as he shall deem appropriate.

Sec. 2. *Functions.* (a) The Council shall advise the Secretary on matters related to the development of the National Information Infrastructure. The National Information Infrastructure shall be the integration of hardware, software, and skills that will make it easy and affordable to connect people with each other, with computers, and with a vast array of services and information resources.

(b) The Council shall advise the Secretary on a national strategy for promoting the development of a National Information Infrastructure. Issues that the Council may address include, but are not limited to:

(1) the appropriate roles of the private and public sectors in developing the National Information Infrastructure;

(2) a vision for the evolution of the National Information Infrastructure and its public and commercial applications;

(3) the impact of current and proposed regulatory regimes on the evolution of the National Information Infrastructure;

(4) national strategies for maximizing the benefits of the National Information Infrastructure, as measured by job creation, economic growth, increased productivity, and enhanced quality of life;

(5) national strategies for developing and demonstrating applications in areas such as electronic commerce, agile manufacturing, lifelong learning, health care, government services, and civic networking;

(6) national security, emergency preparedness, system security, and network protection implications;

(7) national strategies for maximizing interconnection and interoperability of communications networks;

(8) international issues associated with the National Information Infrastructure;

(9) universal access; and

(10) privacy, security, and copyright issues.

(c) The chairperson(s) may, from time to time, invite experts to submit information to the Council and may form subcommittees of the Council to review specific issues.

Sec. 3. *Administration.* (a) The heads of executive agencies shall, to the extent permitted by law, provide to the Council such information as it may require for the purpose of carrying out its functions.

(b) Members of the Council shall serve without compensation but shall be allowed travel expenses, including per diem in lieu of subsistence, as authorized by law, including 5 U.S.C. 5701-57-7 and section 7(d) of the Act, for persons serving intermittently in government service.

(c) The Department of Commerce shall provide the Council with administrative services, facilities, staff, and other support services necessary for the performance of its functions.

Sec. 4. *General.* (a) Notwithstanding any other Executive order, the functions of the President under the Act that are applicable to the Council, except that of reporting to Congress, shall be performed by the Secretary in accordance with guidelines that have been issued by the Administrator of General Services.

(b) The Council shall exist for a period of two years from the date of this order, unless the Council's charter is subsequently extended prior to the aforementioned date.

(c) Members of the Council and its subcommittee shall not be considered special government employees for any purpose or for purposes of 18 U.S.C. 201-203, 205, 207-209, and 218-219.

William J. Clinton

THE WHITE HOUSE

September 15, 1993.

appendix B
Biographies of Council Members

Morton Bahr

Morton Bahr is president of the Communications Workers of America, where he is responsible for leading the more than 600,000-member union. Mr. Bahr is a vice president of the AFL-CIO and a member of the Labor Advisory Committee on Trade Negotiations for the U.S. Trade Representative. He is a founder and co-chair of Jobs with Justice, a community-labor action coalition group, and serves as co-chairman of the Collective Bargaining Forum. Mr. Bahr is a member of the FCC's Network Reliability Council and is the co-chair of the Telecommunications Industry Health Care Coalition. He serves as vice chairman of the United Way board of governors and is an executive committee member of the Democratic National Committee. He is chair of a blue-ribbon commission funded by the Kellogg Foundation in support of lifelong learning in the United States.

Mr. Bahr holds a bachelor's degree in science from Empire State College in New York. He is a regular guest lecturer at the Harriman School for Labor-Management Policy at Stony Brook College in New York.

Toni Carbo Bearman

Toni Carbo Bearman, Ph.D., is dean of the School of Library and Information Science at the University of Pittsburgh. Before being named to her post, Dr. Bearman was executive director of the U.S. National Commission on Libraries and Information Science (NCLIS), the government agency responsible for advising the President and U.S. Congress on policy and planning in the information field. She has worked in the information field since 1962.

Dr. Bearman is vice chair of the U.S. National Committee for the International Federation for Information and Documentation and currently chairs the federation's Global Information Infrastructure and Superhighways Task Force and its Information Policy Committees. She served as chair of Section T, the Information, Computing and Communications section of the AAAS (of which she is a fellow) in 1992-1993, and was a member of the board of the Greater Pittsburgh Literacy Council (GPLC). Dr. Bearman has served as president of the American Society for Information Science. She has a bachelor's degree in literature from Brown University and holds a master's degree in information science and a Ph.D. in the management of information resources from Drexel University. She is also a fellow of the Institute of Information Scientists and the Special Libraries Association, and she is president-elect of the Association for Library and Information Science Education.

Marilyn Bergman

Marilyn Bergman is president and chairman of the board of the American Society of Composers, Authors and Publishers (ASCAP). She is the first woman to be

elected to the ASCAP board of directors. She is also an award-winning lyricist. Among her many awards and honors, she has received three Academy Awards, three Emmy Awards, two Grammy Awards, and a Cable Ace Award. Ms. Bergman was inducted into the Songwriters Hall of Fame in 1980, received the Crystal Award from Women in Film in 1986, and received the National Academy of Songwriters Lifetime Achievement Award in 1995. She is a member of the executive committee of the Music Branch of the Academy of Motion Picture Arts & Sciences, a member of the National Academy of Songwriters, and a member of the Nashville Songwriters Association. Ms. Bergman is also founder of the Hollywood Women's Political Committee, serves on the board of directors of the Streisand Foundation, and is serving in a leadership capacity—on behalf of songwriters on the world stage—as president of CISAC, the International Confederation of Performing Rights Societies. Ms. Bergman was a music major at New York's High School of Music and Arts, and studied Psychology and English at New York University. She holds an honorary doctorate degree from the Berklee School of Music in Boston, Massachusetts.

Bonnie Laverne Bracey

Bonnie Laverne Bracey is a former teacher for the Ashlawn Elementary School in Arlington, Virginia, and a teacher-in-residence at the Arlington Career Center, where she teaches all subjects. She is a graduate researcher at George Mason University's telecommunications department, where she evaluates new programs and technologies. Ms. Bracey is also a member of the George Lucas Educational Foundation advisory board.

Ms. Bracey was a Christa McAuliffe Educator for the National Foundation of Education, National Education Association, and a member of the Challenger Center Faculty. She is a Young Astronaut teacher and in 1990 was named a Challenger Fellow and received the President's award in science. Ms. Bracey attended the Hubbell Space Science Institute and holds honors in a variety of fields in education, including technology, aerospace, physics, geography, and multicultural education. Ms. Bracey received a graduate degree from Marymount University (SED) program.

John F. Cooke

John F. Cooke is executive vice president, corporate affairs, for The Walt Disney Company, responsible for the company's worldwide corporate alliances government relations, and the Disney/telephone company joint venture. Prior to his appointment as a corporate officer, Mr. Cooke served as president of The Disney Channel from June 1985 to January 1995. Before joining Disney, he was associated with the Times Mirror Company for more than 10 years.

Mr. Cooke is a member of the board of trustees of Johns Hopkins University. He is also a member of the boards of trustees for The J. Paul Getty Trust, the Harry S Truman Library Institute, and The Asia Society. He is a member of the board of directors for the Pacific Council on International Policy and a member of the Council on Foreign Relations.

Locally, Mr. Cooke sits on several Los Angeles boards: the Los Angeles County Museum of Art (LACMA), The Huntington Library Board of Overseers, the Constitutional Rights Foundation, and The American Film Institute. Also, he is chairman of the board of governors for the UCLA Center for Communication Policy.

Mr. Cooke holds a bachelor's degree in history, and did graduate work in American History, at the University of California, Los Angeles. He holds a master's degree in business administration from the University of Southern California.

Esther Dyson

Since 1983, Esther Dyson has been owner and president of EDventure Holdings, which publishes *Release 1.0*, a monthly newsletter about the computer/communications market. It also sponsors two annual forums: PC (Platforms for Communication) Forum and East–West High-Tech Forum. Fluent in Russian, Ms. Dyson is a frequent public speaker in both the East and West, and has published articles in *Forbes*, *Wired Magazine*, and *The New York Times* (among other venues). She is also managing partner of EDventure Ventures, which funds for-profit online services and software startups in Eastern Europe.

Ms. Dyson is chairman of the Electronic Frontier Foundation, and sits on the boards of the Santa Fe Institute, The Eurasia Foundation, and the Institute for East/West Studies. She is also a director of Cygnus Support, Thinking Tools Corporation, and PRT Corporation, and an advisor to Perot Systems Corp. Earlier, Ms. Dyson worked as a reporter for *Forbes Magazine* (1974-77) and was a securities analyst at New Court Securities and Oppenheimer & Company (1977-82). She earned a bachelor of arts degree in economics from Harvard University in 1972.

Craig Fields

Craig Fields, Ph.D., is vice chairman of Alliance Gaming, Inc., a diversified entertainment company. He was formerly chairman and CEO of the Microelectronics and Computer Technology Corporation, and former director of the Defense Advance Research Projects Agency (DARPA), the research arm of the Office of the Secretary of Defense. Dr. Fields works with the Senate and the House of Representatives on technology activities of interest to Congress. He is a frequent speaker at community organizations, professional societies, colleges, and universities across the Nation. Dr. Fields has been responsible for the implementation of joint technology development efforts with countries in Europe and the Pacific Rim.

Dr. Fields is chairman of the Defense Science Board and serves on the U.S.–Israel Science and Technology Commission. He is a member of the board of ENSCO Energy Service Company and Perot Systems Corporation. Dr. Fields serves on the advisory boards of SRI International, United Technologies Corporation, and the Economic Strategy Institute. He received his bachelor's degree from the Massachusetts Institute of Technology in 1966, and his doctorate from Rockefeller University in 1970.

R. Jack Fishman

R. Jack Fishman is president and CEO of Lakeway Publishers Inc., where he is publisher and editor for the *Citizen Tribune* in Morristown, Tennessee. He is chairman of the National Newspaper Association and has served as president of the Tennessee Press Association.

Mr. Fishman is a member of the Tennessee Board of Regents and former chairman of the Walters State Community College advisory board. He is a former chairman of The Tennessee Industrial and Agricultural Development Commission. Mr. Fishman has received numerous civic awards, including The Southern Industrial Council's Volunteer of the Year Award, the Tennessee Press Association's President's Award, life membership in Kiwanis International, and The Rotary International Paul Harris Fellow Award.

Mr. Fishman received his bachelor's degree from the University of Memphis. He has attended institutes for organization management at the University of North Carolina and economic development at the University of Oklahoma.

Lynn Forester

Lynn Forester is president and CEO of FirstMark Holding, Inc. FirstMark specializes in the acquisition and management of telecommunications companies worldwide. Previously, Ms. Forester was chairman of the board for TPI Communications International, Inc., one of the largest radio paging companies in Latin America; was executive vice president for development for Metromedia Telecommunications, Inc; and practiced corporate law as an associate with Simpson, Thacher and Bartlett. She was elected to the board of directors of General Instrument Corporation in 1995, and served as director of Mobile Satellite Corporation from 1983 to 1984.

Ms. Forester was named Global Leader for Tomorrow by the World Economic Forum in 1994 and 1995. She is a member of the Council on Foreign Relations, a Corporate Advisory Board member for the National Commission on Children, a director of the Together Foundation, a director of the New York City Outward Bound Center, a director of Asphalt Green, and a member of the American Bar Association and the Association of the Bar of New York State.

Ms. Forester earned a bachelor of arts in government, Phi Beta Kappa, from Pomona College in Clarement, California, in 1976, a Juris Doctor from Columbia University School of Law in New York in 1980, and was an International Rotary Fellow at the Graduate Institute of International Studies in Geneva, Switzerland, from 1978 to 1979.

Carol Fukunaga

Carol Fukunaga is a State senator in the Hawaii State Legislature and chairs the Senate's Communications and Public Utilities Committee as well as the National Conference of State Legislatures' ASI Communications and Information Policy Committee.

A long-time technology advocate, she has pioneered models to expand use of educational technology and public access to government services. Hawaii became the first State to make its legislature more accessible to the general public via the 1990 Public Access Project. The project overhauled the existing legislative process using telecommunications technology, such as fax equipment, computer-generated audio response systems, interactive video teleconferences and electronic town meetings via cable television. Legislative ACCESS, an online electronic service, allowed the public to receive copies of bills, committee hearing notices, and reports.

An attorney by profession, Senator Fukunaga is currently a member of the Hawaiian Air board of directors. She received her legal and undergraduate degrees from the University of Hawaii.

Jack Golodner

Jack Golodner is president of the Department for Professional Employees AFL-CIO, the successor organization of the Council of AFL-CIO Unions for Scientific, Professional and Cultural Employees, an organization Mr. Golodner was instrumental in forming.

He is a member of the Labor Advisory Committee for Trade Negotiations and Trade Policy of the U.S. Department of Labor, executive director of the Labor Institute for Human Enrichment, and a member of the Advisory Committee on Salaried and Professional Workers, International Labour Organization (ILO). Mr. Golodner was chairman and a delegate of the workers group at ILO Tripartite meetings on Salaried Authors and Inventors and on Conditions of Work and Employment of Performers. He has also served as a member of delegations to UNESCO and the World Intellectual Property Organization (WIPO).

Mr. Golodner is first vice president of the International Secretariat of Media and Entertainment Unions, a member of the National Executive Board of the Industrial Relations Research Association, of the executive committee, New American Realities Project, National Planning Association, and the advisory council of the Center for Theory and Simulation in Science and Engineering at Cornell University.

Mr. Golodner holds a bachelor's degree in industrial and labor relations from Cornell University and a Juris Doctor from Yale University Law School.

Eduardo Gomez

Eduardo Gomez is president and general manager of KABQ Radio in Albuquerque, New Mexico. He started his career with KRIO Radio in McAlien, Texas, as program director and later became a radio announcer at KTBC Radio and TV in Austin, Texas. Mr. Gomez was the first Hispanic general market anchor in South Texas, where he worked from 1967 to 1970.

Mr. Gomez founded KQXX Radio in McAllen, Texas, and later bought KIRT Radio in Mission, Texas, and KABQ Radio in Albuquerque, New Mexico. He

currently owns all three radio properties. Mr. Gomez is a co-founder and vice president of the American Hispanic Owned Radio Association (AHORA), an association of 110 Hispanic-owned radio stations in 12 States. In addition, Mr. Gomez is founder and owner of The Albuquerque Corporation, a marketing and promotions services company.

Mr. Gomez attended the University of Texas at Austin, Texas.

Haynes G. Griffin

Haynes G. Griffin is president, chief executive officer, and co-founder of Vanguard Cellular Systems, Inc. Vanguard is one of the largest independent cellular telephone companies in the nation with operational cellular systems in 22 markets covering 6.5 million people. Mr. Griffin is also past chairman of the board of the Cellular Telecommunications Industry Association, the national trade association for the cellular industry.

Mr. Griffin is a member of the board of directors of Lexington Global Asset Managers Inc., a publicly held diversified financial service holding company, and serves as a trustee for The Center for Creative Leadership, one of the world's largest organizations devoted to the study of leadership, creativity, and effective management. He is also a member of the board of directors of Geotek Communications, Inc., a wireless telecommunications company operating both in the United States and internationally. Mr. Griffin is a graduate of Princeton University, where he has served on the National Alumni Council executive committee. He is chairman of the board of Greensboro Day School and is a member of the board of trustees of Woodberry Forest School.

LaDonna Harris

LaDonna Harris devotes her life to building coalitions, organizations, and working relationships that create change. She is a consistent and ardent advocate on behalf of Tribal America and she is active in civil rights, environmental, women's, and world peace movements. Born in Walters, Oklahoma, during the Great Depression and raised by her maternal grandparents, Ms. Harris is a citizen of the Comanche Nation. In 1980, she was the U.S. Vice Presidential nominee on the Citizens' Party ticket with Barry Commoner. Since 1970, Harris has presided over Americans for Indian Opportunity, a national nonprofit organization that works with Tribal governments and Tribal people to develop leadership, institutions, and structures using new ideas and creative initiatives based on traditional Tribal values.

Because Ms. Harris recognizes the significance of the Information Age and the impact computer technology will have on Tribal communities, she created the first national Indian-owned and operated computer telecommunications network. *INDIANnet* incorporates Tribal values in a modern technology and is dedicated to establishing and developing affordable public access to electronic information and communication services for Native Americans. Vice President Gore recognized Harris as a leader in the area of telecommunications in his remarks at the White House Tribal Summit in April 1994.

George Heilmeier

George H. Heilmeier, Ph.D., is president and chief executive officer of Bellcore (Bell Communications Research), a leading provider of communications software and professional services based on world-class research. Before joining Bellcore, Dr. Heilmeier was senior vice president and chief technical officer of Texas Instruments, Inc. Prior to joining Texas Instruments, he was director of the Defense Advanced Research Projects Agency (DARPA), where he initiated major efforts in space-based lasers and reconnaissance systems, infrared technology, and stealth aircraft.

Dr. Heilmeier is a member of the Defense Science Board, the President's National Security Telecommunications Advisory Committee, and the National Security Agency Scientific Advisory Board. Dr. Heilmeier holds a bachelor's degree in electrical engineering from the University of Pennsylvania and a master's and doctorate in solid state materials and electronics from Princeton University.

Susan Herman

Susan Herman is general manager of the Department of Telecommunications for the City of Los Angeles. Ms. Herman has been responsible for leading the city through changes in local and Federal telecommunications policy. She is responsible for developing telecommunications franchises and contracts for the design and development of the City of Los Angeles' long-term telecommunications plans. In addition, Ms. Herman contributed her leadership skills to the board of the National Association of Telecommunications Officers and Advisors (NATOA), an affiliate of the National League of Cities. She served as the association's president in 1991 and 1992, leading to the passage of the 1992 Cable Consumer Protection and Competition Act. She also served as chair of the NATOA's National Policy Task Force.

Ms. Herman is an adviser and lecturer to various entities on telecommunications issues, including the British, Japanese, and West German governments, the Hispanic Information and Telecommunications Network, the Committee for Communications for the Disabled, the National Academy of Television Arts and Sciences, the National Cable Television Association, and the Independent Television Association.

James R. Houghton

James R. Houghton is chairman and chief executive officer of Corning Incorporated, where he has served in various management positions since 1962.

Mr. Houghton is a director of Dow Corning Corporation, Metropolitan Life Insurance Company, J.P. Morgan Company, Inc., and EXXON Corporation. He serves as a trustee of the Corning Museum of Glass, Corning Incorporated Foundation, The Pierpont Morgan Library, and The Metropolitan Museum of Art. He is past chairman of the Business Council of New York State, and is a member of the Council on Foreign Relations, the Business Council, and the Business Roundtable.

Mr. Houghton graduated from Harvard College and received a master's degree from Harvard Business School.

Stanley S. Hubbard

Stanley S. Hubbard is chairman and chief executive officer of Hubbard Broadcasting, Inc., and the United States Satellite Broadcasting Company, Inc. Mr. Hubbard is a second-generation broadcaster, following his father, Stanley E. Hubbard, who signed on the company's first radio station in 1923.

Mr. Hubbard has served on the Broadcast Advisory Committee to the House Subcommittee on Communications. An inductee in *Broadcasting & Cable Magazine*'s first Hall of Fame (1992) and the Society of Satellite Professionals International Hall of Fame (1992), Mr. Hubbard formed the United States Satellite Broadcasting Company in 1981, becoming one of the first proponents of Direct Broadcast Satellite. Mr. Hubbard was honored with the Arthur C. Clarke Award given by the Satellite Broadcasting and Communications Association, in February 1994. Mr. Hubbard is the only recipient of the award, other than Arthur C. Clarke himself, and was awarded this honor for his pioneering work in the direct broadcast field. In 1995, Mr. Hubbard was awarded (jointly with his father, Stanley E. Hubbard) the NAB Distinguished Service Award.

Mr. Hubbard holds a bachelor's degree in sociology from the University of Minnesota.

Robert L. Johnson

Robert L. Johnson is founder and CEO of Black Entertainment Television (BET), the Nation's first and only black-owned cable network. Prior to founding BET, Mr. Johnson served as vice president of government relations for the National Cable Television Association (NCTA), a trade association representing more than 15,000 cable television companies. Before joining the NCTA, Mr. Johnson was press secretary for the Honorable Walter E. Fauntroy, congressional delegate from the District of Columbia.

Mr. Johnson is a graduate of the University of Illinois and holds a master's degree in public affairs from the Woodrow Wilson School of Public and International Affairs at Princeton University. Mr. Johnson serves on the boards of the Liberty Media Corporation, Hilton Hotels Corporation, the National Cable Television Association's Academy of Cable Programming, American Film Institute, National Park Foundation, and The Advertising Council.

Robert E. Kahn

Robert E. Kahn, Ph.D., is president and CEO of the Corporation for National Research Initiatives (CNRI), which he founded in 1986 after a 13-year term at the Advanced Research Projects Agency (ARPA). CNRI was created as a nonprofit organization to provide leadership and funding for research and development on the national information infrastructure.

Dr. Kahn was responsible for the system design of ARPANET, the world's first packet-switched network, and was a co-creator of the TCP/IP Protocol, which formed the basis of the Internet. He is a member of the National Academy of

Engineering, a fellow of the IEEE and AAAI, and recipient of numerous awards. Dr. Kahn has a bachelor's degree in electrical engineering from the City College of New York and master's and doctorate degrees in electrical engineering from Princeton University.

Deborah Kaplan

Deborah Kaplan is vice president of the World Institute on Disability, where she oversees agencywide program management and represents the agency in public forums. She is the director of the Division on Technology Policy and has advised the National Council on Disability on policy issues. She is treasurer and co-founder of the Alliance for Public Technology, which has the mission of promoting the benefits of the Information Age for all segments of society. She is a past member of the Commission on Mental and Physical Disability Law of the American Bar Association, and president of the board of the Oakland-based Center for Urban Family Life.

Ms. Kaplan founded the Disability Rights Center in Washington, D.C., in 1976 and served as its executive director for 4 years. She worked as staff attorney for the Disability Rights Education and Defense Fund and served as chairperson of the California State Council on Developmental Disabilities.

Deborah Kaplan holds a law degree from Boalt Hall Law School in Berkeley, California.

Delano E. Lewis

Delano E. Lewis is president and chief executive officer of National Public Radio (NPR), the leading public provider of high-quality news, information, and cultural programming worldwide. Lewis joined NPR as its president and CEO in January 1994. Previously, he was CEO of C&P Telephone, a subsidiary of Bell Atlantic Corporation, where he served for 20 years.

Mr. Lewis serves on the board of directors of Colgate-Palmolive, the Chase Manhattan Corporation, the Greater Washington Board of Trade, Guest Services, Inc., Apple Computer, Inc., Black Entertainment Television, and GEICO. He is a former chairman of the board of the Eugene and Agnes Meyer Foundation, a major philanthropic organization in the Nation's capital.

Mr. Lewis received a bachelor's degree in political science and history from the University of Kansas and was awarded a Juris Doctor from Washburn School of Law.

Alex J. Mandl

Alex J. Mandl is executive vice president of AT&T and CEO of the Communications Services Group. He heads AT&T's core long-distance services business, wireless services, online services, multimedia services, and credit cards. He has also been named president and chief operating officer-designate of AT&T, and will assume that position when the company completes its restructuring. Mr.

Mandl was previously AT&T's chief financial officer and group executive, where he directed AT&T's financial strategy, policy, and operations. Prior to joining AT&T in 1991, Mr. Mandl was chairman and CEO of Sea-Land Service, Inc., the world's leading ocean transportation and distribution services company.

Mr. Mandl is a member of the Global Business Management Council and serves on the boards of the Warner-Lambert Company, Carnegie Hall, the Museum of Television & Radio, the Walter A. Haas School of Business (University of California at Berkeley), and Willamette University. He holds a bachelor's degree in economics from Willamette University and a master's degree in business administration from the University of California at Berkeley.

Edward R. McCracken

Edward R. McCracken is chairman and chief executive officer of Silicon Graphics, Inc., the world's leading supplier of visual-computing solutions with its family of high-performance computer workstations and servers. He joined the company in 1984, as president and chief executive officer following a 16-year career at Hewlett-Packard. Since then, Silicon Graphics revenues have grown from $5 million to more than $2 billion.

Mr. McCracken earned a B.S. degree in electrical engineering from Iowa State University in 1966 and an M.B.A. from Stanford University in 1968. He then joined Hewlett-Packard as a product manager and taught systems software for employees and customers.

In 1995, he was awarded the National Medal of Technology by President Clinton and received honorary degrees from Santa Clara University and the University of Maryland.

He is a member of the board of directors of National Semiconductor Corporation, Tularik, Inc., a privately held biotechnology company, Acumen International, a privately held management-consulting company, and PRASAD America, a charitable foundation that supports medical care in less-developed countries.

Nathan Myhrvold

Nathan Myhrvold, Ph.D., is group vice president of the Applications and Content group at Microsoft Corporation and reports to CEO Bill Gates as a member of the Office of the President. The Applications and Content group comprises a number of Microsoft divisions, including Desktop Applications, Desktop Finance, Consumer, Research, and Microsoft Online Systems. Prior to this position, Dr. Myhrvold was senior vice president of Microsoft's Advanced Technology Division, responsible for advanced product development in areas such as Interactive Television (ITV), advanced graphics, and new forms of consumer computing. He also founded, and continues to manage, Microsoft Research—a research lab dedicated to creating new technology in support of the company's vision for the evolution of personal computing.

Dr. Myhrvold joined Microsoft in 1986, after serving as CEO of Dynamical Systems, a Berkeley, California, software company he founded. Prior to Dynamical Systems, Dr. Myhrvold worked on research in cosmology and quantum theories of gravitation at Cambridge University.

Dr. Myhrvold holds a bachelor and master's degree from the University of California and a master's degree in mathematical economics and doctorate in theoretical mathematical physics from Princeton University.

N.M. Norton, Jr.

N.M. Norton, Jr., is a partner in the law firm of Wright, Lindsey & Jennings and is chairman of the firm's commercial litigation department and a member of its executive committee. Mr. Norton focuses his practice on public utilities, commercial and government litigation, and administrative and regulatory matters, including environmental issues. Mr. Norton was admitted to practice in 1974, and served with the U.S. Department of Justice, the Arkansas Attorney General, and as chairman of the Arkansas Public Service Commission before entering private practice in 1983.

Mr. Norton received his bachelor's degree in political science from Westminster College and a Juris Doctorate from the University of Arkansas.

Vance K. Opperman

Vance K. Opperman is president of West Publishing, the leading information provider in computer-assisted legal research, CD-ROM, floppy disks, high school and college textbooks, and legal publications. Mr. Opperman is the founder and former senior partner of Opperman, Heins & Paquin, a position he held until becoming president of West in August 1993. The *National Law Journal* named Mr. Opperman one of the 100 Most Influential Lawyers in America in 1991. He was also named one of the top 25 "winningest" litigators by *Minnesota Lawyer* in 1991, and one of the Nation's top litigators by the *National Law Journal* in 1992. Mr. Opperman received his Juris Doctor from the University of Minnesota Law School in 1969. Mr. Opperman is a fellow of the American Bar Association, a life member of the American Law Institute and a member of the board of directors of the University of Minnesota Law School Alumni Association.

Mr. Opperman serves on a number of industry and trade association boards of directors, including the Association of American Publishers, the Information Industry Association, the Minnesota Government Information Access Council, the Minnesota High Technology Council and the Minnesota Business Partnership. He is the co-chair of the International Telecommunications Union 1998 Plenipotentiary Conference.

Jane Smith Patterson

Jane Smith Patterson is adviser to the Governor for Policy, Budget and Technology for the State of North Carolina. She is responsible for the management of policy issues, policy oversight for budget issues, and State planning and develop-

ment of technology policy and deployment strategies. Prior to her current post, Ms. Patterson was vice chancellor for Public Service and Extended Education for the University of North Carolina and Wilmington and vice president of IIT Telecom Network Systems Division. Ms. Patterson also served as secretary of administration for the State of North Carolina.

Ms. Patterson holds a bachelor's degree in political science from the University of North Carolina at Chapel Hill, has completed certificate programs at both the University of North Carolina School of Business and the John F. Kennedy School of Government Executives Program at Harvard University, and is currently completing her thesis requirement for a master's degree in liberal studies from North Carolina State University Graduate School focusing on information infrastructure solutions.

Frances W. Preston

Frances W. Preston is president and chief executive officer of BMI (Broadcast Music, Inc.) a music performing rights organization representing more than 170,000 songwriters, composers, and music publishers. In addition to serving on the BMI board of directors, Ms. Preston is a member of the executive bureau of CISAC (the International Conference of Performing Rights Societies), the boards of directors of the Rhythm and Blues Foundation, Country Music Association, National Association of Popular Music, Rock and Roll Hall of Fame, Gospel Music Association, Peabody Awards for Excellence in Broadcasting, and the President's Advisory Council of the National Academy of Recording Arts and Sciences.

For her years of service to the music industry and her commitment to charitable causes, Ms. Preston has received numerous honors: Friars Foundation Lifetime Achievement Award, Foundation for a Creative America's Lifetime Achievement Award, and American Women in Radio and Television Outstanding Achievement Award. Vanderbilt University recently established the Frances Williams Preston Laboratories at the Vanderbilt Cancer Center. Currently, Ms. Preston serves on the board of the Vanderbilt Medical Center and is president of the T.J. Martell Foundation's board for Leukemia, Cancer and AIDS Research. She has received honorary degrees from the Berklee School of Music, Boston, Massachusetts, and Lincoln College, Lincoln, Illinois.

Ms. Preston previously served as a member of the Commission for the White House Record Library and President Carter's Panama Treaty Study Committee.

Bert C. Roberts, Jr.

Bert C. Roberts, Jr., is chairman and chief executive officer of MCI Communications Corporation. Mr. Roberts became CEO in 1991 after serving as president and chief operating officer with the company since 1985. Mr. Roberts began his career in 1960 at Westinghouse Electric Corporation and was with Leasco Response Inc., a computer time-sharing firm, from 1969 until he joined MCI in 1972.

Mr. Roberts serves on the boards of BT (British Telecommunications, plc), the News Corporation, Ltd., Avantel, S.A., Georgetown University, the National Association of Securities Dealers, Inc., CaP CURE, and the National Alliance of Business (NAB). Mr. Roberts served as the chairman of NAB during 1994-1995. He is a member of the Business Roundtable, the Conference Board, and the President's National Security Telecommunications Advisory Council. Mr. Roberts attended Johns Hopkins University in Baltimore, earning his bachelor of science degree in electrical engineering.

John Sculley

John Sculley built his reputation in marketing while he was president and CEO of Pepsi for 5 years prior to joining Apple and held marketing and management positions with the soft drink giant for 16 years. During his stewardship of Pepsi, the company enjoyed great marketing success, ultimately passing Coca Cola as No. 1 in market share in the United States as measured by AC Nielsen. He was selected as Beverage Industry Man of the Year.

In Silicon Valley, Mr. Sculley is best known for bringing big brand marketing to the personal computer industry in the early 1980s. He was voted Advertising Man of the Year by both *Advertising Age* and *Adweek* magazines. He was also chosen CEO of the Decade for Marketing by the Financial News Network, and in 1992 *Financial World* selected Mr. Sculley and IBM's President as "Men of the Year." By the end of 1992, Apple had also achieved a No. 1 market share position in the personal computer industry. Apple's 1984 commercial introducing the Macintosh was selected as TV Commercial of the Decade by *Advertising Age*. Apple was also given special recognition in 1988 for best advertising and marketing for any consumer products company for the previous 5 years.

Mr. Sculley graduated from Brown University where he studied architectural design and earned an MBA from the Wharton Business School. He holds 10 doctorate honoris causa from various universities including the Rhode Island School of Design, The Johns Hopkins University, the Royal College of Art, and the University of Genoa.

Joan H. Smith

Joan H. Smith is chairman of the Oregon Public Utility Commission. Prior to that post she was assistant to Portland Commissioner, Mike Lindberg, and staff aide to Governor Neil Goldschmidt. Ms. Smith is a member of the NARUC Committee on Communications, Western Conference of Public Service Commissioners Committee on Gas, and chair of the US WEST Regional Oversight Committee.

Ms. Smith earned a bachelor's degree, magna cum laude, and a master's degree from Duke University in Durham, North Carolina, as a Woodrow Wilson fellow.

Raymond W. Smith

Raymond W. Smith became chairman and chief executive officer of Bell Atlantic in 1989, after holding positions of president and vice chairman within the

organization. He joined the Bell System in Pennsylvania in 1959, holding such positions as director of finance and budget and gaining expertise in operations, engineering, and external affairs, before becoming president of Bell of Pennsylvania in 1983. Mr. Smith also serves on advisory boards of the House of Representatives for Renewing U.S. Science Policy, the Business Roundtable, and the Library of Congress. He is a member of the National Information Infrastructure Advisory Council, which is advising the U.S. Commerce Department on telecommunication policy, and was appointed to the President's Committee on the Arts and Humanities by President Clinton in 1995.

Long a supporter of civil rights and equal opportunity, Mr. Smith was the first recipient of the National Association of Black Telecommunications Professionals' Mickey Leland Award for Diversity in Telecommunications. He is also known as a writer, playwright, and theatrical director. Mr. Smith holds degrees from Carnegie Mellon University, an M.B.A. from the University of Pittsburgh, and has received a number of honorary doctoral degrees, most recently from Temple University and Stevens Institute of Technology.

Al Teller

Al Teller's pure love of music, combined with his background in business, global marketing and engineering, has made him a leader in the entertainment field. An active advocate for copyright legislation, Mr. Teller has testified before Congress on behalf of American recording artists, musicians, and record companies in support of pending legislation. In his position as chairman and CEO of the MCA Music Entertainment Group, Mr. Teller was instrumental in the global expansion of MCA's music companies. He has also been recognized as a leader in the development and implementation of music and other entertainment products in interactive and other new media.

Mr. Teller holds a B.S. from Columbia University and an M.B.A. from Harvard Business School.

Laurence A. Tisch

Laurence A. Tisch is former chairman and CEO of CBS Inc. and is chairman of the board and co-CEO of the Loews Corporation. He currently serves as chairman of the board of directors of CNA Financial Corporation and as chairman of the board of trustees of New York University.

Mr. Tisch received a bachelor of science degree from New York University. In addition, he holds a master's degree in industrial engineering from the University of Pennsylvania and attended the Harvard Law School. In April 1994, he received an Honorary Degree of Doctor of Laws from Skidmore College.

Jack Valenti

Jack Valenti is president and CEO of the Motion Picture Association of America where he has presided over a worldwide sea change in the film industry.

Mr. Valenti has led several lives: wartime bomber pilot decorated with the Distinguished Flying Cross, advertising agency founder, Special Assistant to President Lyndon Johnson, and author of four books. Mr. Valenti's most recent book, a political novel entitled *Protect and Defend*, was published in 1992.

He earned a B.A. from the University of Houston and an M.B.A. from Harvard University.

appendix C
Council Meetings, Outreach, and Research

During the course of its 2 years of work and deliberations, the Council employed several mechanisms to ensure that its decisions were based on sound and timely information and that all dimensions of topics of its study would be considered. The principal mechanisms were Council, MegaProject, and staff meetings, outreach, and research activities.

Council work and deliberations and its outreach and research activities were directed toward illuminating issues in its principal areas of interest regarding the Information Superhighway:

Key Areas of American Life and Work

- Electronic Commerce
- Education and Lifelong Learning
- Emergency Management and Public Safety
- Health
- Government Information and Services

Access

- Universal Access and Services

Rules of the Road

- Intellectual Property
- Privacy and Security

COUNCIL MEETINGS

The Council met 14 times in various parts of the country to frame and discuss issues, hear presentations by representatives of groups and industries, receive comments from the public, and direct its MegaProjects and staff in the development of draft Principles, Action Recommendations, and report material (See box for dates and locations of all Council meetings.)

The Council sought to make itself and its meetings accessible to the public: notices were published in the *Federal Register*, meetings were open to the public, the public was afforded the opportunity to offer comments to the Council at each Council meeting.

OUTREACH ACTIVITIES

Throughout its life, the Council made efforts to seek out advice on specific issues from experts around the country. The Council sponsored a summit on Lifelong Learning & the NII on November 18-20, 1994, to bring together experts from K-12 and higher education as well as research groups working on the issue of using technology to improve learning. Participants included teachers, principals, administrators, and other practitioners as well as top researchers from around

Council Meetings

The full list of Council meetings follows:

- February 10, 1994
  Washington, DC
- March 18, 1994
  Washington, DC
- April 25, 1994
  Washington, DC
- June 20, 1994
  Minneapolis, MN
- September 13, 1994
  New York, NY
- October 19, 1994
  Mountain View, CA
- December 6, 1994
  Washington, DC
- January 26, 1995
  Cary, NC
- March 10, 1995
  Universal City, CA
- April 12, 1995
  Santa Fe, NM
- June 13, 1995
  Washington, DC
- August 9, 1995
  Seattle, WA
- October 10-11, 1995
  Pittsburgh, PA
- December 12-13, 1995
  Washington, DC

the country. Their insights and commentary informed the Council's later formation of principles and action recommendations on lifelong learning and education, as well as its KickStart Initiative.

The Council decided at its December 1994 meeting to conduct a formal outreach campaign to provide individuals and groups the opportunity to share their views with the Council as it developed recommendations for its final report. At the Council's January 1995 meeting, the Co-Chairs established an Outreach Task Force to develop and implement a work plan; all Council members were encouraged to offer staff with related experience to serve on the task force.

As its first official event, the task force chose an outreach panel for the March 1995 Council meeting in Los Angeles. The panel consisted of representatives of the Urban League, LatinoNet, Los Angeles FreeNet, Warner Bros. Studios, and the American Association of Retired Persons. Panelists offered their views on the impact of the Information Superhighway on their constituents.

In March 1995, the Council also distributed 1,500 copies of its first report, *Common Ground: Fundamental Principles for the National Information Infrastructure*, to registered attendees at a conference on people with disabilities and computer technology. The Council subsequently distributed about 10,000 copies of this report across the country.

At its April 1995 meeting in Santa Fe, New Mexico, the Council heard a panel that focused on the multicultural and rural communities. Panelists included a former Governor of New Mexico, a registered nurse and professor, a city council member, and a representative of a Native American Tribe. The Council also had presentations from Educational and Corporate Technologies, Inc. of Riverside, California; and from the Clark County Public Education Foundation of Nevada. Both presentations covered getting school districts as well as other community groups linked together via the Information Superhighway.

In May 1995, the U.S. National Commission on Libraries and Information Sciences presented study findings about public library use of computer networks and the Internet to the Council.

Two panels, both moderated by Council member N.M. Norton, Jr., were held at the meeting on "Internet and the National Information Infrastructure: Policy Development." The meeting, hosted by the University of Arkansas at the University in Fayetteville on May 22, 1995, was designed to provide a public forum and panel discussions covering a variety of legal, technical, practical, and philosophical issues surrounding development of the Information Superhighway. One panel, considering Universal Service, consisted of representatives of State utility companies, the State Senate, the Arkansas Public Service Commission, and the public school network. The other panel, of leaders from the legal profession, discussed Privacy, Security, and Intellectual Property.

The Council presented an outreach panel discussion at the annual MIDnet (Global Internet Access, Inc.) membership conference in Kansas City, Missouri, in June 1995. A panel of Internet service providers and a librarian from the Univer-

sity of Nebraska discussed Privacy, Security, and Intellectual Property and the Information Superhighway. The conference was attended by Internet service providers and university representatives from the seven States served by MIDnet.

The Council's June 1995 meeting featured a public forum on KickStart, the Council's plan to encourage communities across the country to use schools, libraries, and community centers as points of access to the Information Superhighway. Three speakers representing schools, libraries, and community centers joined a local public broadcasting host in a discussion of the benefits of and obstacles to the KickStart concept. In addition, a presentation was made by the Commission on Information Technologies of the National Association of State Universities and Land-Grant Colleges about the role of higher education in realizing the potential of the Information Superhighway, particularly in linking K-12 schools, other community groups, and universities.

In Seattle, Washington, on August 8, 1995, presentations were made to the Advisory Council about two county and regional networks: Lane Education Network of Eugene, Oregon; and TINCAN, the Inland Northwest Community Access Network of Spokane, Washington. The Lane County Network presentations were made by representatives of the University of Oregon-Eugene, the Springfield Public School District in Eugene, and the City of Eugene.

Finally, in Pittsburgh, Pennsylvania, on October 10, 1995, a library panel presented its views on the role of libraries in providing information connectivity and broad public access in the information age. The panel provided the Council the opportunity to learn about the roles libraries play in society and highlighted the actions these institutions have already taken to enter the networked age. It also provided valuable context for the Council's deliberations on the KickStart Initiative. The panel was moderated by the executive director of the Carnegie Library in Pittsburgh. Presenters on this panel represented Westmont Hilltop School District; Chestnut Ridge School District; the University of Pittsburgh's University Library System; Online Computer Library Center, Inc. (OCLC); Enoch Pratt Library, Baltimore; Maryland's SAILOR Project; and the American Library Association.

RESEARCH

The Council, through its MegaProjects, reviewed and conducted research in their areas of focus. For example, the MegaProject on Access, conducted extensive research of primary and secondary source materials to establish baseline data on the nature and extent of access to the Information Superhighway technologies and equipment. Their "environmental scan" developed data on the availability of individual technologies and equipment in American households, in public schools, in libraries, and to persons with disabilities. The Council also examined the current availability of online services, the rate of deployment of telecommunications network technologies such as fiber optics, and related cost data.

In support of the Council's research efforts, the international management consulting firm of McKinsey & Co. conducted research on the costs of connecting schools to the Information Superhighway by the year 2000. McKinsey provided

its services on a pro bono basis. Its report, *Connecting K-12 Schools to the Information Superhighway*, constituted an important input in the Council's volume, *KickStart Initiative: Connecting America's Communities to the Information Superhighway*.

The Council also conducted research on issues related to intellectual property, privacy, and security. They also had discussions with the commissioner of Patents and Trademarks and several experts on privacy.

CO-SPONSORED HEARINGS WITH THE ADMINISTRATION'S INFORMATION INFRASTRUCTURE TASK FORCE

The Council, through its MegaProject on Intellectual Property, Privacy, and Security, together with the Administration's Information Infrastructure Task Force (IITF), sponsored a series of hearings to solicit public input on a number of specific issues associated with the Information Superhighway.

- A hearing on July 15, 1994, in Washington, DC, addressed the diverse security needs of users of the Information Superhighway.
- A hearing on October 18, 1994, in Mountain View, California, focused on the intellectual property rights implications of the Information Superhighway for the entertainment, software, and publishing industries.
- Hearings on December 7, 1994, in Washington, DC, considered issues regarding: (1) ensuring the integrity of proprietary information and liability for compromised information in the finance and insurance industry sectors; and (2) the confidentiality and integrity of personal information in the health and education sectors.
- On January 27, 1995, the Council and the IITF held a hearing in Raleigh, North Carolina, on security for the delivery of government services, including the confidentiality of personal information and the availability of government information in government-to-citizen transactions, such as welfare payments and electronic tax filing. The hearing also addressed the security of trade and transportation information, focusing on the integrity and confidentiality of tracking, scheduling, and billing information in the commercial, transportation, and utility sectors.
- A hearing on March 28, 1995, in Washington, DC, addressed security concerns related to the public switched network and the Internet.

USE OF ELECTRONIC NETWORKS

At its April 1995 meeting, the Council approved establishment of a World Wide Web server to house all published Council work products. The Council posted its mandate on the Internet (http://www.niiac-info.org/~niiac/) and updated this posting with information about its work and products.

appendix D
Acknowledgments

The work of the Council lasted more than 2 years, covered a broad range of diverse and complicated subjects, and required the assistance of many people. The Council wishes to thank all of those people across the country who participated in this undertaking in some way. Without their help, the Council could not have completed its assignment as expeditiously as it did.

In particular, the Council thanks Secretary of Commerce Ron Brown for his unwavering support for and interest in the work of the Council. We also thank the many members of the Department of Commerce who assisted, as well as other members of the Executive Branch, whom we list below.

The Council also thanks the members of the Council whose companies and organizations made staff members available to work on this project, and in many cases also provided financial or in-kind resources to support the work of the Council. Several members were particularly helpful in planning, coordinating, and supporting Council meetings held in various parts of the country. Staff members who participated in the work of the Council are listed below.

Finally, the Council thanks the many people who came forward with suggestions and comments about the best approaches to developing the Information Superhighway. These people provided the information for Success Stories and other elements of the Council's companion volume, *KickStart Initiative: Connecting America's Communities to the Information Superhighway.* They included many people who represent key stakeholders in the development of the Superhighway—the educators, librarians, community center directors, local government officials, and business leaders. It is appropriate that the Council end its Acknowledgments with a final thanks to them.

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appendix E
Letters to the Administration

December 6, 1994
The Honorable Ron Brown
Secretary
U.S. Department of Commerce
14th & Constitution Ave., N.W.
Washington, D.C. 20240

Dear Secretary Brown:

On behalf of the National Information Infrastructure Advisory Council (NIIAC), this letter responds to your October 14 request to assess the Administration's National Information Infrastructure (NII) activities to date. Specifically, the NIIAC was asked to identify:

- those areas in which the Administration has made noteworthy progress; and
- any changes to the Administration's direction or priorities.

NOTEWORTHY PROGRESS—

The Administration's NII efforts have been noteworthy in many important respects.

- Leadership—By personally devoting the time and energy necessary to raise the visibility and discuss the importance of the NII, you and the Vice President have elevated the NII to a priority both for the Administration and the American public. Your leadership has helped to increase the media's awareness of and attention to NII related issues.
- Vision—The Administration has successfully underscored the link between the NII, U.S. competitiveness, economic growth and jobs. YOU have also done a great deal to show how the NII has the potential to deliver applications with social benefits in areas such as education, healthcare and government services.
- National Goals—The Council strongly believes that articulating national NII goals and challenges is critical. To that end, the Council supports the Administration's goal of linking every classroom, library, hospital and clinic to the NII by the year 2000.
- Competition and Deregulation—Your attempts to move toward domestic telecommunications competition and deregulation have been a very significant contribution to the NII debate. In our view, the general direction you are advocating will continue to increase private sector investment in the National Information Infrastructure.

- Significant Issues—The Administration has shown a willingness to confront the challenging issues to accelerate the deployment of the NII. In fact, we commend the Administration's bold leadership in offering its own proposals in these challenging areas, such as telecommunications, privacy, intellectual property, and security.

  While the Council has not completed its substantive analyses of these proposals, the Council believes the Administration has made a major and significant contribution to the NII debate by moving these issues forward.

- Government as a Technology User—Your Administration has found innovative ways to use NII technology to improve the functioning of government. Key examples of this include:

  - The White House World-Wide-Web Server;
  - The IITF Bulletin Board;
  - "Virtual Conferences";
  - Electronic Distribution of Government Documents; and
  - A myriad of new government uses of information technology, as recommended in the National Performance Review.

- Global Leadership—Together, both you and the Vice President have been instrumental in putting the Global Information Infrastructure (GII) on the international agenda. The NII is ultimately a global issue and we commend you for having the vision and commitment to successfully create an exciting international dialogue on this critical subject and the related policy issues.

NEW "DIRECTIONS AND PRIORITIES"—

We would like to suggest the following ways in which the directions and priorities of the Administration's efforts might be enhanced in 1995:

- Stimulate Competition and Speed Deregulation—The Administration should continue its efforts to get domestic telecommunications competition and deregulation legislation through the Congress. In that context, the Administration should work closely with Congress to achieve the objectives of increased competition, diversity of ownership, the establishment of regulatory parity, open access and continued deployment of an advanced infrastructure.

- Enhance Public Awareness Campaign—The degree to which the public understands and supports the NII will be critical over the next two years. The Administration must place a much higher priority on finding ways to communicate effectively the benefits of the NII to the average American. This might include the potential impact of the NII on jobs, lifelong learning, health, and public safety. This will require as much effort in a public education campaign as the Administration has put into various aspects of its public policy agenda. Once such a public education campaign is designed, the Advisory Council would be

pleased to comment on it. Members of the Council also look forward to finding ways that they could participate and be supportive of such a campaign.

We hope the Administration will work jointly with the Advisory Council on the "stakeholder outreach" part of the Council's work. The public education materials that the Administration develops could be helpful in this phase of the Council's work.

- Protect Intellectual Property—The Administration has made its intellectual property agenda a high priority. The Council is still considering its specific substantive recommendations in this area. However, the Council believes that for the NII to succeed, intellectual property must be protected and should therefore be a high priority.

  Once the Administration completes the process of reviewing the existing intellectual property laws, the Administration should actively pursue any legislative measures that may be necessary to adapt those laws to the NII to ensure the protection of intellectual property.

- Overcome Hurdles to Applications—While specific application areas are being highlighted by the Administration and the Advisory Council, not enough is being done to identify the public policy hurdles to their implementation and to develop plans to address those barriers. The Administration should work collaboratively with industry to bring together "stakeholder" panels (including state and local government officials) in application areas to recommend specific actions and timetables that could accelerate implementation of key applications. This discussion should also focus on whether the separate applications are working together closely enough and leveraging their common strengths.

- Incorporate State and Local Perspectives—Much of the NII is happening at a local grassroots level. The Administration must not turn the NII into largely a federal enterprise when it is in reality, a tapestry of thousands of local and state efforts. More work needs to be done in both acknowledging and working with the outstanding state and local efforts currently supporting the development of the NII. Information gleaned from the state and local levels could serve to augment the Administration's NII efforts. Programs at the state and local level could also be evaluated as testbeds and models for emerging best practices for delivering government services and enhancing access to government information. The federal government could also publicize the "best practices" of state and local efforts so they can be emulated around the country.

- Evaluate Costs and Financing—The Council feels strongly that the Administration needs to place a much higher priority on the real costs of various aspects of their NII proposals. In addition, it must place more emphasis on developing appropriate proposals for funding.

- Establish Goals and Deadlines—The establishment of time deadlines or calendar goals for certain aspects of the NII can help galvanize public

support for its implementation. The Vice President's goal of connecting schools, libraries, hospitals and clinics by the year 2000 is an outstanding example of this. We would recommend that the Administration build a consensus and propose funding mechanisms to achieve this goal.

The Administration should also consider whether there are additional aspects of its NII work that will lend themselves to such goals and deadlines. Otherwise, affected communities may feel general intentions do not translate into concrete action. For example, while the Administration has rhetorically supported progress related to the NII and disabilities, it would be more helpful to have specific timetables whereby specific milestones, (e.g., significant R&D on access barriers related to disability) could be completed.

- Build Consensus Between Industry and the Public Interest—While the Administration has consulted with many outside groups, in many instances consultation has not been adequate. Some areas require actual consensus building between government and stakeholder groups.

  For example, privacy and security is one area in which the Administration needs to work towards building real consensus with the private sector, and may need to bring the international community into these discussions.

  The GII is another area in which additional consensus building is needed between the Administration and stakeholder groups. Our Advisory Council would like to take a more active role in working with the Administration on the GII issue. The Administration should also reach out to the public interest sector on the GII. There are public interest groups functioning at the international level that can be helpful in this regard.

- Human Resources and the NII—We recommend that the Administration place a high priority on the human resource impacts of the NII. We also hope the Administration will explore the degree to which worker training and lifelong learning will be needed to support its development.

- Integrate Technology and Public Policy Perspectives—Where possible, public policy perspectives and technological perspectives should be integrated. The IITF and all of its subcommittees and working groups should work toward bringing a technological perspective to as wide a range of NII public policy issues as possible.

  More reliance should be placed on private sector technological expertise. It will also be important for the government to avoid choosing amongst or favoring specific competitive technical solutions to realizing the NII.

- Address Liability Issues—The Administration has already addressed several key issues that could represent significant challenges to NII implementation if not addressed. One additional such area is liability. Certainty with respect to liability may be an incentive to private sector

investment in the NII. Therefore, the Administration should analyze the issue of liability and make recommendations.

CONCLUSION—

We hope these observations and suggestions are taken in the context of our strong endorsement of the Administration's outstanding record on the NII. Your national and international leadership and vision have been an outstanding contribution to progress of the NII to improve our quality of life at home, work and in our schools. We are glad to be given the opportunity to offer our comments to you as you formulate your NII priorities for 1995.

In summation, we applaud you and your track record in moving the NII forward. We are available to elaborate on any of these items in more detail. We commend you for the noteworthy progress you have made to date and look forward to working with you in the months ahead. We hope you will call upon us.

Sincerely,

Delano E. Lewis
Co-Chair, NII Advisory Council

Edward R. McCracken
Co-Chair, NII Advisory Council

December 6, 1994

The Honorable Ronald H. Brown
Secretary of Commerce
14th and Constitution, N.W.
Washington, DC 20230

Dear Secretary Brown:

We understand that you will be heading the U.S. Delegation to the upcoming G-7 Conference in Brussels, which will address the emerging Global Information Infrastructure ("GII"). On behalf of the National Information Infrastructure Advisory Council, we are writing to provide you with the recommendations of the Advisory Council concerning the issues to be addressed at the G-7 Conference.

We believe that the Administration has laid an important foundation in articulating its basic vision of the GII and challenging the world community to join in the development of the GII. Of course, the process of developing an international consensus on the GII will require resolution of a number of significant issues, and the G-7 Conference represents only an early phase of that process. In addition, we believe that the successful development of the GII will depend on the active participation of U.S. private industry and closer consultation between private industry and the Administration. We are confident, however, that the collaborative efforts of industry and government will ultimately prove successful.

As you know, the Advisory Council has been actively engaged in assessing a range of legal, technological, and social issues associated with the development of the National Information Infrastructure ("NII"). After considerable deliberation and debate, the Advisory Council has adopted fundamental principles concerning intellectual property, electronic commerce, and lifelong learning. We will provide you with these principles shortly, and we will forward principles addressing access, privacy and security, and overall issues once the Council completes them. While some of these principles may be most applicable in the context of the NII, we believe that the objective and spirit of the principles may also be applied in the GII environment.

The Advisory Council recognizes that many countries have distinct legal, cultural, and social traditions that affect how the GII may be implemented. The preservation of distinct cultures and national sovereignty are important for all nations; and the GII must accommodate these considerations. However, while there is unlikely to be a common approach to implementing the GII, the Council believes that it is appropriate for the Administration to pursue a consensus among the G-7 nations on GII goals and to work toward agreement and measurable progress in achieving those goals.

The Advisory Council commends the Administration's leadership in identifying five basic principles for the GII. The Advisory Council agrees that the keys to the successful development of the GII are private investment and competition.

Complementing these two building block principles is the need for a flexible regulatory environment that permits private enterprise to flourish while protecting the public interest. Open access for information providers is also essential to the development of the GII. Finally, while we recognize that universal service may be a desirable long-term goal, its attainment must remain subject to the resources and priorities of each country.

In your discussions with the leaders of the other G-7 member countries, the Advisory council also believes that the following specific matters warrant special emphasis:

- National markets should be internally competitive and open to foreign competition. This is a "First Principle" which all global markets should honor.
- Intellectual property rights on the GII must be ensured.
- The United States should pursue technology trials that are jointly supported by the participating nations and that explore pre-competitive GII technologies.
- The harmonization of laws and regulations consistent with the United States' national interest is essential to the successful development of the GII.
- The United States should promote the goal of interoperability among national information infrastructures.
- The United States should seek to promote the development of the GII through every means possible, including multilateral, bilateral, and, in certain instances, unilateral means.

National markets should be internally competitive and open to foreign competition. This is a "First Principle" which all global markets should honor. The building block principles of private investment and competition should apply to national markets as well as to international markets. The telecommunications and computer revolution in the United States over the past twenty-five years is traceable to the adoption of policies aimed at promoting competition and private investment. The Advisory Council believes that other countries will realize similar benefits by taking steps to promote competition and private investment within their domestic markets. Moreover, progress in the development of the GII will depend on the extent to which markets are open to competition. We also believe that procurement decisions should be open, transparent, pro-competitive, non-discriminatory, and based solely on reasonable business decisions and sound commercial principles.

To the extent there are limitations on market access derived from cultural or other domestic public interest considerations, the G-7 member countries should pursue ways to accommodate their concerns without merely denying foreign access to national markets. Because of the substantial transmission capacity that the GII is expected to offer, a country might reserve a reasonable portion of its overall total capacity for indigenous or other public interest programming,

without effectively denying access to their market to foreign program producers and providers by, for instance, applying these restrictions to individual channels.

Intellectual property rights on the GII must be ensured. In an electronic environment offering instant, worldwide communication, the rights of those who own, create, or contribute to intellectual property must be respected and preserved. It is essential to provide meaningful incentives for the creation and dissemination of works in the GII, while ensuring adequate access to and appropriate privileges of use of those works.

Complementing the legal recognition of intellectual property rights in the GII is the practical need for technical mechanisms to control the use of protected works. Enforcement of intellectual property interests will continue to occur primarily through private means, and the GII will need to offer rights owners the technical means of controlling the exploitation of their works.

The United States should pursue technology trials that are jointly supported by the participating nations and that explore pre-competitive GII technologies. While public policy is important to the development of the GII, the adoption of technology will ultimately determine how the GII actually develops. Just as domestic U.S. technology trials have offered invaluable experience with basic NII technologies, the United States should pursue cooperative test-bed ventures with its trading partners. The Council believes that such joint technology trials should focus on innovative applications, such as environmental, educational, library, and electronic commerce applications, should be supported by the participating nations, and should explore pre-competitive technologies.

The harmonization of laws and regulations consistent with the United States' national interest is essential to the successful development of the GII. Part of the promise of the GII is its potential capability to enable individuals to share in the diversity of cultures, traditions, and viewpoints around the world. To realize this potential, however, the GII will have to accommodate a variety of legal and social structures. Part of the process will involve efforts to develop common approaches to legal and technological issues. Where agreement on specific approaches to implementing the GII is not achievable, however, the United States should work towards agreement on approaches that are consistent with the national interests of the United States.

The United States should promote the goal of interoperability among national information infrastructures. Because of the unique legal, cultural, and social traditions of individual G-7 members, it is essential for the United States to stress the goal of achieving interoperability among national information infrastructures. This goal will be accomplished through a variety of means, including primarily through voluntary, industry-led standard setting processes. While the United States and its G-7 partners should support those efforts, the interests of key contributors to the development of the GII must not be sacrificed. Thus, for instance, the goal of interoperability should not be achieved through means that denigrate U.S. intellectual property rights.

The United States should seek to promote the development of the GII through every means possible, including multilateral, bilateral, and, in certain instances, unilateral means. The United States currently seeks to promote its legitimate interests through multilateral, bilateral, and, in certain instances, unilateral means. While agreement on fundamental objectives and approaches to developing the GII will depend on multilateral initiatives, such as the G-7 Conference, there will remain a need to utilize bilateral and, in appropriate circumstances, unilateral measures to achieve specific objectives.

* * *

On behalf of the Advisory Council, we applaud the efforts of you and the Administration in promoting the development of the NII and the GII, and we appreciate the opportunity to offer the Council's views on those matters.

Sincerely,

The National Information Infrastructure Advisory Council

by:

Delano Lewis
Co-Chair

Edward R. McCracken
Co-Chair

December 12, 1994

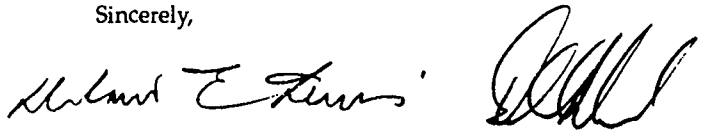
The Honorable Bruce A. Lehman
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks
Department of Commerce
Washington, D.C. 20231

Dear Commissioner Lehman:

On behalf of the National Information Infrastructure Advisory Council, we are enclosing the Council's response to "Intellectual Property and the National Information Infrastructure," the preliminary draft of the report of the Working Group on Intellectual Property Rights.

We recognize and support the important work that you and the Working Group have undertaken. The NII Advisory Council appreciates the opportunity to comment on the Green Paper, and looks forward to hearing a response to the Working Group. We would be pleased to provide further input or participate in discussions on the issues raised.

Sincerely,



Delano E. Lewis
NIIAC Co-Chair

Edward R. McCracken
NIIAC Co-Chair

cc. Secretary Ronald Brown
Sally Katzen

A. General

The members of the National Information Infrastructure Advisory Council commend the July 1994 Preliminary Draft of the Report of the Working Group on Intellectual Property Rights (known as "the Green Paper") as a thoughtful and well-formulated document. The Green Paper is a valuable contribution, providing a good starting point and general framework for an analysis of the copyright issues raised by the NII. Moreover, as described below, the Advisory Council endorses several fundamental principles espoused in the Green Paper as well as a number of its specific recommendations.

Nevertheless, concerns were expressed about a number of issues. A few of the Green Paper's recommendations proved controversial. Members of the Council also identified various issues discussed in the Green Paper that may warrant further exploration, either because the recommendations need clarification as to their rationale or scope, or because other resolutions might be preferable. Finally, several issues not addressed in the Green Paper were identified by individual members as important, including the relationship between copyright and other areas of law.

The majority of the Advisory Council found the Green Paper to reflect a good faith effort to promote the public interest. However, a few members expressed the view that the Green Paper's proposals tip the balance of interests between proprietors and the public interest so as to disfavor the latter.

B. Areas of Agreement

1. Fundamental Principles

The Advisory Council strongly supports the Green Paper's premise that adequate and effective protection of intellectual property is essential in order to develop a successful NII. Unless copyright owners are assured that their rights will be protected, they will not be willing to license their product—without which the NII cannot function at its full potential.

The Council agrees that existing U.S. copyright law applies to uses of works on the NII, and will cover most of the problems that can currently be anticipated. It also agrees that some modifications and clarifications may be advisable in order to ensure adequate and effective protection in the digital environment. Such modifications, however, must not undermine existing rights or established limitations on those rights, such as fair use and the first sale doctrine.

2. Specific Recommendations

The Advisory Council agrees that transmissions and other communications of copyrighted works over the NII should fall within the scope of the copyright owner's exclusive rights. As one member put it, it is important for the copyright owner to enjoy a "seamless web of protection." More controversial are the questions of which existing right is implicated, or whether a new right must be added, and how existing limitations on rights will be incorporated within the digital realm.

As a matter of principle, the Advisory Council supports the grant of a performance right for sound recordings applicable to their transmission or other communication through the NII, other than by conventional broadcasting (whether analog or digital), provided that this new right shall be granted in such a way that it does not derogate from existing rights. The Council takes no position on the specific recommendations included in the Green Paper, insofar as they may relate to the grant of a broader performance right in sound recordings, including its applicability to conventional broadcasting. Some Council members believe that it is premature to take any position on this issue, but do believe that it warrants further exploration. The concern was also expressed that whatever is done in the NII should be compatible with the future evolution of technology.

The majority of the Advisory Council also agrees with the Green Paper's recommendation against adding any new compulsory licenses to the Copyright Act, stressing that the copyright owner should retain control through the ability to grant exclusive rights. To the majority, the difficulty of clearing rights for multimedia works is not a sufficient justification to eliminate this control. A suggestion was made that consideration be given to phasing out current compulsory licensing schemes and emphasizing the need to develop rights management systems for the NII. On the other hand, some suggested that a compulsory license may be a practical necessity when marketplace solutions do not work, or in other appropriate circumstances.

There is general consensus that technological protection against unauthorized uses is necessary to supplement legal rights, and that public education about the importance and meaning of copyright and about the fair use doctrine is critical to successful implementation of the NII.

Finally, given the complexity of the issues and the diversity of opinion over intellectual property in the digital networked environment, a few members of the Advisory Council recommended the establishment of a second National Commission on New Technological Uses of Copyrighted Works ("CONTU2"); however, the majority of the Council does not believe there is a need for a CONTU2.

C. Areas of Disagreement

The chief area of disagreement relates to the Green Paper's conclusion that a transmission must involve either a distribution of a copy or a performance. Members of the Advisory Council made several comments: that all transmissions to the public of works such as music constitute public performances under existing law; that more than one right can be implicated by the same conduct, and a digital transmission may involve both distribution and performance rights; and that some transmissions may involve neither a distribution nor a performance.

In addition, some members felt that a broadcast transmission should be defined to constitute a distribution; some expressed concern about the potential adverse effect if the new right of distribution by transmission were to replace or supplant the existing right of public performance.

As to the "primary purpose or effect" test proposed in the Report for distinguishing between transmissions of reproductions and transmissions of performances, reactions were uniformly negative. Objections ranged from the philosophical, questioning the relevance of "purpose" or the distinction between "primary" and secondary," to the practical, noting the inherent uncertainty of the test and the resulting likelihood of burdensome litigation.

D. Issues to Be Explored

The most basic question raised by the Advisory Council is the degree to which the proposals in the Green Paper would effectively protect creators and copyright owners while accommodating the interests of users, and whether there are ways in which protection could be made more effective. There was also a concern that the application of fair use in the NII environment be adequately explored in the Working Group's final report. Other issues identified by members of the Council were more specific. They are listed below without indicating any consensus within the Council as to their basis or relative importance.

1. Issues Addressed in the Green Paper

a. Exclusive rights generally

Do the proposed definitions of the copyright owner's exclusive rights cover "the entire mosaic of all delivery and communications in the NII . . . so there are no gaps for unauthorized users to escape liability"?

b. New "transmission" right

Is it necessary to change existing law? Aren't transmissions covered by the existing exclusive rights?

Is "transmission" too narrow a concept? Should the law instead adopt the broader concept of "communication"?

Under current law, rights can co-exist, with a single act potentially implicating more than one right. Is it "clear" that every transmission involves either a performance or the distribution of a reproduction? What other options are there?

If there is to be a new right, why define it in terms of a distribution of copies by transmission? Could there instead be a right "to transmit" a work, which need not necessarily involve either a performance or a reproduction?

Would the "transmission of a reproduction" cover the situation where binary digits, but not images or sounds, are received at a remote computer? How would the existing definition of "transmit" under section 101 of the copyright law apply where only bits are sent and received?

How would the new distribution by transmission right be reconciled with established limitations on the exclusive rights of owners? Should such a right be added without the enactment of limitations corresponding to the limitations on existing rights?

Will an economic analysis be done of the effect on authors of placing electronic transmissions under the proposed distribution right rather than the existing performance right? How will "back end payment structures" for compensating copyright owners, such a royalty payments and residuals, be affected by proposed changes in the law?

What would be the impact of the proposed distribution by transmission right on case law holding that a work does not have to be audible or visible for a television or radio transmission of the work to constitute an infringement of the right of public performance?

What is the rationale behind the "primary purpose or effect" test for distinguishing between the transmission of a reproduction and the transmission of a performance? Could a transmission involve both a distribution of a reproduction and a public performance? Could the transmission of a reproduction be commercially significant even if it is "secondary" in purpose or effect? Who should decide, and won't this test lead to much litigation?

c. Concepts of "Public" and "Publication"

Does the concept of "public" performance or display under current copyright law need to be redefined to ensure that it covers individuals at home calling up works from a server, or accessing a computer program on an interactive basis?

Should we eliminate the "public" limitation on the copyright owner's exclusive rights of performance and display, and instead privilege truly "private" uses through exemptions and limitations on the exclusive rights (such as fair use)?

What are the implications of the proposed new definition of "publication," both domestic and international? As noted in the Green Paper, the concept of publication appears in many different contexts in the Copyright Act, including the Library of Congress deposit requirement in section 407. Would all electronically disseminated works become subject to the deposit requirement?

d. First sale doctrine

Does the suggested change in the law go far enough in making clear that copies taken off the NII can't be distributed further? What would be the status of copies of performances made in the course of communication to the public or at the point of reception?

Does the suggested change in the law go too far? What is the electronic equivalent of routing a single printed copy? Can technical fixes be exploited to achieve the same result?

Should the law expressly affirm the ability of copyright owners to impose contractual restrictions on the use of transmitted copies? Would contractual restrictions defeat claims of fair use, the right to make copies of computer programs pursuant to section 117 of the Copyright Act, or conduct within other statutory limitations on exclusive rights?

e. Categories of works

Have developments in technology erased the distinctions between the categories of works listed in section 102(a) of the Copyright Act? If so, should the distinctions be eliminated from the law?

What are the implications, both national and international, of eliminating the definitions of different categories of works?

f. Importation rights

Is it "clear" that current copyright law does not cover importation from abroad by transmission? If not, how would this be handled under communications law? trade law? or other agreements?

g. Fair use

The Green paper postpones analysis of the important issues of fair use, and educational use generally, until the conclusion of conferences and hearings. What are the issues? Will uses beyond educational and library settings be addressed, as well as the full range of educational activities such as distance education? What recommendations should be made? What is the basis for the fair use analysis? Existing law and technology? If not, what scenarios should be used for guidance? How will fair use be accommodated within the digital networked environment?

h. Other exemptions/limitations

The Green Paper notes that various specific exemptions and limitations on the copyright owner's rights, most of which apply only to certain rights, may be affected by which right is determined to be implicated by an unauthorized transmission. Have all of the exemptions and limitations in sections 108-120 of the Copyright Act been analyzed in detail to determine whether any modifications are necessary in light of the Report's proposals? For example, in what circumstances would existing compulsory licenses for secondary transmissions apply?

i. Bans on decoding devices and services

Should bans on unauthorized decoding devices and services be placed in the Copyright Act or elsewhere in the U.S. Code, such as Title 18 or Title 47? Should the manufacture, distribution or use of such unauthorized devices or services be considered copyright infringement, if a cause of action will be given to manufacturers and operators as well as copyright owners? If it is defined as copyright infringement, how should the fair use doctrine be taken into account (for example, as applied to the provision of public access channels)? What impact will a ban on unauthorized decoding devices have on the ability to achieve interoperability under fair use, or to gain access to encrypted works that are not protected by copyright?

In addition to banning unauthorized decoding devices and services, should the law also bar the development and dissemination of software that decodes or "unlocks" programs without the copyright owners' permission? Should it expressly recognize the right to encode against copying?

j. Liability of service providers

Should service providers, such as electronic bulletin board service ("BBS") operators, be required to periodically scan and delete any unauthorized copies, or face liability as a contributory or vicarious infringer?

The Green Paper suggests the possible application of libel law principles to issues of vicarious and contributory liability for service providers. Since defamation law appears to impose different standards for liability than current copyright law, how should copyright principles be reinforced and distinguished?

k. Digital signatures

Should the law explicitly state that copyright owners may affix a digital signature or fingerprint to their works? Why should this be different from encryption of cable programming today?

Should the proposed prohibition against altering copyright management information be expanded to include a prohibition against modifying or deleting digital signatures?

l. Derivative works

Would the Green Paper's recommendations continue current law in prohibiting the creation and exploitation of derivative works without the consent of the owners of the underlying works? Can rights in derivative works be strengthened without weakening rights in underlying works?

Is there a point at which a work can become so transformed that it can no longer be considered a derivative work? Can sophisticated information search and retrieval tools that become essential navigational aids for content providers and users of the NII be seen as violating copyright if they require transmission of a work, but not its viewing, to evaluate suitability in response to a user query?

m. "Rendering" software

In referring to "rendering" software, a distinction can be drawn between software that renders an output for humans to interpret and software that renders an output for delivery to another machine or program. Should both types of "rendering" be included (separately or together) within the scope of the copyright owner's exclusive rights as "performances"?

n. International issues

How would the Green Paper's proposals interact with our international treaty obligations? Are the proposals all consistent with Berne?

In particular, would the new "distribution by transmission" right undercut or violate Berne Article 11, which requires member countries to grant to authors of dramatic, dramatico-musical and musical works the rights of public performance "by any means or process" and of "communication to the public"? If so, what would be the likely consequences of American copyright owners abroad?

What are the international implications of the Green Paper's interpretation of the public display right as covering virtually all NII uses, in light of Berne's lack of an independent public display right? How will licensing be handled, in circumstances involving primary displays of the work at the point of origination, embodied in communications that are further distributed to the public, and intermediate displays that may occur in the telecommunications pathway? When would there be "private displays" that are not subject to a copyright owner's exclusive rights?

How would the Green Paper's proposals be integrated into a Global Information Infrastructure?

Are the Green Paper's proposals important in securing global harmonization of intellectual property law?

How do the Green Paper's proposals relate to the Administration's current international efforts, including negotiations with respect to the Berne Protocol and the proposed rights and obligations of U.S. record companies, performers, songwriters, performing rights organizations, and broadcasters?

Many of the developing countries that will benefit greatly from a Global Information Convention are members of the Universal Copyright Convention, but not Berne. Would this issue become moot if GATT TRIPs is adopted by most of these countries? How should we take into account the freedom-enhancing potential of a Global Information Infrastructure, while still providing adequate protection for copyrights?

2. Issues Not Addressed in the Green Paper

a. Relationship to other areas of law

How will the proposed changes in copyright law fit into the various legal regimes that apply to communications? For example, how do the current cable and satellite compulsory licenses fit into the picture? How would the proposed right to distribute fit into the picture? How would the proposed right to distribute by transmission coexist with legal rights outside of copyright? What is the effect of various aspects of patent protection that may overlap with copyright rights in the NII?

b. Special issues in applying traditional copyright concepts in the network environment

In the network environment, it is necessary to separate out the need for clearance of copyrights from the task of delivery of packaged objects independent of their contents? (In the broadcast industry, by analogy, retransmission consent is a level of authorization separate from the authorization by the owners of copyright in the programs that are broadcast.)

The Green Paper refers to "information objects" transmitted on the NII. A more fundamental concept, however, may be a "digital object which incorporates the information in the form of bits," which can be "unwrapped" to obtain the "information entities" it contains. The legal framework under communications law that governs interception of and access to such objects should be addressed, apart from the licensing of any rights under copyright. The Green Paper does not address the incorporation of "intelligent software agents" that might access a computer program and query it on behalf of a user. In the course of providing a reply, might there be a "rendering" or other performance of the program as well as of the "agent," and is it likely that one or more derivative works will be created?

c. Analog environments

Since both analog and digital technologies will exist side-by-side for a number of years, both need to be addressed. For example, will bridging the analog world and the digital world involve the transformation of signals in ways that may result in the creation of derivative works?

d. Impact on digitized format

Should the law make clear that the status of a work does not change when it is placed in a digitized format?

Are there circumstances in which a separate derivative work may be generated when an existing work is placed in digitized format?

Will the communication of works in digitized format materially affect the economic relationship between owners and users of works?

e. Unauthorized manipulation of digital works

Does the law need to be modified in any way to take into account the ease of unauthorized manipulation of digital works?

f. Scope of reproduction right in sound recordings

Should we remove the limitation in section 114(b) of the Copyright Act, which limits the reproduction right for sound recordings to reproduction in the form of phonorecords, motion pictures or other audiovisual works, and which could be interpreted to rule out liability for unauthorized reproduction in multimedia works?

g. Specific exemptions

Should any of the existing exemptions in the Copyright Act, for example those applying to educational institutions, be revisited, in light of the increased opportunities for commercial exploitation in the NII environment or in order to assure access for noncommercial educational and other uses?

How can the existing exemptions in the Copyright Act be accommodated in the digital networked environment, continuing the traditional balance between the rights of intellectual property owners and the privileges of users?

h. Possibility of implementing voluntary copyright identification system

Could a voluntary copyright identification system provide many practical benefits without violating the Berne Convention's prohibition on formalities?

i. Ownership and joint authorship

The principal focus of the common law copyright tradition has been the protection of economic rights. Do the Green Paper's proposals do this for all copyright owners, whether individuals or corporations?

In the digital universe, there may be more collaborative authorship. Does this require any changes in existing law?

j. Criminal liability

Are the provisions of current law dealing with criminal liability adequate to handle the potential for massive infringement on the NII?

The NII Advisory Council appreciates the opportunity to comment on the Green Paper, and looks forward to hearing a response from the Working Group on Intellectual Property Rights of the Information Infrastructure Task Force. We would be pleased to provide further input or participate in discussion of the issues raised.

October 25, 1995

The Honorable Sally Katzen
Administrator, Office of Information & Regulatory Affairs
Office of Management and Budget
Washington, DC 20503

Dear Ms. Katzen:

On behalf of the NII Advisory Council, we are responding to your request for comments on the draft report entitled "NII Security: The Federal Role." We appreciate the opportunity to continue our ongoing discussions in this manner, and we commend you for the openness of the process for the development of NII policies and for your collaborative efforts. We look forward to continued cooperation in the future.

The members of the Council are favorably impressed with the discussion, analysis, and readability of the report. The subject is complex, and the report does a good job of offering an evenhanded portrayal of the current situation. This letter discusses the larger issues raised by the report, and the appendix includes other points and editorial suggestions.

Overall, the report fairly describes the role of the federal government in NII security matters. With a few exceptions noted below, the federal actions described in part IV are comprehensive and appropriate. In this regard, the paper largely fulfills its promise of setting out the government's role as lawmaker, user, and role model. There is, however, a broader framework for NII security issues that extends well beyond the federal government. The paper's concentration on federal action does not offer the background or context that places those actions in perspective. The reader is not made aware of the important role played by the private sector in assuring NII security.

Security is not an abstract or externally imposed requirement. It is a response to demands that come from users of the NII, including individuals, corporations, non-profits, and government. The paper does not offer a definition of security or the applied concept of privacy, and perhaps it should. As defined in *Common Ground*, the first report of the NIIAC, these terms reflect distinct but related user concerns about protecting valuable information and controlling the use of personal data. Users need to be aware of their responsibilities to secure their own information, and service providers have a responsibility to let users know about the types of protections that are available. Greater knowledge and awareness will serve the interests of all and will lead to better responses to the concerns of the marketplace.

I. The Role of Users and the Private Sector

The Advisory Council believes strongly that responses to the security needs of the NII will and must come principally from the private sector in response to demands from users. There is, or course, an important part for the government

to play as well. This point is well established in the paper. The essential and primary role of the private sector in meeting NII security needs to be highlighted in the paper.

The paper's structure is illustrative. The first three sections lead the reader through a balanced discussion of the issues and to conclusions that recommend government actions. The final section concentrates attention almost exclusively on the government, suggesting that the government is the key player in NII security matters. Each of the final subsections lists a series of federal government security actions.

The implied message is that the primary solution to security needs will come from the government. The central role played by the private sector role is lost here rather than misrepresented. For example, on page 19, the paper correctly and fairly states:

> These public discussions indicated that the marketplace, to the extent that users are demanding security, is responding with both specific security products as well as general NII products and services that incorporate security protection.

This is a vitally important conclusion that reflects the importance of the marketplace and the role of user demand. It is, however, in the middle of a paragraph in the middle of a discussion of technology.

The reports notes on page 11 that the power grid, transportation systems, financial institutions, and economic transaction data will all be dependent on the NII. The importance of these institutions indisputably makes NII security a vital national interest. Yet the private sector operates these critical infrastructure components. There is, to be sure, some government regulation, but essential operations are controlled by the private sector. While nothing in the report directly suggests otherwise, this will also be true for NII security.

Security needs in other areas are the responsibility of the private sector. This ranges from basic locked doors to sophisticated protections for high-risk activities. This pattern must be followed for the NII, where security devices include encryption, digital signatures, and authentication. In an era of rapidly changing technology, reliance on the private sector is essential because of the budgetary and bureaucratic limitations of government. Not all needed security measures have been invented, but the private sector should be allowed the opportunity to develop products and services to meet the needs of users. The government in its role as user and as educator can help to define those needs.

The report would benefit from a discussion of the differing roles of the private and public sectors and from greater recognition of the interests of users. The role of the private sector is broader and deeper than is suggested by the description on page 27 as one requiring governmental promotion for the development of high-quality security products and services.

It is the private sector that will design and implement the system architecture, develop and make available hardware and software security products and services, respond to market demands for better and easier-to-use security methods, and provide the capital necessary to accomplish these tasks. These are the major elements of NII security. The report should acknowledge that the private sector should and will build the global NII security system. This includes all aspects of security, including appropriate safeguards for children and effective protections for intellectual property. The title of the report might be adjusted to lessen the implication that the federal role in NII security is the only or primary one.

The report would be improved by including a broader discussion of the types of threats faced by NII users. For example, there should be more recognition that significant threats to user privacy and security interests arise from abuses of system and network insiders. External threats, such as those form spies and hackers, are real but may cause less damage because they are relatively rarer. This is an appropriate security issue for the private sector to address because many of the problems arise in the private sector.

Nothing in these comments is intended to undermine the clear responsibilities that the federal government has to establish the necessary legal foundations for NII security. The government actions proposed in the report are appropriate. In some cases, a stronger case can be made for a government role as a catalyst and convener. For example, in the setting of standards, the government could facilitate more rapid development through increased financing, mediating disputes, and supporting research.

II. Relationship Between the Private Sector and the Government

The federal government can assist the private sector in the development and implementation of needed NII security, and this assistance is appropriately described in this paper. Another way that the government can help is by not interfering with the ability of the private sector to find security solutions. There are three prime examples.

First, it is apparent to all that encryption is an important element of network security. Encryption tools have been and are being created privately. The federal government should not interfere with the development, use, or export of encryption software and hardware. There are additional comments on encryption below.

Second, the government should step aside and allow for the private development of suitable software and hardware filters for end users to protect children from accessing unsuitable materials. Several companies are already offering filters for children, and other products and services are being actively developed, including restrictive access schemes, metering and intellectual property protection methods, encryption devices, and farewells. In addition, other non-technical methods for accomplishing these purposes exist, including parental and teacher supervision and administrative policies and procedures. The need for government-

sponsored content prohibitions has not been demonstrated nor is there evidence of market failure. The private sector should be given time to meet these needs. The real effect of government controls over editorial content will be to undermine the utility of the NII. Undue interference by government in this arena will have disastrous effects.

Third, criminal and civil laws are appropriately identified in the report as playing a role in encouraging NII participants to respect security rules. It is vital that any such laws deter harmful conduct. Laws also should be written to support participants who are willing and able to undertake fair and appropriate security measures. Rules should create positive incentives for system operators to provide security, control access, and respond reasonably to complaints regarding wrongdoing.

III. Encryption in a National and Global Environment

Export limitations on encryption make it more difficult for the private sector to meet NII security needs. Export restrictions put U.S. encryption developers and other vendors who incorporate their products at a competitive disadvantage by preventing their participation in an established international market. Legal constraints also make it harder for American businesses with international operations to use available encryption techniques.

These existing constraints and the possibility of new restrictions are also unduly inhibiting the use of encryption domestically. Any restrictions—direct or indirect —on the domestic use of encryption could significantly undermine NII security.

The government must allow American companies to develop products and to compete globally without restrictions that are not productive because of the worldwide availability of encryption technology. The private sector should be free to meet encryption needs without federal mandates for hardware or software. This will do the most to enhance NII security by fostering the use of commercially viable encryption. Market forces will meet the demand if left alone. The commitment in the report to overseas use of encryption for personal use is insufficient.

In the existing global environment, international restrictions are not consistent with overall NII security needs. Not only must the U.S. government recognize this, but it should take the lead with other nations in removing international barriers. The Advisory Council urges that the United States take steps to raise these concerns in discussions of the global information infrastructure with the G-7 nations. The government should also work closely with the private sector to develop a better balance between privacy and security and between public and private roles.

This comment is not intended to prejudge or exclude fair consideration of legitimate law enforcement needs. Nothing here is inconsistent with the private sector's willingness or ability to meet fully law enforcement and national security needs. Of course, those needs must be clearly defined, be consistent with

constitutional requirements, and not interfere with the development of global networks. Because there are strongly held views on all sides of this complex issue, it will not be easy to develop consensus. What is essential is that the process for defining government encryption requirements be public and open to participation for everyone.

The private sector may actually be in a position to adopt more quickly standards that have more effective global reach and that will ensure both privacy protections and appropriate process for responding to requests from law enforcement and national security agencies. The private sector and the government should work closely together to develop means by which sound procedures for cooperation and for protection of basic rights can be addressed globally.

IV. Intellectual Property

The appropriate protection of intellectual property is a key issue relating to NII security. The importance of this issue calls for more recognition of the dilemmas now faced by content producers, system operators, and transport providers and the implications for the NII. The discussion of civil liability on pages 15-16 and the problems currently faced by content providers, system operators, and transport providers does not adequately reflect the seriousness of the issue or the depth of concern.

The paper would benefit greatly from a commitment for action to address the issue. An already adopted NII Advisory Council intellectual property principle emphasizes that "intellectual property laws, and effective legal means for enforcing those laws, must keep pace with technological development." The Council asks for greater recognition and acceptance of this principle. Protection of intellectual property is crucial because the potential of the NII will never be achieved if content entitled to legal protection is not secure. There is also a need to recognize and balance the incentives for system operators and transport providers to adopt reasonable preventive measures on the one hand and the avoidance of undue risks of liability as a result of user actions on the other.

Thank you for your consideration of these comments. The Council is prepared to offer additional assistance in the future.

Sincerely,

Delano Lewis
Co-Chair, NIIAC

Edward R. McCracken
Co-Chair, NIIAC

- There is a potential conflict between the first and second security tenets on page 4. Caller ID offers a clear example because there may be differing and conflicting interests on different ends of the telephone line. The ability to control information and the ability to know who is being communicated with may conflict. There is a general recognition that the tenets must be read in light of the need to protect another's rights. While this is appropriate, it does not adequately recognize the sharpness of the potential conflict. The second tenet implies that blocking a caller ID may be inappropriate, and this implied right of authentication may be either overstated or unintended.
- On page 6, there is a discussion of technological approaches for entertainment, software, and computer services. Because security needs are defined in part by technological alternatives, more detailed consideration of technology options would be helpful.
- The same section states that "participants indicated that adequate technical capability was being developed to protect their own products." It is unclear whether this refers to protection of systems or to protection of intellectual property, and this vagueness might lead to the incorrect conclusion that there are current technological methods for protecting intellectual property once it has been released from a protected network. More clarity is needed here. The same section also would benefit from a mention of the issue of liability and a reference to the later discussion. Also appropriate here would be some consideration of the conflict between the benefits of open systems and the benefits of encryption.
- The paper is too summary in some places. For example, a non-expert reader would benefit from a more complete discussion of the consequences of the NII on health care information (page 7) and a clearer description of the functions of emergency response teams.
- The discussion of ethics and education beginning on page 11 might include a reference to the Copyright Awareness Campaign sponsored by the Patent and Trademark Office and the Department of Education.
- The section on civil law fairly reflects the uncertainty that surrounds liability for negligent security and takes note of the benefits of civil incentives for improving security. Clearer laws would certainly help. The present legal uncertainties do not, however, preclude recognition for a policy that each person is responsible for his or her own actions. The paper already concludes appropriately by emphasizing awareness of risk and informed choice in light of that risk. An additional emphasis on personal responsibility is both consistent with broader goals and beneficial to the reliability of the NII for everyone.
- The discussion of technology that begins on page 19 is such an essential component of the paper that it might usefully be moved to an earlier point. No one can fully appreciate security issues without an understanding of the technology. In addition, a better description of technological alternatives would be very helpful. For example, the brief discussion of protecting content from unauthorized duplication in a digital environment would

benefit from an analysis of possible solutions and the barrier to their development. A highly relevant example is the possibility of legislation for digital visual recording devices and media that would be similar in purpose to the Audio Home Recording Act. This would give the reader a sharper understanding of the difficulties and trade-offs that are involved.

- The paper would benefit from a discussion of certification and authentication of the NII. Principal concerns include how trust will be implemented on the NII; what it means to "certify" digital communications, records, and information; and what bodies and procedures are appropriate to carry out these functions. Both private and public means of authentication and certification may be desirable.

December 12, 1995

The Honorable Ronald H. Brown
Secretary of Commerce
Department of Commerce
15th St. & Constitution Ave., NW
Washington, DC 20230

Dear Mr. Secretary:

As you know, the important subject of free speech in a digital environment is currently being debated on Capitol Hill. Today, the NII Advisory Council has adopted recommendations on a number of issues, including that of free speech.

The Council has agreed on a KickStart Initiative, which recommends that every community provide points of access to the information superhighway through its schools, libraries and community centers. We must provide parents and teachers with the tools to guide children. The NIIAC believes that appropriate access to the data superhighway can be handled without government intervention and restrictions. Our KickStart Initiative gives guidance to parents and schools on this issue and points to available means of filtering out inappropriate material and rating systems which can be used to guide children's access to material.

The NIIAC believes that the rights of free speech should not be abridged in the digital age. Furthermore, technologies, content and services which may be appropriate for some, may be inappropriate for others. Rather than restrict all people from access to that content and services, we should find other ways to deal with the issue. Also, to ensure that information technology and services may evolve in a timely, productive and competitive fashion, maximum freedom of choice by individuals and organizations selecting the technologies, content and services is critical. Therefore, the NIIAC has unanimously adopted the following recommendation:

The government should not be in the business of regulating content on the Information Superhighway. It should defer to the use of privately provided filtering, reviewing, and rating mechanisms, and parental supervision as the best means of preventing access by minors to inappropriate materials.

We hope that this recommendation will be useful to you in your deliberations on this issue.

Sincerely,

Delano Lewis
Co-Chair

Edward R. McCracken
Co-Chair

What is the United States Advisory Council on the National Information Infrastructure?

The United States Advisory Council on the National Information Infrastructure was created by executive order at the end of 1993 by President Clinton. The 36-member advisory panel was formally established and appointed by the Secretary of Commerce Ron Brown in early 1994.

Through its diverse membership, the Advisory Council represents many of the key constituencies with a stake in the National Information Infrastructure (NII), including private industry; State and local governments, community, public interest, education, and labor groups; creators and distributors of content; privacy and security advocates; and learning experts in NII-related fields.

The Advisory Council is co-chaired by Delano E. Lewis, President and Chief Executive Officer of National Public Radio, and Edward R. McCracken, Chairman and Chief Executive Officer of Silicon Graphics. The Council has the responsibility of advising the Secretary of Commerce, and the Administration, on a national strategy for promoting the development of the NII and the Global Information Infrastructure.

The Advisory Council has specifically focused on: defining the roles of the public and private sector; maintaining the balance of protection of intellectual property rights of creators and copyright owners with the needs of users; generating national strategies for developing applications in electronic commerce, education and lifelong learning, health care, government information and services, and public safety; conceiving approaches to maximize interconnections and interoperability of networks; and addressing the important issues of privacy and security.