DOCUMENT RESUME

ED 383 220 IR 017 105

TITLE	Satellite Interconnection and Distance Delivery in Alaska: Toward the 21st Century. Summary and Recommendations of the Satellite Interconnection Project under the Direction of the Telecommunications Information Council.
INSTITUTION	Alaska Public Broadcasting Commission, Juneau.
PUB DATE	95
NOTE	185p.
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC08 Plus Postage.
DESCRIPTORS	*Communications Satellites; Computer Mediated Communication; Distance Education; *Information Networks; Information Technology; *Telecommunications
IDENTIFIERS	Alaska; Communications Infrastructure; *Information Infrastructure

ABSTRACT

The Satellite Interconnection Project was created for the purpose of investigating the interest and need for improved interconnection, faster and of greater capacity than the capability of present systems, especially among Alaska state-supported users of video and audio transmissions. The intent was to explore the cost-benefit and the potential improvement in the quality and range of services supported by the state. It was anticipated that through the use of advanced telecommunications, the state would realize significant savings, improved productivity, and more meaningful levels of service for Alaskans in K-12 education, University of Alaska courses, state agency training, public broadcasting, and other applications. The Satellite Interconnection Project would consolidate state-supported distance delivery and put in place the first phase of such an integrated system by the summer of 1995, bringing together private, public, state, and federal planning and investment. This collection of reports summarizes the research, studies, consulting, multitude of site visits and face-to-face meetings, and recommendations to and endorsement of the Telecommunications Information Council for further planning and implementation. A summary of the Satellite Interconnection Project to date is given. Proceedings are provided from the Telecommunications Forum II meeting in October 1994, including: assessing the state environment for infrastructure development; the planning process to date; Delphi study; other states' efforts; ongoing interconnection: current status of 5 projects; building on the present infrastructure; and next steps and later phases. Appendices include: "TIC Endorsement for Further Planning Work"; "Delphi Study Final Report, School of Business, University of Alaska"; "Other States' Comparisons: 'Satellite Interconnection Planning Project'"; "The National Information Infrastructure: Agenda for Action"; "Selected 1993 State Telecommunications Legislation"; and "Telecommunications Forum I, 'Visions of Alaska's Future,' March, 1993." (MAS)

IR

Satellite Interconnection and Distance Delivery in Alaska:

Toward the 21st Century

Summary and Recommendations

of the

Satellite Interconnection Project

under the direction of the

Telecommunications Information Council

Project Team:

Douglas Samimi-Moore
Executive Director
Alaska Public Broadcasting Commission

Lois Stiegemeier
Instructional Television Specialist
Department of Education

IR017105

Satellite Interconnection and Distance Delivery in Alaska:

Toward the 21st Century

Summary and Recommendations

of the

Satellite Interconnection Project

under the direction of the

Telecommunications Information Council

Project Team:

Douglas Samimi-Moore
Executive Director
Alaska Public Broadcasting Commission

Lois Stiegemeier
Instructional Television Specialist
Department of Education

Douglas Samimi-Moore, Project Director
Alaska Public Broadcasting Commission
P.O. Box 110223
Juneau, AK 99811-0223

voice: 907-465-2846
fax: 907-465-2496
email: jgapbc@tundra.alaska.edu

Table of Contents

Preface

The Satellite Interconnection Project was created for the purpose of investigating the interest and need for improved interconnection -- faster and of greater capacity than the capability of present systems -- especially among state-supported users of video and audio transmissions. The intent was to explore the cost-benefit and the potential improvement in the quality and range of services supported by the state. The project team anticipated that through the use of advanced telecommunications, the state would realize significant savings, improved productivity, and more meaningful levels of service for Alaskans in K-12 education, University of Alaska courses, state agency training, public broadcasting, and other applications.

The Video Broadcasting Task Group, a working committee of the Governor's Telecommunications Information Council, oversaw the project, which was conducted by Douglas Samimi-Moore, Executive Director of the Alaska Public Broadcasting Commission, and Lois Stiegemeier, Instructional Television Specialist with the Department of Education. The project was funded by a grant of $100,000 from the Legislature to the Alaska Public Broadcasting Commission. Work took place over the summer and autumn months of 1993.

This collection of reports summarizes the research, the studies, the consulting, the multitude of site visits and face-to-face meetings, and the recommendations to and the endorsement of the Telecommunications Information Council for further planning and implementation.

Acknowledgments

The undertaking demonstrated an incredible amount of interest in improving interconnection among Alaskans in its many far-flung cities, towns, and villages. It also brought forward the multitude of talent and capacity in the scores of deeply committed educators, health professionals, broadcasters, librarians, engineers, and others who stand ready to work together to improve the level and depth of services to Alaskans. The project staff wish to note the contributions of several individuals whose time and energy went into the work. Our thanks to Bill Legere and Jack McKain of KTOO-TV & FM, Juneau; Tom McGrane and Greg Ruff of KUAC-TV & FM, University of Alaska-Fairbanks; Bob Medinger and Jim Schaefer of the Distance Delivery Consortium, Bethel; Ron Pritchard of the Mat-Su School District. And thanks to all who participated in the many phases of the project.

Douglas Samimi-Moore
Project Director

Introduction

Alaska stands at a crossroads of opportunity. Other states across the country have realized the cost benefit and the human value of investing heavily in their information infrastructure. They have seen that the development of that infrastructure is as vital as universal telephone service, public education, or the inter-state highway system. As in the absence of those systems, without a long-term investment in information infrastructure, social and economic development is unlikely, if not impossible.

From North Dakota to Texas, from Florida to Hawaii, state governments and private industry have developed coordinated plans for distance delivery through video, audio, and data services. And, while such states have consistently realized the educational, social, and economic benefits of the comprehensive and systematic use of such technology, Alaska has yet to seize the vision of its people connected through advanced communications. It is in reach. Imagine:

- A Department of Community and Regional Affairs director trains municipal workers over a video distance-delivery system, thereby saving travel dollars and enhancing productivity through a more efficient use of time;

- A corporate marketing director researches and monitors key Alaskan and Pacific Rim economic indicators through access to "electronic bulletin boards" of state, national and international data bases and their associated networks of information;

- All Alaskans have equal access through RATNET (Rural Alaska Television Network) and public radio and television to information and entertainment programming, thus promoting informed citizenship, cultural understanding, and unity in diversity;

- High school students in Togiak, Klukwan, Hoonah, McGrath, Ft. Yukon, Tok, St. Paul, and Shageluk take an advanced math class from a master teacher in Barrow or a Japanese class from an instructor in the Mat-Su, bringing the video courses to districts otherwise unable to provide them;

- Community health aides receive regular training by video, updating their diagnostic skills and patient care, and report patients' vital signs and diagnostics over high-speed data transmissions to doctors who can "see" the patient from a distance rather than in person, thereby reducing costs of travel and per diem while providing more expert care;

- Alaskans in dozens of locations pursue work on their University of Alaska degrees through video distance delivery while maintaining their home life in their own towns and villages, thereby increasing the opportunities and reducing the costs -- human and financial -- of completing a degree;

- Citizens in scores of locations statewide participate in an important legislative hearing by viewing it on video and testifying over the phone.

These are but a few of the examples of the benefits to be achieved with the building of the Alaska distance delivery highway.

The Satellite Interconnection Project would consolidate state-supported distance delivery and put in place the first phase of such an integrated system by the summer of 1995, bringing together private, public, state, and federal planning and investment to ensure that the interconnection works for all Alaska.

Executive Summary: The Satellite Interconnection Project to Date

January 1994

Douglas Samimi-Moore, Project Team Leader, is the Executive Director for the Alaska Public Broadcasting Commission. Lois Stiegemeier, Project Team Member, is the Instructional Television Specialist for the Department of Education.

The Satellite Interconnection Project planning grew out of the work of the Telecommunications Information Council's Video Broadcasting Task Group's efforts to bring integration and coordination to state-supported video services, among them RATNET, the University of Alaska, K-12 education, and public broadcasting.

In March 1993, the group sponsored a statewide telecommunications forum to begin the discussion on the policy, technical, and use issues of a system of satellite interconnection. More than 75 people -- private, public, broadcasters, educators, university officials, state agency representatives -- contributed to the two-days proceedings. The primary proposal was that the state conduct an initial investigation -- or pre-planning -- of the potential for such a system to bring economies to the users through the use of distance delivery. A second forum took place in October 1993, to follow on the work of the project team.

Following the success of the forum in March 1993, $100,000 was appropriated by the Legislature to the Alaska Public Broadcasting Commission (APBC) for a planning effort to be coordinated with the Telecommunications Information Council (TIC). Initial planning focused on the digital compression of the RATNET signal, allowing additional multiple video and audio channels for a variety of other state-supported uses. Douglas Samimi-Moore, APBC Executive Director, and Lois Stiegemeier, Instructional Television Specialist with the Department of Education, comprised the project team which was to follow on the course of work determined at the March forum.

After the three-month project, it was clear that:

- The planning process needed to continue in order that interest (which was determined to be very high) might be translated into budgetary and programmatic commitment.
- A Delphi Study, conducted as a part of the planning project, identified contradictions from the public sector -- the desire to supply services when the project needs to be demand-driven.
- A determination needs to be made on what resources each potential user, provider, and producer can bring to the process.

- A certain state responsibility exists to provide the infrastructure, but the state is committed to using the facilities of private entities.
- Users of the network will have to pay their own way. Thus pricing of time is an issue that needs definition.
- The state should be methodical in its planning so that the project is done right the first time, rather than trying to build something right away.
- This being a difficult budgetary and legislative year; the state will have to answer whether this is the "highest and best use" of public funds at this time.

Scope of the work

- The team conducted an investigation of ongoing projects in Barrow; Bethel; the main campuses of the University of Alaska in Fairbanks, Anchorage, and Juneau; the Mat-Su school district; public broadcasting; and RATNET.
- The team met with private telecommunications firms and researched other states' telecommunications planning and implementation.
- The team interviewed dozens of people in state agencies, school districts, health corporations, community colleges, and social service agencies about their distance delivery needs.
- The team supervised a study of expectations across the state among potential users and beneficiaries of improved interconnection, working with the UAA School of Business on a Delphi Study.
- The team coordinated a second forum in October 1993, that brought together many of the state's key figures in telecommunications infrastructure development to explore further the elements that need attention in the ongoing planning work.
- The team conducted a comprehensive survey of other states' experience in telecommunications planning, implementation, management, and policy development.

Key assumptions

- The less that belongs to the state, the better.
- Implementation is to be incremental and phased over several years.
- The local utilities are key to the first- and last-mile delivery.
- Sufficient new incentives -- regulatory, financial -- can be developed for private first- and last-mile development and interconnection.

TIC Endorsement

The Telecommunications Information Council Executive Committee endorsed in the autumn of 1993 the project team's recommendation to take the planning to the next stage. The team identified that as being the organizing of the system's operation and

governance, obtaining budgetary commitment from those agencies and groups which had expressed serious interest in participation, analyzing cost-benefit and designing the technical infrastructure. In the recommendation, this would be accomplished through a "blue ribbon" panel of representatives from private telecommunications firms, other private industry, education, the University of Alaska, state agencies, other key users and providers, and the general public. The TIC endorsed the Department of Administration's request for $250,000 for FY 1995 in support of the planning.[1]

Findings and the Future

Beyond those initial steps, the Satellite Interconnection Project (SIP) recommended a coordinated system of comprehensive distance delivery of state-supported services to the people of Alaska. The SIP would integrate and broaden the delivery of ongoing, state-funded video and audio services from the University of Alaska, public radio and television, the Rural Alaska Television Network (RATNET), and the Department of Education.

Moreover, the SIP proposes that additional cost-beneficial use of distance delivery by state agencies with ongoing training and administration requiring travel could be possible by video over satellite. Further, the proposal links distance delivery already extant through much of Alaska. The SIP also recommends pro-active cooperation with telephone utilities and other private telecommunications entities to develop high-speed data traffic statewide and, in a later phase, two-way video.

Findings

- Governance of the Project should be by a public/private consortium organization with some board members appointed by state government and others appointed or elected by users.
- Development of a system of satellite interconnection is a high priority throughout the state.
- A profound need is evident for the integration of the many efforts already underway or being planned.
- A compelling need is evident for video and high-speed data delivery, both in rural and urban areas.
- Major benefits of such a system include improved education programs and opportunities, access without travel, state services closer to the people,

[1] The TIC endorsement is attached as Appendix One.

"electronic reduction" in the vast size of Alaska, better health services and training.
- Alaska's economic development would be enhanced through the SIP.

The Future

- Implementation of the SIP can proceed; the technology is available now.
- New federal funding initiatives make the likelihood of such support very high.
- The regulatory climate adapts to new technologies, encouraging rate variations for public service use and increased cooperation across industries and between the state and private telecommunications firms.
- The role of government is to ensure that Alaskans have ready, equitable access to the technologies increasingly essential to life in the closing years of the 20th century.

Telecommunications Forum II
October 1993, Anchorage

Introduction

Some 65 representatives from state agencies, private telecommunications firms, telephone companies, educational institutions, and commercial and non-commercial broadcasting gathered for the Forum, October 25-26, 1994, at the West Coast International Inn, Anchorage.[2] The group heard presentations on the first day from the Commissioner of the Department of Administration, Nancy Bear Usera; the planning project director, Douglas Samimi-Moore; Richard Hezel, a national telecommunications planner and consultant; a panel of current distance education groups; a panel of local and long-distance telephone companies; and an engineer expert in digital technologies.

The second day's discussions centered on the national environment being conducive to infrastructure development. There was discussion of the funding opportunities nationally. Also, there was an exploration of the planning process underway and the steps yet to be taken.

Assessing the State Environment for Infrastructure Development -- Nancy Bear Usera, Commissioner, Department of Administration

Commissioner Nancy Bear Usera noted that the planning effort is the outgrowth of the March Telecommunications Forum in Juneau.[3] Following on the work of the Forum, the Legislature appropriated $100,000 to a planning effort under her department which initially focused on the digital compression of the RATNET signal allowing multiple channels for a variety of additional educational, training, and public broadcasting uses. Based on her observations of the project to date, Commissioner Usera outlined a number of conclusions:

- The outcomes for the telecommunications network, while broadly identified through the planning process to date, need further clarity and commitment.
- The planning process needs to continue.

---

[2] A list of participants begins on page 22 of this report.

[3] A report on the March Telecommunications Forum, "Visions of Alaska's Future," is attached as Appendix Six.

- The Delphi study pointed out some contradictions from the public sector, including the desire to supply services when the proposed system's development needs to be demand driven.
- The planning process must determine what resources each player is able and willing to bring to the table.
- There is a certain state responsibility to provide the infrastructure, but the state is committed to using the facilities of private entities.
- Users of the network will have to pay their own way. Thus, pricing of time is an issue in need of further exploration.
- The schedule for the development of the satellite interconnection system is subject to budgetary processes at both the state and federal levels.
- The state's planning needs to be methodical so that the project is done right the first time.
- As FY 1995 promises to be a difficult budgetary and legislative year, the state will have to determine whether this is the "highest and best use" of public funds at this time.

The Planning Process to Date -- Douglas Samimi-Moore, Project Director

Douglas Samimi-Moore presented an overview of the planning process, noting that the more the planners talked to people, the more there was to talk about. The needs quickly escalated to include two-way video and data transmission needs, making it clear that there should be a more detailed planning effort so that the elements that have been discussed across the state (data transmission, emergency transmissions, geophysical institute needs, medical diagnostic, in addition to those more central to the project) are included in the plan.

The project grew out of the Governor's Telecommunications Information Council Video Broadcasting Task Group. The Task Group sponsored the first Telecommunications Forum which called for a planning effort. The Alaska State Legislature allocated $100,000 for the planning process.

Overview

The planning process included:

- A Delphi Study, involving 200 selected participants, 115 of whom responded, from private telecommunications companies, private industry, state agencies, the university system, public broadcasting, the Legislature, school districts, commercial broadcasting, health corporations, RATNET, and others.

- Site visits to educational and other groups currently engaged in distance education activities. The visits were intended to elicit information about the technologies used in those projects, the services provided, and the further needs for interconnection of those groups. Site visits were made to Barrow's videoconference and Wide Area Network system; Bethel's Distance Delivery Consortium; the Bethel district National Guard; the Yukon-Kuskokwim Health Corporation; Mat-Su School District's fiber-optic, fully interactive video system; LiveNet at the University of Alaska in Fairbanks; all three main campuses of the University; the Geophysical Institute; Anchorage School District; University and state libraries; and others.

- Meetings with a variety of private companies, state agencies, University faculty and others. The purpose of the meetings was to explain the project and the vision that was emerging for the information network. Participants were asked to describe their possible uses of the network and to help us further define the needs that such a network could help meet. Meetings were held with representatives of telephone companies; Alascom; commercial television; public broadcasters; deans and directors of all three campuses of the University, including the President's Task Force on Alternative Methods of Instruction; state agency representatives, including commissioners or deputy commissioners from the Departments of Commerce, Education, Health and Social Services, Community and Regional Affairs, Administration, plus surveys of many directors within those agencies; Association of Village Council Presidents' representatives; the Southeast Regional Resource Center; school superintendents; Star Schools, and others.

- A comprehensive survey of other states' experience in telecommunications planning, implementation, management and policy development, with an eye toward system governance; analyzing states with fairly decentralized management structures and histories of private and public partnership, such as Montana, Wyoming, New Mexico, North Dakota, South Dakota, Nebraska and Kansas; further regard for systems developed in Arizona, Colorado, Idaho, Texas, Vermont and Washington. Information was compiled on the other states' telecommunications planning efforts with the assistance of Hezel Associates of Syracuse, New York. Particular attention was paid to states with similarities to Alaska in that they are relatively large and/or sparsely populated. Also examined were those states that take a decentralized approach to planning and implementation or have an interesting or innovative telecommunications effort.[4] In addition, information

[4] See Appendix Three, "Satellite Interconnection Planning Project," other states' comparisons.

on national initiatives for information infrastructure was gathered and analyzed for its impact on the funding of a statewide information network.[5]

The information elicited from the planning process included:

- needs and potential users;
- expected benefits;
- barriers to implementation;
- recommendations for next steps.

Needs and Potential Users

All information gathered showed that the following uses were those for which a state-of-the-art system of interconnection would have the greatest impact:

- distance education for university and K-12;
- public health;
- emergency services;
- public radio and television;
- public safety;
- access through videoconferencing to the Legislature;
- general economic development uses;
- access to library resources;
- videoconferencing/access to state agencies;
- state government information and data;
- RATNET.

Expected Benefits

It is expected that the following benefits would accrue to Alaska if such a network were to be put in place:

- improved educational opportunities and programs;
- access to services without travel;
- state services closer to the people;
- vast distances in the state electronically bridged;
- better health services;
- cost savings;
- broader access to public television, radio, and RATNET.

Barriers to Implementation

The planners noted that the benefits are not without barriers to implementation. These perceived barriers will have to be overcome in further stages in order that the

[5] See Appendix Four, "The National Information Infrastructure: Agenda for Action."

implementation of the network not become politicized. The most often perceived barriers are:

- costs;
- "turf" issues;
- lack of cooperation between private and public entities;
- lack of communication between interested parties.

Recommendations for Next Steps

Taking into account all the information received, the planning team recommended that several areas be considered in further planning and implementation. Those areas are:

- design and planning;
- technical standards;
- organizational structure and governance;
- evaluation.

In further planning, the team recommended that a planning group be appointed by the Telecommunications Information Council to design a system of interconnection and to analyze the financial, regulatory, and technological obstacles to implementation of the plan. In addition, the planning team recommended that the TIC establish prospective evaluation criteria, utilizing a pilot study and an analysis of the system's component development and delivery.

The planning team recommended the development of compatible standards for a statewide system. The standards should take into account the desire to use existing infrastructure, as much as practicable.

The team recommended that in the next stage of planning an examination of the organization and governance of such a network include the idea presented by the Delphi Study participants that a public-private consortium corporation be created to govern the network. The board of the corporation should be representative of private and public sectors and consumers of the network. Further planning should include the level of staffing needed for administration and technical operation; some of those staff should be provided through the consolidation of current state services.

Finally, the planning team recommended that further planning include a plan for evaluation of the network. In addition, noting the rapid pace of technological change, the team recommended that implementation include a three-year study of the initial system for further planning and development, and that the system be continually assessed for inclusion of new technologies in the system.

Delphi Study -- George Geistauts, Ph.D., School of Business, University of Alaska-Anchorage

The Delphi Study was summarized at the Forum by Dr. George Geistauts, UAA Business School. The discussion generated by the Delphi Study summary assessed the range of the Study's participants and the inadequate representation from the business and Native communities. Their representation must be fully considered in further planning efforts.[6]

Other States' Efforts -- Richard Hezel, Hezel Associates

Richard Hezel of Hezel Associates, Syracuse, New York, presented a brief overview of the information amassed for the planning team regarding other state's telecommunications planning efforts. He included brief summaries of activities in some rural states, in states with centralized and decentralized planning efforts, and a profile of national agencies or groups with responsibility for telecommunications planning.[7]

Ongoing Interconnection: Current Status -- Panel Presentation

A panel of current distance education groups in the state presented their projects and spoke briefly about the need for interconnection.

The Distance Delivery Consortium, Bethel and the Y-K Delta

Bob Medinger, Lower Kuskokwim School District, and Carl Williams, Yukon-Kuskokwim Health Corporation, spoke of the Distance Delivery Consortium's efforts to serve its members with C-Band interactive satellite training, courses for K-12, the University, and the National Guard; interagency email and bulletin board service; and other pilot projects using new technology. They reiterated the need for the state to take leadership in telecommunications planning and in the implementation of a high-speed, digital infrastructure for voice, video, and data. Moreover, they expressed eagerness to share resources in order to lower costs, holding up the DDC as a model of what could be done statewide.

---

[6] Please see Appendix Three for a complete report on the Study's findings.

[7] Please see Appendix Three, Hezel Associates' "Satellite Interconnection Planning Project."

Alaska's Public Television Stations

Alaska's public television stations, represented by Dean Hoke, KAKM, Anchorage, and Bill Legere, KTOO, Juneau, reported on the University of Alaska-Anchorage courses carried by public television stations, GED programming, "Ready-to-Learn" programming, cooperative efforts with the DDC, the University of Alaska system, and local school districts in the delivery of services. They expressed the need for improved interconnection, not only among public broadcasters but across agencies and organizations, in order to achieve broader services and an improvement in cost efficiencies.

Matanuska-Susitna School District's Two-Way Video System

Ron Pritchard of the Matanuska-Susitna School District described the fully interactive, two-way video system that links the district's schools via fiber optic. The Matanuska Telephone Association, in cooperation with the district, received a waiver on its tariff that makes the district's use of fiber cost-effective. The system permits faculty at one location to teach courses at other locations in the district, reducing staff costs and broadening the offerings available to students.

University of Alaska President's Task Force on Alternative Instruction Methods

Roberta Stell, Dean of Graduate Studies at the University of Alaska-Southeast, described the efforts of officials at the three main campuses, under the President's leadership, to coordinate and improve their cooperation in the delivery of audio-conference courses and telecourses. Dr. Stell spoke of the President's commitment to make wider use of telecourses between campuses and as an outreach to its rural campuses.

Star Schools

Lois Stiegemeier, coordinator of Star School programs for the Alaska Department of Education, described the infrastructure in place to deliver K-12 and teacher in-service courses to some 150 schools across the state. The project hardware (receive dishes and the associated electronics) is jointly financed by local and federal matching funds. Courses are paid for on a per-student fee basis. The system's courses, originating in Spokane, Washington, make it possible for students in rural Alaska to enroll in courses not available on-site, such as advanced placement, college-preparatory, and foreign language classes. Moreover, teachers are kept abreast of educational and pedagogical initiatives, mandates, and opportunities through the system's in-service component.

Building on the Present Infrastructure -- Panel Presentation

A panel of representatives from local and long distance telephone companies discussed the idea of the statewide telecommunications network. The panel was moderated by Lloyd Morris, owner and President of Alaska Telecom and Chairman of the Alaska Public Broadcasting Commission. Panelists included: Blaine Brown of Anchorage Telephone Utility, Jim Collard of PTI, Larry Hathaway of United Utilities, Randy Nelson of GTE, Randy Owenby of Alascom, Graham Rolstad of the Matanuska Telephone Association.

Among the main ideas presented were:

- We are no longer talking about one network utilizing a single technology, but rather a network of networks with interfacing technologies.
- The technologies are not static; they are ever-changing.
- Rather than reinvent the wheel, we can draw upon the expertise and technologies that we currently have in the state.
- There are pricing and regulatory problems that must be faced to allow the telephone companies to assist in these efforts.
- We need to look at incentive regulations from the APUC.

A short presentation was made by Radiation Systems, Inc., on the different technologies that allow for the digitizing of video and satellite signals.

Next Steps and Later Phases -- Moderated by Richard Hezel, Ph.D., Hezel Associates

The second day consisted of a discussion on the current environment that makes the timing right for further telecommunications planning, and a discussion on what the next steps should be.

Federal Funding Initiatives

Richard Hezel presented an overview and then led a discussion of the funding picture on the federal level.

1. National Telecommunications and Information Administration, U.S. Department of Commerce
   - The Public Telecommunications Facilities Program has funds available for these projects including funds for planning at the state level. The PTFP is

being redirected from a strictly public broadcasting mission to distance delivery. There will possibly be $40 million available in the next round with the likelihood of annually increasing appropriations, given the new administration's position on the emerging information infrastructure. The grants are typically a 50:50 match of state and local funds.

- NII (National Information Infrastructure) is a new fund yet be finalized in Congress.[8] Congress will probably allocate $25 million for assisting in the implementation of infrastructure using the public switched networks. The program is designed to build the infrastructure, to make connections, to link public and private interests in the planning and development of the infrastructure.[9] The funding is a 50:50 match of state and local funds.

2. U.S. Department of Education
   - The DOE is creating a new Office of Educational Technology to provide leadership to state departments of education.
   - Star Schools is being funded with additional funds, some $19 million to $20 million for interstate distance education. Grants are awarded with a two- to five-year commitment. Perhaps there will be some new funding for statewide planning for educational technology.

3. USDA Rural Electrification Grants
   - The REA has made $10 million in grant funds available for telemedicine, health, and educational purposes.

4. National Institute of Health (NIH)
   - There is a great interest in technology but no specific funding at this time.

5. Centers for Disease Control (CDC)
   - The CDC has some funding for a health training network.

6. National Science Foundation (NSF)
   - The NSF has a Statewide Systemic Initiative fund for math and science education reform.
   - Other technology funds may be available.

---

[8] The funding program was established in 1994 to provide FY 1995 grants. It was named the Telecommunications Information Infrastructure Application Program, or TIIAP.

[9] With the establishment in 1994 of the Telecommunications Information Infrastructure Application Program, the PTFP had been redirected again to serve a narrower purpose than TIIAP. PTFP was to serve the needs more specifically of public broadcasting facilities development with a grants pool of $26 million for FY 1996 disbursement. TIIAP is to serve a wider mission in funding the states' multi-agency development of information infrastructure that links states to the National Information Infrastructure. Its grants pool for FY 1996 is $64 million. The FY 1995 cycle saw the TIIAP receive 1300 applications for some $24 million in its first year of operation.

7. Department of Justice
   - Funding is available for law enforcement training.

8. Department of Defense
   - So-called defense conversion money is being made available to convert defense to civilian use, especially at the community level. Six billion dollars will be available in the dual-use technology fund. Applicants must demonstrate that theirs is a cooperative effort with a number of agencies; a consortium of affected businesses and communities.

There was a great deal of discussion on how all these pieces can come together. How will the state data network be integrated into the project? What is the vision for this project as opposed to the other projects of the TIC? While some of the participants argued that the state should start moving on the implementation, others stated that we are not quite ready at this time, that further planning needs to take place, and that we need to clarify our vision of what we are planning.

General Planning Process

Dr. Hezel outlined the steps typically taken in a planning process:

1. Information
2. Collaboration
3. Needs Assessment
4. Technical feasibility
5. Funding
6. Government/management
7. Policy
8. Programs/software
9. Training
10. User support
11. Marketing
12. Evaluation

He closed his comments by noting that this effort seems to have incorporated some of the first four or five areas, but that in his assessment, we need a comprehensive needs analysis, increased collaboration with those affected by such planning, and a solid technical feasibility study.

Forum Close

The Forum closed with an invitation to all participants to continue their involvement in telecommunications planning and to keep in touch with the project team. The team committed to drafting a recommendation for further work to be passed on to the TIC at its earliest meeting.

Telecommunications Forum II, List of Participants

Helen Barrett, Ph.D.
AK Society for Technology in Education
6426 Village Parkway
Anchorage, AK 99504-3903

John Borge
ASK
1602 Hillcrest Avenue
Anchorage, AK

Neal B. Brown
Geophysical Institute
University of Alaska Fairbanks
910 Yukon Drive
Fairbanks, AK 99775

Blaine Brown
Anchorage Telephone Utility
600 Telephone Avenue
Anchorage, AK 99503-6091

Jim Collard, Area Supervisor
PTI Communications
5545 Glacier Highway
Juneau, AK 99801

Jerry V. Curlee
Anchorage Telephone Utility
600 Telephone Avenue
Anchorage, AK 99503-6091

Dennis P. Donovan
Alaska Army National Guard
P.O. Box 5800
Ft. Richardson, AK 99501

Robert Eldridge
General Manager
KIAM-AM
P.O. Box 474
Nenana, AK 99760

Susan Elliott
Librarian III
Alaska State Libraries
344 West Third Avenue, Ste. 125
Anchorage, AK 99501

Steve Estes
Geophysical Institute
University of Alaska
910 Yukon Drive
Fairbanks, AK 99775

Dan Etulain
North Star TV
520 Lake Street
Sitka, AK 99835

Ruth Farrens
General Manager
KSDP-AM
P.O. Box 328
Sand Point, AK 99661

Ken Fate
General Manager
KCAW-FM
102B Lincoln Street
Sitka, AK 99835

Louise Fowler
Director, Distance Education
University of Alaska
3211 Providence Drive
Anchorage, AK 99508

David Geesin
KIMO-TV
Alaska Broadcasting Network
2100 East Tudor Road
Anchorage, AK 99507

Duane Guiley
Director, School Finance
Department of Education
801 West 10th Street, Ste 200
Juneau, AK 99801-1894

Jim Harpring
Communications Officer
DMVA/DES
P.O. Box 5750
Ft. Richardson, AK 99501

Larry Hathaway
United Utilities
P.O. Box 92730
Anchorage, AK 99509

Diane Heard
General Manager
KSKA-FM
4101 University Drive
Anchorage, AK 99508

Augie Hiebert
Board Chairman
Northern Television, Inc.
1007 West 32nd
Anchorage, AK 99503

Linda Hoff
Department of Labor
3301 Eagle, Suite 372
Anchorage, AK 99510

Dean Hoke
General Manager
KAKM-TV
3877 University Drive
Anchorage, AK 99508

David Knight
Anchorage Telephone Utility
600 Telephone Avenue
Anchorage, AK 99503-6091

Kellie Law
General Manager
KMXT-FM
718 Mill Bay Road
Kodiak, AK 99615

Robert Libbey
Deputy Commissioner
Department of Administration
P.O. Box 110200
Juneau, AK 99811-0200

JoAnn McDowell
President
PWS Community College
Box 97
Valdez, AK 99686

Frank Mengel
KAKM-TV
3877 University Drive
Anchorage, AK 99508

John Morrone
Department of Administration
Division of Information Svcs
5900 East Tudor Road
Anchorage, AK 99507-1266

Frederick Pearce, Ph.D.
University of Alaska
Bldg. K 104H
Anchorage, AK 99508

K.C. Jackson
General Manager
KDLG-AM
P.O. Box 670
Dillingham, AK 99576

Donn Kruse, MD.
Yukon-Kuskokwim Health
Corp.
P.O. Box 528
Bethel, AK 99559

Bill Legere
General Manager
KTOO-FM & TV
224 Fourth Street
Juneau, AK 99801

Pierre A. Lonewolf
KOTZ-AM
P.O. Box 78
Kotzebue, AK 99752

Jack McKain
Chief Engineer
KTOO-FM & TV
224 Fourth Street
Juneau, AK 99801

Alicia Misikin
Station Manager
KUHB-FM
c/o Pribilof School District
St. Paul, AK 99660

Randy Owenby
Alascom
210 East Bluff Road
Anchorage, AK 99501

Will Peterson
General Manager
KBBI-AM
3913 Kachemak Way
Homer, AK 99603

Wilson Justin
Heartbeat Alaska
2642 Bryant Circle
Anchorage, AK 99507

Jeremy Lansman
KYES-TV
3700 Woodland Drive, #600
Anchorage, AK 99517

John Lehman, Ph.D.
UACN
University of Alaska
Fairbanks, AK 99775

Ann McCoy
Anchorage, AK

Bob Medinger
Director of Technology
Lower Kuskokwim Schools
Box 305
Bethel, AK 99559-0305

Lloyd Morris
Alaska Telecom, Inc.
P.O. Box 110541
Anchorage, AK 99511

Walt Parker
Parker Associates
3724 Campbell Avenue
Anchorage, AK 99504

Ron Pritchard
Director
M.I.S., Mat-Su School District
350 East Dahlia Avenue
Palmer, AK 99645

Rob Rawls
General Manager
KOTZ-AM
P.O. box 78
Kotzebue, AK 99752

James V. Schaefer
Coordinator
Distance Delivery Consortium
P.O. Box 2401
Bethel, AK 99559

John Sibert
Executive Director
ASTF
550 West 7th, Suite 360
Anchorage, AK 99501-3555

Robert Sommer
General Manager
KIYU-AM
P.O. Box 165
Galena, AK 99741

Franz Stiegemeier
PA Analyst II
State of Alaska
DHSS/DPA/F.O.
P.O. Box 240249, Ste. 434
Anchorage, AK 995524-0249
Jerry Sutter
REA
Anchorage

James Winchester
General Manager
KCHU-AM
P.O. Box 467
Valdez, AK 99686

Michael Roberge
Rock Associates/AK
Cablevision
5808 Lake Washington Blvd.
Suite 400
Kirkland, WA 98033
Carol Schatz
KYES-TV
3700 Woodland Drive, #600
Anchorage, AK 99517

Steve Smith
Rasmussen Library
University of Alaska
Fairbanks, AK 99775-1000

Bob Stanberry
Director, Applied Science
Lab DMVA/DES
P.O. Box 5750
Fort Richardson, AK 99595

Steven Strait
Alaska Public Broadcasting
Commission
2500 Douglas Drive
Anchorage, AK 99517

Alice Walsh
President
Alaska Center for the Perf.
Arts
621 West 6th Avenue
Anchorage, AK 99501

Charlotte Rowe, Ph.D.
Geophysical Institute
University of Alaska Fairbanks
910 Yukon Drive
Fairbanks, AK 99775

Mike Searcy
Account Executive
Alascom, Government Services
P.O. Box 196607
Anchorage, AK 99519-6607

Bruce Smith, Ph.D.
General Manager
KUAC-FM & TV
P.O. Box 755620
Fairbanks, AK 99775-5620

Roberta Stell, Ph.D.
Dean
Graduate Studies, UAS
11120 Glacier Highway
Juneau, AK 99801-8697

Jim Stricks, Director
CDE & UL, UAF
129 Red Building, UAF
Fairbanks, AK 99775

Carl Williams
Yukon-Kuskokwim Health
Corporation
P.O. Box 528
Bethel, AK 99559

Telecommunications Information Council Policy
Satellite Interconnection Project
Endorsed, Fall 1993

Background

It is increasingly apparent that the state would benefit from a comprehensive, integrated enhancement of the state's telecommunications infrastructure in order to provide for and coordinate the delivery of video, audio and high speed data services in support of emergency needs, health, social and economic development, education, state agency training and administration, university enrollment and degree completion, broadcasting, access to data bases, libraries, and national and international services and markets.

Standards

The project will ensure the development of compatible, interoperable distance delivery systems statewide under the umbrella of the SIP. The project will define in detail -- with due regard to program providers and users -- the technical and engineering specifications of the system's construction, involving key decisions on the choice of delivery systems and kind of satellite transponder. The project will define the appropriate level and share of state and private support for further development of the information infrastructure in the state. Regulatory and financial obstacles will be identified and overcome to ensure private sector partnership in the system's development.

Costs

The staff support, engineering and technical planning and support of the planning group's activities, in addition to the ongoing work of the SIP, $250,000.

Other Benefits

Further planning will identify a range of needs statewide and the interconnection necessary to integrate use extant of telecommunications for

cont'd.../

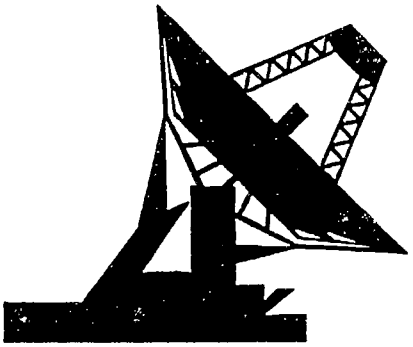
distance delivery. Moreover, the project will build on the increased amount of interest in the potential of such services to bring cost benefit to the users and providers. Further planning and development will capture the maximum advantage that such a system promises to bring to the state.

Proposed Policy

1. The TIC will appoint by December 1993, from both the private and public sectors, a planning group of technical and planning specialists to devise further the system of interconnection, addressing especially the above remaining issues, and further, analyzing the financial, regulatory, and technological obstacles to full implementation.

2. Further, the TIC will establish prospective evaluation criteria, including a pilot study to analyze system component development and delivery.

Douglas Samimi-Moore
Project Director



STATEWIDE TELECOMMUNICATIONS NETWORK

DELPHI STUDY

FINAL REPORT

GEORGE A. GEISTAUTS
Principal Consultant

ANCHORAGE
September 1993

UNIVERSITY OF ALASKA
ANCHORAGE
SCHOOL OF BUSINESS

GOVERNOR'S
TELECOMMUNICATIONS
INFORMATION COUNCIL

TABLE OF CONTENTS

ABOUT THIS DELPHI STUDY

This is the final report of a Delphi study exploring options and policies for development of a statewide telecommunications network for Alaska. It is part of a planning process that will culminate in a capital budget request to the legislature. The Delphi study was conducted for the Governor's Telecommunications Information Council by the University of Alaska Anchorage School of Business.

Delphi is a method of forecasting and policy evaluation, first developed by the RAND Corp., which uses a panel of individuals who are knowledgeable about the facts and issues in the forecast/policy target area. The panel does not meet face-to-face; communication between panelists takes place through a series of questionnaires. Each subsequent questionnaire is based on ideas and results drawn from the previous questionnaire. This feedback of results in effect makes Delphi not just a simple survey, but rather *a structured communication process*. A Delphi study coordinator/consultant develops the questionnaires and analyzes the results; Prof. George Geistauts of the UAA School of Business was the principal consultant on this project.

An important feature of Delphi is that all answers are treated anonymously, and at no time are panelists identified with any answers or opinions they give. This means ideas and predictions are examined on their own merits, and not on their authorship.

Two Delphi questionnaires were sent to approximately 200 individuals who had indicated a desire to be part of the telecommunications network planning process. The first questionnaire was based on results of a Statewide Telecommunications Forum, "Visions for Alaska's Future," held in Juneau during March 1993. A briefing paper on technology was sent with the first questionnaire. The second questionnaire was based on results of the first questionnaire.

The project duration was from August 2nd to September 17, 1993. Because of a timetable driven by budget submission deadlines, panelists were asked to return questionnaires within three working days; the overall panel response rate was approximately 50%. A total of 119 panelists responded to one or both of the questionnaires; 107 usable responses were received for Round 1, and 94 for Round 2. Section G and the Appendix provide information about panel membership, affiliation, and expertise.

In interpreting the results summarized in this report, the reader should keep several points in mind. First, although data is presented in terms of statistical measures (means, medians, quartiles, percentages) it would be incorrect to interpret these as estimates of the views of some larger population. The panel is not an unbiased random sample, but rather a deliberately chosen group of those potentially affected by the network. Second, for a number of question areas several alternative measures could be applied to interpreting the results. Thus, for example, rankings of preferences could change somewhat if the median rather than the mean were used as the critical statistic. However, while this might shift the order or ranking of items differing very little in the measures being used, major changes in rank or comparative importance are not likely. Third, consensus points are reported here, and individual positions or preferences held by only a very small number of panelists are generally not included in this report. To do otherwise would largely obscure the more important areas of consensus and difference.

Perhaps a good guideline for the reader is to approach the report as the summary of major points made by the panelists through a very special structured "conversation" process!

A. DESIRABILITY AND BENEFITS OF NETWORK

A1. The Delphi starting point was the March 1993 Statewide Telecommunications Forum, which set broad goals and a timetable for getting the network to the operating point.

In March 1993 the Governor's Telecommunications Information Council invited some 75 representatives of state agencies, local school districts, the University of Alaska, radio and TV stations, telephone companies, and other organizations to a two-day conference in Juneau to discuss how Alaska telecommunications could serve Alaskans more efficiently and how services could be enhanced.

This statewide telecommunications forum, "Visions of Alaska's Future," concluded that

- The state should, as soon as possible, initiate a planning effort for development of a coordinated, statewide telecommunications network. This network should have the capacity for interactive, real-time communication of video, audio, and data transmissions.

- A statewide network should be operating within 3 years.

- The new network must be a "private/public" operation that brings the strengths of both sectors to the partnership.

The conference report from this forum served as the starting point for development of the first Delphi questionnaire.

A2. More than 80% of responding Delphi panelists stated that creating such a network should be a very high or high priority from an Alaska statewide perspective.

When asked in Round 1 what priority, from an Alaska statewide perspective, should be given to development of a coordinated statewide telecommunications network, 55% of responding panelists gave it very high priority, 29% gave it high priority, 11% gave it moderate priority, and 5% gave it low priority.

A3. From the perspective of their individual organizational affiliations, 73% of respondents felt access to such a network would be highly valuable, 24% felt it would be moderately valuable, and 3% felt it would be of little value.

A4. The top five major benefits predicted by the panel are improved education opportunities/courses/programs, access without travel, state services/government closer to the people, an electronic reduction in the vast size of Alaska, better health services/health personnel training. Other benefits are also likely to be significant.

Major network benefits from an Alaska statewide perspective were suggested by panelists in Round 1. In Round 2 panelists ranked the importance of the most commonly suggested benefits. These benefits are listed below in descending order of significance. Panelists could also indicate which benefits--if any--are unlikely to materialize; the % of respondents stating that a benefit is unlikely is shown in [ ] brackets.

1. Improved education opportunities/courses/programs [0% said unlikely]
2. Access without travel [1% said unlikely]
3. State services/government closer to people [2% said unlikely]
4. Vast size of Alaska electronically reduced [2% said unlikely]
5. Better health services/health personnel training [1% said unlikely]
6. Cost savings [9% said unlikely]
7. Broader/better access to public TV, radio, RATNET [4% said unlikely]
8. Increased rural/urban equality [16% said unlikely]
9. Better Alaska ties to rest of the world [8% said unlikely]
10. Improved "bush" quality of life [11% said unlikely]
11. Increased economic opportunities/jobs [11% said unlikely]

A5. In terms of the impact of such a network on <u>overall Alaska economic development</u>, 45% of responding panelists predicted a major positive impact, 37% predicted a moderate positive impact, 18% predicted very little positive impact, and one panelist predicted a negative impact.

A6. In terms of the impact of such a network on <u>increasing rural Alaska economic development</u>, 44% of responding panelists predicted a major positive impact, 44% predicted a moderate positive impact, 11% predicted very little positive impact, and 1% predicted some negative impact.

A7. From an Alaska business/economic perspective the following likely network benefits are of high to medium importance (listed in decreasing order of importance):

1. Reduced travel time/costs
2. Improved employee training possibilities
3. Improved access to market/economic information
4. Ability to establish business outside urban areas
5. Access to national/global markets
6. Enhanced negotiation/deal making ability

A8. Benefits identified by panelists for their own organizations generally paralleled those for Alaska as a whole, with variations reflecting the nature of the panelist's own organization. Reduced costs, increased efficiency, increased access to a variety of services and programs, improved distance delivery of services, better education services, reduced travel, and increased coordination are indicative of the benefits identified.

A9. When asked whether they currently have ready access to specific telecommunication means or technologies, responding panelists indicated that

98% had access to touch-tone telephone service

82% had access to reliable computer data transmission

78% had access to one-way audio

59% had access to one-way video

42% had access to one-way video/two-way audio

29% had access to two-way video/audio

26% had access to imaging

B. USER DEMAND LEVELS AND PRIORITIES

B1. Panelists predicted network demand levels would be highest for education, public radio and television, RATNET, health, emergency services, and video conferencing/access to the legislature. Together with public safety, these also received the highest priorities for network access.

The table below lists uses in order of decreasing predicted demand levels for network services, and indicates the predicted 5-year growth level for each use/user. Priority levels assigned by panelists are also shown (1 = highest).

POTENTIAL USER/USE	5-year Growth	Priority Ranking
Public radio and television	2x	5
Distance education for university courses	3x	1
Distance education for K-12	3x	4
RATNET (Rural Alaska Television Network)	1.5x	8
Public health	3x	2/3
Emergency services	2x	2/3
Video conferencing/access to legislature	2x	7
State government information/data	3x	11
Video conferencing/access to state agencies	2.5x	10
Access to library materials	3x	9
Public safety	2x	6
Access to national networks/data bases	3x	13
Commercial radio and television	2x	20
Video conferencing for professional groups & non-profits	2x	17
Cable television	2x	15
General economic development activity	2x	12
Military/National Guard use	2x	14
Court system/judicial use	2x	16
Video conferencing/general business	2x	19
Access to Alaska Congressional delegation	2x	18
Arts organizations/museums	1.5x	21

C. ESTABLISHING THE NETWORK: STRATEGY AND BARRIERS

C1. The majority of panelists prefer to have the network initially focus on 2-way video, audio, teleconferencing, etc., with computer data capability added later.

Given that panelists could choose only one of the two options listed below

37% chose **A**: The network initially will have computer data transmission capability; 2-way video, audio, teleconferencing, etc. to be added later.

63% chose **B**: The network initially focuses on 2-way video, audio, teleconferencing, etc., with computer data capability added later.

C2. The majority of panelists prefer a "demand pull" approach where network design and implementation focuses on clearly identified specific needs, as opposed to a "supply push" approach where network capability and capacity attract new users.

Asked to choose, from a total Alaska statewide perspective, between the two alternative policies listed below

63% chose **A**: The initial network design and implementation focuses on clearly identified specific needs, and expansion is in response to clear additional needs--i.e., **a "demand pull" approach.**

37% chose **B**: The initial network design, implementation, and expansion focuses on developing a strong general telecommunications capability and high capacity for all Alaska, with users attracted by the new possibilities--i.e., **a supply push" approach.**

C3. Public support and understanding may be needed to get the network started. Only 21% of responding panelists felt there was high or some general awareness among the general Alaska public of the possibilities and significance of such a telecommunications network; 79% felt there was low or very low general awareness.

C4. Panelists felt that the general level of awareness and understanding of the possibilities and significance of the network among the most likely user groups in Alaska is significantly higher, with 19% having high general awareness, 57% having some general awareness, and 25% having low general awareness.

C5. Panelists felt that the level of general understanding of the network technological issues and limits among the most likely users in Alaska was somewhat lower than the understanding of the network possibilities and significance. Of the responding panelists, 6% believe there is high, 47% believe there is some, and 47% believe there is low or very low technological understanding on the part of the most likely Alaska users.

C6. Potential barriers to starting the network envisioned by panelists are listed below in order of decreasing perceived significance. The % of responding panelists listing each barrier as the single most significant one is also shown. Initial capital costs and operating costs/funding are perceived to be the most significant.

POTENTIAL BARRIERS TO STARTING NETWORK	% OF PANELISTS CHOOSING THIS AS THE MOST SIGNIFICANT BARRIER
Initial capital costs	41%
Operating costs/funding	15%
"Turf" conflicts	7%
Political priorities	2%
Reaching user consensus	2%
Poor public understanding	3%
Agreement on governance structure	3%
Interagency cooperation	2%
Poor planning	6%
General coordination	1%
User training	1%
Lack of private sector participation	7%
Lack of defined uses	2%
Special interest opposition	2%
Interfacing technology	0%
Agreement on standards	1%
Lack of technical expertise	0%
Regulatory barriers	0%
Providing adequate bandwidth	1%
Satellite capacity	1%
Integrating with existing telecommunications	7%
Access privileges	0%
Technology limitations	0%

D. COSTS AND FUNDING

D1. In terms of reasonable and fair shares of the capital investments needed to establish the network, the panel in general stated that 43% should come from state government, 25% from the federal government, 20% from network users, and 12% from other sources--primarily from the private sector. (Note: percentages are median response values.)

D2. In terms of a reasonable and fair funding mix for operating the network, including equipment maintenance, the panel share preference was (again, percentages are median values) 40% from state government, 15% from the federal government, 40% from network users, and 5% from other sources--primarily from the private sector.

D3. When asked what percentage of their organization's total budget would be the likely maximum that their organization would allocate to membership/use in the network, panelists gave answers below:

25% of panelists predicted it would be less than 1%

30% of panelists predicted it would be more than 1% but less than 3%

21% of panelists predicted it would be more than 3% but less than 6%

10% of panelists predicted it would be more than 6% but less than 10%

9% of panelists predicted it would be more than 10% but less than 20%

6% of panelists predicted it would be more than 20%

D4. The overwhelming majority of panelists cited cost savings as a major benefit of having such a network. However, a few pointed out that it might actually result in a net cost increase, as equipment, maintenance, training, and program development activity all increase.

D5. Panelists predicted the net impact (in constant dollars) of the network on their organization's total budget would most likely be in the range of a 0% to 10% increase, with the most probable level of increase being approximately 4%.

E. NETWORK GOVERNANCE AND ACCESS POLICIES

Network governance and access policies are potential sources of conflicts and possible barriers to establishing the network. Accordingly, governance models and access policies were investigated in both Delphi questionnaire rounds.

E1. In Round 1 panelists were asked to rank a number of possible models for operating or administering the network from a policy perspective. This resulted in the ranking shown below (in descending order of desirability):

1. **A public/private consortium organization with some board members appointed by state government and others appointed/elected by users**
2. **An independent network organization board elected by user members, with each user organization having one vote**
3. **A quasi-independent board/commission appointed by the governor & confirmed by the legislature**
4. **The Alaska Public Broadcasting Commission**
5. **An independent network organization board elected by user members, with each organization having voting power proportional to $ use of network**
6. An office within the Alaska Department of Administration
7. A separate cabinet-level state government department
8. An office within the Alaska Department of Commerce
9. Only a coordinating group or board, but no formal administration

E2. In Round 2 panelists were asked to rank the top five governance choices shown above in (E1). The ranking order remained unchanged, with *"A public/private consortium organization with some board members appointed by state government and others appointed/elected by users"* the overwhelming first choice.

E3. Two (2) panelists felt the first-ranked governance model, "A public/private consortium organization with some board members appointed by state government and others appointed/elected by users," was unacceptable.

The objections were to too much government, and a belief that a private corporation is needed.

E4. Seven (7) panelists felt the second-ranked governance model, "An independent network organization board elected by user members, with each user organization having one vote," was unacceptable.

Governance should not be by users only, non-vested interest members required on board, $ comes from state but state left out of governance, a private corporation would be better.

E5. Twenty (20) panelists felt that the third-ranked governance model, "A quasi-independent board/commission appointed by the governor & confirmed by the legislature" was unacceptable.

Objectors perceived this model as being too political, and lacking in continuity.

E6. Seventeen (17) panelists felt the fourth-ranked governance model, "The Alaska Public Broadcasting Commission," was unacceptable.

The APBC is too narrowly focused, this is beyond its mandate, as a user it has a vested interest.

E7. Twenty-seven (27) panelists felt the fifth-ranked governance model,"An independent network organization board elected by user members, with each organization having voting power proportional to $ use of network," was unacceptable.

This alternative does not provide equity, discriminates against smaller user and less populated areas, better funded users would capture network, $ do not automatically equal good public policy, $ not necessarily representative of real needs.

E8. By a ratio of two to one, responding panelists felt the Alaska Public Utilities Commission should <u>not</u> have substantial regulatory authority over the network, but 83% of responding panelists felt the APUC should use economic and social development as criteria in creating incentives for telephone utilities to participate in network development and operation.

E9. Distance should not be a significant factor in setting user fees, according to 92% of responding panelists.

E10. In instances where demand for services exceeds network capacity, 79% of responding panelists felt priority access should be determined by administrative policy guidelines set by the network's governing board.

E11. Some examples provided by panelists of priority access policy guidelines that panelists believe would be both fair and effective are:

- Emergency/life/safety/health uses come first
- Education has next priority
- Priority for areas/users without other alternatives
- Public sector should have priority over private sector
- Priority for uses reaching most population
- Priority based on financial contribution
- Priority rules set by governing body with user group input
- Priority to achieving rural/urban equity
- Priority to uses reducing Alaska government costs
- Priority determined by benefit/cost analysis
- Priority based on greatest public policy benefits
- Low priority for entertainment

F. TECHNOLOGY/TECHNICAL ISSUES

F1. When asked if it will be feasible to have an "interoperable network" which can integrate existing and new telecommunications programs with the statewide network, 51% of panelists said "yes, definitely," 45% said very likely, 3% said somewhat likely, and only one panelist said it would be very unlikely.

F3. Panelists suggested and then rated the importance for interoperability of a number of different approaches to network planning, design, and operation. The weighted importance score (3 = High, 2 = medium, 1 = low) for each approach is shown in the table below.

APPROACH FOR ENSURING INTEROPERABILITY	WEIGHTED IMPORTANCE SCORE
Competent, reliable technical support	2.83
Inventory current technology in Alaska	2.79
Strong leadership from policy-making body	2.70
Establish standards/contracts specifying interoperability	2.69
Adopt standards being set by industry	2.60
Agency cooperation/planning	2.58
Bring engineers & users together	2.56
Significant broad-band capacity	2.50
Commitment/budget for interfacing	2.45
Software-based, not hardware-based system	2.40
Work closely with local utility co's.	2.39
Interoperability incentives	2.28
Do not build private network to bypass public network	2.26
100% digital bandwidth on demand	2.25
Procure services in integrated manner from commercial telecom company	1.97

F3. When asked how important it is to have the network be compatible with the technologies listed in the table below, panelists generally assigned high importance to compatibility with all of the technologies, as shown by the average importance scores. (3 = High, 2 = Medium, 1 = Low.)

TECHNOLOGY	NETWORK COMPATIBILITY IMPORTANCE SCORE
VSAT satellite communications	2.82
Other planned compression networks: PBS, Star Schools, etc.	2.80
Fiber optics	2.75
ISDN international standards	2.68
Cable	2.60

G. PANELIST AFFILIATION AND EXPERTISE

G1. Round 1 respondents were asked to indicate which category in the table below best describes their current affiliation; the resulting percentage distribution is shown.

Note: Because of multiple responses, this distribution should be considered as an approximation of the panel member affiliation; the Appendix of this report lists the respondents and their organizations. Also, Round 2 respondents were not identical with all Round 1 respondents.

State government	28%
Television/radio	18%
Telephone utility	4%
Other telecommunications organization	7%
Other business	4%
Federal government	1%
Local government	3%
Native corporation/organization	4%
Social services/health organization	2%
Education: K-12	11%
Education: university	13%
Other affiliation	5%

G2. The number of Round 1 respondents rating their expertise on different areas in terms of HIGH, MEDIUM, or LOW as defined by the scale below is given in the following table.

HIGH - actively involved in decisions, research, or analysis in area
MEDIUM - generally well informed in the area through experience, reading, analysis
LOW - knowledge or expertise in area about same as that of well-informed citizen

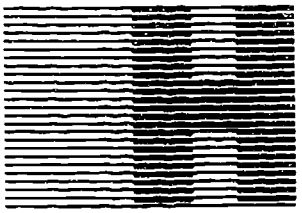
AREA OF EXPERTISE	LEVEL OF EXPERTISE		
	HIGH	MEDIUM	LOW
Telecommunications technology in general	29	53	20
Television/radio	32	41	26
Telephone technology	10	43	47
Business/economic development	26	44	29
Government operations	41	45	14
Distance delivery of education	26	37	38
Computers/data transmission	30	45	12
Emergency services	9	27	64
Non-profit organizations	31	35	34

APPENDIX: DELPHI STUDY RESPONDENTS THROUGH 9/15/93

NAME	AGENCY/LOCATION	ROUND	
		1	2
ALEXANDER, ROSEMARIE	SENATOR DUNCAN'S OFFICE	X	X
BARNES, ALLAN	DEPT OF EDUCATION	X	X
BARNES, TWYLA	SE REG RESOURCE CTR	X	X
BARRETT, DR. HELEN	AK SOC FOR TECH IN ED	X	X
BENEDICT, BILLIE	RATNET-DILLINGHAM	X	X
BEREZIN, MARK	KENAI BOROUGH SCHOOLS	X	X
BERG, PAUL	JUNEAU	X	
BRAINE, SUSAN	KSKO-AM	X	X
BRANSON, PATRICIA	AK PUBLIC BROADCAST. C.	X	
BRIDE, JUDITH	UAS, COMPUTING SERV.	X	X
BROWN, BENJAMIN	ANCHORAGE	X	X
BROWN, REP. KAY	AK LEGISLATURE	X	X
BURTON, RICHARD	DEPT OF PUBLIC SAFETY	X	
CAMPBELL, BRUCE	DOT & PF	X	X
CARY, MARTIN	NORTH SLOPE SCHOOL DIS	X	X
COLE, HENRY	FAIRBANKS		X
COLLARD, JAMES	PTI COMMUNICATIONS	X	X
COX, MAJOR GEN. HUGH	DEPT OF MIL. & VET. AF.	X	X
DAVIES, REP. JOHN	AK LEGISLATURE		X
DENKINGER, BILL	MT. EDGECUMBE HIGH S.	X	X
DOW, BARNABY	KHNS-FM	X	
ELLIOT, SUSAN	AK STATE LIBRARIES	X	X
ELLIS, DR. CARL	UA CONTINUING ED	X	
ENGEN, SUSAN	FOLLETT SOFTWARE CO.	X	X
ESTES, STEVE	UA GEOPHYSICAL INST.	X	X
ETULAIN, DAN	RATNET-SITKA	X	X
FAHRENS, RUTH	KSDP-AM		X
FISHER, ROBERT	AK COURT SYSTEM	X	X
FLANNIGAN, LARRY	DENALI BOROUGH EMERG. S.	X	
FOSTER, MARK	AK PUB UTILITIES COM		X
FRANK, SEN. STEVE	AK LEGISLATURE	X	
FUHS, PAUL	DEPT OF COMMERCE	X	
GAIPTMAN, SHARON	AK PUBLIC BROADCAST. C.	X	X
GORMAN, MARK	SEARHC		X
HALL, STEVE	ALASCOM	X	X
HARDING, DAVID	REP. MACLEAN'S OFFICE	X	X
HARMON, G. MICHAEL	DIV OF PUBLIC SERV/LEGIS	X	X
HENSLEY, ABBE	ALASKA PTA	X	
HIDALGO MIKE	ITCA	X	X
HIEBERT, AUGIE	NORTHERN TELEVISION INC.		X
HILDEBRAND, STEVE	DEPT OF COMMERCE	X	
HOKE, DEAN	KAKM-TV	X	X
HOLMES, MATT	KFSK-FM	X	X
HOYLE, FRANCIS	BARTLETT MEM HOSPITAL	X	
HUDSON, REP. BILL	AK LEGISLATURE	X	X

JACKSON, K.C.	KDLG-AM (DILLINGHAM)	X	X
JAMES, REP. JEANNETTE	AK LEGISLATURE	X	X
JARVIS, ROGER	AK BOARD OF EDUCATION	X	X
JONES, STAN	ANCH DAILY NEWS	X	
JORDAN, KAREN	JUNEAU SCHOOL DISTRICT	X	X
KAELKA, MIKE	SHELDON JACKSON COLLEGE		X
KAPLAN, DIANE	APRN	X	X
KASTELIC, PATTY	AK PUBLIC BROADCAST. C.	X	X
KOMISAR, JEROME	UA PRESIDENT	X	X
KOWALSKI, KARL	NW ARCTC BOR SCHOOLS	X	X
LAUGHY, LIN	WRANGELL SCHOOL DIST.	X	X
LAW, KELLIE	KMXT-FM	X	X
LEGERE, BILL	KTOO-FM	X	
LEMASTER, ALAN	AK PUBLIC BROADCAST. C.	X	X
LOMMEL, DAN	AK RAILROAD	X	
MAHLEN, CHARLES	DEPT OF LABOR	X	X
MALA, DR. TED	DEPT OF HEALTH	X	X
MALLOTT, BYRON	UAS	X	X
MCCARTHY, PAUL	UA UNIV. LIBRARIES	X	
MCCLEAR, RICH	KCAW-FM (SITKA)	X	X
MCDONALD, JACK	CITY OF KODIAK	X	X
MCDONALD, JOHN	KYUK-AM (BETHEL)	X	X
MCDOWELL, JOANN	PWS COM. COLLEGE	X	X
MEDINGER, BOB	LOWER KUSK SCHOOL D.	X	X
MERCULIEFF, LARRY	ISLAND OF ST. PAUL	X	
MORRONE, JOHN	DOA/ INFOR SERVICES	X	X
MURRAY, BERNADETTE	VP-PTI COMMUNICATIONS		X
NANENG, MYRON	AVCP		X
NELSON, RUSSELL	RATNET (DILLINGHAM)	X	X
NOAH, HARRY	DEPT OF NATURAL RES	X	X
NORTON, JUDY	AK STATE BOARD OF ED	X	X
OINES, GARY	AK PUBLIC BROADCAST. C.	X	X
ORSBORN, ALYS	TELECOM (UACN)	X	X
PARKER, WALT	PARKER ASSOCIATES	X	X
PEARCE, SEN. DRUE	AK LEGISLATURE	X	X
PEARCE, DR. FRED	UAA TELECOMMUNICATIONS	X	X
PEARSON, LARRY	UAA JOURNALISM DEPT.	X	X
PETERMAN, TIS	KSTK-FM (WRANGELL)	X	X
PETERSON, WILL	KBBI-AM (HOMER)	X	X
PRITCHARD, RON	MIS (MAT-SU SCHOOLS)	X	X
PROENZA, LUIS	UA STATEWIDE ACAD AFF	X	
PUGH, JOHN	UAS-SCHOOL OF ED	X	
REED, GLENN	DEPT OF COMMERCE	X	
REXWINKEL, DARREL	DEPT OF REVENUE	X	X
RINKER, DON	KBRW-AM (BARROW)	X	X
ROWE, CHARLOTTE	UA GEOPHYSICAL INST.	X	X
ROY, TOM	AK TELEPHONE ASSN		X
RUSSELL, CHUCK	UNITED UTLITIES	X	X

SANDOR, JOHN	DEPT OF EDUCATION	X	X
SANDORSON, SANDY	AIRRES	X	X
SCHAEFER, JAMES	DISTANCE DELIVERY CONS.	X	
SEARCY, MIKE	ALASCOM		X
SMITH, BRUCE	KUAC-FM & TV	X	X
SMITH, STEVE	UA-RASMUSSEN LIB	X	X
SNELL, WILLIAM	AIDEA	X	X
SOMMER, ROBERT	KIYU (GALENA)	X	X
STANDLEY, MARK	AK GATEWAY SCHOOL	X	X
SWENSON, PATTI	REP. BUNDE'S OFFICE	X	X
SWISHER, KENT	AK MUNICIPAL LEAGUE	X	
TALBOT, BRIAN	ESD 101	X	X
TAYLOR, TOM	COMMUNITY & REG. AF.	X	X
TOWARAK, TIM	RATNET (UNALAKLEET)		X
TULUK, PETER	KCUK-FM (CHEVAK)	X	X
TURPIN, HOPE	AK PUBLIC BROADCAST. C.	X	X
TWITCHELL, PETER	RATNET (BETHEL)	X	
USERA, NANCY BEAR	DEPT OF ADMIN	X	X
VALE, NELLIE	RATNET (YAKUTAT)	X	
WALP, ROBERT	AK BOARD OF EDUCATION	X	X
WALSH, ALICE CHEBA	KSKA-FM	X	X
WARNER, SUSAN	UAS MEDIA SERVICES	X	
WEST-WHITE, MARTY	KRBD-FM (KETCHIKAN)	X	
WIGET, LAWRENCE	ANCH SCHOOL DIST	X	X
WILLIS, BARRY	UAA DISTANCE ED	X	X
WINCHESTER, JAMES	KCHU-AM (VALDEZ)	X	X



HEZEL
ASSOCIATES

Satellite Interconnection Planning Project

for the

Alaska Department of Administration

By Hezel Associates

September, 1993

Hezel Associates
Communication Planning
and Research

1201 East Fayette Street
Syracuse, New York 13210
315-422-3512
FAX: 315-422-3513

Satellite Interconnection Planning Project

for the

Alaska Department of Administration

By Hezel Associates

September, 1993

Executive Summary

The State of Alaska is currently undertaking a statewide telecommunications plan for Alaska's Satellite Interconnection Planning Project. Under a contract with the Department of Administration and Alaska Public Broadcasting Commission, Hezel Associates has undertaken research to investigate statewide planning processes in other states that are geographically and demographically similar to Alaska.

This report describes governance structures in states which have already implemented telecommunications systems for public uses such as education, health and government. In particular, the report focuses on states which, like Alaska, are geographically large and have sparse population. Decentralized structures for telecommunications planning and implementation are emphasized. Also discussed are several states which, although not necessarily large or underpopulated, have instituted systems which are nevertheless worthy of investigation.

Centralized and Decentralized Planning

In a move toward greater efficiency and cost effectiveness, many states have empowered a centralized organization such as the department of information and telecommunications, budget and finance, or higher education to assume responsibility for telecommunications planning. In other, "decentralized" states planning responsibilities are spread among several agencies and/or organizations. Whether a state has centralized its planning functions depends on the politics and values of the state. Hezel Associates, in its reports on statewide telecommunications planning, has long viewed centralized planning and operation as technically and financially beneficial to a state.

With respect to the actual use of telecommunications, however, decentralized systems often are more effective. For example, institutions and agencies in Oklahoma, which is a relatively rural state, were not all prepared to advance in telecommunications as rapidly as the Oklahoma Board of Regents for Higher Education. As a result, the Board has consistently led the planning of educational telecommunications for the state.

The Locus of Telecommunications Planning

A diversity of planning organizations is often considered one of the strengths of state-level telecommunications planning. Decision making at the agency or organization level is often designed to insure that maximum use will be made of the resources and strengths available in the state, and that the institution most capable of planning for specific priorities is vested with the responsibility.

Neighboring states Montana and Wyoming represent diverse models for the involvement of divisions of telecommunications. The Montana division supported the preparation of the plan for statewide telecommunications, but leaves much of the control of systems in the hands of the agencies. In Wyoming, the division not only prepared the plans for statewide compressed video, but also procures and operates the telecommunications system.

Examples from Large, Sparsely Populated, Decentralized States

Several states are similar to Alaska in that they are relatively large, are sparsely populated, and employ a decentralized planning structure for telecommunications. Interesting examples from the states of Montana, New Mexico, North Dakota, South Dakota, Nebraska, and Kansas should be considered in planning for the Alaska Satellite Interconnection Planning Project.

Other Decentralized States

The governance system for telecommunications in several decentralized states is worthy of consideration even though those states are not necessarily large or sparsely populated. States which may serve as a model for Alaska include Arizona, Colorado, Idaho, Texas, Vermont, and Washington.

Smaller, More Populous States to Consider

A third set of states, neither necessarily large, unpopulated, nor decentralized, nevertheless have instituted systems of interest. These include Iowa and Virginia in particular.

Integration and Interoperability

Each state has its own particular telecommunications resources and needs. Often the telecommunications requirements of a state are most efficiently met by the use of diverse technologies and delivery systems. Populous areas of the state are often best served by different technologies than those in use in sparsely populated, remote regions.

When several different technologies are used to deliver telecommunicated information, the issues of integration and interoperability must always be considered. Ideally, each system must speak to the others with a minimum of translation. A lack of interoperability leads to inefficiency and restrictions on information distribution. More and more, effort is being made to coordinate technologies to construct a system that is both fully compatible and optimally efficient.

Several states and projects have successfully integrated terrestrial (microwave, broadcast, copper and fiber optics) with satellite technology. Terrestrial-based technologies are often best suited for the delivery of information over short distances and in populous areas, and are frequently found in use in and among nearby cities. To serve rural and outlying areas, however, states usually find it more effective and cost efficient to deliver information by satellite. The best and most flexible of these operations employ both technologies in an integral, fully interoperable system.

Retrofitting for Digital Transmission

As existing telecommunications systems age and new technology becomes available and more cost effective, more and more states are modifying, upgrading, and otherwise improving their telecommunications systems. Retrofitting for digital transmission is now being carried out on a small scale in a handful of states, and is being considered in several others.

Quality of the signal is an important factor when considering new systems for health or distance education. On the other hand, cost is also a major consideration in most cases, and the need for superior signal quality must often be balanced according to available funds. As digital services become more available at a lower cost and higher signal quality, a migration toward digital systems with full bandwidth is projected to take place. A migration from satellite-based systems to terrestrial systems is also projected.

Public/ Private Partnerships for Telecommunications

In many states, private-public sector partnerships have become particularly important, resulting in a number of benefits in the field of telecommunications. Such partnerships make technical expertise available to educators at the planning state of educational technology programs. Cooperation between the private sector and higher education will also help create sound training programs in response to identified needs, and will help make these programs equitably available to all teachers in the state, whether from urban or rural locations.

The Role of State Government in Public/ Private Partnerships

State government policy makers play a critical role in encouraging and implementing the economic and social benefits of the information technology revolution. The influence of a Governor's office plays a substantial role in formulating decisions concerning the allocation of state funds for the implementation of distance education systems. This involvement is most evident in those states characterized by well-funded programs for the implementation of advanced technologies for distance learning.

Table of Contents

Satellite Interconnection Planning Project

The State of Alaska is currently undertaking a statewide telecommunications plan for Alaska's Satellite Interconnection Planning Project. Under a contract with the Department of Administration and Alaska Public Broadcasting Commission, Hezel Associates has undertaken research to investigate statewide planning processes in other states that are geographically and demographically similar to Alaska. This report is based on a review of documents maintained in Hezel Associates' library, as well as follow up telephone calls to key people in several states.

To assure that the Alaska plan benefits from other states' experience in telecommunications planning, implementation, management and policy development, the Alaska planners have requested information about those activities in other states which might inform the planning efforts in Alaska. It is recognized that models derived from other states may be appropriate to employ in Alaska.

This report describes governance structures in states which have already implemented telecommunications systems for public uses such as education, health and government. In particular, the report focuses on states which, like Alaska, are geographically large and have sparse population. Decentralized structures for telecommunications planning and implementation are emphasized.

Nevertheless, in the interest of providing a comprehensive view of planning in states, and in order to exhibit the best models of statewide telecommunications, telecommunications planning activities are also described for "interesting" states which may not precisely fit the descriptors established for the study.

Governance Structures in Geographically Large, Rural States

No state matches Alaska in size or sparseness of population, but some states, especially Rocky Mountain and plains states, have relatively small populations in large territories. Specifically, Montana, Wyoming, New Mexico, North Dakota, South Dakota, Nebraska, and Kansas are sparsely settled, relatively large states. Each of those states has a fairly decentralized structure of telecommunications management.

Other decentralized states have already implemented telecommunications systems for use in education, health, and government, and while they are not necessarily large or sparsely populated, they too deserve attention. Arizona, Colorado, Idaho, Texas, Vermont, and Washington are among those states. Finally, several states deserve consideration even though they are neither large and sparse in population nor decentralized in telecommunications structure. States such as Nebraska, Iowa, Virginia, and South Carolina are examples of states that have developed unusually useful telecommunications planning and implementation structures.

Centralized and Decentralized Planning

In a move toward greater efficiency and cost effectiveness, many states have empowered a centralized organization such as the department of information and telecommunications, budget and finance, or higher education to assume responsibility for telecommunications planning. In other, "decentralized" states planning responsibilities are spread among several agencies and/or organizations. Whether a state has centralized its planning functions depends on the politics and values of the state. Hezel Associates, in its reports on statewide telecommunications planning, has long viewed centralized planning and operation as technically and financially beneficial to a state.

With respect to the actual use of telecommunications, however, decentralized systems often are more effective. For example, institutions and agencies in Oklahoma, which is a relatively rural state, were not all prepared to advance in telecommunications as rapidly as the Oklahoma Board of Regents for Higher Education. As a result, the Board has consistently led the planning of educational telecommunications for the state.

The Locus of Telecommunications Planning

A diversity of planning organizations is often considered one of the strengths of state-level telecommunications planning. Depending on the telecommunications needs, financing, and political characteristics of each state, telecommunications leadership may stem from higher education, the office of budget, the department of administration, or from some other organization. Decision making at the agency or organization level is often designed to insure that maximum use will be made of the resources and strengths available in the state, and that the institution most capable of planning for specific priorities is vested with the responsibility.

Table 1 reveals the location of telecommunications planning in selected states. In all of the states, with the exception of Arizona, Texas, and Vermont, an agency such as the department of administration, budget, or information services is involved in the planning. In Colorado, the State Division of Telecommunications is responsible for procuring telecommunications resources for all agencies. Nevertheless, much of the coordinating work is now in the hands of the Telecommunications Advisory Commission. The Department of Information Services in Washington has attempted to bring all state users, including education, into a common planning system. While K-12 schools and community colleges have followed, the state university system has been noticeably resistant.

Neighboring states Montana and Wyoming represent diverse models for the involvement of divisions of telecommunications. The Montana division supported the preparation of the plan for statewide telecommunications, but leaves much of the control of systems in the hands of the agencies. In Wyoming, the division not only prepared the plans for statewide compressed video, but also procures and operates the telecommunications system.

Table 1
Telecommunications Planning Loci in Selected "Decentralized" States

State	Planning Loci
Arizona	Commission on Higher Education; Department of Education
Colorado	Colorado Learning Network; State College System; State Division of Telecommunications
Idaho	Telecommunications Council (TELCOM)
Montana	State Information and Telecommunications; Office of General Services; Department of Administration; Office of Public Instruction; Office of the Commissioner of Higher Education
New Mexico	Board of Education; Commission on Higher Education
South Dakota	Rural Development Telecommunications Network (RDTN) Governing Board; South Dakota Public Broadcasting; Information Services
Texas	Texas Education Agency (TEA); Texas Higher Education Coordinating Board;
Vermont	Vermont Technical College
Washington	Office of the Superintendent of Public Instruction (OSPI); Higher Education Coordinating Board (HECB); State Board for Community and Technical Colleges (SBCTC); Information Services
Wyoming	Postsecondary Planning and Coordinating Council; State Information and Telecommunications

Examples from Large, Sparsely Populated, Decentralized States

Several states are similar to Alaska in that they are relatively large, are sparsely populated, and employ a decentralized planning structure for telecommunications. Interesting examples from the states of Montana, New Mexico, North Dakota, South Dakota, Nebraska, and Kansas should be considered in planning for the Alaska Satellite Interconnection Planning Project.

In Montana, educational programming via satellite is becoming increasingly available due to steady decreases in the cost of satellite hardware. Existing telecommunications infrastructure throughout the state is being upgraded to digital facilities or fiber. Concurrently, advances in video compression technology are making video transmission at cost effective data rates possible.

Montana's well-conceived state telecommunications system, the Montana Educational Telecommunications Network (METNET) is in its early stages of implementation. During 1992, four compressed video sites were installed: at the state capitol, at the University of Montana at Missoula, at Montana State University (MSU) at Bozeman, and at Eastern Montana State College. Established by the state legislature in 1989, METNET is a cooperative venture involving the Department of Administration's Office of Telecommunications, the Office of the Commissioner of Higher Education, and the Office of Public Instruction (OPI). The Department of Administration administers funds and handles technical decision making for the system, while the Commission on Higher Education and OPI resolve curriculum issues. The state legislature initially appropriated $450,000 per year for two years for METNET, with the stipulation that $300,000 per year come out of a general fund with a 50 percent match of cash or equipment value from private sources.

METNET completed its network design phase in 1990. The system consists of voice, data, and two-way video components. By the end of 1995, METNET will include over 300 distance education sites, 15 regional training centers, 10 two-way compressed video sites, one high speed public television link, and one KU-band uplink.

Nebraska's Multiple Channel Satellite and Optical Fiber Educational Telecommunications Network (NEB*SAT) was established in 1990 when Nebraska leased a full-time satellite transponder for educational and public service programming. Nebraska was the first state to purchase a dedicated multiple channel transponder for statewide educational use involving all sectors of education. NEB*SAT was designed to fulfill four distinct and concurrent needs: a broadcast-quality channel interconnects the state's ETV Network transmitters and public radio

transmitters; a second broadcast quality channel provides statewide distribution of distance learning and continuing education programming for formal education as well as in-service and continuing education; compressed video technology allows additional transmission of video and audio signals between origination and reception sites; and telephone companies serving Nebraska will work with NEB*SAT to develop regional fiber optic networks to link schools desiring to share two-way information.

The Nebraska Educational Television Network is a nine-channel, 16 translator system operating through a partnership between the University of Nebraska and the Nebraska Educational Telecommunications Commission. Four agencies contribute to the Nebraska ETV Network program service--University of Nebraska-Lincoln Television, which provides non-instructional public television services; University of Nebraska-Omaha Television, producing programs for broadcast in the Omaha area; the Nebraska Department of Education, in partnership with the Nebraska ETV Network, offering elementary and secondary instructional television programming through the Schools TeleLearning Service (STS); and NETCHE, Inc., a consortium of Nebraska colleges and universities using Nebraska ETV Network services to supplement classroom instruction.

As in all states with well-designed telecommunications systems, in New Mexico the focus of educational technology projects is not on technology for its own sake, but rather on the ways technology can be used as a tool to "assist learning, equalize educational opportunities, and ease administrative burdens (*New Mexico's Challenge 2000*, 1991).

The Educational Technology Coordinating Council, assembled in April of 1992 by the state Board of Education and the Commission on Higher Education, advises these two entities on policies to facilitate education through the use of technology. The council acts as a forum for coordinating educational telecommunications efforts among participants, and established three working groups to examine work force training, technology in schools, and options for a statewide distance education system. The ETCC comprises 15 members representing two-year and four-year postsecondary institutions, state libraries, national laboratories, the broadcasting system, parents, and private industry.

NEDCOMM, the New Mexico Educators' Network for Educational Communication, is a free data communications network used for education. NEDCOMM is part of TECHNET, a cooperative project of the federal and state governments and private firms.

North Dakota was one of the first states to create a statewide system allowing multiple two-way video conferences to connect two or more sites. The North Dakota Interactive Video Network (ND IVN), established in 1990, now links all 11 campuses of the ND University System and the state capitol with full two-way audio and video communications. Through this system, no state resident is more than 90 minutes by car from an interactive video classroom. This allows state residents to attend classes, meetings, and seminars originating from several different sites and involving persons from widespread communities without driving to a central location.

South Dakota has determined through a needs assessment that its two best options for telecommunications-related technology are (1) terrestrial digital networks (the phone system) and (2) satellite transmission. The two systems will be used in concert in South Dakota, for a thorough study determined that neither alternative can properly address all of the demonstrated statewide needs in a cost effective manner in and of themselves.

As the Rural Development Telecommunications Network (RDTN) becomes a reality, South Dakota moves from planning to implementation of a statewide educational telecommunications system. RDTN, a hybrid telephone company-compressed video and satellite network, resulted from a recommendation made by the 1991 Governor's Telecommunications Task Force, which charged the RDTN group to implement and coordinate educational telecommunications initiatives. To date, six two-way video sites have become operational, and four others are scheduled to be operating shortly.

Also taking an active, although independent, role in planning for the state's distance education is the South Dakota Board of Directors for Educational Telecommunications, the governing board for South Dakota Public Broadcasting (SDPB), an agency in the Department of Education and Cultural Affairs. The Educational Telecommunications Board anticipates using RDTN facilities to increase distribution of educational programming across the state, beyond the currently available broadcast networks.

During 1992, Wyoming proceeded with the implementation of the Wyoming State Telecommunications Video Network. The University of Wyoming (UW), in collaboration with the state Telecommunications Office, developed the compressed video system, which utilizes the T-1 and fiber optic lines of the Wyoming Statewide Network (WSN) to deliver data, voice, and video.

Wyoming public broadcasting also began planning for the expansion of its statewide microwave network. In 1992, the state received an NTIA grant of approximately $977,000, matched by state funds, to expand the public radio and television network

to cover the southeastern part of the state. Construction began in the summer of 1993, with completion of the first phase of he network scheduled for September 1994.

The state's Postsecondary Planning and Coordinating Council (PSPCC) develops and maintains a state plan for educational telecommunications. The council, comprised of representatives from state agencies, the university system, and community college-related entities, submits an annual report on the status of educational telecommunications to the legislature. The 1992 report was largely concerned with policy and access issues surrounding the new compressed video network. The Distance Education Team is aligned with the council and is composed of members from the governor's office, the state Department of Education, community colleges, the private sector, and an *ad hoc* member from the Department of Administration and Information.

Other Decentralized States

The governance system for telecommunications in several decentralized states is worthy of consideration even though those states are not necessarily large or sparsely populated.

The Arizona Education Telecommunications Cooperative (AETC) is a consortium of representatives from higher education, community colleges, and elementary and secondary education. AETC is governed by a 13-member Board of Directors, and under its existing structure has several functions. These include (1) providing a forum for public policy debate, (2) assisting with the development of coordinated policies, (3) providing assistance with the development and utilization of telecommunications delivery systems, (4) encouraging individual educational entities to develop and staff internal telecommunications planning, development, and utilization units, (5) encouraging the planning and development of telecommunicated instructional courses and related services, (6) facilitating common technical and operating standards for telecommunications technologies, and (7) facilitating partnerships with the private sector. Institutions of higher education, schools and school districts, non-profit and for-profit corporations, and government agencies would be allowed to participate as members.

ASSET, Arizona School Services through Educational Technology, is a non-profit corporation residing at Arizona State University and KAET-TV. ASSET provides over 100 video telecourses to schools in 135 school districts in all of the K-12 curricular areas via videocassette recordings distributed to participating schools. ASSET is governed by a board of directors comprised of participating school superintendents and curriculum administrators.

The state Department of Education (DOE) completed a statewide plan in 1990 entitled *Technology Integrated Educational Delivery System (TIEDS): A K-12 Master Plan for the Infusion of Technology into Arizona Schools in the Teaching/Learning Environment.* The report established the conceptual framework for a new vision of learning and the transformation of schools. For each of the educational issues--quality education, equity, accountability, and productivity--objectives, recommendations, outcomes, and processes were listed.

The state Department of Administration (DOA) is undertaking a two-phase strategic plan to meet the telecommunications needs of state agencies. An initial statewide plan was assembled in 1992. The governor's office will review their initial suggestions and approve subsequent planning efforts for the second phase. The AETC will be present on the planning committee and will be developing a strategic plan for educational telecommunications in the state.

The Colorado state legislature created the Telecommunications Advisory Commission (TAC) in 1989 to coordinate statewide educational telecommunications. The advisory Commission adopted the task of forming a plan for a statewide infrastructure supporting educational telecommunications. Subsequently, the TAC's Technology Committee drafted a series of infrastructure plans for the development of CLN.

CLN is a consortium of all state educational telecommunications users, with members from elementary and secondary education, higher education, businesses, and agencies. Currently, CLN is working to incorporate as a non-profit organization. System planning, collaboration, program sharing, lobbying for state funds for distance education, and cost effectiveness are among the goals of the proposed Colorado Learning Network.

Idaho's Telecomm '92 planning team is a broad-based assembly of state agency personnel, legislators, private industry representatives, telecommunications providers, and potential users established by the governor in 1991. The 32-member planning group was charged with forming a strategic telecommunications plan in order to more efficiently coordinate the development of statewide telecommunications.

In addition to the Telecomm '92 planning group, the Telecommunications Council (TELCOM), created by the state Board of Education (SBOE), oversees the development of telecommunications in education. TELCOM has focused its attention on the formation of the IEPBS/Higher Education Microwave Network. Considering broad issues in instructional technology, encouraging collaboration among its members, and meeting the training needs of all educators also are among TELCOM's goals.

The council now proposes to expand the scope of its mission and charge to include the coordination and review of all forms and applications of distance learning. To carry out its new mission, TELCOM has proposed: (1) amending the composition of the council to include representatives from the academic library and computing services communities, (2) forming a distance education subcommittee on which most of the current TELCOM would serve, and (3) adding members from the private sector of the telecommunications industry. Council membership now includes representatives from each of the publicly funded postsecondary institutions, the state Department of Education, the State Library, the state Vocational Division, and Idaho Educational Public Broadcasting.

As a result of a lawsuit seeking equitable funding for education, the Texas education system has undergone considerable change, and educational technologies are a key component of the reform. In 1988, Texas ranked last among the 15 most populous states in expenditures for technology programs. As a result, the State Board of Education established by legislative mandate a Committee on long range planning for technology in 1987. The Texas Education Agency's (TEA) report, *1988-2000 Long Range Plan for Technology*, was unanimously adopted by the State Board of Education in November 1988.

The four priorities established in the original plan were technology use for classroom instruction, instructional management, distance education, and telecommunications. Phase I of the *Long Range Plan*, 1988-89 through 1991-92, had among its goals and objectives the creation of a statute for the *Long Range Plan*, funding for implementation, an equipment allotment of $50 per student per year, support for instructional television, establishment of a statewide electronic information transfer system, expansion of distance education programs, and revision of curriculum rules to reflect the use of electronic media.

Through statutes passed in partial support of the *Long Range Plan*, state funds for several initiatives were allocated, including Access Resource (T-STAR) and the Texas Center for Educational Technology (TCET). In February, 1991, the State Board of Education authorized the Commissioner of Education to enter into contracts for the necessary equipment and services to complete Phase I implementation of T-STAR. This plan envisioned a satellite-based system for delivery of video and data services to the district level. The system would be augmented and expanded through terrestrial and other transmission media within regions and school districts. Although 150 receive-only satellite dishes (VSATS) were planned to be installed in districts during 1992, subsequent state action prevented the development of the VSAT component, and implementation of 250 TVROs began. T-STAR still calls for VSATs and for all 1050 school districts to be interconnected by 1997.

The *Long Range Plan* also called for the creation of a statewide educational research and development center. As a result, the State Senate established the Texas Center for Educational Technology (TCET) in 1990. A consortium of education, business, and industry, TCET is charged with promoting and testing innovative applications of existing and emerging technologies to be integrated into the public schools.

Vermont Technical College leads the state in planning and developing an educational telecommunications system due to the administrative and fiduciary responsibilities for Vermont Interactive Television (VIT) delegated to the College. Planning and policy development for VIT, a statewide distance education and videoconferencing network, is designated to a seven-member Coordinating Council appointed by the governor. The council represents the education, government, and business partnership that has sustained the growth and development of VIT.

VIT is supported by a combination of funds from local communities, a separate state appropriation, and federal grants. Originally created to deliver instruction between colleges and businesses, VIT has expanded to include K-12 schools and state agencies for the telecommunicated distribution of educational and training programs and teleconferencing activities.

Telecommunications planning for education in Washington occurs in two areas: the Office of the Superintendent of Public Instruction (OSPI) coordinates telecommunications planning for K-12, while the Higher Education Coordinating Board (HECB) and the State Board for Community and Technical Colleges (SBCTC) oversee planning for higher education.

During 1991 OSPI, HEBC, SBCTC, and the Department of Information Services (DIS) collaborated to develop a video telecommunications network for education and state agencies. The result of the 1991 planning effort was the *Triad Video Telecommunications Demonstration Project (Triad)*. This project demonstrated and documented the use of shared resources, the costs of multiple systems and programs, and the implementation of enhancements for the state's educational video infrastructure. The mission of the plan is to implement, by 1997, a shared statewide video telecommunications system integrating new technologies and existing resources to serve government, education, and the general public.

Smaller, More Populous States to Consider

A third set of states, neither necessarily large, unpopulated, nor decentralized, nevertheless have instituted systems of interest.

Iowa has a strong and advanced telecommunications infrastructure, particularly relative to other rural states. It is becoming a digital-based system, with expanding fiber optics networks and cellular coverage, and cable television services are widespread. In a comparison with technologically advanced states, however, Iowa found it was too dependent on analog switches and lines, that it did not have sufficient SS7 capabilities, that too many multiparty lines were in use, there was not universally available cellular or CATV coverage, and in certain areas of the state, quality and/or cost of service are inadequate or cause for complaint. Iowa has determined that to correct these deficiencies, the state must speed up the time frame for electromechanical switch conversion, begin conversion of interexchange trunks to fiber, initiate SS7 deployment, increase cellular coverage, and eliminate multiparty lines.

Due to a combination of insightful planning and foresight and continued dedication of monies and other resources, the state of Virginia has emerged as a leader in telecommunications planning and infrastructure development. Virginia has a centralized telecommunications planning organization, the Department of Information Technology. DIT provides telecommunications services to all state agencies, including public education institutions. The Telemedia Services Division plans for the efficient use of the states telemedia resources, coordinates state support for public broadcasting, provides teleconferencing facilities and services, manages and schedules all network capacities, and forecasts the use of new technologies in the state.

The Virginia Public Telecommunications Board (VTPB), a 15 member entity that provides leadership in public telecommunications systems and service delivery, is advised by the DIT on issues and trends, technology options, user requirements, and long range needs. The board expanded the participation of users in statewide planning and, in particular, has established regional grass roots planning organizations to advise the board on uses.

Integration and Interoperability

Each state has its own particular telecommunications resources and needs. Often the telecommunications requirements of a state are best served by the use of diverse technologies and delivery systems. Populous areas of the state are often best served by different technologies than those in use in sparsely populated, remote regions.

When several different technologies are used to deliver telecommunicated information, the issues of integration and interoperability must always be considered. Ideally, each system must speak to the others with a minimum of translation. A lack of interoperability leads to inefficiency and restrictions on information distribution. More and more, effort is being made to coordinate technologies to construct a system that is both fully compatible and optimally efficient.

Several states and projects have successfully integrated terrestrial (microwave, broadcast, copper and fiber optics) with satellite technology. Terrestrial-based technologies are often best suited for the delivery of information over short distances and in populous areas, and are frequently found in use in and among nearby cities. To serve rural and outlying areas, however, states usually find it more effective and cost efficient to deliver information by satellite. The best and most flexible of these operations employ both technologies in an integral, fully interoperable system.

Interoperability and Flexibility

Distance Education in Indiana: A Policy Paper by Indiana's Commission for Higher Education sums up the prevailing viewpoint among states striving for interoperability and flexibility in their telecommunications systems. The report states:

(1) that no single medium or strategy for providing instruction should be adopted by Indiana to meet its distance education needs, and

(2) that the state should promote a flexible and multifaceted use of instructional programming and delivery mechanisms for meeting distance education needs.

In concurrence with these goals, recent changes in the technology supporting Indiana's distance education are apparent. The Indiana Higher Education Telecommunications System (IHETS), one of the key planning agencies for educational telecommunications in the state, recently began migrating from terrestrial fiber optics and ITFS to satellite. In addition, IHETS began exploring the use of

compressed video in several colleges with the goal of determining whether a shared statewide multi-way video service is appropriate and what form it might take.

As further example of increased integration in Indiana, IHETS Television leases fiber from INTELNET to deliver programming from major University campuses to a central satellite uplink in Indianapolis. In January 1993, IHETS restructured its shared television network to begin a transition from fiber optics to satellite. By 1995 IHETS will lease eight satellite channels. The IHETS network serves 260 sites throughout the state, including campuses, public schools, county extension services, hospitals, businesses, and public television stations.

Importance of Integrated Systems in Rural States

Montana is an apt example of a state which employs terrestrial-based systems to communicate between nearby populated centers and satellite-based systems to reach the distant and sparsely populated areas in the north and west. Its newly implemented and well-conceived state telecommunications system, the Montana Educational Telecommunications Network (METNET), will coordinate telecommunications within the state.

Satellites are currently being used by many programmers in Montana to deliver credit courses for all levels of education. Montana State University has completed construction of a KU band uplink which will give them the capability to deliver programming directly from their campus to all parts of the state.

In conjunction with satellite service, Montana employs a wide variety of ground-based delivery methods:

- **The Montana Public Broadcast System** is based upon the programming delivered from KUSM in Bozeman through limited off-air transmitters and extensive carriage by Montana cable television systems. The signal is delivered to these systems via a microwave system owned by TCI and WTCI.

- The College of Great Falls has been utilizing **audio link talk-back programs** for over a decade. These courses consist of materials being delivered to one or more remote classroom sites in the form of print and videotape which are augmented by a live exchange between student and teacher through the telephone.

Non-Traditional Sources of Educational Telecommunications

Traditionally, business has shown great interest and involvement in new public service-related technologies. In regard to educational telecommunications, **private sector involvement**--especially among cable television owner/operators, telephone cooperatives and "independents"--should also be considered a valuable resource. The cable television companies have many programs now in effect which will benefit the Montana schools on all levels.

Other communications systems include at least four **educational network applications of personal computers** now in use in Montana, a number of **microwave systems**, including the State of Montana Telecommunications Network, and **audio service** served by the local exchange carriers in the state.

Through the restructuring of the Utah Education Network Consortium and the expansion of the network's broadcast facilities, Utah continues to develop both organizational and technical components of its educational telecommunications system . The state has a multiple option telecommunications system, the Utah Education Network (EDNET), which gives its users technology alternatives for distance communication. These options include:

- **Public television station KUED** (Channel 7);
- KULC, **Utah's Learning Channel**, a full power VHF broadcast television station licensed to the Utah State Board of Regents and operated by the University of Utah on behalf of the state's colleges, universities, and public education institutions. Reception of the signals extends into outlying areas of the state through an expanded translator system;
- Two **public radio stations**;
- EDNET, an interactive, two-way video microwave television system connecting 35 sites across the state and providing voice and data channels to colleges, universities, and public schools. EDNET will be expanded to include a compressed video network for data and video transmissions;
- **ITFS transmission** in the metropolitan Salt Lake City area;
- **Satellite distribution and reception**; and
- **Teletext** via the state's public television network's vertical blanking interval (VBI).

Integration in Decentralized States

Missouri has one of the country's most decentralized systems for telecommunications, with planning responsibilities distributed among the Department of Education, higher education (the University of Missouri System), the Video Instructional Development and Educational Opportunity (Video) Advisory Committee, and the Department of Telecommunications. The Education Satellite Network (ESN), an organization of the Missouri School Boards Association, has been the coordinating body for elementary and secondary educational telecommunications in Missouri, and has provided programming and planning functions for the Department of Education, the Coordinating Board for Higher Education, and state agencies.

The University of Missouri System implemented a fiber backbone network with microwave links connecting all of its campuses and the state capital for voice, data, and video.

Other Examples of State-Level Interoperability

The Kentucky Council on Higher Education is developing a statewide compressed video network for distance learning. The proposed system would use leased T-1 copper lines to connect all state universities and all community colleges for two-way, interactive data, voice, and video.

KET, the Kentucky Educational Television Authority, provides a number of video and data-based systems. KET's public broadcast system consists of 15 public television stations and six translators. The KET Star Channels system reaches all of Kentucky's high schools, as well as schools from other states through distribution by SERC. SERC is a two-channel satellite delivery system which provides instructional video materials, live interactive high school courses, professional development seminars, and teleconferences.

South Dakota's Rural Development Telecommunications Network (RDTN) is a hybrid telephone company-compressed video and satellite network. RDTN's five-year plan calls for 19 sites to be interconnected by telephone lines, with two-way video and audio through a central switching point in Pierre. A satellite uplink at the switching point will be accessible from all points on the network and will reach approximately 200 community center sites in schools and other sites equipped with satellite downlinks on a one-way video, two-way audio basis.

MINSAT, a satellite network financed by Minnesota's technical colleges, has both a KU-band uplink and a C-band uplink. In addition to serving the technical colleges system, MINSAT reaches all government agencies.

The K-12 regional clusters and Technical College System in Minnesota primarily rely on analog video transmissions for distance education. Clusters employ various transmission technologies, such as broadcast, ITFS, microwave, coaxial cable, and fiber optics

Retrofitting for Digital Transmission

As existing telecommunications systems age and new technology becomes available and more cost effective, more and more states are modifying, upgrading, and otherwise improving their telecommunications systems. Retrofitting for digital transmission is now being carried out on a small scale in a handful of states, and is being considered in several others.

Quality of the signal is an important factor when considering new systems for health or distance education. On the other hand, cost is also a major consideration in most cases, and the need for superior signal quality must often be balanced according to available funds. States using distance education systems for instruction to younger audiences must be aware of that audience's demand for high quality imaging. Children have been exposed at home to increasingly higher quality video in games and cable TV. As a result, they have very demanding expectations for educational school video. In general, children have less tolerance for poor quality video than adults.

For this and other reasons, many educators feel that the ultimate goal should be to achieve the highest quality educational experience by making the technology transparent.

As digital services become more available at a lower cost and higher signal quality, a migration toward digital systems with full bandwidth is projected to take place. A migration from satellite-based systems to terrestrial systems is also projected. With recent advances in technology, terrestrial systems are more often found to be of acceptable reliability and quality.

Retrofitting of older systems to allow integration of new technologies is of increasing importance to educators. Administrators require the ability to add to the systems that are now in place, with better and increased capabilities to add voice, data, and video of high quality signals. In Tennessee, the selection of a distance education technology was based on both quality and the comparisons students made with the types of high visual quality broadcast signals that they view at home.

Programs to retrofit specifically for digital transmission can now be found in a handful of states, including Texas, North Carolina, and Kentucky, but only on a limited basis. The states of Florida and South Carolina, on the other hand, have instituted perhaps the largest and most advanced retrofitting programs.

In 1992, South Carolina began an upgrade of their ITFS system. Their new Multichannel Digital Satellite Network, which will initially provide up to 20 channels, will greatly expand service to higher education institutions, state agencies, and other users. South Carolina has outlined a number of advantages in the use of digital satellite technology (*South Carolina Educational Television Multichannel Digital Satellite Network Report*, 2/17/92):

- The technical quality of digitally delivered video is better than good quality VHS tape. The audio component is near CD quality.

- Digital technology permits transmission of multiple video channels over a single satellite transponder, greatly lowering transmission costs.

- Low cost satellite receiving sites can be located almost anywhere, and any number of receive sites can be accommodated.

- Existing statewide microwave networks can be upgraded to allow origination from multiple locations.

- Any origination location can feed a group of receiving sites, thus forming an ad hoc network. Several such networks can operate simultaneously. These network connections can be changed as often as needed, even on a program per program basis. Any receiving site can participate in several networks simultaneously if they have several receive channels installed.

- Access to each network can be controlled and program transmissions limited only to previously authorized users. Signals can be encrypted for further security.

- Two or more origination locations can be connected to operate two-way for interactive exchange of video and audio such as teleconferencing.

- Data can be transmitted with video and audio."

A communications survey conducted in the summer of 1992 by the University of Central Florida's Institute for Simulation and Training addressed, among other things, the issue of transition to digital communications. The survey revealed that analog transmission still dominates over digital transmission. Only nine percent of survey respondents reported using exclusively digital systems, while 33 percent use both analog and digital systems. It appears, however, that as older analog systems become obsolete, users are slowly upgrading to entirely new digital systems. The growing use of compression, along with the reliability and flexibility

of digital systems, has served to attract more and more users. The transition to video will certainly accelerate once lower cost equipment becomes available.

In what has been termed the *Florida Retrofit for Technology Program*, the 1992 Florida state legislature appropriated approximately $17 million from Public Education Capitol Outlay (PECO) funds on a competitive basis to retrofit the power and signal capabilities of existing schools for the use of emerging technologies. More than 500 proposals from individual schools had been received by October 1992. The state awarded an average of $225,000 to each of 75 schools during 1993, and appropriated an additional $30 million for continuation of the program, which will be operational through 1994.

The *Florida Retrofit for Technology Program* is a joint effort of the state Bureau of Educational Technology and the Office of Educational Facilities, both within the state Department of Education. The aim of the program is to improve the physical infrastructure of the school systems, thereby helping to support the new technologies. Historically, money for new equipment has not been a limiting factor in the state of Florida. As a matter of fact, the Program for Technology recently provided $55 million for equipment upgrades, awarded on a full-time student equivalent-- as opposed to a competitive--basis. Unfortunately, however, many school systems did not have the physical plant necessary to support new or upgraded technologies. The *Florida Retrofit for Technology Program* was instituted to provide funding to the most needy schools for the purchase of surge suppressors, for physical changes and additions including communications closets and cableways, and for expanded phone systems. Major remodeling and the upgrading of uniform building codes through the *Florida Retrofit for Technology Program* further insure that the new technologies will be optimally supported.

Public/ Private Partnerships for Telecommunications

In many states, private-public sector partnerships have become particularly important, for several reasons:

- Educational technologies are expensive, and many states cannot find the funding needed to implement them;
- In states with rural populations, schools often do not have the private sector support enjoyed in the population centers;
- Initiatives launched by institutions of higher learning to bring educational technology into the curricula lack the broad public backing required to win legislative support.

The symbiosis between state government and the private sector has resulted in a number of benefits in the field of telecommunications. Such partnerships make technical expertise available to educators at the planning state of educational technology programs. Cooperation between the private sector and higher education will also help create sound training programs in response to identified needs, and will help make these programs equitably available to all teachers in the state, whether from urban or rural locations.

A further benefit of the synergistic relation ship between the public and private sectors is the integration of resources in management and technical expertise, equipment, and funds that the private sector donates into the educational system, where they can be distributed equitably throughout the state. It is also widely held that the base of public support for education will be significantly broadened by giving the private sector a voice in the councils of the education community.

The Role of State Government in Public/ Private Partnerships

State government policy makers play a critical role in encouraging and implementing the economic and social benefits of the information technology revolution. State policy makers can ensure equity of access and development of telecommunications applications by addressing several points:

- Determine the balance between regulation and cooperation needed to achieve the desired development.
- Investigate the implementation of alternative regulatory policies which will create equity of access to the telecommunications infrastructure.
- Identify priority needs and encourage the most effective utilization of telecommunications services to enhance the quality of life.

The influence of a Governor's office plays a substantial role in formulating decisions concerning the allocation of state funds for the implementation of distance education systems. This involvement is most evident in those states characterized by well-funded programs for the implementation of advanced technologies for distance learning. In Texas, the new Technology Advisory Council was initiated, in part, through instrumental activity at the Governor's level. Other states successful in the implementation of statewide distance education systems describe their governors as playing influential roles in urging educational reform.

State financial support plays a critical role in the organization of statewide councils mandated to chose the optimal distance education system for each school. Of state respondents contacted for a recent distance learning market report, two-thirds (10 out of 15) report that state financial support is available for distance education in their state. The larger issue, however, concerns degree of funding, with one half of those states awarded funding receiving only partial or inconsistent support. These five states found it difficult to actually obtain state funding, and said that the monies were allocated in various forms.

Newly-formed technology committees were responsible for sparking interest in distance education in the five states offering strong financial support. Legislative arrangements are helping to channel funds to distance education programs, often through a telecommunications agreement between a state and the local telephone company to allow for a reduction in transmission fees. Several states have already implemented or plan to soon instate programs in which preferential telephone rate treatment is afforded education and health, including Nebraska and South Dakota.

Vermont has an agreement with the local telephone company to reduce the annual transmission fees by 15 percent Such preferential treatment is not always across-the-board, but instead is often awarded on a case-per-case basis.

State systems that integrate multiple functions for telecommunications are viewed by the public and by legislators as a community network and are more likely to gain support for telecommunications than a distance education system operating alone. The funding of joint programs with private businesses, the community, and sometimes other states tends to encourage state funding. Few states had full statewide coordination and cooperation. States that exhibit joint effort are further along in the process of addressing distance education.

The following states each have an active Governor's Task Force specifically for Telecommunications: Alabama, Georgia, Idaho, Missouri, Nebraska, New York, North Carolina, Oklahoma, Oregon, and South Dakota.

Satellite Interconnection Planning Project

Contact List

Centralized and Decentralized Planning:

Examples from Large, Sparsely Populated, Decentralized States

Montana

Jim White
Department of Administration
Information Services Division
219 Sam W. Mitchell Bldg.
Helena, MT 59620

John Aubry, TCM Dev. Mgr.
Montana Dept of Administration
Information Services Division
Sam W. Mitchell Bldg., Room 22
Helena, MT 59620
(406) 444-2586

Alan Ludwig
Information Services Division
Sam W. Mitchell Bldg., Room 221
Helena, MT 59620
(406) 444-1354
(404) 444-2701 FAX

New Mexico

Art St. George, Ex. Ntwk Svcs. Ofcr
University of New Mexico
Executive Network Svcs., CIRT
Albuquerque, NM 87131
(505) 277-8040
(505) 277-8101 FAX

Gary Tydings, Director
Instructional Television
University of New Mexico
152 Woodward Hall
Albuquerque, NM 87131

North Dakota

Joe Linnertz, Dir. Admin.
ND Education Broadcasting Council
Dept of Public Instruction
600 Blvd. Ave., E.
State Capitol Bldg. 11th Floor
Bismarck, ND 58505
(701) 224-2278
(701) 224-2461 FAX

Marvin A. Fettiz, TCM Officer
Division of Information Svcs.
State Capitol Bldg.
600 E. Blvd. Ave.
Bismarck, ND 58505
(701) 224-3190
(701) 224-3000 FAX

Russell Poulin, Director
North Dakota Interactive Video
North Dakota University System
600 East Boulevard Avenue 10th Floor
Bismarck, ND 58505-0154
(701) 224-2964
(701) 224-2961 FAX

South Dakota

F. Russell Helm, Director
Information Systems
South Dakota Board of Regents
Kneip Bldg.
Pierre, SD 57501

Karon Schaack, Director
Division of Education
Instructional Services
700 Governors Drive
Pierre, SD 57501
(605) 773-5407

Jim Larson, Director
Rural Development Telecom Network
500 East Capitol Avenue
Pierre, SD 57501
(605) 773-3333

Nebraska

Lee Rockwell, Director
GPN
P.O. Box 80669
Lincoln, NE 68501
(402) 472-2007

Melodee Landis, Director
Education Technology Center
301 Centtennial Mall South
Box 94987
Lincoln, NE 68509
(402) 471-2918
(402) 471-2701 FAX

William Mikller, Director
Dept. of Administrative Services
Division of Communications
P.O. Box 8311
Lincoln, NE 68503
(402) 471-2761
(402) 471-3339 FAX

Kansas

Mel Chastain, Director
Educational Communications Center
Kansas State University
128 Bob Dole Hall
Manhattan, KS 66506
(913) 532-7041

Robert Gast, Director
Information Services
Kansas State Dept of Education
120 SE 10th Street
Topeka, KS 66612-1182
(913) 296-4961

Other Decentralized States

Arizona

Larry Beauchat, Communications Mgr
Department of Administration
1616 West Adams Street
Phoenix, AZ 85007
(602) 542-2255
(602) 542-3998

Kathryn Kilroy, Administrator
Arizona Dept. of Education
1535 W. Jefferson
Phoenix, AZ 85007
(602) 542-5024
(602) 542-3590

Colorado

Eric Feder, Director
Telecommunications Division
Dept. of Administration
201 East Colfax Avenue
Denver, CO 80203
(303) 866-6859
(303) 830-0793

Robert Tolman
Telecommunications Division
Dept of Administration
2452 W. Second Ave., Suite 19
Denver, CO 80223
(303) 866-2341
(303) 922-1811 FAX

Timothy Grieder, Director
Continuing Ed. & Ext Academic Prog.
Commission on Higher Education
1300 Broadway-FL 2
Denver, CO 80203

Idaho

Vicki Johnson, Assoc. Adademic Officer
Idaho State Board of Education
650 W. State St., LBJ #307
Boise, ID 83720
(208) 334-2270
(208) 334-2632 FAX

Ken Reed
Idaho Dept. of Education
650 W. State Street
Boise, ID 83720
(208) 334-2166

Lloyd Howe
General Services Division
Department of Administration
650 W. State Street
Boise, ID 83720
(208) 334-3387
(208) 334-5315 FAX

Texas

Geoffrey Fletrcher, Assist. Commissioner
Texas Education Agency
Technology Unit
1701 N. Congress Ave.
Austin, TX 78707
(512) 463-9087

Connie Stout, Director
TENET
1701 N. Congress Ave.
Austin, TX 78701
(512) 463-9091
(512) 643-9090

Martha Richardson, Librarian
Department of Info Resources
P.O. Box 13564
Austin, TX 78711-3564
(512) 475-4728

Vermont

Darrell Thompson, Director
Vermont Interactive Television
Vermont Technical College
Randolph, VT 05061
(802) 728-3391

Paul F. Ohlson
State Of Vermont
General Services Division
133 State Street
Montpelier, VT 05633
(802) 828-3331

Washington

Marilyn Freeman, Proj. Mgr.
Washington State Dept. of Info.
1110 Jefferson Street, SE
Olympia, WA 98504-2444
(206) 664-9254
(206) 664-0495 FAX

Paul Hartman
Washington Education Network
KYVE-TV
1105 S. 15th Ave.
Yakima, WA 98902

Smaller, More Populous States to Consider

Iowa

Linda Schatz
Iowa Public TV
6450 Corporate Drive
Johnston, IA 50310
(515) 281-6936

Dean Crocker
Department of Gen. Svc.
Communications Division
Hoover Bldg.
Demoine, IA 50319
(515) 242-6152
(515) 281-6513 FAX

Virginia

Bill Rodgers, PGU Administrator
Virginia Department of Education
Virginia State Ed Network
P.O. Box 2120
Richmond, VA 23216-2120
(804) 225-2833
(804) 225-2833 FAX

Anne L. Hardwick
Commonwealth of Virginia
Department of Information Tech
110 S. 7th Street, 1st Floor
Richmond, VA 23219
(804) 344-5525
(804) 344-5556 FAX

Integration and Interoperabilility

Indiana

Mary Jo Erdberg
Instructional Technology Consultant
Indiana Department of Education
Center for School Improvement
Room 229 State House
Indianapolis, IN 46204-2798
(317) 232-9108

Donise Herberer
State of Indiana
Communications Divsion
100 N. Senate Ave., Room N551
Indianapolis, IN 46204
(317) 232-4600

Montana

Jim White
Department of Administration
Information Services Division
219 Sam W. Mitchell Bldg.
Helena, MT 59620

John Aubry, TCM Dev. Mgr.
Montana Dept of Administration
Information Services Division
Sam W. Mitchell Bldg., Room 22
Helena, MT 59620
(406) 444-2586

Alan Ludwig
Information Services Division
Sam W. Mitchell Bldg., Room 221
Helena, MT 59620
(406) 444-1354
(404) 444-2701 FAX

Utah

Helen Lacy
KUED - Channel 7
Utah Education Network
101 Wasatch Drive
Salt Lake City, UT 84112
(801) 581-4194
(801) 581-5620 FAX

Stephen Hess
University of Utah, Media Svcs.
The Utah Education Network
101 David Gardner Hall
Salt Lake City, UT 84112-1107
(801) 581-6180
(801) 581-5735 FAX

Craig M. Jorgensen, Asst Director
Div. of Information Tecfh Svcs.
Administrative Services Dept.
5000 State Office Bldg.
Salt Lake City, UT 84114
(801) 538-3332
(801) 538-3321

Missouri

Jean Cole
Supervisor
Missouri Department of Education
P.O. Box 480
Jefferson City, MO 65012
(314) 751-8449

Dr. Ronald J. Turner
University of Missouri
321 University Hall
Columbia, MO 65211
(314) 882-2011

Gary L. Phillips
Manager, Telecommunications Services
Division of Data Processing and Telecommunications
Office of Administration
Truman Building, Rm 65101
Jefferson City, MO 65101
(314) 751-1527
(314) 751-7276 (fax)

Kentucky

Tim Tassie, Dir. Research & Planning
Kentucky Educational TV
600 Cooper Drive
Lexington, KY 40502
(606) 258-7002
(606) 258-7399 FAX

Lydia Wells-Sledge
Kentucky Dept of Education
Unit for Math & Tech
1825 Capital Plaza Tower
Frankfort, KY 40601
(502) 564-7168

J. Paul Warnecke
Division of Telecommunications
100 Fair Oaks Lane
Suite 102
Frankfort, KY 40601
(5020) 564-5266

South Dakota

F. Russell Helm, Director
Information Systems
South Dakota Board of Regents
Kneip Bldg.
Pierre, SD 57501

Karon Schaack, Director
Division of Education
Instructional Services
700 Governors Drive
Pierre, SD 57501
(605) 773-5407

Jim Larson, Director
Rural Development Telecom Network
500 East Capitol Avenue
Pierre, SD 57501
(605) 773-3333

Minnesota

Penny Dickhudt, Telecomm. Mgr.
Minnesota Technical Colleges
550 Cedar Street
St. Paul, MN 55101
(612) 296-0669
(612) 296-0872 FAX

Jack Ries
Department of Administration
Business Technology
653 Cedar Street
St. Paul, MN 55155
(612) 297-4071
(612) 297-53687 FAX

Retrofitting for Digital Transmission

Texas

Geoffrey Fletrcher, Assist. Commissioner
Texas Education Agency
Technology Unit
1701 N. Congress Ave.
Austin, TX 78707
(512) 463-9087

Connie Stout, Director
TENET
1701 N. Congress Ave.
Austin, TX 78701
(512) 463-9091
(512) 643-9090

Martha Richardson, Librarian
Department of Info Resources
P.O. Box 13564
Austin, TX 78711-3564
(512) 475-4728

North Carolina

Elsie Brumback, Director
NC Department Public Instruction
Media and Technology
301 N. Wilmington Street
Raleigh, NC 27601-2825
(919) 715-1530

Sam Rule, Director
Office of Telecommunications
Department of Administration
3700 Wake Forest Road
Raleigh, NC 27609

Paul Vandergrift, Jr.
University of North Carolina Center
for Public TV
T.W. Alexandra Drive
Research Triangle Park, NC
27709-4910
(919) 547-7000

Florida

David Brittain
Director
Department of Education
325 W. Gaines St. Suite B1-54
Educational Technology
Tallahassee, FL 32399
(904) 488-0980

Bill Schmid
Florida Information Resource Network
325 W. Gaines St. Suite B1-14
Tallahassee, FL 32399
(904) 487-8656
(904) 488-3691 (fax)

Glenn W. Mayne
Director
Division of Communications
Department of GeneralServices
2737 Centerview Drive
Tallahassee, FL 32399-0950
(904)-488-3595
(904) 487-2329 (fax)

Kentucky

Tim Tassie, Dir. Research & Planning
Kentucky Educational TV
600 Cooper Drive
Lexington, KY 40502
(606) 258-7002Y
(606) 258-7399 FAX

J. Paul Warnecke
Division of Telecommunications
100 Fair Oaks Lane
Suite 102
Frankfort, KY 40601
(5020) 564-5266

Lydia Wells-Sledge
Kentucky Dept of
Education
Unit for Math & Tech
1825 Capital Plaza Tower
Frankfort, KY 40601
(502) 564-7168

South Carolina

Ted Lightle
Director
Division of Information Resources Management
Budget and Control Board
1201 Main Street, Suite 930
Columbia, SC 29201
(803) 737-0070

Public/ Private Partnerships for Telecommunications

Alabama

Windell Humphries, Director
Telecommunications Division
State Dept. of Finance
64 North Union St., Suite 204
Montgomery, AL 36130-3053

Georgia

Joey Baughman, Director Media Resources
Georgia Department of Education
Instructional Technology Unit
1954 Twin Towers E. _ Suite 2054
Atlanta, GA 30334
(404) 656-2685
(404) 651-8582 FAX

Idaho

Vicki Johnson, Assoc. Aca. Office
Idaho State Board of Education
650 W. State Street LBJ #307
Boise, ID 83720
(208) 334-2270
(208) 334-2632 FAX

Ken Reed
Idaho Department of Education
650 West State Street
Boise, ID 83720
(208) 334-2166

Lloyd Howe
General Services Division
Department of Adminisxtration
650 W. State Street
Boise, ID 83720
(2008) 334-3387
(208) 334-5315 FAX

Missouri

Jean Cole
Supervisor
Missouri Department of Education
P.O. Box 480
Jefferson City, MO 65012
(314) 751-8449

Dr. Ronald J. Turner
University of Missouri
321 University Hall
Columbia, MO 65211
(314) 882-2011

Gary L. Phillips
Manager, Telecommunications Services
Division of Data Processing and Telecommunications
Office of Administration
Truman Building, Rm 65101
Jefferson City, MO 65101
(314) 751-1527
(314) 751-7276 (fax)

Nebraska

Lee Rockwell, Director
GPN
P.O. Box 80669
Lincoln, NE 68501
(402) 472-2007

William Mikller, Director
Dept. of Administrative Services
Division of Communications
P.O. Box 8311
Lincoln, NE 68503
(402) 471-2761
(402) 471-3339 FAX

Melodee Landis, Director
Education Technology Center
301 Centennial Mall South
Box 94987
Lincoln, NE 68509
(402) 471-2918
(402) 471-2701 FAX

New York

Dr. Charles Blunt, Assoc. Vice Chancellor
Officer of Information Technology
State University of New York
State University Plaza
Albany, NY 12246
(518) 443-5546
(518) 443-5799 FAX

Jay Yablon, Director
Telecommunications Exch.
NYS Dept. of Economic Dev.
One Commercle Plaza
Albany, NY 12245
(518) 473-4886
(518) 473-9748

North Carolina

Elsie Brumback, Director
NC Department Public Instruction
Media and Technology
301 N. Wilmington Street
Raleigh, NC 27601-2825
(919) 715-1530

Sam Rule, Director
Office of Telecommunications
Department of Administration
3700 Wake Forest Road
Raleigh, NC 27609

Paul Vandergrift, Jr.
University of North Carolina Center
for Public TV
T.W. Alexandra Drive
Research Triangle Park, NC
27709-4910
(919) 547-7000

Oklahoma

Ray Penrod
Communications Operations
Office of State Finance
State Capitol Bldg. Rm 4F
Oklahoma City, OK 73105
(405) 521-3084
(405) 521-3089 FAX

Patricia A. Paske, Admin. Mgr.
OK State Regents for Higher
500 Education Bldg.
State Capitol Complex
Okllahoma City, OK 73105-4503
(405) 524-9138
(405) 524-9230

Oregon

Raymond Lewis, Director
Oregon Ed-Net
7140 Macadam Ave SW., Suite 260
Portland, OR
(503) 293-1995
(503) 293-1889 FAX

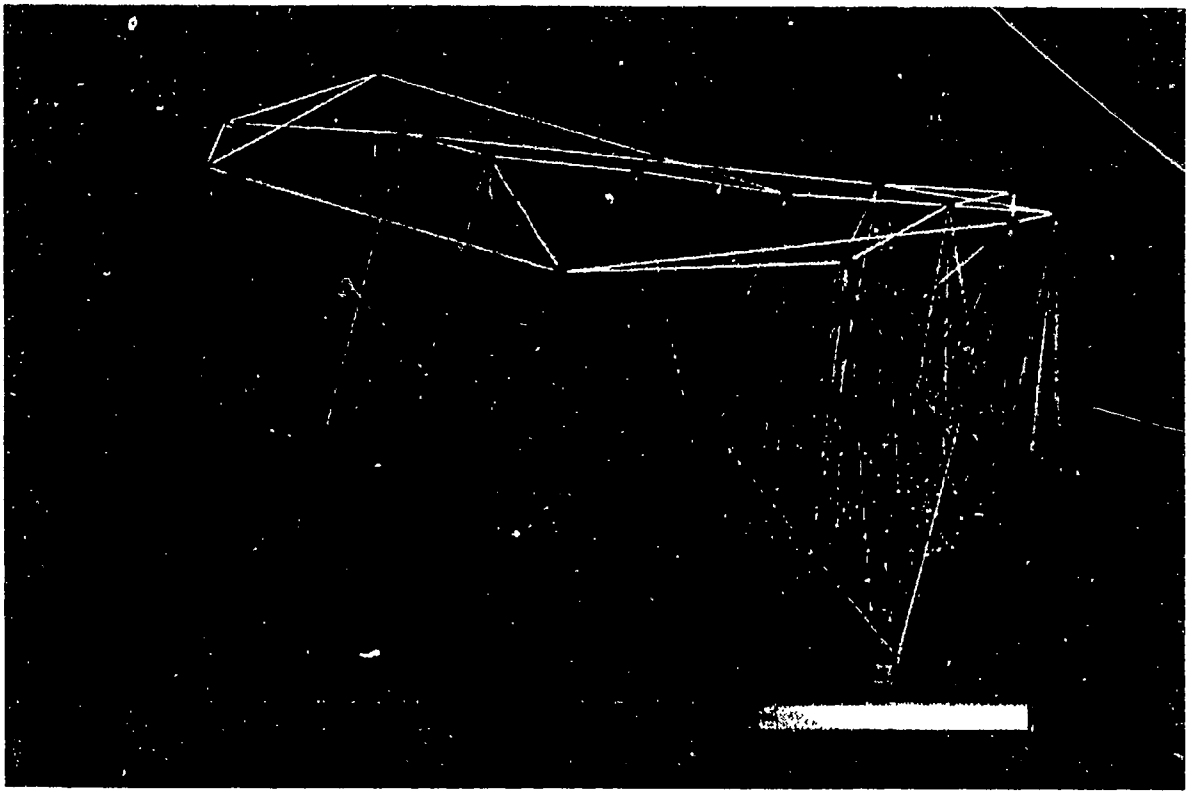
South Dakota

F. Russell Helm, Director
Information Systems
South Dakota Board of Regents
Kneip Bldg.
Pierre, SD 57501

Jim Larson, Director
Rural Development Telecom Network
500 East Capitol Avenue
Pierre, SD 57501
(605) 773-3333

Karon Schaack, Director
Division of Education
Instructional Services
700 Governors Drive
Pierre, SD 57501
(605) 773-5407

THE NATIONAL INFORMATION INFRASTRUCTURE: AGENDA FOR ACTION



Information Infrastructure
Task Force
September 15, 1993

THE NATIONAL INFORMATION INFRASTRUCTURE: AGENDA FOR ACTION

Ronald H. Brown, Secretary of Commerce
Chair, Information Infrastructure Task Force

Larry Irving, Director
National Telecommunications and Information Administration
U.S. Department of Commerce
Chair, IITF Telecommunications Policy Committee

Arati Prabhakar, Director
National Institute of Standards and Technology
U.S. Department of Commerce
Chair, IITF Applications Committee

Sally Katzen, Administrator
Office of Information and Regulatory Affairs
Office of Management and Budget
Chair, IITF Information Policy Committee

THE NATIONAL INFORMATION INFRASTRUCTURE: AGENDA FOR ACTION

EXECUTIVE SUMMARY

All Americans have a stake in the construction of an advanced National Information Infrastructure (NII), a seamless web of communications networks, computers, databases, and consumer electronics that will put vast amounts of information at users' fingertips. Development of the NII can help unleash an information revolution that will change forever the way people live, work, and interact with each other:

- People could live almost anywhere they wanted, without foregoing opportunities for useful and fulfilling employment, by "telecommuting" to their offices through an electronic highway;
- The best schools, teachers, and courses would be available to all students, without regard to geography, distance, resources, or disability;
- Services that improve America's health care system and respond to other important social needs could be available on-line, without waiting in line, when and where you needed them.

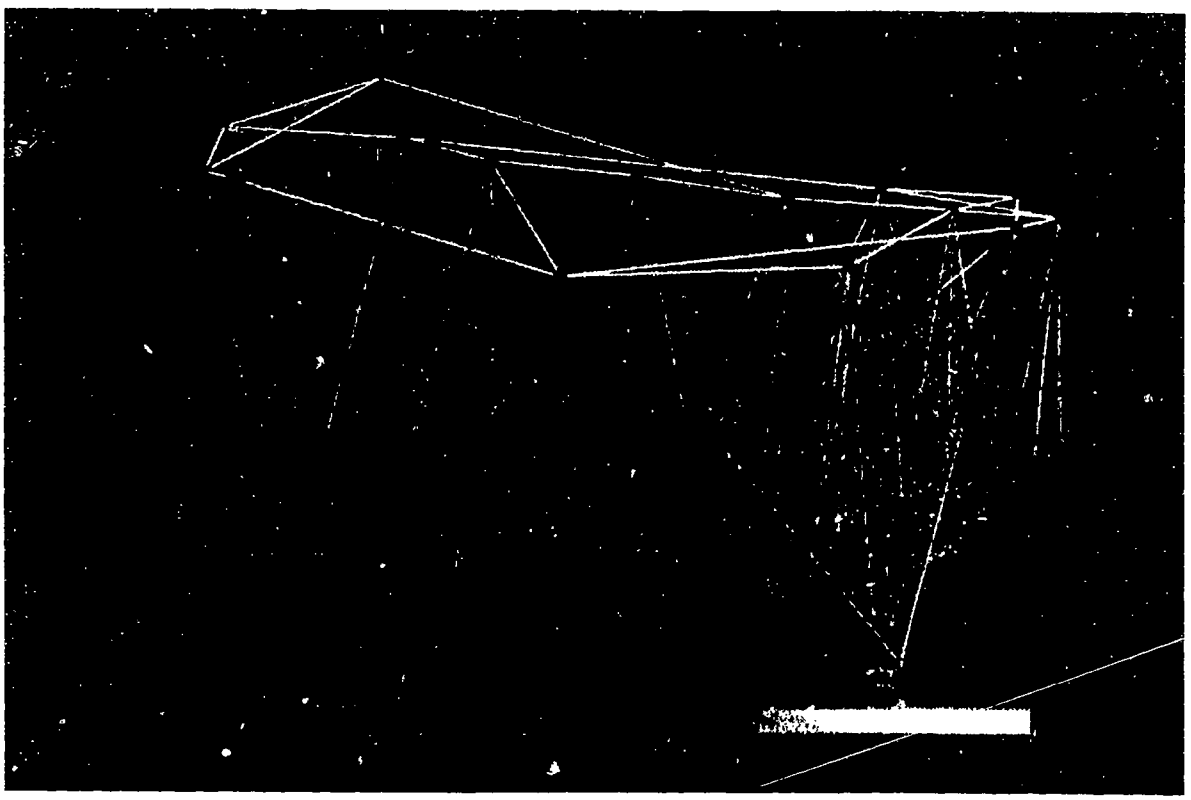
Private sector firms are already developing and deploying that infrastructure today. Nevertheless, there remain essential roles for government in this process. Carefully crafted government action will complement and enhance the efforts of the private sector and assure the growth of an information infrastructure available to all Americans at reasonable cost. In developing our policy initiatives in this area, the Administration will work in close partnership with business, labor, academia, the public, Congress, and state and local government. Our efforts will be guided by the following principles and objectives:

- **Promote private sector investment,** through appropriate tax and regulatory policies.
- **Extend the "universal service" concept to ensure that information resources are available to all at affordable prices.** Because information means empowerment—and employment—the government has a duty to ensure that all Americans have access to the resources and job creation potential of the Information Age.
- **Act as catalyst to promote technological innovation and new applications.** Commit important government research programs and grants to help the private sector develop and demonstrate technologies needed for the NII, and develop the applications and services that will maximize its value to users.
- **Promote seamless, interactive, user-driven operation of the NII.** As the NII evolves into a "network of networks," government will ensure that users can transfer information across networks easily and efficiently. To increase the likelihood that the NII will be both interactive and, to a large extent, user-driven, government must reform regulations and policies that may inadvertently hamper the development of interactive applications.
- **Ensure information security and network reliability.** The NII must be trustworthy and secure, protecting the privacy of its users. Government action will also ensure that the overall system remains reliable, quickly repairable in the event of a failure and, perhaps most importantly, easy to use.
- **Improve management of the radio frequency spectrum,** an increasingly critical resource.
- **Protect intellectual property rights.** The Administration will investigate how to strengthen domestic copyright laws and international intellectual property treaties to prevent piracy and to protect the integrity of intellectual property.
- **Coordinate with other levels of government and with other nations.** Because information crosses state, regional, and national boundaries, coordination is critical to avoid needless obstacles and prevent unfair policies that handicap U.S. industry.
- **Provide access to government information and improve government procurement.** The Administration will seek to ensure that Federal agencies, in concert with state and local governments, use the NII to expand the information available to the public, ensuring that the immense reservoir of government information is available to the public easily and equitably. Additionally, Federal procurement policies for telecommunications and information services and equipment will be designed to promote important technical developments for the NII and to provide attractive incentives for the private sector to contribute to NII development.

The time for action is now. Every day brings news of change: new technologies, like hand-held computerized assistants; new ventures and mergers combining businesses that not long ago seemed discrete and insular; new legal decisions that challenge the separation of computer, cable, and telephone industries. These changes promise substantial benefits for the American people, but only if government understands fully their implications and begins working with the private sector and other interested parties to shape the evolution of the communications infrastructure.

The benefits of the NII for the nation are immense. An advanced information infrastructure will enable U.S. firms to compete and win in the global economy, generating good jobs for the American people and economic growth for the nation. As importantly, the NII can transform the lives of the American people — ameliorating the constraints of geography, disability, and economic status — giving all Americans a fair opportunity to go as far as their talents and ambitions will take them.

THE NATIONAL INFORMATION INFRASTRUCTURE: AGENDA FOR ACTION



Information Infrastructure
Task Force
September 15, 1993

THE NATIONAL INFORMATION INFRASTRUCTURE: AGENDA FOR ACTION

Ronald H. Brown, Secretary of Commerce
Chair, Information Infrastructure Task Force

Larry Irving, Director
National Telecommunications and Information Administration
U.S. Department of Commerce
Chair, IITF Telecommunications Policy Committee

Arati Prabhakar, Director
National Institute of Standards and Technology
U.S. Department of Commerce
Chair, IITF Applications Committee

Sally Katzen, Administrator
Office of Information and Regulatory Affairs
Office of Management and Budget
Chair, IITF Information Policy Committee

THE NATIONAL INFORMATION INFRASTRUCTURE: AGENDA FOR ACTION

EXECUTIVE SUMMARY

All Americans have a stake in the construction of an advanced National Information Infrastructure (NII), a seamless web of communications networks, computers, databases, and consumer electronics that will put vast amounts of information at users' fingertips. Development of the NII can help unleash an information revolution that will change forever the way people live, work, and interact with each other:

- People could live almost anywhere they wanted, without foregoing opportunities for useful and fulfilling employment, by "telecommuting" to their offices through an electronic highway;
- The best schools, teachers, and courses would be available to all students, without regard to geography, distance, resources, or disability;
- Services that improve America's health care system and respond to other important social needs could be available on-line, without waiting in line, when and where you needed them.

Private sector firms are already developing and deploying that infrastructure today. Nevertheless, there remain essential roles for government in this process. Carefully crafted government action will complement and enhance the efforts of the private sector and assure the growth of an information infrastructure available to all Americans at reasonable cost. In developing our policy initiatives in this area, the Administration will work in close partnership with business, labor, academia, the public, Congress, and state and local government. Our efforts will be guided by the following principles and objectives:

- **Promote private sector investment,** through appropriate tax and regulatory policies.
- **Extend the "universal service" concept to ensure that information resources are available to all at affordable prices.** Because information means empowerment—and employment—the government has a duty to ensure that all Americans have access to the resources and job creation potential of the Information Age.
- **Act as catalyst to promote technological innovation and new applications.** Commit important government research programs and grants to help the private sector develop and demonstrate technologies needed for the NII, and develop the applications and services that will maximize its value to users.
- **Promote seamless, interactive, user-driven operation of the NII.** As the NII evolves into a "network of networks," government will ensure that users can transfer information across networks easily and efficiently. To increase the likelihood that the NII will be both interactive and, to a large extent, user-driven, government must reform regulations and policies that may inadvertently hamper the development of interactive applications.
- **Ensure information security and network reliability.** The NII must be trustworthy and secure, protecting the privacy of its users. Government action will also ensure that the overall system remains reliable, quickly repairable in the event of a failure and, perhaps most importantly, easy to use.
- **Improve management of the radio frequency spectrum,** an increasingly critical resource.
- **Protect intellectual property rights.** The Administration will investigate how to strengthen domestic copyright laws and international intellectual property treaties to prevent piracy and to protect the integrity of intellectual property.
- **Coordinate with other levels of government and with other nations.** Because information crosses state, regional, and national boundaries, coordination is critical to avoid needless obstacles and prevent unfair policies that handicap U.S. industry.
- **Provide access to government information and improve government procurement.** The Administration will seek to ensure that Federal agencies, in concert with state and local governments, use the NII to expand the information available to the public, ensuring that the immense reservoir of government information is available to the public easily and equitably. Additionally, Federal procurement policies for telecommunications and information services and equipment will be designed to promote important technical developments for the NII and to provide attractive incentives for the private sector to contribute to NII development.

The time for action is now. Every day brings news of change: new technologies, like hand-held computerized assistants; new ventures and mergers combining businesses that not long ago seemed discrete and insular; new legal decisions that challenge the separation of computer, cable, and telephone industries. These changes promise substantial benefits for the American people, but only if government understands fully their implications and begins working with the private sector and other interested parties to shape the evolution of the communications infrastructure.

The benefits of the NII for the nation are immense. An advanced information infrastructure will enable U.S. firms to compete and win in the global economy, generating good jobs for the American people and economic growth for the nation. As importantly, the NII can transform the lives of the American people — ameliorating the constraints of geography, disability, and economic status — giving all Americans a fair opportunity to go as far as their talents and ambitions will take them.

THE NATIONAL INFORMATION INFRASTRUCTURE: AGENDA FOR ACTION

Version 1.0

I. The Promise of the NII

Imagine you had a device that combined a telephone, a TV, a camcorder, and a personal computer. No matter where you went or what time it was, your child could see you and talk to you, you could watch a replay of your team's last game, you could browse the latest additions to the library, or you could find the best prices in town on groceries, furniture, clothes — whatever you needed.

Imagine further the dramatic changes in your life if:

- The best schools, teachers, and courses were available to all students, without regard to geography, distance, resources, or disability;
- The vast resources of art, literature, and science were available everywhere, not just in large institutions or big-city libraries and museums;
- Services that improve America's health care system and respond to other important social needs were available on-line, without waiting in line, when and where you needed them;
- You could live in many places without foregoing opportunities for useful and fulfilling employment, by "telecommuting" to your office through an electronic highway instead of by automobile, bus or train;
- Small manufacturers could get orders from all over the world electronically — with detailed specifications — in a form that the machines could use to produce the necessary items;
- You could see the latest movies, play your favorite video games, or bank and shop from the comfort of your home whenever you chose;
- You could obtain government information directly or through local organizations like libraries, apply for and receive government benefits electronically, and get in touch with government officials easily; and
- Individual government agencies, businesses and other entities all could exchange information electronically — reducing paperwork and improving service

Information is one of the nation's most critical economic resources, for service industries as well as manufacturing, for economic as well as national security. By one estimate, two-thirds of U.S. workers are in information-related jobs, and the rest are in industries that rely heavily on information. In an era of global markets and global competition, the technologies to create, manipulate, manage and use information are of strategic importance for the United States. Those technologies will help U.S. businesses remain competitive and create challenging, high-paying jobs. They also will fuel economic growth which, in turn, will generate a steadily-increasing standard of living for all Americans.

That is why the Administration has launched the National Information Infrastructure initiative. We are committed to working with business, labor, academia, public interest groups, Congress, and state and local government to ensure the development of a national information infrastructure (NII) that enables all Americans to access information and communicate with each other using voice, data, images or video at anytime, anywhere. By encouraging private sector investment in the NII's development, and through government programs to improve access to essential services, we will promote U.S. competitiveness, job creation and solutions to pressing social problems.

II. What Is the NII?

The phrase "information infrastructure" has an expansive meaning. The NII includes more than just the physical facilities used to transmit, store, process, and display voice, data, and images. It encompasses:

- A wide range and ever-expanding range of equipment including cameras, scanners, keyboards, telephones, fax machines, computers, switches, compact disks, video and audio tape, cable, wire, satellites, optical fiber transmission lines, microwave nets, switches, televisions, monitors, printers, and much more.

The NII will integrate and interconnect these physical components in a technologically neutral manner so that no one industry will be favored over any other. Most importantly,

the NII requires building foundations for living in the Information Age and for making these technological advances useful to the public, business, libraries, and other nongovernmental entities. That is why, beyond the physical components of the infrastructure, the value of the National Information Infrastructure to users and the nation will depend in large part on the quality of its other elements:

- The information itself, which may be in the form of video programming, scientific or business databases, images, sound recordings, library archives, and other media. Vast quantities of that information exist today in government agencies and even more valuable information is produced every day in our laboratories, studios, publishing houses, and elsewhere.

- Applications and software that allow users to access, manipulate, organize, and digest the proliferating mass of information that the NII's facilities will put at their fingertips.

- The network standards and transmission codes that facilitate interconnection and interoperation between networks, and ensure the privacy of persons and the security of the information carried, as well as the security and reliability of the networks.

- The people — largely in the private sector — who create the information, develop applications and services, construct the facilities, and train others to tap its potential. Many of these people will be vendors, operators, and service providers working for private industry.

Every component of the information infrastructure must be developed and integrated if America is to capture the promise of the Information Age.

The Administration's NII initiative will promote and support full development of each component. Regulatory and economic policies will be adopted that encourage private firms to create jobs and invest in the applications and physical facilities that comprise the infrastructure. The Federal government will assist industry, labor, academia, and state and local governments in developing the information resources and applications needed to maximize the potential of those underlying facilities. Moreover, and perhaps most importantly, the NII initiative will help educate and train our people so that they are prepared not only to contribute to the further growth of the NII, but also to understand and enjoy fully the services and capabilities that it will make available.

III. Need for Government Action To Complement Private Sector Leadership

The foregoing discussion of the transforming potential of the NII should not obscure a fundamental fact -- the private sector is already developing and deploying such an infrastructure today. The United States communications system — the conduit through which most information is accessed or distributed — is second to none in speed, capacity, and reliability. Each year the information resources, both hardware and software, available to most Americans are substantially more extensive and more powerful than the previous year.

The private sector will lead the deployment of the NII. In recent years, U.S. companies have invested more than $50 billion annually in telecommunications infrastructure — and that figure does not account for the vast investments made by firms in related industries, such as computers. In contrast, the Administration's ambitious agenda for investment in critical NII projects (including computing) amounts to $1-2 billion annually. Nonetheless, while the private sector role in NII development will predominate, the government has an essential role to play. In particular, carefully crafted government action can complement and enhance the benefits of these private sector initiatives. Accordingly, the Administration's NII initiative will be guided by the following nine principles and goals, which are discussed in more detail below:

1) Promote private sector investment, through tax and regulatory policies that encourage innovation and promote long-term investment, as well as wise procurement of services.

2) Extend the "universal service" concept to ensure that information resources are available to all at affordable prices. Because information means empowerment, the government has a duty to ensure that all Americans have access to the resources of the Information Age.

3) Act as catalyst to promote technological innovation and new applications. Commit important government research programs and grants to help the private sector develop and demonstrate technologies needed for the NII.

4) Promote seamless, interactive, user-driven operation of the NII. As the NII evolves into a "network of networks," government will ensure that users can transfer information across networks easily and efficiently.

5) Ensure information security and network reliability. The NII must be trustworthy and secure, protecting the privacy of its users. Government action will also aim to ensure that the overall system remains reliable, quickly repairable in the event of a failure and, perhaps most importantly, easy to use.

6) Improve management of the radio frequency spectrum, an increasingly critical resource.

7) Protect intellectual property rights. The Administration will investigate how to strengthen domestic copyright laws and international intellectual property treaties to prevent piracy and to protect the integrity of intellectual property

8) Coordinate with other levels of government and with other nations. Because information crosses state, regional, and national boundaries, coordination is important to avoid unnecessary obstacles and to prevent unfair policies that handicap U.S. industry.

9) Provide access to government information and improve government procurement. As described in the *National Performance Review*, the Administration will seek to ensure that Federal agencies, in concert with state and local governments, use the NII to expand the information available to the public, so that the immense reservoir of government information is available to the public easily and equitably. Additionally, Federal procurement policies for telecommunications and information services and equipment will be designed to promote important technical developments for the NII and to provide attractive incentives for the private sector to contribute to NII development.

The time for action is now. Every day brings news of change: new technologies, like hand-held computerized assistants; new ventures and mergers combining businesses that not long ago seemed discrete and insular; new legal decisions that challenge the separation of computer, cable and telephones. These changes promise substantial benefits for the American people, but only if government understands fully the implications of these changes and to work with the private sector and other interested parties to shape the evolution of the communications infrastructure.

IV. Managing Change/ Forging Partnerships

We will help to build a partnership of business, labor, academia, the public, and government that is committed to deployment of an advanced, rapid, powerful infrastructure accessible and accountable to all Americans.

Forging this partnership will require extensive intergovernmental coordination to ensure that Administration, Congressional, state and local government policy regarding the NII is consistent, coherent, and timely. It also requires the development of strong working alliances among industry groups and between government and the businesses responsible for creating and operating the NII. Finally, close cooperation will be needed between government, users, service providers, and public interest groups to ensure that the NII develops in a way that benefits the American people.

Specifically, the Administration will:

1) Establish an interagency Information Infrastructure Task Force

The President has convened a Federal inter-agency "Information Infrastructure Task Force" (IITF) that will work with Congress and the private sector to propose the policies and initiatives needed to accelerate deployment of a National Information Infrastructure. Activities of the IITF include coordinating government efforts in NII applications, linking government applications to the private sector, resolving outstanding disputes, and implementing Administration policies. Chaired by Secretary of Commerce Ron Brown and composed of high-level Federal agency representatives, the IITF's three committees focus on telecommunications policy, information policy, and applications.

2) Establish a private sector Advisory Council on the National Information Infrastructure

To facilitate meaningful private sector participation in the IITF's deliberations, the President will sign an Executive Order creating the "United States Advisory Council on the National Information Infrastructure" to advise the IITF on matters relating to the development of the NII. The Council will consist of 25 members, who will be named by the Secretary of Commerce by December 1993. Nominations will be solicited from a variety of NII constituencies and interested parties. The IITF and its committees also will use other mechanisms to solicit public comment to ensure that it hears the views of all interested parties.

3) Strengthen and streamline Federal communications and information policy-making agencies

In order to implement the ambitious agenda outlined in this document, the federal agencies most directly responsible for the evolution of the NII (such as NTIA, the Office of Information and Regulatory Affairs at OMB, and the FCC) must be properly structured and adequately staffed to address many new and difficult policy issues. The Administration intends to ensure that these agencies have the intellectual and material resources they need. In addition, in accord with the Vice President's *National Performance Review*, these agencies will make the organizational and procedural changes needed to most effectively contribute to the NII initiative.

V. Principles and Goals for Government Action

The Task Force currently is undertaking a wide-ranging examination of all issues relevant to the timely development and growth of the National Information Infrastructure. Specific principles and goals in areas where government action is warranted have already been identified and work has begun on the following matters:

1. Promote Private Sector Investment

One of the most effective ways to promote investments in our nation's information infrastructure is to introduce or further expand competition in communications and information markets. Vibrant competition in these markets will

spur economic growth, create new businesses and benefit U.S. consumers.

To realize this vision, however, policy changes will be necessary:

Action: **Passage of communications reform legislation.** The Administration will work with Congress to pass legislation by the end of 1994 that will increase competion and ensure universal access in communications market--particularly those, such as the cable television and local telephone markets that have been dominated by monopolies. Such legislation will explicitly promote private sector infrastructive investment-- both by companies already in the market and those seeking entry.

Action: **Revision of tax policies.** Tax policies are important determinants of the amount of private sector investment in the NII. The President has signed into law tax incentives for private sector investment in R&D and new business formation, including a three-year extension of the R&D credit and a targeted capital gains reduction for investments in small businesses. Both of these tax incentives will help spur the private sector investment needed to develop the NII.

2. Extend the "Universal Service" Concept to Ensure that Information Resources Are Available to All at Affordable Prices

The Communications Act of 1934 articulated in general terms a national goal of "Universal Service" for telephones — widespread availability of a basic communications service at affordable rates. A major objective in developing the NII will be to extend the Universal Service concept to the information needs of the American people in the 21st Century. As a matter of fundamental fairness, this nation cannot accept a division of our people among telecommunications or information "haves" and "have-nots." The Administration is committed to developing a broad, modern concept of Universal Service — one that would emphasize giving all Americans who desire it easy, affordable access to advanced communications and information services, regardless of income, disability, or location.

Devising and attaining a new goal for expanded Universal Service is consistent with efforts to spur infrastructure development by increasing competition in communications and information markets. As noted above, competition can make low cost, high quality services and equipment widely available. Policies promoting greater competition in combination with targeted support for disadvantaged users or especially high cost or rural areas would advance both rapid infrastructure modernization and expanded Universal Service.

Action: **Develop a New Concept of Universal Service.** To gather information on the best characteristics of an expanded concept of Universal Service, the Commerce Department's National Telecommunications and Information Administration (NTIA) will hold a series of public hearings on Universal Service and the NII, beginning by December 1993. The Administration will make a special effort to hear from public interest groups. Building on the knowledge gained from these activities, the IITF will work with the Advisory Council on the National Information Infrastructure, as well as with state regulatory commissions, to determine how the Universal Service concept should be applied in the 21st Century.

3. Promote Technological Innovation and New Applications

Government regulatory, antitrust, tax, and intellectual property policies all affect the level and timing of new offerings in services and equipment — including the technology base that generates innovations for the marketplace. But technological innovations ultimately depend upon purposeful investment in research and development, by both the private sector and government. R&D investment helps firms to create better products and services at lower costs.

As noted in the Administration's February 22, 1993 technology policy statement: "We are moving to accelerate the development of technologies critical for long-term growth but not receiving adequate support from private firms, either because the returns are too distant or because the level of funding required is too great for individual firms to bear." Government research support already has helped create basic information technologies in computing, networking and electronics. We will support further NII-related research and technology development through research partnerships and other mechanisms to accelerate technologies where market mechanisms do not adequately reflect the nation's return on investment. In particular, these government research and funding programs will focus on the development of beneficial public applications in the fields of education, health care, manufacturing, and provision of government services.

Action: **Continue the High-Performance Computing and Communications Program.** Established by the High-Performance Computing Act of 1991, the HPCC Program funds R&D designed to create more powerful computers, faster computer networks, and more sophisticated software. In addition, the HPCC Program is providing scientists and engineers with the tools and training they need to solve "Grand Challenges," research problems — like designing new drugs — that cannot be solved without the most powerful computers. The Administration has requested $1 billion for the HPCC Program in fiscal year 1994, and is in the process of forming a "High-Performance Computing Advisory Committee," to provide private sector input on the Program.

We have also requested an additional $96 million in the FY 1994 budget to create a new component of the HPCC Program -- Information Infrastructure Technologies and

Applications (IITA). The Administration is working with Congress to obtain authorization to fund this effort, which will develop and apply high-performance computing and high-speed networking technologies for use in the fields of health care, education, libraries, manufacturing, and provision of government information.

Action: **Implement the NII Pilot Projects Program.** In its FY 94 budget, the Administration has requested funding from the Congress for NII networking pilot and demonstration projects. Under NTIA's direction, this pilot program will provide matching grants to state and local governments, health care providers, school districts, libraries, universities, and other non-profit entities. The grants will be awarded after a competitive merit review process and will be used to fund projects to connect institutions to existing networks, enhance communications networks that are currently operational, and permit users to interconnect among different networks. Funded projects will demonstrate the potential of the NII and provide tangible benefits to their communities. Equally important, they will help leverage the resources and creativity of the private sector to devise new applications and uses of the NII. The successes of the these pilot projects will create an iterative process that will generate more innovative approaches each year.

Action: **Inventory NII Applications Projects.** Many insights can be gained by sharing information about how government can effectively use the NII. By the end of January 1994, the IITF will complete an inventory of current and planned government activities and will widely disseminate the results through electronic and printed means. An electronic forum is being established to encourage government and private sector contributions and comments about government applications projects.

4. Promote Seamless, Interactive, User-Driven Operation

Because the NII will be a network of networks, information must be transferable over the disparate networks easily, accurately, and without compromising the content of the messages. Moreover, the NII will be of maximum value to users if it is sufficiently "open" and interactive so that users can develop new services and applications or exchange information among themselves, without waiting for services to be offered by the firms that operate the NII. In this way, users will develop new "electronic communities" and share knowledge and experiences that can improve the way that they learn, work, play, and participate in the American democracy.

To assure interoperability and openness of the many components of an efficient, high-capacity NII, standards for voice, video, data, and multi-media services must be developed. Those standards also must be compatible with the large installed base of communications technologies, and flexible and adaptable enough to meet user needs at affordable costs. The United States has long relied on a consensus-based, voluntary standards-setting process in communications. Particularly in the area of information and communications technology, where product cycles are often measured in months, not years, the standards process is critical and has not always worked to speed technological innovation and serve end-users well. Government can catalyze this industry-driven process by participating more actively in private-sector standards-writing bodies and by working with industry to address strategic technical barriers to interoperability and adoption of new technologies.

To increase the likelihood that the NII will be both interactive and, to a large extent, user-driven, government also must reform regulations and policies that may inadvertently hamper the development of interactive applications. For example, government regulations concerning the lack of reimbursement of health care procedures may deter the growth of distance medicine applications.

Action: **Review and clarify the standards process to speed NII applications.** By October 15, 1993 the Commerce Department's National Institute for Standards and Technology (NIST) will establish a panel and work with other appropriate agencies to review the government's involvement in establishing network requirements and standards with domestic and international partners. The panel, with input from the private sector and other levels of government, will consider the role of the government in the standards process and will identify opportunities for accelerating the deployment of the NII.

Action: **Review and reform government regulations that impede development of interactive services and applications.** The Administration will work closely with the private sector, as well as state and local governments, to identify government policies and regulations that may hinder the growth of interactive services and applications. The IITF will determine how those regulations should be changed.

5. Ensure Information Security and Network Reliability

The trustworthiness and security of communications channels and networks are essential to the success of the NII. Users must be assured that information transmitted over the infrastructure will go when and where it is intended to go. Electronic information systems can create new vulnerabilities. For example, electronic files can be broken into and copied from remote locations, and cellular phone conversations can be monitored easily. Yet these same systems, if properly designed, can offer greater security than less advanced communications channels.

Through the use of information systems, gathering, sending, and receiving a wide variety of personal information is now simple, quick, and relatively inexpensive. The use of information technologies to access, modify, revise, repackage, and resell information can benefit individuals, but unauthorized use can encroach on their privacy. While media reports often emphasize the role of modern information technology in invading privacy, technology advances and enhanced management oversight also offer the opportunity for privacy protection. This protection is especially important to businesses that increasingly transmit sensitive proprietary data through electronic means. In a climate of tough global competitiveness to gain market advantage, the confidentiality of this information can spell the difference between business success or failure.

In addition, it is essential that the Federal government work with the communications industry to reduce the vulnerability of the nation's information infrastructure. The NII must be designed and managed in a way that minimizes the impact of accident or sabotage. The system must also continue to function in the event of attack or catastrophic natural disaster.

Action: **Review privacy concerns of the NII.** The IITF has developed a work plan to investigate what policies are necessary to ensure individual privacy, while recognizing the legitimate societal needs for information, including those of law enforcement. The IITF has also developed a work plan to investigate how the government will ensure that the infrastructure's operations are compatible with the legitimate privacy interests of its users.

Action: **Review of encryption technology.** In April, the President announced a thorough review of Federal policies on encryption technology. In addition, Federal agencies are working with industry to develop new technologies that protect the privacy of citizens, while enabling law enforcement agencies to continue to use court-authorized wiretaps to fight terrorism, drug rings, organized crime, and corruption. Federal agencies are working with industry to develop encryption hardware and software that can be used for this application.

Action: **Work with industry to increase network reliability.** The National Communications System brings together 23 Federal agencies with industry to reduce the vulnerability of the nation's telecommunications systems to accident, sabotage, natural disaster, or military attack. And the Federal Communications Commission has an industry and user Network Reliability Council to advise it on ensuring the reliability of the nation's commercial telecommunications networks. These efforts are increasingly important as the threat posed by terrorism and computing hacking grows. The NCS will continue its work and will coordinate with the IITF. In addition, the National Security Telecommunications Advisory Committee, which advises the President in coordination with the NCS, as well as the FCC's Network Reliability Council, will coordinate with and complement the work of the Advisory Council on the National Information Infrastructure.

6. Improve Management of the Radio Frequency Spectrum

Many of the dramatic changes expected from the development of the information infrastructure will grow out of advances in wireless technologies. The ability to access the resources of the NII at any time, from anywhere in the country, will be constrained, however, if there is inadequate spectrum available. To ensure that spectrum scarcity does not impede the development of the NII, the Administration places a high priority on streamlining its procedures for the allocation and use of this valuable resource.

Action: **Streamline allocation and use of spectrum.** The Administration is working with Congress to fully implement the spectrum management provisions of the Omnibus Budget and Reconciliation Act of 1993, to streamline government use of spectrum and to get spectrum to the public efficiently. These provisions will provide greater flexibility in spectrum allocation, including increased sharing of spectrum between private sector and government users, increased flexibility in technical and service standards, and increased choices for licensees in employing their assigned spectrum.

Action: **Promote market principles in spectrum distribution.** Further, the Administration will continue to support policies that place a greater reliance on market principles in distributing spectrum, particularly in the assignment process, as a superior way to apportion this scarce resource among the widely differing wireless services that will be a part of the NII. At the same time, the Administration will develop policies to ensure that entrepreneurs and small, rural, minority- and women-owned businesses are able to participate in spectrum auctions.

7. Protect Intellectual Property Rights

Development of an advanced information infrastructure will create unprecedented market opportunities and new challenges for our world-preeminent media and information industries. The broad public interest in promoting the dissemination of information to our citizens must be balanced with the need to ensure the integrity of intellectual property rights and copyrights in information and entertainment products. This protection is crucial if these products — whether in the form of text, images, computer programs, databases, video or sound recordings, or multimedia formats — are to move in commerce using the full capability of the NII.

Action: **Examine the adequacy of copyright laws.** The IITF will investigate how to strengthen domestic copyright laws and international intellectual property treaties to prevent piracy and to protect the integrity of intellectual property. To ensure broad access to information via the NII, the IITF will study how traditional concepts of fair use should apply with respect to new media and new works.

Action: **Explore ways to identify and reimburse copyright owners.** The IITF will explore the need for standards for the identification of copyright ownership of information products in electronic systems (e.g., electronic headers, labels or signature techniques). The Task Force will also evaluate the need to develop an efficient system for the identification, licensing, and use of work, and for the payment of royalties for copyrighted products delivered or made available over electronic information systems.

8. Coordinate with Other Levels of Governmental and With Other Bodies

Domestic: Many of the firms that will likely participate in the NII are now subject to regulation by Federal, state, and local government agencies. If the information infrastructure is to develop quickly and coherently, there must be close coordination among the various government entities, particularly with respect to regulatory policy. It is crucial that all government bodies — particularly Congress, the FCC, the Administration, and state and local governments — work cooperatively to forge regulatory principles that will promote deployment of the NII.

Action: **Seek ways to improve coordination with state and local officials.** The IITF will meet with state and local officials to discuss policy issues related to development of the NII. The Task Force will also seek input from the private sector and non-federal agencies as it devises proposals for regulatory reform. The Administration is committed to working closely with state and local governments in developing its telecommunications policies.

International: The NII also will develop in the context of evolving global networks. Because customers typically demand that U.S. communications providers offer services on a global basis, it is critical that the infrastructure within this country can meet international, as well as domestic, requirements.

Action: **Open up overseas markets.** The Administration has shown its willingness to work directly on behalf of U.S. firms to ensure that they have an equal opportunity to export telecommunications-related goods and services to potential overseas customers. For example, the Commerce Department is developing new export control policies governing computers and telecommunications equipment manufactured by U.S. firms. These changes will remove export restrictions on many of these products and permit U.S. manufacturers to enter new markets not previously available to them. The Administration will continue to work to open overseas markets for U.S. services and products.

Action: **Eliminate barriers caused by incompatible standards.** Equally important is the need to avoid trade barriers raised by incompatible U.S. and foreign standards or — more subtly — between the methods used to test conformance to standards. Through its participation in international standards committees, the Administration is working to eliminate or avert such barriers.

Action: **Examine international and U.S. trade regulations.** The IITF will coordinate the Administration's examination of policy issues related to the delivery of telecommunications services to and from the U.S., including claims by some U.S. companies that regulatory practices in foreign countries — including denial of market access for U.S. carriers and the imposition of excessive charges for completing calls from the United States — are harming the competitiveness of the industry and the costs charged to U.S. customers for service. The IITF also will reexamine U.S. regulation of international telecommunications services.

9. Provide Access to Government Information and Improve Government Procurement

Thomas Jefferson said that information is the currency of democracy. Federal agencies are among the most prolific collectors and generators of information that is useful and valuable to citizens and business. Improvement of the nation's information infrastructure provides a tremendous opportunity to improve the delivery of government information to the taxpayers who paid for its collection; to provide it equitably, at a fair price, as efficiently as possible.

The Federal government is improving every step of the process of information collection, manipulation, and dissemination. The Administration is funding research programs that will improve the software used for browsing, searching, describing, organizing, and managing information. But it is committed as well to applying those tools to the distribution of information that can be useful to the public in their various roles as teachers, researchers, businesspeople, consumers, etc.

The key questions that must be addressed are: What information does the public want? What information is in electronic form? By what means can it be distributed? How can all Americans have access to it? A secondary question is: How can government itself improve through better information management?

Action: Improve the accessibility of government information. IITF working groups will carefully consider

the problems associated with making government information broadly accessible to the public electronically. Additionally, several inter-agency efforts have been started to ensure that the right information is stored and available. Finally, to help the public find government information, an inter-agency project has been formed to develop a virtual card catalogue that will indicate the availability of government information in whatever form it takes.

Action: **Upgrade the infrastructure for the delivery of government information.** The Federal government has already taken a number of steps to promote wider distribution of its public reports. Legislation has been enacted to improve electronic dissemination of government document by the Government Printing Office. A number of Federal agencies have moved aggressively to convert their public information into electronic form and disseminate it over the Internet, where it will be available to many more people than have previously had access to such information. In the future, substantial improvements will be made to "FedWorld," an electronic bulletin board established by the Department of Commerce's National Technical Information Service (NTIS), which links the public with more than 100 Federal bulletin boards and information centers. These improvements will enhance FedWorld's ability to distribute to the public scientific, technical, and business-related information generated by the U.S. Government and other sources. Finally, a conference will be held in the Fall of 1993 to begin teaching Federal employees how they can use these distribution mechanisms.

Action: **Enhance citizen access to government information.** In June 1993, OMB prescribed new polices pertaining to the acquisition, use, and distribution of government information by Federal agencies. Among other things, the policies mandate that, in distributing information to the public, Federal agencies should recoup only those costs associated with the dissemination of that information, not with its creation or collection. Moreover, a number of inter-agency efforts are under way to afford greater public access to government information. One project seeks to turn thousands of local and field offices of various Federal agencies into Interactive Citizen Participation Centers, at which citizens can communicate with the public affairs departments of all Federal agencies.

Action: **Strengthen inter-agency coordination through the use of electronic mail.** To implement the *National Performance Review's* recommendation on expanded use of electronic mail within the Federal government, an inter-agency coordinating body has been established to incorporate electronic mail into the daily work environment of Federal workers. The group is also sponsoring three pilot projects to expand connectivity that will build a body of experience that other Federal agencies can draw on when they begin to use electronic mail.

Action: **Reform the Federal procurement process to make government a leading-edge technology adopter.** The Federal government is the largest single buyer of high technology products. The government has played a key role in developing emerging markets for advanced technologies of military significance; it can be similarly effective for civilian technologies. The Administration will implement the procurement policy reforms set forth in the *National Performance Review*.

VI. America's Destiny is Linked to our Information Infrastructure

The principles and goals outlined in this document provide a blueprint for government action on the NII. Applying them will ensure that government provides constructive assistance to U.S. industry, labor, academia and private citizens as they develop, deploy and use the infrastructure.

The potential benefits for the nation are immense. The NII will enable U.S. firms to compete and win in the global economy, generating good jobs for the American people and economic growth for the nation. As importantly, the NII promises to transform the lives of the American people. It can ameliorate the constraints of geography and economic status, and give all Americans a fair opportunity to go as far as their talents and ambitions will take them.

BENEFITS AND APPLICATIONS OF THE NATIONAL INFORMATION INFRASTRUCTURE

The development of the National Information Infrastructure is not an end in itself; it is a means by which the United States can achieve a broad range of economic and social goals. Although the NII is not a "silver bullet" for all of the problems we face, it can make an important contribution to our most pressing economic and social challenges.

This infrastructure can be used by all Americans, not just by scientists and engineers. As entrepreneurs, factory workers, doctors, teachers, federal employees, and citizens, Americans can harness this technology to:

- Create jobs, spur growth, and foster U.S. technological leadership;
- Reduce health care costs while increasing the quality of service in underserved areas;
- Deliver higher-quality, lower-cost government services;
- Prepare our children for the fast-paced workplace of the 21st century; and
- Build a more open and participatory democracy at all levels of government.

This is not a far-fetched prediction. As shown below, our current information infrastructure is already making a difference in the lives of ordinary Americans, and we have just begun to tap its potential.

ECONOMIC BENEFITS

The National Information Infrastructure will help create high-wage jobs, stimulate economic growth, enable new products and services, and strengthen America's technological leadership. Whole new industries will be created, and the infrastructure will be used in ways we can only begin to imagine. Below are some of the potential benefits to the U.S. economy:

1. Increased economic growth and productivity

- The Computer Systems Policy Project estimates that the NII will "create as much as $300 billion annually in new sales across a range of industries."
- The Economic Strategy Institute concluded that accelerated deployment of the NII would increase GDP by $194
- $321 billion to GNP by the year 2007, and increase productivity by 20 to 40 percent.

2. Job creation

Although there are no definitive estimates for the total number of U.S. jobs the deployment of the NII will create, it is clear that it has the potential to create hundreds of thousands of jobs. For example:

Industry experts believe that the Personal Communications Services industry, a new family of wireless services, could create as many as 300,000 jobs in the next 10-15 years. The development of this industry will be accelerated by the Emerging Telecommunications Technology Act, which was signed by President Clinton as part of the budget package.

3. Technological leadership

The NII will serve as the driver for a wide variety of technologies, such as semiconductors, high-speed networking, advanced displays, software, and human/computer interfaces such as speech recognition.

This technology will be used to create exciting new products and services, strengthening U.S. leadership in the electronics and information technology sector. For example, experts envision the production of powerful computers that will be held in the palm of our hand, "as mobile as a watch and as personal as a wallet, ... [they] will recognize speech, navigate streets, take notes, keep schedules, collect mail, manage money, open the door and start the car, among other computer functions we cannot imagine today."

4. Regional, state, and local economic development

In today's knowledge-based, global economy in which capital and technology are increasingly mobile, the quality of America's information infrastructure will help determine whether companies invest here or overseas. States and regions increasingly recognize that development of their information infrastructure is key to creating jobs and attracting new businesses:

• In May 1993, Governor Jim Hunt announced the creation of the North Carolina Information Highway, a network of fiber optics and advanced switches capable of transmitting the entire 33-volume Encyclopedia Britannica in 4.7 seconds. This network, which will be deployed in cooperation with BellSouth, GTE, and Carolina Telephone, is a key element of North Carolina's economic development strategy.

• In California's Silicon Valley, academics, business executives, government officials, and private citizens are working together to build an "advanced information infrastructure and the collective ability to use it." A nonprofit organization, Smart Valley Inc., will help develop the information infrastructure and its applications. Many business applications are envisioned, including desktop videoconferencing, rapid delivery of parts designs to fabrication shops, design of chips on remote supercomputers, electronic commerce, and telecommuting.

• The Council of Great Lakes Governors has developed a regional telecommunications initiative, which includes creating an open data network as a first step towards creation of a Great Lakes Information Highway, promoting access in rural areas, developing a set of telecommunications service goals and a time table for achieving them, and developing a computerized inventory of each state's advanced telecommunications infrastructure.

5. **Electronic commerce**

Electronic commerce (e.g., on-line parts catalogues, multimedia mail, electronic payment, brokering services, collaborative engineering) can dramatically reduce the time required to design, manufacture, and market new products. "Time to market" is a critical success factor in today's global marketplace. Electronic commerce will also strengthen the relationships between manufacturer, suppliers, and joint developers. In today's marketplace, it is not unusual to have 12 or more companies collaborating to develop and manufacture new products.

HEALTH CARE

The NII can help solve America's health care crisis. The Clinton Administration is committed to health care reform that will ensure that Americans will never again lose their health care coverage and that controls skyrocketing health care costs. The costs of doing nothing are prohibitive:

• Since 1980, our nation's health care costs have quadrupled. Between 1980 and 1992, health expenditures shot up from 9 percent to 14 percent of GDP; under current policies, they will hit 19 percent by the year 2000. Health care cost increases will eat up more than half of the new federal revenue expected over the next four years.

• Twenty-five cents out of every dollar on a hospital bill goes to administrative costs and does not buy any patient care. The number of health care administrators is increasing four times faster than the number of doctors.

These problems will not be solved without comprehensive health care reform. Better use of information technology and the development of health care applications for the NII, however, can make an important contribution to reform. Experts estimate that telecommunications applications could reduce health care costs by $36 to $100 billion each year while improving quality and increasing access. Below are some of the existing and potential applications:

1. **Telemedicine:** By using telemedicine, doctors and other care givers can consult with specialists thousands of miles away; continually upgrade their education and skills; and share medical records and x-rays.

   Example: In Texas, over 70 hospitals, primarily in rural areas, have been forced to close since 1984. The Texas Telemedicine Project in Austin, Texas offers interactive video consultation to primary care physicians in rural hospitals as a way of alleviating the shortage of specialists in rural areas. This trial is increasing the quality of care in rural areas and providing at least 14 percent savings by cutting patient transfer costs and provider travel.

2. **Unified Electronic Claims:** More than 4 billion health care claims are submitted annually from health care providers to reimbursement organizations such as insurance companies, Medicare, Medicaid, and HMOs. Moreover, there are 1500 different insurance companies in the United States using many different claims forms. The administrative costs of the U.S. health care system could be dramatically reduced by moving towards standardized electronic submission and processing of claims.

3. **Personal Health Information Systems:** The United States can use computers and networks to promote self care and prevention by making health care information available 24 hours a day in a form that aids decision making. Most people do not have the tools necessary to become an active and informed participant in their own health care. As a result, far too many people (estimates range from 50 to 80 percent) entering the health care system do not really need a physician's care. Many improperly use the system by, for example, using the emergency room for a cold or back strain. Many of those who end up with serious health problems enter the health care system too late, and thus require more extensive and costly therapy. Michael McDonald, chairman of the Communications and Computer Applications in Public

Health (CCAPH), estimates that even if personal health information systems were used only 25 to 35 percent of the time, $40 to $60 billion could be saved.

Example: InterPractice Systems, a joint venture of Harvard Community Health Plan in Boston and Electronic Data Systems, has placed terminals in the homes of heavy users of health care, such as the elderly, pregnant women, and families with young children. Based on a patient's symptoms and their medical history, an electronic advice system makes recommendations to HCHP's members about using self care, talking with a doctor, or scheduling an appointment. In one instance, "an 11-year old who regularly played with the terminal heard his father complain one day of chest pains and turned to the system for help; it diagnosed the symptoms as a probable heart attack. The diagnosis was correct."

4. **Computer-Based Patient Records:** The Institute of Medicine has concluded that Computer-Based Patient Records are critical to improving the quality and reducing the cost of health care. Currently:

   • 11 percent of laboratory tests must be re-ordered because of lost results;

   • 30 percent of the time, the treatment ordered is not documented at all;

   • 40 percent of the time a diagnosis isn't recorded; and

   • 30 percent of the time a medical record is completely unavailable during patient visits.

CIVIC NETWORKING TECHNOLOGY IN THE PUBLIC INTEREST

The benefits of the NII extend far beyond economic growth. As the Center for Civic Networking observed,

> "A country that works smarter; enjoys efficient, less costly government, guided by a well-informed citizenry; that produces high quality jobs and educated citizens to fill them; that paves a road away from poverty; that promotes life-long learning, public life and the cultural life of our communities. This is the promise of the National Information Infrastructure."

The NII could be used to create an "electronic commons" and promote the public interest in the following ways:

1. **Community Access Networks:** Grass-roots networks are springing up all over the country, providing citizens with a wide range of information services. The National Information Infrastructure should expand a citizen's capacity for action in local institutions, as it must honor regional differences and the cultural diversity of America's heritage.

   Example: The Heartland FreeNet in Peoria, Illinois provides a wide range of community information to the citizens of Central Illinois 24 hours a day. Topics covered include 113 areas of social services; a year long community calendar; the American Red Cross; current listings from the Illinois Job Service; resources for local businesses; and local government information. Experts in all fields from law to the Red Cross to chemical dependency volunteer their time and expertise to answer questions anonymously asked by the public.

   Example: The Big Sky Telegraph began operation in 1988 as an electronic bulletin board system linking Montana's 114 one-room schools to each other and to Western Montana College. Today, the Big Sky Telegraph enables the formation of "virtual communities"—linking schools, libraries, county extension services, women's centers, and hospitals. Montana's high-school students learning Russian can now communicate with Russian students, and science students are participating in a course on "chaos theory" offered by MIT.

2. **Dissemination of government information:** The free flow of information between the government and the public is essential to a democratic society. Improvements in the National Information Infrastructure provide a tremendous opportunity to improve the delivery of government information to the taxpayers who paid for its collection; to provide it equitably, at a fair price, as equitably as possible.

   Example: Some of the most powerful examples of the power inherent in information collection and dissemination come from the experience of Federal agencies. For example, the Emergency Planning and Community Right-to-Know Act of 1986 established a Toxic Release Inventory (TRI), which required industries to report their estimated total releases of toxic chemicals to the environment. The Environmental Protection Agency has used a variety of means for making the data available to the public, including a collaborative effort involving the agency, the nonprofit community, and philanthropy. This effort involved making the TRI available through an online service called RTK NET (the Right-to-Know Computer Network), operated by OMB Watch and Unison Institute

   As a result of the TRI program, EPA and industry developed the "33/50" program, in which CEOs set a goal of reducing their pollution by 33 percent by 1992 and 50 percent by 1995. Because of RTK NET's success, EPA is seeking to expand the information available on the service.

3. Universal access: The NII must be used to bring Americans together, as opposed to allowing a further polarization between information "haves" and "have nots."

   Example: As part of a recent cable franchise negotiation, fiber optic cable was deployed in Harlem, where 40 percent of the residents live below the poverty line. New York City is exploring the use of interactive video conferencing between community rooms in housing projects and government offices, schools, and New York corporations. These facilities could be used to teach parenting to teenage mothers, and promote mentoring programs between inner city youth and employees of New York corporations.

RESEARCH

One of the central objectives of the High Performance Computing and Communications Initiative (HPCCI) is to increase the productivity of the research community and enable scientists and engineers to tackle "Grand Challenges," such as forecasting the weather, building more energy-efficient cars, designing life-saving drugs, and understanding how galaxies are formed.

As a result of advances in computing and networking technologies promoted by the HPCCI, America's scientists and engineers (and their colleagues and peers around the world) are able to solve fundamental problems that would have been impossible to solve in the past. U.S. researchers will continue to benefit from the HPCCI and the emerging National Information Infrastructure. Below are just a few of the ways in which this technology is being used by U.S. researchers:

1. Solving Grand Challenges: As a result of investments in high performance computers, software, and high-speed networks, researchers have access to more and more computational resources. As a result, scientists and engineers have been able to more accurately model the Earth's climate; design and simulate next-generation aircraft (the High Speed Civil Transport); improve detection of breast cancer by turning two-dimensional MRI images into three-dimensional views; and enhance the recovery of oil and gas from America's existing reservoirs.

2. Enabling remote access to scientific instruments: Because of advancements in networks and visualization software, scientists can control and share remote electron microscopes, radio telescopes, and other scientific instruments.

3. Supporting scientific collaboration: The Internet has allowed scientists in the United States and around the world to access databases, share documents, and communicate with colleagues. For example, one computer language was developed by 60 people in industry, government and academia over a period of 3 years with only two days of face-to-face meetings. Instead, project participants sent 3,000 e-mail messages to each other, dramatically reducing the time required to develop the language. As scientific research becomes increasingly complex and interdisciplinary, scientists see the need to develop "collaboratories," centers without walls in which "the nations' researchers can perform their research without regard to geographical location — interacting with colleagues, access instrumentation, sharing data and computational resources, [and] accessing information in digital libraries."

LIFE-LONG LEARNING

Increasingly, what we earn depends on what we learn. Americans must be well-educated and well-trained if we are compete internationally and enjoy a healthy democracy. The magnitude of the challenge we face is well-known:

- 25 percent of students nation-wide no longer complete high-school, a figure which rises to 57 percent in some large cities.

- Currently, 90 million adults in the United States do not have the literacy skills they need to function in our increasingly complex society.

The Clinton Administration has set ambitious national goals for lifelong learning. The "Goals 2000: Educate America Act" would make six education goals part of national policy: 90 percent high school graduation rate; U.S. dominance in math and science; total adult literacy; safe and drug-free schools; increased competency in challenging subjects; and having every child enter school "ready to learn." Secretary of Labor Robert Reich also has emphasized the need to move towards "new work." New work requires problem-solving as opposed to rote repetition, upgrading worker skills, and empowering front-line workers to continuously improve products and services. All of the Administration's policy initiatives (national skill standards, school-to-work transition, training for displaced workers) are aimed at promoting the transition towards high-wage, higher-value "new work."

Although technology alone can not fix what is wrong with America's education and training system, the NII can help. Studies have shown that computer-based instruction is cost-effective, enabling 30% percent more learning in 40% less time at 30% less cost. *Fortune* recently reported that:

"From Harlem to Honolulu, electronic networks are sparking the kind of excitement not seen in America's classrooms since the space race ... In scores of programs and pilot projects, networks are changing the way teachers teach and students learn."

The United States has just begun to exploit the educational applications of computers and networks. Students and teachers can use the NII to promote collaborative learning between students, teachers, and experts; access on-line "digital libraries"; and take "virtual" field trips to museums and science exhibits without leaving the classroom.

Example: Headquartered in Cambridge, Massachusetts and funded by the National Science Foundation, the Global Laboratory Project links students from over 101 schools in 27 states and 17 foreign countries, including Japan, Saudi Arabia, Russia and Argentina. All over the world, students establish environmental monitoring stations to study climate change, monitor pollutants such as pesticides and heavy metals, and measure ultraviolet radiation. Students share their data over the Global Lab telecommunications network with each other and with scientists to make comparisons, conduct analyses, and gain a global perspective on environmental problems.

Example: In Texas, the Texas Education Network (TENET) now serves over 25,000 educators, and is making the resources of the Internet available to classrooms. One Texas educator from a small school district described the impact it was having on the learning experiences of children:

> "The smaller districts can now access NASA, leave messages for the astronauts, browse around in libraries larger than ever they will ever be able to visit, discuss the Superconducting Supercollider project with the physicist in charge, discuss world ecology with students in countries around the world, read world and national news that appears in newspapers that are not available in their small towns, work on projects as equals and collaborators with those in urban areas, and change the way they feel about the size of their world. This will create students that we could not create otherwise. This is a new education and instruction."

As computers become more powerful and less expensive, students may eventually carry hand-held, computer-based "intelligent tutors," or learn in elaborate simulated environments. One expert predicted the following educational use of virtual reality:

> "Imagine a biology student entering an immersive virtual laboratory environment that includes simulated molecules. The learner can pick up two molecules and attempt to fit them together, exploring docking sites. In addition to the three-dimensional images in the head-mounted display, the gesture gloves on his hands press back to provide feedback to his sense of touch. Alternatively, the student can expand a molecule to the size of a large building and fly around in it, examining the internal structure."

CREATING A GOVERNMENT THAT WORKS BETTER & COSTS LESS

The Vice President Gore's *National Performance Review* (NPR) provides a bold vision of a federal government which is effective, efficient and responsive. Moving from red tape to results will require sweeping changes: emphasizing accountability for achieving results as opposed to following rules; putting customers first; empowering employees; and reengineering how government agencies do their work. As part of this vision, the NPR emphasizes the importance of information technology as a tool for reinventing government:

> "With computers and telecommunications, we need not do things as we have in the past. We can design a customer-driven electronic government that operates in ways that, 10 years ago, the most visionary planner could not have imagined."

The NPR has identified a number of ways in which "electronic government" can improve the quality of government services while cutting costs, some of which are described below:

1. **Develop a nationwide system to deliver government benefits electronically:** The government can cut costs through "electronic benefits transfer" for programs such as federal retirement, social security, unemployment insurance, AFDC, and food stamps. For example, 3 billion Food Stamps are printed and distributed to over 10 million households. Estimates suggest that $1 billion could be saved over five years once electronic benefits for food stamps is fully implemented.

2. **Develop integrated electronic access to government information and services:** Currently, citizen access to federal government information is uncoordinated and not customer-friendly. Electronic kiosks and computer bulletin boards can result in quick response, complete information, and an end to telephone tag.

   Example: Info/California is a network of kiosks in places like libraries and shopping malls. Californians can use these touch-screen computers to renew vehicle registration, register for employment openings, and get information on 90 different subjects, such as applying for student loans or resolving tenant-landlord disputes. These kiosks

have reduced the cost of job-match services from $150 to $40 per person.

3. **Establish a National Law Enforcement/Public Safety Network:** Whether responding to natural or technological disasters, or performing search and rescue or interdiction activities, federal, state, and local law enforcement and public safety workers must be able to communicate with each other effectively, efficiently, and securely. Currently, federal, state and local law enforcement agencies have radio systems which can not communicate with each other because they occupy different parts of the spectrum.

4. **Demonstrate and Provide Governmentwide Electronic Mail:** Government-wide e-mail can provide rapid communications among individuals and groups, break down barriers to information flows between and within agencies, allow better management of complex interagency projects, and permit more communication between government officials and the public.

THE INFORMATION INFRASTRUCTURE TASK FORCE

Mission

While the private sector will build and run virtually all of the National Information Infrastructure, the President and the Vice President have stated clearly that the Federal government has a key leadership role to play in its development. Accordingly, the White House formed the Information Infrastructure Task Force (IITF) to articulate and implement the Administration's vision for the NII. The task force consists of high-level representatives of the Federal agencies that play a major role in the development and application of information technologies. Working together with the private sector, the participating agencies will develop comprehensive telecommunications and information policies that best meet the needs of both the agencies and the country. By helping build consensus on thorny policy issues, the IITF will enable agencies to make and implement policy more quickly and effectively.

A high-level Advisory Council on the National Information Infrastructure has been established by Executive Order to provide advice to the IITF. It will consist of representatives of the many different stakeholders in the NII, including industry, labor, academia, public interest groups, and state and local governments. The Secretary of Commerce will appoint the 25 members of the advisory committee.

The IITF is working closely with the High Performance Computing, Communications, and Information Technology (HPCCIT) Subcommittee of the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET), which is chaired by the White House Office of Science and Technology Policy. The HPCCIT Subcommittee provides technical advice to the IITF and coordinates Federal research activities that support development of the National Information Infrastructure.

Membership

All the key agencies involved in telecommunications and information policy are represented on the task force. The task force operates under the aegis of the White House Office of Science and Technology Policy and the National Economic Council. Ron Brown, the Secretary of Commerce, chairs the IITF, and much of the staff work for the task force will be done by the National Telecommunications and Information Administration (NTIA) of the Department of Commerce.

Structure

To date, three committees of the IITF have been established.

1) **Telecommunications Policy Committee,** which will formulate a consistent Administration position on key telecommunications issues, is chaired by Larry Irving, head of the National Telecommunications and Information Administration of the Department of Commerce. Recently, the Committee created:

> **The Working Group on Universal Service,** which will work to ensure that all Americans have access to and can enjoy the benefits of the National Information Infrastructure.

2) **Information Policy Committee,** which is addressing critical information policy issues that must be addressed if the National Information Infrastructure is to be fully deployed and utilized. Sally Katzen, head of the Office of Information and Regulatory Affairs at the Office of Management and Budget (OMB), chairs the Committee. The Committee has created three working groups:

> **The Working Group on Intellectual Property Rights,** to develop proposals for protecting copyrights and other IPR in an electronic world. Bruce Lehman, head of the Patent and Trademark Office of the Department of Commerce, chairs this group.
>
> **The Working Group on Privacy,** to design Administration policies to protect individual privacy despite the rapid increase in the collection, storage, and dissemination of personal data in electronic form. It is chaired by Pat Faley, Acting Director of the Office of Consumer Affairs, Department of Health and Human Services.
>
> **The Working Group on Government Information** focuses on ways to promote dissemination of government data in electronic form. Bruce McConnell, OMB's Office of Information and Regulatory Affairs, chairs this group.

3) **Applications Committee,** which coordinates Administration efforts to develop, demonstrate, and promote applications of information technology in manufacturing, education, health care, government services, libraries, and other areas. This group works closely with agencies involved in the High-Performance Computing and

Communications Program, which is funding development of new applications technologies, to determine how Administration policies can best promote the deployment of such technologies. Arati Prabhakar, Director of the National Institute of Standards and Technology, chairs the committee. This committee is responsible for implementing many of the recommendations of the Vice President's *National Performance Review* that pertain to information technology. So far, the Committee has created one working group:

The Working Group on Government Information Technology Services (GITS) will coordinate efforts to improve the application of information technology by Federal agencies.

UNITED STATES ADVISORY COUNCIL ON THE NATIONAL INFORMATION INFRASTRUCTURE

• The President will sign an Executive Order creating the "United States Advisory Council on the National Information Infrastructure" to facilitate private sector input to the Information Infrastructure Task Force. The IITF, which is chaired by the Secretary of Commerce, will work with Congress and the private sector to propose the policies and initiatives needed to accelerate deployment of the NII.

• The Council will consist of not more than 25 senior-level individuals to be named by the Secretary of Commerce this year. A chair and/or vice chair will be appointed by the Secretary from among the Council members.

• Nominations will be solicited from a variety of NII constituencies and interest groups. The IITF and its committees also will use other mechanisms to solicit public input to ensure that it hears the views of all interested parties.

• The Council will be broadly representative of the key constituencies impacted by the NII, including business, labor, academia, public interest groups, and state and local governments.

• The Council shall advise the IITF on matters related to the development of the NII, such as: the appropriate roles of the private and public sectors in NII development; a vision for the evolution of the NII and its public and commercial applications; the impact of current and proposed regulatory regimes on the evolution of the NII; privacy, security, and copyright issues; national strategies for maximizing interconnection and interoperability of communications networks; and universal access.

• The Council is expected to invite experts to submit information to the Council and form subcommittees of the Council to review specific issues.

• The Department of Commerce will act as "secretariat" for the Council, providing administrative services, facilities, staff and other support services.

• The Council will exist for two years unless its charter is extended.

• The Council will be separate from, and complementary to, the High Performance Computing Advisory Committee, which will be established to provide private sector input on the High Performance Computing and Communications Initiative.

ADMINISTRATION NII ACCOMPLISHMENTS

During its first seven months, the Clinton-Gore Administration has taken major steps to make its vision of the National Information Infrastructure a reality:

1. Freeing up spectrum to create information "skyways":

- The President recently signed the Emerging Telecommunications Technology Act, which directs the Secretary of Commerce to transfer, over a ten-year period, at least 200 Mhz of spectrum now used by federal agencies to the FCC for subsequent licensing to the private sector. It allows the FCC to use competitive bidding to grant new license assignments for spectrum.

- This will create high-tech jobs and accelerate the development of new wireless industries such as Personal Communications Services. The entire cellular industry, which has created 100,000 jobs, was created by licensing only 50 Mhz of spectrum.

2. Reinventing Government:

- The Administration is committed to using "electronic government" to ensure that the federal government works better and costs less.

- As part of the National Performance Review, the Vice President has identified a number of concrete ways to use information technology to cut costs and improve services, such as electronic benefits transfer; access to government information and services through electronic "kiosks"; a national law enforcement/public safety network; and electronic procurement.

3. Investing in technology:

The President's FY 1994 budget includes:

- $1.1 billion for the High-Performance Computing and Communications Initiative, including a new $100 million program to develop applications in areas such as education, manufacturing, health, and digital libraries. The House has passed legislation which would authorize these new programs; Senate action is expected in the fall of 1993.

- $50 million for NTIA grants to demonstrate the applications of the NII for non-profit institutions such as schools, hospitals, and libraries.

- $40 million for research by the Department of Energy's National Labs on the information infrastructure.

The ARPA-led Technology Reinvestment Project (TRP), funded at $472 million in FY 1993, has generated almost 3,000 proposals from the private sector, requesting a total of $8.5 billion. Many of these proposals are for technology development for the National Information Infrastructure and its applications in health care, manufacturing, electronic commerce, and education and training. The President recently endorsed increasing the funding of the TRP to $600 million for FY 1994.

4. Making government information more available to citizens:

- The Office of Management and Budget issued a new policy in June (OMB Circular A-130) to encourage agencies to increase citizen access to public information.

- Also in June, the President and Vice President announced that the White House would be accessible to the public via electronic mail. The Administration is using on-line information services and the Internet to make available speeches, press briefings, executive orders, and a summary of the budget.

5. Creating the right environment for private sector investment in the National Information Infrastruture:

- The President has signed into law tax incentives for private sector investment in R&D and new business formation, including a three-year extension of the R&D credit and a targeted capital gains reduction for investments in small businesses. Both of these tax incentives will help spur the private sector investment needed to develop the National Information Infrastructure

ADMINISTRATION NII INFORMATION SOURCES

To submit comments on "The National Information Infrastructure: Agenda for Action" or to request additional copies of this package:

Write: NTIA NII Office
15th Street and Constitution
Avenue Washington, D.C.
20230 Call: 202-482-1840
Fax: 202-482-1635
Internet: nii@ntia.doc.gov

To obtain copies of this package electronically see instructions on next page.

Key Administration Contacts:

Ronald H. Brown, Secretary of Commerce
Chair, Information Infrastructure Task Force
15th Street and Constitution Avenue, NW
Washington, D.C. 20230
phone: 202-482-3934 fax: 202-482-4576
internet: nii@ntia.doc.gov

Larry Irving, Assisant Secretary for Communications and Information, Director, National Telecommunications and Information Administration, Chair, IITF Telecommunications Policy Committee
15th Street and Constitution Avenue, NW
Washington, D.C. 20230
phone: 202-482-1840
fax: 202-482-1635
internet: li@ntia.doc.gov

Arati Prabhakar, Director, National Institute of Standards and Technology, Chair, IITF Applications Committee
NIST, Administration Building, Room A1134
Gaithersburg, MD. 20899
phone: 301-975-2300
fax: 301-869-8972
internet: arati@micf.nist.gov

Sally Katzen, Administrator, Office of Information and Regulatory Affairs, Office of Management and Budget, Chair, IITF Information Policy Committee
New Executive Office Building, Room 350
Washington, D.C. 20503
phone: 202-395-4852
fax: 202-395-3047

Mike Nelson, Special Assistant, Information Technology, Office of Science and Technology Old Executive Office Building, Room 423
Washington, D.C. 20500
phone: 202-395-6175
fax: 202-395-4155
internet: mnelson@ostp.eop.gov

Tom Kalil, Director of Science and Technology National Economic Council Old Executive Office Building, Room 233
Washington, D.C. 20500
phone: 202-456-2801
fax: 202-456-2223
internet: kalil@arpa.mil

Donald Lindberg, Director, HPCC National Coordination Office National Library of Medicine
8600 Rockville Pike Bethesda, MD. 20894
phone: 301-402-4100
fax: 301-402-4080
internet: lindberg@hpcc.gov

Press contact: Carol Hamilton, Deputy Director, Office of Public Affairs, Department of Commerce
phone: 202-482-6001
fax: 202-482-6027
internet: CHamilton@doc.gov

The package is available in ASCII format from a variety of electronic sources including the following:

1. Internet The package is available in ASCII format through both FTP and Gopher. The name of the file is "niiagenda.asc". Access information and directories are described below.

FTP:

Address: ftp.ntia.doc.gov
Login as "anonymous". Use your email address or guest as the password. Change directory to "pub".

Address: enh.nist.gov
Login as "pub" using "guest" as the password.
Address: isdres.er.usgs.gov
Login as "anonymous". Use your email address or "guest" as the password. Change directory to npr.

The package also may be present in a self extracting compressed file named "niiagend.exe". Remember to issue the binary command before "getting" the compressed file.

Gopher (server/client):

Address: gopher.nist.gov
Login as "gopher". Choose the menu item "DOC Documents". Choose "niiagenda.asc".

2. Bulletin Boards The package is available for downloading on the following bulletin boards:

Name: NTIA Bulletin Board
Phone: (202) 482-1199
Communications parameters should be set to either 2400 or 9600 baud, no parity, 8 data bits and 1 stop bit. The package is available under the "press releases" menu item as "niiagenda.asc" (ascii) and "niiagend.exe" (compressed-self extracting).

Name: Department of Commerce Economic Bulletin Board
Phone: 202-482-1986 (voice instructions for subscription information)
This is a "fee for service" bulletin board. Subscribers may download the "niiagenda" document for normal on-line charges. Non- subscribers may subscribe for $35 and download the report for no additional charge. Free telnet access and download services are available through the Internet by using the address: ebb.stat-usa.gov. Use trial as your user id.

Name: FedWorld Bulletin Board
Phone: (703) 321-8020
Communications parameters should be set to either 2400 or 9600 baud, no parity, 8 data bits and 1 stop bit. To access "niiagend.asc" from the FedWorld menu, enter "<f s w-house>". Telnet access is available through the Internet using the address: fedworld.doc.gov. Further information about FedWorld can be obtained by calling (voice) 703-487-4648.

Selected 1993 State Telecommunications Legislation

by

Bob Stumberg, Shelley Williams and Burck Smith

Center for Policy Alternatives
1875 Connecticut Ave. NW
Suite 710
Washington, DC 20009
v: (202) 387 6030
f: (202) 986 2539
email: cfpa@cap.gwu.edu
contact: Burck Smith

1993 STATE TELECOMMUNICATIONS LEGISLATION BY TOPIC

January, 1994

The following is a brief summary of legislation regarding telecommunications which was proposed in the United States during calendar year 1993. Unless otherwise indicated, there has been no final action on the legislation. This list does not include legislation relating to emergency access, or live-operator access. The name of the primary sponsor(s) appears at the end of the brief description, in parentheses.

TOPIC OVERVIEW

Telecommunications Policy/Policy Taskforces, General

CA A.B. 1289: Concerns long-term investment in infrastructure to achieve economic growth and other social benefits. Signed by Governor 10/11/93. (Moore)

CA A.B. 1385: Mandates PUC (public utilities commission) adoption of administrative procedures that will facilitate deployment of fully integrated digital network. Vetoed by Governor 10/11/93. (Moore)

CA S.B. 600: Establishes a telecommunications policy task force. Signed by Governor 10/11/93. (Rosenthal)

CT S.B. 989: Establishes a telecommunications policy task force. Signed by Governor. (Cmte on Enrg & Pub Util)

GA H.R. 244: Establishes House Communications Study Committee. (Parrish)

HI H.B. 2106: Establishes education and research consortium in furtherance of network development. (Ige)

HI S.B. 949: Establishes Telecommunications and Information Coordination and Policy Council. See also HI H.S.R. 195. (Matsuura)

HI H.R. 334 & 361: Requires PUC to study public access to telecommunications technology and report to legislature. (Bunda, Ige, Lee)

HI H.R. 387: Encourages adoption of policies and procedures that will promote competition on telecommunications services. (Bunda)

HI H.C.R. 480: Telecommunications "free-trade zone" feasibility study. (Stegmaier)

ID H.C.R. 23: Adopts principles of "Telecomm 92" Report as guide for improvement of state telecommunications systems. (Cmte on State Affairs)

ME S.B. 530: Creates Maine Economic Growth Council and stresses the need for high-tech infrastructure investment. Not adopted. (Pingree)

MD H.J.R. 15: Establishes taskforce on Telecommuting. (Pitkin)

MI S.C.R. 323: Concerns Telecommunications Act of 1993. (Hoffman)

MS S.C.R. 505: Establishes th telecommunications Study Committee. (Graham)

NV A.B. 118: Requires State Board for Management of Information to conduct studies. (Cmte on Nat Resources)

NM H.B. 576: Enacts the Information and Communication Act and a five-year-plan. (Coll)

NY A.B. 8324: Requires governmental agencies to develop plans to maximize use of telecommunications technology. Signed by Governor on 04/03/93. (Cmte on Rules)

PA H.R. 144: Requires select government agencies to study methods to maximize use of telecommunications and establish pilot programs. (Remington)

TN H.B. 1199: Enacts Cellular Mobile Telecommunications act of 1993. (Thompson)

TX H.B. 2521: Concerns the development of a statewide telecommunications network. (Smith)

VT H.B. 365: Requires Public Service Board to conduct study and develop procedures and standards for ensuring public, educational, and state and local governmental access to modern telecommunications networks. (Bouricius)

VA H.J.R. 581: Establishes taskforce to study telecommuting and "family friendly" telecommunications. (Mims)

WA H.B. 1920: Establishes Telecommunications task force to study telecommuting. (Finkbeiner)

Access

AR S.B. 229: Incentive to provide telecommunication relay services to the hearing impaired by allowing the state PSC (public service commission) to provide rate recovery for the cost of the service. Vetoed by Governor. (Hopkins and Moore)

AR S.B. 283: Concerns rural telecommunications cooperatives. Signed by Governor on 03/03/93. (Hopkins)

AR S.B. 777: Incentive to provide telecommunication relay services to the hearing impaired by allowing the state PSC to provide rate additive of .20 cents per month on all lines. (Hopkins and Moore)

CA S.B. 662: Plan for telecommunications services for disabled persons and motorist aid. Failed to pass. (Bergeson)

CT H.B. 6115: No discrimination in access to public rights-of-way for the provision of interexchange telecommunication service. (Joyce)

CT H.B. 6804: Modifies state regulation of telecommunications companies with a view toward providing ratepayers with most economically efficient access. (Fonfara and Peters)

CT S.B. 703: Facilitates increased deployment of wireless telecommunications services. (Somma)

HI H.B. 1440: Authorizes all state agencies to implement telecommuting programs. (Oshiro)

HI H.B. 1853: Prohibits discrimination in access to services. (Kawakami)

HI H.B. 1854: Persons providing shared-tenant services shall not unfairly discriminate in selection of subscribers, but shall have no obligation to provide "universal service". (Kawakami)

HI S.B. 168: Companion to H.B. 1440, authorizes all state agencies to implement telecommuting programs. (Matsuura)

IL H.B. 674: Concerns telecommunications and the hearing impaired. (Schakowsky)

IL H.B. 1354: Concerns telecommunications and the hearing impaired. (Ackerman)

IL S.B. 789: Establishes mandatory procedures prior to termination of telecommunications service. (Molaro)

IN S.B. 169: Modernizes the rural cooperative telecommunications law. (Thompson and Craycraft)

IA S.B. 79: Permits school districts to use fully interactive telecommunications systems as the exclusive means to provide the required courses in grades seven through twelve. (Cmte on Communications)

KS S.B. 420: University of Kansas Medical Center authorized to establish telemedicine program. (Cmte on Ways and Means)

KY B.R. 223: Elected officials are required to provide telephone access to the citizens. (Buford)

MN H.B. 630: Concerns access to telecommunications services by the communication impaired. See also S.B. 454. (Lynch)

MN H.B. 751: Concerns access to telecommunications for "transient" individuals. (Jacobs)

MO H.B. 396: Prohibits telecommunications providers from placing surcharge on deaf relay services. (Treadway)

NE L.B. 635: Intended to facilitate teleconferencing. Signed by Governor on 04/19/93. (Hillman)

NM H.B. 822: Provides access, funding, and equipment for telecommunications for the hearing impaired. Signed by Governor on 03/18/93. (King)

OK S.B. 319: Establishes a privilege for communications between volunteer counselors of certain non-profit organizations or governmental entities and program participants. (Hendrick)

OK S.B. 376: Concerns increasing access to telecommunications technology by the elderly and the needy. Enacts the Oklahoma Telecommunications Act. Signed by Governor 05/25/93. (Hooper)

PA H.B. 83: Concerns rural access; provides for voice, video, and data communication links through the Department of Health. (Wright, D)

PA H.B. 1082: Amends Public Utilities Code to provide for the regulation of the provision of telecommunications services. (Lloyd)

VT H.B. 70: Clarifies state telecommunications policy which seeks to ensure that telecommunications are regulated with a view toward universal and affordable access to all citizens. (Boricius)

VA H.J.R. 212: Urges Congress to speed deployment of superhighway. (Steiffen)

WA S.B. 5673: Concerns workers' access and telecommuting. (Erwin)

Privacy

AL H.B. 979: Requires state Board of Education to promulgate rules guaranteeing educational personnel certain telephone and (E-) mail privacy. (Millikan)

CA A.B. 4: Concerns privacy implications of caller-ID technology. (Areias)

CA A.B. 660: Concerns disclosure requirements of "800/900" commercial services. See also A.B. 661. (Moore)

CA A.B. 2271: Prohibits state employees from monitoring, intercepting, eavesdropping or recording employee conversations. (Martinez)

CA S.B. 222: Concerns implications of caller-ID technology. (Boatwright)

CO H.B. 1125: Limits public disclosure of information held by the state on an individual. (Pierson)

CT H.B. 5157: Protects consumer's right to privacy with regard to telephone solicitors. (Fuchs)

CT H.B. 5351: Concerns privacy and cordless telephones. See also H.B. 5646 (Flaherty, B)

GA H.B. 47: Concerns wiretapping. (Poston)

HI H.B. 1572: Concerns intercepting of information. (Marumoto)

HI S.B. 1579: Concerns the consensual recording of telephone conversations. (Levin)

IL H.B. 309: Telecommunications carriers prohibited from redistributing individual information of its customers. (Balthis)

IN H.B. 1738: Concerns commercial disclosure provisions. (Lytle and Grubb)

LA H.B. 1831: Requires that telecommunications services provide a service which allows a caller to block the display of his (the calling) number from the caller-ID monitor of the person called. (Landrieu)

MD H.B. 171: Concerns confidentiality of conversations conducted through dual-party-relay operators. (Vallario)

MD H.B. 1288: Concerns intercepting of page-device communication by state. (Ehrlich)

MA H.B. 1456: Concerns caller-ID technology. See also H.B. 3515, 3886, 5132, and 5202 concerning employee monitoring. (Hall)

MA S.B. 736: Concerns wiretapping. (Jajuga)

MI S.B. 857: Exempts from Freedom of Information Act, trade secrets, commercial information, and financial information that is provided to a public university by a private, external source. (Schwartz)

MN H.B. 1084: Allows caller-ID technology. (Erhardt)

MN S.B. 174: Concerns unsolicited faxes. Signed by the Governor on 05/14/93. (Reichgott)

NV A.B. 82: Concerns wiretapping. Signed by Governor on 04/14/93. (Cmte on the Judiciary)

NV S.B. 259: Concerns intercepted communications. (Brown)

NJ A.B. 2237: Concerns caller-ID technology. (Russo)

NY A.B. 2044: Concerns privacy of consumers involved in electronic fund-transfers; limits the amount of information that may disclosed about the individual or the transaction. Prescribes penalties. (Jacobs)

NY A.B. 2500: Concerns eavesdropping/monitoring telecommunications. (Griffith)

NY S.B. 3245: Prohibits sale of eavesdropping equipment. (Seward)

OH S.B. 343: Protects confidentiality of telecommunications of communications impaired individuals. Signed by Governor. (Kearns)

OR H.B. 2290: Facilitates intragovernmental sharing of confidential information to enforce paternity laws. (Office of Justice)

TN S.B. 562: Concerns wiretapping.(Crowe)

VA H.B. 295: Concerns confidentiality of personal data. Signed by Governor. (Diamonstein)

Increasing Competitiveness

AZ S.B. 1314: State Corporation Commission directed to increase competitiveness and spur investment in infrastructure. Signed by Governor on 04/13/93. (Phillips)

HI S.B. 1575: Creates "telecommunications free-trade-zones" (wherein telecommunications service providers may act free of PUC regulation) in an effort to promote economic development. (Matsuura and Matsunaga)

HI S.R. 195: Urges the adoption of policies and procedures that promote competitiveness in telecommunications. (Matsuura)

HI H.C.R. 427: Urges state PUC to adopt policies and procedures similar to New York PUC in order to increase competition. (Bunda)

Educational

IL H.B. 2274: Amends School Code; requires State Education Department to develop and run a pilot telecommunications (distance- learning) program for students in rural areas in the 1994-95 school year. See also S.B. 730. (Brunsvold)

ND H.B. 1439: Concerns membership eligibility in the North Dakota educational telecommunications council. (Grumbo)

OK H.C.R. 1015: Directs school districts to develop telecommunications and distance learning programs. (Henshaw) NC S.B. 345: Concerns study and evaluation of distance learning program. See also H.B. 1014. (Martin, W)

TX S.C.R. 66: Encourages institutions of higher learning to expand telecommunications. (Zaffirini)

Rate Regulation

CA S.B. 319: Requires PUC to implement specified principles (fair competition, fair rates, and fair return) of the new regulatory framework for local exchange carriers. (Rosenthal)

CA S.B. 320: Allows PUC to expand funding base of Universal Lifeline Telephone Service Program through a surcharge (not to include POTS). (Rosenthal)

DE S.B. 115: Furthers state public policy objectives (fair rates through increased competition) of the Regulatory Authorization Act of 1992. Signed by Governor on 07/08/93. (Adams)

ID H.B. 350: Concerns various rate and cross-subsidy provisions such as eligibility for the Idaho Universal Service Fund. Signed by Governor on 03/26/93. (Cmte on State Affairs)

IL S.B. 976: Requires that telecommunications service providers offer option of flat-rate local calling. (Severns)

IA S.B.428: Allows for alternative regulation of rate-regulated public utilities. (Horn and Rife)

MD H.B. 1302: Concerns rate regulation provisions of the dual party telephone relay program. (Hattery and Dembrow)

MN S.B. 670: Authorization for PUC to continue certain incentive programs for an additional year (until August, 1995). (Novak)

MO H.B. 302: Concerns PSC (PUC) authority to adjust rates for telecommunications providers. (White)

MO S.B. 173: General PSC rate regulation authority provisions. (Banks and Mathewson)

OR S.B. 595: Requires telecommunications providers to offer alternative service pricing in the bill of residential customers. (Cmte on Bus Hous Con Af)

TX H.B. 904: Concerns to regulation of certain telecommunications utilities. See also, TX S.B. 979. (Seidlits)

Telecommunications Industry (Non-Rate) Regulation

HI S.B. 950: Allows providers of telecommunications equipment to install and operate equipment that will allow public access to the telecommunications network of a regulated telephone public utility. (Matsuura)

HI S.B. 1571: Authorizes PUC to regulate telecommunications services. (Matsuura and Matsunaga)

FL H.B. 1531: Modifies language regarding authority of PSC, increasing its authority to regulate new technology. See also S.B. 1638. (Lippman)

MI H.B. 4204: PSC shall have jurisdiction over unfair trade practices with regard to telecommunications. (Gustafson) MN H.B. 986: Concerns allocation of radio spectrum. (Kelley)

MO S.B. 160: Requires telecommunication companies planning new services to file to file with the PSC (PUC) a justification for offering the new service. PSC may suspend rate charges for that service. (Merrell)

NE L.B. 275: Regulates activities involving automatic dialing- announcing devices, facsimile, and similar devices. (Wesely)

NE L.B. 350: Authorizes financing, construction, and use of fiber optic communications system in state schools. (Withem)

WI A.B. 439: Concerns cellular telephone regulation. (Kunicki)

Taxation

AZ S.B. 1345: Allows telecommunications companies to deduct from base tax rate, FCC established end-user common-line charges and FCC established carrier access charges. (Wright and Johnson)

AZ S.B. 1357: Limitation and penalty provisions. (Wright and Spitzer)

AR H.B. 1143: Sales, use, and repair of communication devices for persons with hearing and/or speech impairments are exempt from local taxes. (Hogue and Curran)

ID H.B. 55: Concerns expansion of sales and use taxes on intrastate and certain interstate telecommunications and cable television. (Cmte on Revenue Tax)

MA H.B. 813: Exempts telecommunications devices for the deaf from sales tax. (Walrath)

SC H.B. 3905: Essential definitions for application of sales and use tax to telecommunications. (Kirsh)

TX S.B. 979: Tariffs for educational telecommunications. (Carriker)

VT H.B. 71: Supports government telecommunications programs through a cross-subsidy/gross revenue tax on regulated and unregulated telecommunications services. (Bouricius)

Appropriations/Funding

AR S.B. 192: Concerns education department; approximately $7 million over two years for equipment and personnel for Educational Television Fund. (Cmte on Joint Budget)

CA A.B. 1727: Concerns essential definitions for use in evaluation and procurement of telecommunications goods and services. See also A.B. 1726. (Polanco)

GA H.B. 1145: Concerns definitions relating to telecommunications infrastructure construction bonds. (Skipper)

HI S.B. 1345: Authorizes special purpose revenue bonds to assist a private corporation in developing digital telecommunications systems for air control. (Matsunaga)

HI S.C.R. 95: Requests U.S. Congress to allow for the issuance of exempt facility bonds for the financing of telecommunications facilities. (Matsunaga)

IA H.B. 674: Provides for educational telecommunications and the (debt-) financing of same. (Cmte on Appropriations)

KS H.B. 2538: Authorizes the acquisition of telecommunications/data processing equipment for state agencies. (Cmte on Appropriations)

ME H.B. 405: Supplemental allocations for the Intergovernmental Telecommunications Fund. (Reed, G)

MN H.B. 1695: Appropriations for establishment of the higher educational telecommunications network. See also S.B. 1465. (Krueger)

MT H.B. 11: Appropriates funds for the Montana Educational Telecommunications Fund. (Johnson, R)

NC S.B. 345: Concerns study and evaluation of distance learning program. See also H.B. 1014. (Martin, W)

OK H.C.R. 1015: Directs school districts to develop telecommunications and distance learning programs. (Henshaw)

PA S.B. 375: Provides financing and use of funds by the State Public Schools Building Authority for leasing telecommunication and distance learning equipment. (Rhoades).

TX S.C.R. 66: Encourages institutions of higher learning to expand telecommunications. (Zaffirini) ------

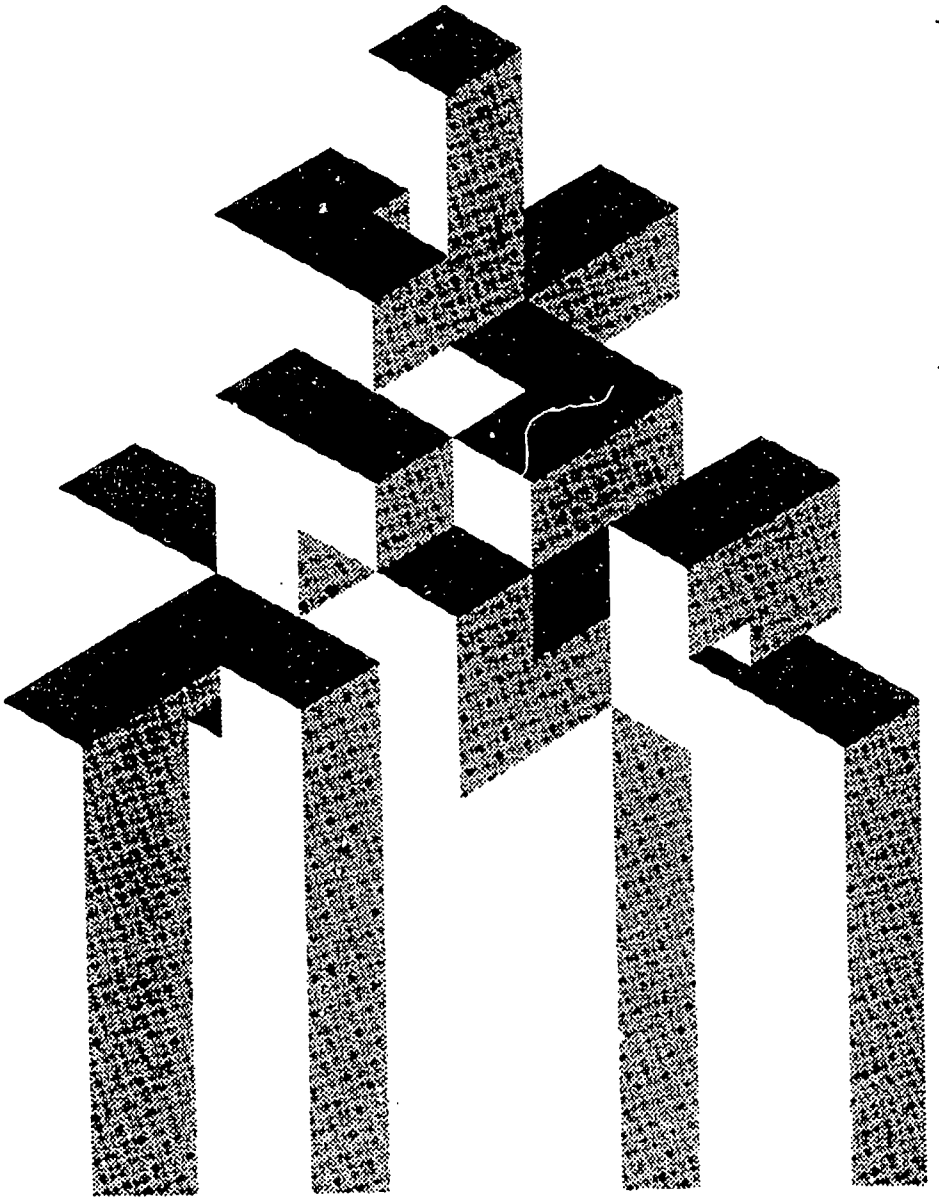
RFC-822-headers ==========

Received: from wingra.adp.wisc.edu by acad3.alaska.edu
(PMDF V4.2-11 #3250) id <01H90UGSG0FK8WY94S@acad3.alaska.edu>; Fri, 18 Feb 1994 07:40:35 -900
Received: from (self.loopback.wisc.edu) by wingra.adp.wisc.edu with SMTP id
AA20651 (5.65c/IDA-1.5); Fri, 18 Feb 1994 10:35:43 -0600 Date: Fri, 18 Feb 1994 10:35:43 +0300
From: borton@macc.wisc.edu (Barry Orton)
Subject: state legislation outline
Sender: telecomreg@relay.adp.wisc.edu
To: Multiple recipients of list <telecomreg@relay.adp.wisc.edu>
Errors-to: borton@macc.wisc.edu
Reply-to: telecomreg@relay.adp.wisc.edu
Message-id: <199402181630.KAA29546@audumla.students.wisc.edu>
X-Envelope-to: afllp@acad2.alaska.edu, ffdmg@acad2.alaska.edu
Content-transfer-encoding: 7BIT Originator: telecomreg@relay.adp.wisc.edu
Precedence: bulk X-Listprocessor-Version: 6.0b -- ListProcessor by Anastasios Kotsikonas
Received: by ORION.ALASKA.EDU (UACN MRDaemon, v6.00) Type 16; Fri, 18 Feb 1994 07:40:03 -0900

TECHNO\STATELEG.DOC [Dean Gottehrer]

Development of a Statewide Telecommunications Network

Conference Report
Goals and Recommendations



Visions of Alaska's Future

Statewide Telecommunications Forum

March 29-30, 1993
Centennial Hall
Juneau, Alaska

Attachments include Assessment of Audio and Video Telecommunications in Alaska

Conference Report Table of Contents

"Visions of Alaska's Future"
Statewide Telecommunications Forum

This report was prepared by **Infomatrix, Inc.**, 4467 Mountainside Dr., Juneau, Ak. 99801

Statewide Telecommunications Forum
Executive Summary

Some 75 representatives of state agencies, local school districts, the University of Alaska and private companies convened in Juneau on March 29-30, 1993 to discuss how Alaska telecommunications could serve Alaskans more efficiently and how services could be enhanced. The Statewide Telecommunications Forum, "Visions for Alaska's Future," was sponsored by the Governor's Telecommunications Information Council. The group discussed:

■ **The compelling need for improved coordination** of government and private sector telecommunications;

■ **Uses of new "compression" technology** to build a coordinated and efficient telecommunications network for Alaska from what is now a group of separate and potentially duplicative services; and

■ **Potential ways a coordinated telecommunications network could better serve Alaskans** in such areas as education, economic development, public health, emergency services, radio and television at less cost than presently achievable.

Goals for Statewide Telecommunications Network

■ **The state should, as soon as possible, initiate a planning effort for development of a coordinated, statewide telecommunications network.**

■ **A statewide network should be operating within 3 years.**

■ **"Equitable access" for all Alaskans must be a key concept** in planning a statewide network.

■ **The proposal for building a coordinated network must be built on a solid base of information about what Alaskans want and how much it will cost.**

■ **Regional interests, such as those served by the Distance Delivery Consortium in Western Alaska, must be considered in developing a network.**

■ **Alaska's telecommunications history, experiences in other states and experiences in other countries, particularly Canada, must be reviewed.**

■ **A "flexible and dynamic" infrastructure is important for success of a new network.**

■ **The new network must be a "private/public" operation that brings the strengths of both sectors to the partnership.**

Executive Summary (Cont.)
Recommendations of the Telecommunications Forum

■ **The Telecommunications Information Council should pursue funding for development of a plan.**

■ **Project staff should be hired to coordinate and develop the plan.**

■ **The state should pursue federal appropriations for planning and establishment of a new network.**

■ **The planning process should include:**

1.) A **comprehensive, functional inventory** of telecommunications hardware in Alaska and how it is used to provide services by government agencies and the private sector.

2.) A **comprehensive assessment of the needs and potential demand for telecommunications services in Alaska,** including, but not limited to, the areas of distance delivery of education, public radio and television, public health, emergency services and public safety, the Alaska Court System, delivery of state government information, video-conferencing by the Alaska Legislature and state agencies, retail and manufacturing businesses in all regions of the state and professional development organizations.

3.) An **assessment of private sector telecommunications services in Alaska,** such as those provided by Alascom, GCI and other companies, and what will be available in the future.

4.) A **review of coordinated telecommunications efforts in other states and Canada** to review successes and failures and to avoid "reinventing the wheel" in Alaska.

5.) A **review of Alaska's telecommunications history,** its successes and failures.

6.) **Development of "interoperability standards"** to ensure that existing and new telecommunications programs are capable of integration with a statewide network.

7.) A **review of the potential impact of a statewide telecommunications network on the public switch network,** such as local telephone companies and the rates they charge to local customers.

Recommendations for administration, operation, and technical deployment of the network.

Statewide Telecommunications Forum: Who was there and what did they discuss?

The **Governor's Telecommunications Information Council** invited representatives of state agencies, school districts, the University of Alaska, private businesses and non-profit organizations to attend a conference in Juneau on March 29-30, 1993 that focused on the future of telecommunications in Alaska. The goal of the conference, "Visions of Alaska's Future," was to gather users and potential users of audio and video telecommunications services in one place for discussions on how Alaska's technological infrastructure could be made more efficient and how it could be enhanced.

Of particular interest was the potential for using new "compression technology" to build an integrated, statewide telecommunications network from what is now a group of separate and potentially duplicative services. The group discussed how a coordinated network could better serve Alaskans in such areas as education, economic development, public health, emergency services and radio and television at less cost than is presently achievable.

About 75 representatives of various state agencies and private businesses (see Attachment A) attended the conference and participated in both small-group and general discussions. The conference attendees met in small groups to help define the major state policy issues affecting such a network, the potential users and uses of a network and the technical issues that must be resolved in order for a statewide network to become reality. They met as a large group to discuss goals and recommendations for establishment of a statewide network.

The group reached a consensus on goals, core principles and recommendations to be forwarded to the Telecommunications Information Council on establishment of a statewide network. They are outlined in this report.

Two nationally recognized experts in the field of telecommunications planning, Richard Hezel and Heather Hudson, addressed the conference and helped facilitate discussions. Hezel is publisher of *Planning for Educational Telecommunications: A State by State Report*, and president of Hezel Associates, specializing in telecommunications planning, media evaluation and distance education policy. Hudson, co-author of *Electronic Byways: State Policies for Rural Development through Telecommunications*, is director of the Telecommunications Management and Policy Program at the University of San Francisco's McLaren School of Business.

The conference attendees were given an assessment (see Attachment C) of audio and video telecommunications programs offered by state agencies and the University of Alaska. The assessment focused on the types of services, and the costs, offered by the state Department of Education, the University of Alaska, local school districts, Public Radio, Public Television and the Rural Alaska Television Network.

Statewide Telecommunications Forum: Goals for Creating a Statewide Network

The representatives who attended the Statewide Telecommunications Forum reached a consensus on goals and principles that should guide the Telecommunications Information Council and other policy makers in building an integrated, statewide telecommunications network.

The goals and core principles were recommended by small groups that focused on state policy issues, users and potential users of the network and technical issues that need resolving in order to accomplish the task. Conference attendees meeting as a large group determined which goals and core principles represented a consensus of the entire group. Those consensus goals and core principles are the following:

■ **The state should, as soon as possible, initiate a planning effort for development of a coordinated, statewide telecommunications network.**

It was generally accepted by the conference attendees that Alaska needs an integrated system that would use new technology to provide more efficient and enhanced services. New "compression technology" will, in the next few years, greatly enhance the amount of audio and video that can be transmitted on a single band-width. It will enable a statewide, integrated network to transmit tremendous amounts of information at a reasonable cost. The state of Alaska, in partnership with private sector telecommunications service providers, must capitalize on the flexibility and efficiency that the new technology will offer and begin planning an information "superhighway" that would incorporate current users and eliminate potential duplication of services.

■ **A statewide network should be operating within 3 years.**

Conference attendees agreed that creation of a statewide network with the capacity for interactive, real-time communication of video, audio and data transmissions could and should be achieved within three years. New technology is expected to be available well before then. It is in the state's best interests to immediately begin building an efficient system that is capable of meeting the broad spectrum of needs.

■ **"Equitable access" for all Alaskans is key to the success of a statewide telecommunications network.**

The concept of "equitable access" was among the most often repeated phrases of the conference. All Alaskans - rural and urban, young and old, rich and poor - must have access to the potential services that a superhighway of information could offer. A thorough job of assessing demand and potential for the network will do much to keep the concept of equitable access at the forefront of the planning process.

■ **The proposal for building a coordinated network must be built on a solid base of information about what Alaskans want and how much it will cost.**

The process must include an assessment of demand for uses of the system, a cost-benefit analysis on how a network can build efficiencies into government and private sector operations, and policy analyses. Planning must determine how an efficient telecommunications system can improve Alaska's development, educational opportunities, health and safety, and access to news and information.

■ **Regional interests, such as those served by the Distance Delivery Consortium in Western Alaska, must be considered in developing a network.**

The planning and design of a statewide network is an important function of state government. The importance of regional organizations and activity cannot be overlooked. Because of the disparity of interests in the different corners of our state, it is recommended that regional organizations play a key role in assessment activities.

■ **Alaska's telecommunications history, experiences in other states and experiences in other countries, particularly Canada, must be reviewed.**

Alaska must not "reinvent the wheel" in its effort to improve its telecommunications system. A review of our state's successes and failures and an assessment of successes and failures in other locales will help provide a basis for sound decisions.

■ **A "flexible and dynamic" infrastructure is important for success of a new network.**

It is important that the new network be capable of servicing as many kinds of demands and programs as necessary. The infrastructure must therefore be flexible and built to incorporate a wide diversity of potential services. Standards must be developed to ensure that the various programs and services are compatible.

■ **The new network must be a "private/public" operation that brings the strengths of both sectors to the partnership.**

Private telecommunications businesses must be consulted on the services they are capable of providing and how they could support and use a statewide network. The state should not build a system that duplicates what the private sector can provide. The state must also be mindful of how a statewide network could affect private utilities, such as local telephone companies, and the prices they charge their customers.

Statewide Telecommunications Forum:
Recommendations for Developing a Statewide Network

■ **The Telecommunications Information Council should pursue funding for development of a plan.**

The funding should be regarded as a one-time expenditure - not a permanent addition of operating funds. The conference attendees agreed that state government does not currently have the resources to develop a statewide telecommunications plan. Additional resources from both state and federal sources should be sought.

■ **Staff should be hired to coordinate and develop the plan.**

The coordinator in charge should be an Alaskan who is not tied to any particular "interest group" in telecommunications. The coordinator needs a working knowledge of the uses and users of telecommunications in Alaska. A background in telecommunications technology and potential applications is also required. Experience in marketing and strong organizational and writing skills are necessary. The coordinator should also be familiar with regional and statewide politics.

■ **The state should pursue federal appropriations for planning and establishment of a new network.**

The Clinton Administration has expressed a commitment to improving America's technological infrastructure, which includes increased funding for telecommunications projects. It was discussed that the administration is already planning increased funding for telecommunications planning through the U.S. Department of Commerce. It is recommended that such potential sources of funding for planning and installation of infrastructure be immediately pursued.

■ **The planning process for a statewide network should include:**

1.) A **comprehensive inventory** of telecommunications hardware in Alaska and how it is used to provide services by government agencies and the private sector. It was strongly emphasized by various conference attendees information about current resources is lacking and that private telecommunications providers, in particular, must be consulted about current resources and future plans.

2.) A **comprehensive assessment of the needs and potential demand for telecommunications services in Alaska,** including, but not limited to, the areas of distance delivery of education, public radio and television, public health, emergency services and public safety, the Alaska Court System, delivery of state government information, teleconferencing by the Alaska Legislature, retail and manufacturing businesses in all regions of the state and professional development organizations. The needs assessment

should be accompanied by a public information effort geared towards soliciting public comment on long-term implications and options for use of a statewide telecommunications network.

3.) An **assessment of private sector telecommunications services in Alaska**, such as those provided by Alascom, GCI and other companies, and what will be available in the future.

4.) A **review of coordinated telecommunications efforts in other states and Canada**. The successes and failures of other locales could help us avoid pitfalls and spur us on to make services more efficient in ways that we do not currently envision. Such a review is necessary to avoid "reinventing the wheel" in Alaska.

5.) A **review of Alaska's telecommunications history** to review successes and failures. Past telecommunications ventures in Alaska, such as the LearnAlaska Network, need to be reviewed. Alaskans who were important in developing Alaska's private and public telecommunications systems, such as television pioneer Augie Hebert, must be interviewed and consulted. Expertise and experience can be key to avoiding repeats of past mistakes.

6.) **Development of "interoperability standards"** that would ensure existing and new telecommunications programs are capable of integration with a statewide network. With any kind of developing technology the potential exists for development of incompatible components. The development of interoperability standards will do much to ensure equitable access for all Alaskans to a statewide network.

7.) A **review of the potential impact of a statewide telecommunications network on the public switch network**, such as local telephone companies and the rates they charge to local customers. The development of huge new networks can have the affect of taking business away from small, private utilities. The loss of that business can leave them with an infrastructure that must be supported by the remaining customers at an increased cost. Is It is therefore imperative that a statewide plan consider the impact of a statewide network on local utilities, particularly local telephone companies.

8.) **Recommendations for administration of the network.** The plan should review potential options for how a statewide network should operate on a day-to-day basis, including who is responsible for administering it. If it is to be administered by state government, for example, the plan should indicate which state agency is best able to run the network how affected agencies and private sector interests will have a say in the administration.

Statewide Telecommunications Forum:
Uses and Users of a Statewide Network

One of the working groups at the conference was assigned to discuss the potential uses of an integrated, statewide telecommunications network and to develop a list of potential users. The Uses and Users Group made the following findings and recommendations, some of which were incorporated into the conference's overall goals and recommendations for development of a statewide telecommunications plan:

■ **The group's findings and recommendations regarding potential uses included:**

1.) A statewide network must be capable of providing **education, information and entertainment** to serve the carefully determined needs of all Alaskans.

2.) The network must be developed with the philosophy that **lifelong learning, or "cradle to grave" educational services,** are key to economic development.

3.) Network services must be **"user friendly"** in order for the full potential of the system to be met.

4.) The potential for private sector use of such a network for **economic development** must be fully examined and incorporated where policy and market analyses show benefit to the state.

5.) "Information kiosks" in public locations throughout the state could be a valuable, interactive tool for using the network to **disseminate public information of all kinds,** particularly government information, and provide more efficient access to government services such as licensing bureaus and regulatory agencies, the Alaska Legislature and the Alaska Court System.

6.)A network would be valuable in providing **emergency services** of all kinds, particularly in the dissemination of information to regions and communities facing minor and major emergencies.

7.)A network could provide **universal access in Alaska to public television and radio.**

8.)**Libraries** throughout the state could greatly benefit from the information available through an integrated, statewide network and the ability to transfer information from one area of the state to another.

9.)Adequate **training** for users must be a key element of planning for a statewide network.

■ **The Uses and Users Group recommended that, in addition to the Rural Alaska Television Network (RATNET), the University of Alaska, public broadcasting and the educational system, the following agencies and organizations be regarded as potential users of an integrated network and that they be included in future discussions and planning:**

1.) All departments and agencies of state government

2.) The Alaska Legislature

3.) The Alaska Court System

4.) Native corporations

5.) Native non-profit organizations

6.) Commercial broadcasters

7.) Cable television companies

8.) Military organizations, including the National Guard

9.) Arts organizations

10.) Local telephone companies

11.) Labor organizations

12.) Health-care providers

13.) The Alaska Congressional delegation

14.) Statewide professional organizations

15.) Search and rescue operations

Statewide Telecommunications Forum: State Policy and Network Issues

Another working group of conference attendees focused on State Policy and Network Issues that must be addressed in the planning process and the installation of a statewide network. The group recommended the following, some of which have been incorporated in the overall goals and recommendations for development of a statewide telecommunications plan:

■ **The telecommunications plan must include a process for assessing the potential demand for services of a statewide network.** In order to obtain an adequate sampling of public opinion the process must include a public education and publicity campaign that explains the long-term implications and options for use of a network.

■ **A comprehensive, functional inventory of telecommunications hardware** must be undertaken to determine what equipment would be compatible with development of the network.

■ **The Telecommunications Information Council should establish an advisory committee composed of private sector telecommunications providers** to serve as an information resource in development of a telecommunications plan for Alaska.

■ **The state should establish a network within three years.**

■ **The state must consider the impact of a statewide network on the public switch network,** such as local telephone companies.

■ **Interoperability standards** must be established to give developing programs the information they need to ensure that new services are compatible with the statewide network.

■ **The state planning process must include a review of Alaska's telecommunications history and experiences in other states and Canada.**

■ **The state must immediately pursue opportunities for federal funding** of telecommunications planning and network installation.

Statewide Telecommunications Forum: Technical Issues

Another working group of conference attendees focused on Technical Issues that must be addressed in the planning process and installation of a statewide network. The group generated the following recommendations, some of which were included in the overall goals and recommendations for development of a statewide telecommunications plan:

- The telecommunications plan should address the **potential transmission of one-way and two-way video, audio and data information.**

- **The planning process should include a comprehensive, functional inventory of existing delivery networks and systems.** It should include but not be limited to the user function, specific use, location and cost of each network and system.

- The planning process should develop, at least in a broad sense, a **list of available public and private networks that could service the transmission of information.**

- The telecommunications plan should **investigate and document similar transmission systems planned or operating in other states.**

- The plan must address **qualitative standards for specific kinds of services.** System integrity should be a consideration in developing the standards.

- **Interoperability standards** must be established to give developing programs the information they need to ensure that new services are compatible with the statewide network.

- An action plan for development of a statewide network should include a **budget for personnel** to conduct the inventory, needs assessment and review of experiences in other locales. A framework for development of a plan should include **milestones and timelines** for completion for assessment activities and the development of qualitative standards.

LIST OF CONFERENCE PARTICIPANTS

Rosemarie Alexander
Senator Jim Duncan's Office
State Capitol, Room 119
Juneau, AK 99801

Bob Alvarado, Manager
Alascom, Government Services
P.O. Box 196607
Anchorage, AK 99519-6607

Susan Armstrong
PTI
3940 Arctic Blvd.
Anchorage, AK 99503

Helen Barrett
AK Soc. for Tech. in Ed.
6426 Village Parkway
Anchorage, AK 99504

Dennis Bracy, Vice-President
RXL
2121 Fifth Avenue
Seattle, WA 98121

Representative Kay Brown
Alaska State Legislature
State Capitol, Room 517
Juneau, AK 99801

Jim Collard, Area Superintendent
PTI
3940 Arctic Blvd.
Anchorage, AK 99503

Jerry Covey, Commissioner
Department of Education
801 West 10th Street, Ste. 200
Juneau, AK 99801-1894

Karen Crane, Director
DOE, Alaska State Libraries
801 West 10th Street, Ste. 200
Juneau, AK 99801-1894

Jerry Curlee
Anchorage Telephone Utility
600 Telephone Avenue
Anchorage, AK 99503-6091

Clifton Eller
Yukon Telephone Company
P.O. Box 873509
Wasilla, AK 99687

Susan Elliot, Auto. Consultant
Alaska State Libraries
344 West Third Avenue, Ste. 125
Anchorage, AK 99501

Dr. Carl Ellis, Associate Dean
Continuing Education, UA
3211 Providence Drive
Anchorage, AK 99508

John Flanigen, Account Executive
Alascom
8745 Glacier Highway, Ste. 382
Juneau, AK 99801-8091

Mark Foster, Commissioner
Alaska Public Utilities Commission
1016 West Sixth Avenue, Ste. 400
Anchorage, AK 99501

Louise Fowler, Director
Distance Education, UA
3211 Providence Drive
Anchorage, AK 99508

Dean Gottehrer, Regional Director
Office of the Ombudsman
P.O. Box 102636
Anchorage, AK 99510-2636

Lawrence Hartman, Sales Mgr.
Unisys Corp., Alaska Operations
4300 B Street, Ste. 102
Anchorage, AK 99503

Kim Hastings, News Director
KFSK-FM
P.O. Box 149
Petersburg, AK 99833

Larry Hathaway
United Utilities
P.O. Box 92730
Anchorage, AK 99509

Norman Heyano
Nushagak Telephone Cooperative
P.O. Box 350
Dillingham, AK 99576

Richard Hezel
Hezel and Associates
1201 East Fayette St.
Syracuse, NY 13210

Dean Hoke, General Manager
KAKM-TV
2677 Providence Drive
Anchorage, AK 99508

Matt Holmes, General Manager
KFSK-FM
P.O. Box 149
Petersburg, AK 99833

Heather Hudson
McLaren Sch. of Business USF
2130 Fulton Street
San Francisco, CA 94117-1080

Tom Jensen
Alascom, Inc.
217 Second Street #203
Juneau, AK 99801

Mark Johnson, Chief
EMS Section, DH & SS
P.O. Box 110616
Juneau, AK 99811-0616

Stan Jones, City Editor
Anchorage Daily News
P.O. Box 149001
Anchorage, AK 99514-9001

Karen Jordan
Juneau-Douglas School District
10014 Crazy Horse Drive
Juneau, AK 99801

Diane Kaplan, President
Alaska Public Radio Network
810 East 9th Avenue
Anchorage, AK 99501

Richard Kenshalo
Matanuska Telephone Association
1740 South Chugach
Palmer, AK 99645

David Knight
Anchorage Telephone Utility
600 Telephone Avenue
Anchorage, AK 99503-6091

Bill Legere, General Manager
KTOO-FM & TV
224 Fourth Street
Juneau, AK 99801

Bob Libbey, Deputy Commissioner
Department of Administraton
P.O. Box 110200
Juneau, AK 99811-0200

Marshall Lind, Chancellor
University of Alaska SE
11120 Glacier Highway
Juneau, AK 99801-8697

Tom McCarty
University of Alaska
910 Yukon Drive
Fairbanks, AK 99775 2388

Rich McClear, General Manager
KCAW-FM
102B Lincoln Street
Sitka, AK 99835

John McDonald, General Manager
KYUK-AM
Pouch 468
Bethel, AK 99559

Jack McKain, Chief Engineer
KTOO-FM & TV
224 Fourth Street
Juneau, AK 99801

John McKay
Attorney
211 H Street
Anchorage, AK 99501

Steve McPheters, Exe. Dir.
AK Assoc. of School Admin.
326 Fourth Street
Juneau, AK 99801

Bob Medinger, Director
Lower Kuskokwim Sch. Dist.
Box 305
Bethel, AK 99559-0305

Frank Mengel, Chief Engineer
KAKM-TV
2677 Providence Drive
Anchorage, AK 99508

Lloyd Morris
Alaska Telecom, Inc.
P.O. Box 110541
Anchorgae, AK 99511

John Morrone
DOA/Div. of Information Serv.
5900 East Tudor Road
Anchorage, AK 99507-1266

Bernadette Murray, Vice-President
PTI
3940 Arctic Boulevard
Anchorage, AK 99503

Russell Nelson, President
RATNet Executive Council
P.O. Box 161
Dillingham, AK 99576

Carrie Nichols, Cust. Support Rep.
Alascom
P.O. Box 196607
Anchorage, AK 99519-6607

Alys Orsborn
Alaska Teleconferencing Network
2221 E. Northern Lights #210
Anchorage, AK 99508

Donna Ostrowski-Cooley
SERRC, Inc.
210 Ferry Way, Ste. 200
Juneau, AK 99801

Dr. Frederick Pearce
Professor of Telecommunications
UAA, Bldg. K 104H
Anchorage, AK 99508

Larry Pearson
University of Alaska
3890 University Lake Drive
Anchorage, AK 99508

Ron Pritchard, Director
M.I.S., Mat-Su School District
350 East Dahlia Avenue
Palmer, AK 99645

John Pugh
University of Alaska SE
11120 Glacier Highway
Juneau, AK 99801

Michael Roberge
Rock Associates
5808 Lk Washington Blvd., #400
Kirkland, WA 98033

Charlotte Rowe, Sesmologist
University of Alaska
910 Yukon Drive
Fairbanks, AK 99775

Greg Ruff
KUAC-TV
University of Alaska
Fairbanks, AK 99775-1420

John Rush, Comm. Consultant
PTI
3940 Arctic Blvd.
Anchorage, AK 99503

Douglas Samimi-Moore, Ex. Dir.
AK Public Brdcstg Commission
P.O. Box 110223
Juneau, AK 99811-0223

Mike Searcy, Account Executive
Alascom, Government Services
P.O. Box 196607
Anchorage, AK 99519-6607

Janice Shilanski
Nushagak Telephone Cooperative
P.O. Box 350
Dillingham, AK 99576

Bob Stanberry, Director
App. Sci. Lab DMVA/DES
P.O. Box 5750
Fort Richardson, AK 99505

Nancy Bear Usera, Commissioner
Department of Administration
P.O. Box 110200
Juneau, AK 99811-0200

Jim Weber
GCI Marketing
8745 Glacier Highway, Ste. 386
Juneau, AK 99801

Barry Willis, Statewide Director
Distance Education, UA
3890 University Lake Drive
Anchorage, AK 99508

Dr. Bruce Smith, General Manager
KUAC-FM & TV
910 Yukon Drive
Fairbanks, AK 99775-1420

Lois Steigemeier
Department of Education
801 West 10th Street
Juneau, AK 99801

John Valensi, Director
DOA, Div. of Information Serv.
P.O. Box 110206
Juneau, AK 99811-0206

Larry Wiget, Tech. Sprvsr.
Anchorage School District
P.O. Box 196614
Anchorage, AK 99519-6614

Tom Willis
Fairport Engineering
Box 22527
Juneau, AK 99802

Steve Smith
Rasmussen Library, UA
910 Yukon Drive
Fairbanks, AK 99775

Brian Talbott
ESD 101
1025 W. Indiana Avenue
Spokane, WA 99205-4400

James Waste, Manager
KTOO-FM
224 Fourth Street
Juneau, AK 99801

Dave Williams
Distance Delivery Consortium
Box 305
Bethel, AK 99559-0305

James Winchester, Gen. Mgr.
KCHU-AM
P.O. Box 467
Valdez, AK 99686

ELECTRONIC TRAILS ACROSS THE NORTH: NEW DIRECTIONS FOR ALASKA

Heather E. Hudson, Ph.D., J.D.
Director
Telecommunications Management and Policy Program
University of San Francisco

I am very pleased -- and honored -- to be with you here today. It was 20 years ago this month that I first came to Alaska as a graduate student, to work on the evaluation of the world's first experiments using satellite communications for health care delivery and village communications. Via NASA's ATS-1 satellite, villages in the Tanana region were linked to the Tanana hospital, the University of Alaska, and the Alaska Native Medical Center. And perhaps most important of all, they were linked to each other.

Alaskans knew that they needed communications -- for health care, but also for education, for ordering supplies and for keeping in touch with relatives in other villages and in the city. For them, ATS-1 was not an experiment. It was an opportunity to overcome the isolation of distance. And they were not going to let the opportunity slip away. Alaskans became the pioneers of satellite communications, following ATS-1 with ATS-6, and then with Alascom's SATCOM and AURORA.

What I learned from Alaskans, some of whom are in this room, profoundly influenced the direction of my career. I have strived to understand the role of telecommunications in development, and to help rural people around the world to get access to telecommunications. What drew me to this field was what I learned from rural people about the importance of information. Access to information and the ability to share information are critical to the development process -- to get help when you need it, to keep in touch with

family and friends, to upgrade the quality of education and social services, to run businesses and government activities. I have tried to share what I learned in Alaska with people in remote areas in other parts of the world -- in the South Pacific, Australia, Africa, Asia and the Middle East and the Caribbean -- to help them to get access to satellite services and to use satellites for development. And I have encouraged the U.S. government to bring people from these countries and regions to Alaska to see firsthand what you have done.

I found that working with people with very limited access to telecommunications helped me to see the dramatic benefits that communications could bring. These lessons turned out to be valuable when I participated in a forum sponsored by the Aspen Institute and the Ford Foundation. The question they posed was "Do economic development planners need to know anything about telecommunications? Is telecommunications something that could make a difference in rural development?" Those of us assembled at Aspen said that telecommunications was critical because of the importance of information in the development process and the penalty of distance that rural residents face. Because of their distance from urban areas and from each other, rural people take longer and pay more to get information than their urban counterparts. But affordable and accessible modern telecommunications can eliminate distance barriers. That was the theme of the first book we produced for the Ford Foundation and the Aspen Institute, called *Rural America in the Information Age.*

We wrote that book quickly so that we could get it into the hands of Congress and federal agencies in Washington who were considering cuts in programs that support rural telecommunications. But we went back to our funders and told them that there was another

-- and potentially more important -- story to tell. We knew that responsibility for telecommunications policy and regulation within the states lies with the state legislatures and regulatory commissions. We had also found that much of the innovation in terms of new initiatives and projects was coming from the state and local level -- from local telephone companies, school districts, towns, state agencies. We convinced the funders that not only were there more stories to tell, but that the action in the future was going to be mostly at the state and community level. These were the people who would make the decisions. The result was our second book, *Electronic Byways* which has the very deliberate subtitle ***State Policies for Rural Development through Telecommunications.***

This is where you come in. The examples and case studies in the book come from people like yourselves and the organizations you represent. The recommendations are designed to reach your various constituencies and to give you some practical suggestions on how to proceed.

People often ask about the top recommendations we came up with. I think we need to go back a step and emphasize that setting goals must come first. If you know where you want to go, you can figure out whether telecommunications will help you get there. If you don't have this vision, you can take some pleasant sidetrips down electronic byways, but you may waste your time and find you are not much closer to your destination.

So what are your goals -- for Alaska and for your communities? Perhaps you want to provide access to all levels of education to everyone in the state, as well as to improve educational standards; to improve the quality and accessibility of health care; to create jobs; to diversity the economy. Telecommunications can contribute to many of these goals. In fact,

more than a decade ago, Alaskans were using satellite communications for consultation between doctors and village health aides and for health aide training, and were planning educational projects using audioconferencing and delivery of educational television programs. Some of these projects are no longer operating, but the wealth of experience from that period should not be lost in planning for the next decade.

Experiences from other parts of the world as well as from "the lower 48" may also be relevant for Alaska. Native people in northern Canada and Australia are using satellite communications to reach their own people. In northern Canada, the Wawatay Native Communications Society has set up an audio conferencing network so that Cree and Ojibway people in the villages can talk to teachers and other students, so that they can complete high school via correspondence, rather than having to leave their communities to attend regional high schools. Canadian Inuit have established the Inuit Broadcasting Corporation which transmits TV programs via satellite across the North, including programs using puppets to teach Inuit kids in their own language about health, hygiene, and northern living; and programs for teens and adults on Inuit culture and skills for survival in a changing world. Aborigines in the Tanami region of the Australian Outback have installed a video conferencing network linking several communities to each other and to video facilities in Alice Springs and Darwin. They are leasing time on this network to government agencies for distance education and social services.

One of your goals may be to extend and improve the educational opportunities throughout the state. Educators are increasingly looking to telecommunications to increase the range of course offerings or to share limited teaching expertise among several schools.

Two basic models have been developed to use telecommunications in K-12 education. The **curriculum-sharing** model links schools so that courses available at one school can be taught to students at another location. This approach typically connects students in a local area or county using microwave, and now more commonly fiber optic links between the schools.

The second model may be called the **outside expert** model; it involves identifying course content that is not available in many rural schools, developing specialized instructional programming, and delivering the programs to the schools. These projects are typically regional or national in scope; many use satellites to transmit the courses to the schools and phone lines for interaction with students. Examples include the Midlands Consortium, SERC (Satellite Educational Resources Consortium), and TI-IN, a satellite network based in Texas and serving rural students nationwide.

Telecommunications can also help to diversify the economic base. Inuit in the Canadian Arctic and Aborigines in the Outback have used video links via satellite to show their artwork to buyers in the city. They can also arrange shipments of art and handicrafts to urban and overseas markets via these networks. Of course, telecommunications is also important to many other industries, including tourism. One of my favorite examples is a travel agency that runs tours to Nepal from Quincy, California. Much of their business comes from word-of-mouth and a color catalog. With an 800 number, fax machine, and modem, they can communicate with their customers and with Kathmandu. Other states have used high quality telecommunications to help attract businesses such as catalog sales, customer support, credit card verification and billing, and reservation systems. Companies such as LL Bean, Lands End and Cabela's use telecommunications to operate from small locations. Bell

Atlantic provides operator services for Washington, DC from West Virginia. Credit card companies provide data bases and customer support from small towns in the Midwest, as do hotel and car rental reservation systems. Telecommunications can help attract such "footloose" industries, as well as other entrepreneurs such as consultants, architects, software developers who appreciate northern life.

To take advantage of these opportunities, Alaska will need to set goals and develop strategies using telecommunications to help achieve them. As we stated in the book, telecommunications and economic development are often like two solitudes. The people in these fields don't often intersect, and probably think they have little to say to each other. The first step is to get together the people who can address these issues at the statewide level and to enable them to communicate with each other so that they can develop a comprehensive statewide plan.

Another step is to exchange information at the local level, so that local businesses understand more about what they can get out of telecommunications, educators and community developers learn more about how they could use telecommunications, and phone companies better understand community needs. We have suggested several strategies for doing this. At the University of San Francisco, we developed a series of booklets called TeleFacts Guides that provide information for small businesses and nonprofit organizations on a variety of telecommunications facilities and services, including choosing telephone equipment and carriers, cellular and paging services, voice messaging and pay phones. We also included strategies for using telecommunications to be more competitive ranging from credit card verification to teleconferencing and telecommuting.

Finally, out of the state level and local level planning should emerge proposals for activities and projects that can help achieve the state and local goals. These could include incentives to upgrade the telecommunications networks in areas where service is limited, proposals for rate plans that reduce disparities in cost between rural and urban users, courses in telecommunications for high schools and community colleges, pilot projects in distance education, online networking, teleconferencing and telecommuting, etc.

Several states have taken some of these steps. Just getting people from diverse backgrounds together to formulate a plan can be a useful exercise in sharing perspectives. But the danger is that not much else will happen if the report just sits on a shelf. That's why we have also included some very specific suggestions so that regulators, legislators, development agencies, and telcos have some concrete starting points to apply to their own organizations.

Another important factor that distinguishes good ideas that languish from ideas that turn into action is incentives. The states where there has been most progress have used incentives to make things happen. In Minnesota, school districts were faced with the prospect of closing rural high schools and bussing their students long distances if they could not offer the required courses. Many have chosen to use telecommunications to link schools so that they can share math, science, and foreign language teachers.

Some regulatory commissions have used incentives to get phone companies to upgrade rural services. Michigan Bell is installing digital switching and optical fiber trunks on the Upper Peninsula ahead of schedule as part of an incentive package worked out with the Michigan Commission. Tennessee has adopted a master plan called Tennessee FYI that

makes regulatc / reform contingent on technology deployment. Vermont developed a "social contract" model that worked out a deregulatory plan involving all the major stakeholders.

An alternative to financial incentives would be a management by objectives approach where regulators would set objectives and carriers would be rewarded for achieving them. These objectives could include service upgrades such as digital switching in rural areas, or meeting quality of service targets in every exchange area rather than in statewide or franchise wide averages.

Another approach is to support pilot projects to try out new applications and services. Several telephone companies have helped to establish fiber optic-based distance education networks. Regulators need to be flexible in order to encourage telephone companies to offer innovative services, for example to schools. In some states, regulators have authorized waivers of established tariffs or set special "development" tariffs for educational projects such as linking schools via optical fiber. Other approaches include special discounts for use of "dark fiber" and free trials or reduced rates for distance education projects.

State governments are also supporting innovative projects. For example, the Colorado Advanced Technology Institute (CATI) is providing seed money to selected rural communities that have proposed using telecommunications as part of their economic development strategies.

Once you have set your goals, you will need to set up a basic set of performance indicators and measurements to track progress toward implementing the plan. We have provided examples from Oregon in the book. You may choose different indicators from Oregon's, but the point is that you need some simple ongoing way to measure progress,

especially when staff and funding resources for extensive data collection are limited.

Using telecommunications for development requires some changes on everyone's part. School schedules may have to change to share courses. Health workers may be getting advice from physicians they have never met. Phone companies may be dealing with schools, hospitals, and businesses which have never had anything but basic telephone service. Too often, demonstrations and pilot projects die because there is not the incentive to really make them work in the long run. It takes careful monitoring to winnow the viable projects from the unworkable; but it will take patience and persistence to make even the most promising projects turn into ongoing activities.

I hope I have not made the challenge sound too daunting. You have already begun to tackle the most difficult part -- getting people with different backgrounds together to share their knowledge and expertise about development as well as about telecommunications. Once this information has been shared, and the process of planning together has begun, you will be well on your way. Just remember that you are continuing Alaska's pioneering tradition -- blazing trails for others to follow.

Thank you!

APPENDIX A:

RECOMMENDATIONS FROM *ELECTRONIC BYWAYS*

Recommendations for Legislators and Policy Makers:

• Develop a comprehensive telecommunications plan for the state or region, taking into consideration its social and economic development goals and strategies.

• Establish high level centralized communications authority to coordinate and set priorities for the state's or region's telecommunications efforts. This entity should include representation from a variety of planning and development agencies as well as communications planners.

• Use the government procurement process to help develop a modernized public switched network. By specifying requirements that could be provided through the public network, governments may provide an incentive to carriers to upgrade facilities that will benefit other customers as well. For example, in some states, the government-operated lottery has high quality data communications links in rural areas, but similar services are not available to local users. A better strategy would be to allow users such as businesses and schools to piggyback on new networks.

• Support telecommunications pilot projects that could benefit rural development. Such projects provide an opportunity to explore new applications at relatively low cost. Successful projects may then be extended to other sites and/or be replicated in other regions.

• Authorize development agencies to advocate telecommunications policies that serve economic development goals. Regulatory commissions hear about service benefits often only from consumer groups. Development agencies should also be prepared to participate in hearings and other fora where regulators are reviewing service access, quality, and pricing.

• Design government telecommunications services to increase citizens' access without regard to location or income. Toll free numbers and free access to government data bases are examples of how government services can be made more accessible using telecommunications.

Recommendations for Regulatory Commissions

• Use incentive regulation to foster efficiency and to encourage investment in and upgrading of rural facilities. As noted above, several U.S. states have used incentives to the carriers to spur upgrading of rural facilities in return for more flexibility in pricing. This strategy should not only result in greater efficiency than the "rate of return" regulatory model, but can also accelerate investment in rural or other underserved areas.

• Consider socio-economic implications of telecommunications regulatory policies. Commissions should include assessments of indirect benefits of telecommunications investment and utilization to the economy and the society in framing their policies and regulations.

• Establish performance measures to monitor progress toward meeting telecommunications goals. These measures can provide feedback to planners and regulators on the status and effectiveness of facilities and services. A list of sample performance measures is presented below.

• Conduct hearings in both urban and rural locations to identify development needs as part of the process of establishing telecommunications policies in support of development goals.

Recommendations for Development Agencies

• Work with regulatory agencies to establish a formal mechanism to coordinate policies and programs to achieve economic development goals.

• Hold regional workshops to gather and to share information about innovative uses of telecommunications and about the role of telecommunications in development generally.

• Sponsor task forces to prepare a set of specific goals and plans for the implementation and use of modernized telecommunications networks and services that could further the state's general development goals.

• Prepare and distribute an inventory of the telecommunications infrastructure and services in their state or region.

• Build a telecommunication component into small business assistance programs in order to foster better understanding by small businesses and rural communities of how they can use the available telecommunications services.

• Arrange for a training course or program on telecommunications for community and economic development professionals.

• Work with local colleges in establishing telecommunications training courses in order to provide adequate training for the rural workforce to meet the telecommunications needs and opportunities of business.

• Encourage and support the establishment and expansion of distance learning programs.

Recommendations for Telecommunications Providers

Telecommunications carriers themselves must get more involved, not only in upgrading their facilities, but in working with rural agencies and businesses to implement projects that will help rural areas to obtain maximum benefits from telecommunications investments. The following are some specific recommendations:

• Upgrade facilities to provide universal single party touchtone service with quality for voice, fax and data.

• Design and promote equipment and services to meet needs of rural users.

• Be prepared to offer facilities for distance education and other video and data services.

• Market products and services effectively so that small businesses and non profit organizations learn how to use telecommunications to support their activities.

• Work to aggregate together the rural and small business demand for modern telecommunications services to help these users to obtain collectively the telecommunications services they might not be able to obtain individually.

APPENDIX B:

EXAMPLES OF PERFORMANCE MEASURES

The following are examples of performance measures that can be used to monitor progress toward rural telecommunications goals:

- Universal telephone service:
  percentage of households with telephone

- Single party service:
  percentage of households/businesses with single party service

- Touchtone service:
  percentage of residential/business lines on which a touchtone phone would operate without change ("works now" status)

- Service quality: (sufficient for fax and 9600 bps data without line conditioning)
  percentage of residential/business lines meeting this standard

- Extended Area Service:
  percentage of exchanges in which 80 percent or more of intra-LATA (regional) calls are local or flat rate calls
  percentage of exchanges where call to seat of government is local or toll free call

- Enhanced Emergency Service:
  percentage of exchanges with all lines served by 911 (emergency service)
  percentage of exchanges with all lines served by E911 (enhanced emergency service)

- Equal Access:
  percentage of exchanges with equal access to competitive carriers on all lines

- Mobile Service:
  percentage of territory with access to mobile telephone service

An Assessment: Audio and Video Telecommunications in Alaska

Table of Contents

This report was prepared by **Infomatrix, Inc.**, 4467 Mountainside Dr., Juneau, Ak. 99801

Education

What do we have for primary and secondary education?

■ The state Department of Education provides **instructional television services to an "ITV" cooperative that includes 54 of the state's 500 schools.** The services include the use of satellite, cable and public television stations to deliver video products to schools. Teachers and other school officials, at their convenience, record programs for use in the classroom.

■ A federal program, **Star Schools, delivers educational programming to 112 schools in rural Alaska.** According to the state Division of Information Services, the sites are receiving high school courses for credit, teacher in-service and some student enrichment at the elementary school level.

■ **Local school districts** have banded together and begun delivering distance education services to schools within their regions:

1.)The **North Slope School Borough School District** has implemented an integrated voice, video and data network that delivers student instruction in mathematics, art and health. The network is also used for administrative purposes. It is currently delivering classes three hours each morning and it includes two-way interactive video. Students in small schools now enjoy access to advanced courses, such as advanced math and pre-calculus.

2.)The **Lower Yukon, Lower Kuskokwim, andYupiat School Districts** have joined with the University of Alaska's Kuskokwim Campus, the Yukon-Kuskokwim Health Corporation, the Alaska National Guard in the Bethel region, KYUK-TV and Prime Cable to form the Distance Delivery Consortium. The group was formed to share personnel, equipment, facilities and expertise in distance delivery for each of the agencies' client groups. The DDC has started monthly satellite deliveries using the KYUK studio in Bethel.

The DDC is considering a contract with the United Native American Network to implement and install a system that will provide a Ku band satellite communications network. The system will provide point to point, multipoint video and data exchanges and includes high tech equipment for each site.

Education

(Cont.) Primary and secondary schools

3.)**Matanuska-Susitna Borough Schools** are in the process of installing and implementing a fiber optic network to connect four high schools in the district for transmission of interactive video. The system has just come on line and is, in the beginning stage, being used for teacher training. The program is a pilot project conducted with the support and cooperation of the Matanuska Telephone Association.

Education

What do we have for the University of Alaska?

■ The University of Alaska is **steadily increasing its offering of distance delivery courses** as a strategy to counteract crowded campuses and meet needs of rural students. During the spring semester of 1992, 221 courses were offered "at a distance" as compared with 191 in the spring of 1991.

■ About **two-thirds of the courses used multiple interactive components,** such as television and computer conferencing.

■ **Audio conference remains a key element of the system,** with more than 250 established sites statewide relying on central, regional and remotely controlled audio bridging facilities in Anchorage, Fairbanks, Bethel and Kotzebue.

■ The University has initiated a systemwide **Presidential Task Force on Program Delivery** to explore the full-range of academic, logistical, support, funding and technical issues related to providing distance delivery services.

■ **Centers of Distance Education** have been located at University campuses in Anchorage, Fairbanks and Juneau to meet regional need:

1.) The **University of Alaska Anchorage** uses its "LiveNet" system that combines satellite-delivered, one-way television and interactive audio conference. UAA offers credit programs in various content areas, including, business, math and the humanities. In addition, UAA delivers more than 24 pre-packaged telecourses per semester to students throughout Southcentral Alaska. These are often supported by audio conferencing and printed materials. Later this fiscal year UAA plans to explore the use of interactive technology to deliver instruction to satellite classrooms. The strategy may be useful in meeting increasing enrollments at the Anchorage campus.

2.) Historically, the **University of Alaska Fairbanks** has delivered courses by audio conferencing to numerous small sites, a system that required minimal local infrastructure. During the past two years efforts have been made to use audio graphics technologies to provide a visual component to supplement

(Cont.) University of Alaska

math, science and laboratory courses. The UAF campus in Bethel continues to use expanding Optel audio graphics to deliver programming to sites in its region.

3.) The **University of Alaska Southeast** has developed a distance delivery center in Juneau to supplement outreach efforts historically coordinated by the UAS Sitka Campus. UAS , in cooperation with the UAA "LiveNet" system, has developed and delivers a Masters of Public Administration program to military sites throughout the state. The Juneau Campus also coordinates the national delivery of education courses designed to meet the in-service training needs of teachers and administrators throughout the United States.

Who pays and how much?

■ The state pays $42,000 a year for the Department of Education's Instructional Television Program. The funds cover tapefeeds on RATNET, printing of schedules, materials for operating the program and maintenance of Department of Education equipment.

■ The annual operating costs for the regional cooperative organizations and the University of Alaska appear to be still developing and are subject to change from year to year. The Distance Delivery Cornsortium is a $500,000 a year operation. Operating costs for the North Slope system are approximately $100,000 a year. The Mat-Su system is now operating at about $20,000 a year. Operating expenses in each case are paid out of school district general funds.

Public Radio

What do we have?

■ **16 public stations in Alaska offer "full service" to listeners**, which includes a federally-mandated professional staff of five employees who originate mostly local program schedules. These stations are:

KSKA-Anchorage
KBRW-Barrow
KYUK-Bethel
KDLG-Dillingham
KUAC-Fairbanks
KHNS-Haines
KBBI-Homer
KTOO-Juneau
KRBD-Ketchikan
KMXT-Kodiak
KSKO-McGrath
KOTZ-Kotzebue
KFSK-Petersburg
KCAW-Sitka
KCHU-Valdez
KSTK-Wrangell

■ **9 "repeater" stations**, each with one or two staff members, provide a minimum local service and repeat the signal of one or more of the full service stations. These stations are:

KCUK-Chevak
KIYU-Galena
KCZP-Kenai
KUHB-St. Paul
KSDP-Sand Point
KSRD-Seward
KTNA-Talkeetna
KNSA-Unalakleet
KIAL-Unalaska

■ **11 stations operate low power translators to extend their signals to 55 distant communities** beyond the reach of transmitters in cities where the stations are licensed. The distant communities served are:

Clover Pass
Craig
North Point/Higgins
Mountain Point
Klawock
Thorne Bay/Hollis
Hydaburg
Larsen Bay
Akhiok
Karluk
Old Harbor
Port Lions
Chignik
Ambler
Shungnak
Kobuk
Point Baker
Port Protection
Angoon
Kake
Tenakee Springs
Pelican
Petersburg (rural)
Port Alexander
Swan Lake
Elfin Cove
Yakutat
Baranof Warm Springs
Cordova
Whittier
Chenega Bay
McCarthy
Girdwood
Talkeetna
Eagle River
Palmer
Prudhoe Bay
Unalaska
Seward

Public Radio

■ (Cont.) Communities served by translators:

Anaktuvak Pass	Delta Junction	Lemon Creek
Kaktovik	Glennallen	Auke Bay
Nuiqsut	Healy	Hoonah
Point Hope	Nenana	Gustavus
Point Lay	Central	
Aniak	Excursion Inlet	

■ The **Alaska Public Radio Network** produces programs and provides services from Anchorage to public stations throughout Alaska.

■ A **radio reading service for the visually impaired** (AIRRES) is broadcast on a subcarrier of the Anchorage public radio station to individuals with special receivers.

Public Radio

Who pays and how much?

■ **Total FY93 funding** for full-service Alaska public radio stations from all sources was $10,173,590. About 52 percent of the funding comes from state and federal sources, 13 percent from member donations, 6 percent from underwriting of programs and the remainder from inkind and miscellaneous donations.

■ The State of Alaska, through an appropriation to the **Alaska Public Broadcasting Commission,** granted public radio stations $3.7 million for FY93.

■ Most stations are qualified to receive **federal matching funds from the Corporation for Public Broadcasting.** CPB grants each entity a "base grant" and uses an incentive formula, based on the stations' non-federal financial support, to award incentive funds. For FY94, the incentive factor for radio is .129 per non-federal dollar.

■ For FY94, The **Corporation for Public Broadcasting has revised its grants programs** to increase funds for minority controlled, rural, and sole-service stations. As a result, total CPB funding to Alaska public radio stations will increase from $2,052,100 in FY93 to $2,545,400 in FY 94, assuming that state and local funding remains constant.

Public Radio

Satellite interconnections

■ **All full-service stations are equipped with a satellite-receive terminal** provided by the Satellite Interconnection Trust, which is operated by National Public Radio. Stations receive programs via satellite from national networks, other stations and the Alaska Public Radio Network. Stations pay an annual fee to NPR ($6,500 in FY92) for access to the system and to maintain their equipment.

■ **One repeater station is equipped with a public radio satellite terminal and seven more, with funding from the U.S. Department of Commerce and the State of Alaska, are scheduled to install antennas this summer.** These stations will pay a reduced fee for access to the system.

■ **The Alaska Public Radio Network owns and operates Alaska's only satellite uplink to the national public radio satellite system.** APRN transmits Alaska-produced programs to stations in Alaska and the Lower 48. APRN recently received funding for a transportable uplink, which could be moved to communities outside of Anchorage when circumstances, such as disasters or other major events, require satellite origination.

Terrestrial interconnections

■ Stations outside of Anchorage distribute regional or statewide programs via **dial-up telephone or leased circuits.** These programs include many regional basketball games and a regional call-in program aired on several rural stations.

■ **Many nearby radio translators can receive the main signal over the air,** retransmitting to improve signal coverage in the city of license or nearby communities at no additional interconnection cost.

■ **Some radio stations feed their signals to repeater stations or their own distant translators via leased, 3.5 kHz telephone circuits** or on the "band-edge" of the state's RATNET transponder. These stations lease the 3.5 kHz broadcast circuits from Alascom. Tariffs normally depend on the mileage between the principal city and the distant translator and average about $600 per station per month.

(Cont.) Terrestrial interconnections

■ **KHNS in Haines owns and operates a private microwave relay link** to feed its signal to a translator in Skagway.

■ **Annual Costs** for public radio interconnections:

APRN's in-state satellite distribution	$70,000
3.5 kHZ leased radio circuits	$30,000
Public Radio Interconnect Fee	$120,000
Occassional use radio circuits	$10,000

Public Radio

Communities served by Alaska Public Radio stations:

Akhiok
Akiachak
Akiak
Akutan
Alakanuk
Aleknagik
Ambler
Anaktuvuk Pass
Anchor Point
Anchorage
Anderson
Angoon
Aniak
Anvik
Atmautluak
Atqasuk
Auke Bay
Barrow
Bear Cove
Beecher Pass
Berner's Bay
Bethel
Big Delta
Big Lake
Bird Creek
Brevig Mission
Buckland
Candle
Cape Lisburne
Cape Sarichef
Central
Chefornak
Chevak
Chignik
Chignik Bay
Chignik Lagoon
Chickaloon
Chilkat Lake
Chilkoot Lake
Chiniak
Chuathbaluk
Chugiak
Circle City
Circle Hot Springs
Clam Gulch
Clarks Point
Clear
Cold Bay
College
Cook Inlet
Cooper Landing
Copper Center
Cordova
Council
Craig
Crooked Creek
Curry's Corner
Deadhorse
Delta Junction
Deering
Denali
Denshu
Dillingham
Diomede
Douglas
Dutch Harbor
Dyea
Eagle Island
Eagle River
Edna Bay
Eek
Egegik
Eklutna
Ekuk
Ekwok
Elim
Ellemar
Emmonak
English Bay
Ester
Excursion Inlet
Fairbanks
Flat
Fort Alexander
Fort Greely
Fortune ledge
Fox
Fritz Creek
Funter Bay
Gakona Junction
Galena
Gambell
Georgetown
Girdwood
Glacier Point
Glennallen
Golovin
Goodnews Bay
Grayling
Kongiganak
Kotlik
Kotzebue
Koyuk
Koyukuk
Kupreanof
Kwethluk
Kwigillingok
Lake Minchumina

(Cont.) Communities served by Alaska Public Radio stations:

Larsen Bay
Lena Point
Levelock
Liarsville
Lime Village
Long Bay
Lower Kalskag
Lutak
Manley Hot Springs
Manokotak
Marshall
McGrath
Medfra
Mekoryuk
Meshik
Metlakatla
Meyers Chuck
Moses Point
Mosquito Lake
Mountain Point
Mountain Village
Mud Bay
Murphy Dome
Naknek
Napakiak
Napaskiak
Nelson Lagoon
Nenana
Newhalen
New Stuyahok
Newtok
Nightmute
Nikishka
Nikolaevsk
Nikolai
Nikolski
Ninilchik
Noatak
Nome
Nondalton
North Douglas Island
North Juneau
North Parks Highway
North Pole
Noorvik
Nuiqsut
Nulato
Nunapitchuk
Nunivak Island
Old Harbor
Oscarville
Ouzinkie
Palmer
Pedro Bay
Pelican
Pennick
Perryville
Peters Creek
Petersburg
Pilot Point
Pilot Station
Pitkas Point
Platinum
Point Baker
Point Hope
Point Lay
Porcupine
Port Alexander
Port Chilkoot
Port Graham
Port Heiden
Port Lions
Port Moller
Port Protection
Portage Creek
Prince of Wales Island
Prudhoe Bay
Quinahak
Quinhagak
Razdolna
Red Devil
Red Dog
Ruby
Russian Mission
St. George
St. Mary's
St. Michael
St. Paul
Sand Point
Saxman
Savoonga
Scammon Bay
Selawik
Seldovia
Seward
Shageluk
Shaktoolik
Sheldon Point
Shishmarek
Shungnak
Sitka
Skagway

Public Radio

(Cont.) Communities served by Alaska Public Radio stations:

Sleetmute
Soldotna
Solomon
South Naknek
Stebbins
Sterling
Stony River
Sumner Strait
Takotna
Talkeetna
Tanana
Tatalina
Tatitlek
Telida
Teller
Tenakee Springs
Thorne Bay
Togiak
Toksook Bay
Trapper Creek
Tuluksak
Tuntutuliak
Tununak
Twin Hills
Tyonek
Ugashik
Unalaska
Unalakleet
Upper Kalskag
Usibelli Mine
Valdez
Wainwright
Wales
Ward Cove
Wasilla
White Mountain
Willow
Willow Creek
Womans Bay
Wrangell

Public Television

What do we have?

■ **Four public television stations** broadcast programs from the Public Broadcasting System (PBS) and produce and originate local, regional and statewide programs. The stations are KAKM Anchorage, KYUK Bethel, KUAC Fairbanks and KTOO Juneau.

■ Three public television stations operate 17 **translators to extend signals to 51 communities.**

■ Three public radio stations (KMXT Kodiak, KFSK Petersburg and KRBD Ketchikan) hold licenses and own and operate **low-power television transmitters, on which they retransmit public television signals** by agreement with the originating station.

Who pays and how much?

■ **Total FY93 funding for all public television stations from all sources was $7,680,947.** About 55% of that total is paid by the public funds from the Alaska Public Broadcasting Commission and the Corporation for Public Broadcasting. About 18 percent came from membership donations, 21 percent came from miscellaneous and inkind donations. Underwriting accounted for 6 percent of the funds.

■ The State of Alaska, through an appropriation to the **Alaska Public Broadcasting Commission**, granted public television stations $2.3 million for FY93.

■ The **Corporation for Public Broadcasting grants the four public television stations $1.548 million per year, as of 1990.** The grants come in the form of a "base grant" and an incentive formula based on the stations' non-federal financial support. For FY94, the federal incentive factor for television is .065 per dollar.

Public Television

Satellite interconnections

■ All four public television **stations are equipped with television receive-only (TVRO) terminals, from which they receive several channels of PBS program services.** The public television stations pay an annual flat fee to PBS ($15,000 in FY92) to operate and maintain the system.

■ No public television uplink exists in Alaska. **Regional and statewide programs are transmitted by Alascom from Anchorage or Juneau on the RATNET transponder (as part of the RATNET program schedule), or, in cases where RATNET will not agree to transmit a public television program, stations uplink via Alascom's occasional use transponder, at a normal cost of $750 per hour.** Alascom can uplink Alaska programs to PBS in Washington, and PBS can then retransmit, via the PBS satellite, to other public TV stations in the Lower 48.

Terrestrial interconnections

■ **Some translators can receive the main signal over the air,** retransmitting to improve signal coverage in the city of license or nearly communities at no additional interconnection cost.

■ **KAKM in Anchorage feeds its signal to six translators on the Kenai Peninsula via the state-funded "Kenai Microwave,"** which it shares with Anchorage commercial broadcasters. The cost of this system is borne by the state's Division of Information Services.

■ **KTOO in Juneau feeds its signal to 7 translators in Southeast Alaska via a terrestrial microwave system leased from Alascom. In** 1993, the tariff for this system is $318,520.

■ **Costs** for state-supported television interconnections:

KTOO's Southeast Microwave	$320,000
Public TV Interconnect Fee	$60,000
Kenai Microwave	$50,000
Occassional use-TV transponder	$15,000

Public Television

Communities reached by public television:

■ KAKM-Anchorage:

Anchorage
Palmer
Wasilla
Eagle River
Chugiak
Tyonke
Houston
Willow
Big Lake
Talkeetna
Bird Creek
Girdwood
Kenai
Soldotna
Kasilof
Ninilchik
Homer
Seldovia

■ KYUK-Bethel:

Bethel
Kwethluk
Akiachak
Akiak
Napakiak
Napaskiak
Oscarville
Nunapitchuk
Atmautluak
Kasigluk
Tuntutuliak
Eek
Tuluksak

■ KUAC-Fairbanks:

Fairbanks
Delta Junction
Healy
Nenana
North Pole
Eielson AFB
Manley Hot Springs

■ KTOO-Juneau:

Juneau-Douglas
Auke Bay
Sitka
Ketchikan
Saxman
Thorne Bay
Ward Cove
Metlakatla
Petersburg
Kake
Wrangell
Angoon

RATNET

What do we have?

■ RATNET provides **commercial and public television services** to rural Alaska. It also provides **emergency broadcast capabilities.**

■ The annual budget for RATNET allows for **18.5 hours of programming per day through a tape-delay center in Anchorage and transmission facilities located in 244 rural communities**. The state employs six full-time technicians in Anchorage to keep the network operating every day.

■ **Programming, provided free of charge by broadcasters in Anchorage, is selected by a council that represents major user groups**. They include 12 regional, non-profit Native associations, appointees of the Governor, the University of Alaska, the Department of Education, and the Alaska Public Broadcasting Commission.

■ **The state owns 224 earth stations in rural Alaska to receive RATNET broadcasts.** Since 1990 the state has spent $2.4 million replacing leased earth stations in remote locations with earth stations owned by the state.

Who pays and how much?

■ The legislature makes annual general fund appropriations to RATNET to pay for all operations. **The FY93 budget is $1.2 million and a request for a $200,000 supplemental appropriation is before the legislature. The Governor has requested $1.2 million for RATNET for FY94.**

■ In FY94, **$342,100 of the $1.2 million budget pays for salaries and benefits of the six full-time employees in Anchorage.** The biggest portion of the operation budget, $802,000, will pay for uplink services, tolls, and fixed and data communications.

■ The state's **replacement of leased earth stations with stations owned by the state** has reduced RATNET's annual operating costs by $500,000 per year.

Does RATNET have competition?

■ A 1992 inventory of communications facilities serving Alaska, conducted by the State Division of Information Services, shows that **103 villages out of the 244 now receiving RATNET also receive television programming from at least one other source**. The bulk of those, 90 villages, receive cable television as their other source of TV.

■ A 1991 study conducted by the University of Alaska's Center for Information Technology suggested that **cable systems are popular in Bush communities and reduce daily viewership of RATNET. The study also pointed out that rural residents, despite the presence of cable in their communities, continue to rely on RATNET for Alaska programming and information and they want more local programming.**

RATNET

Communities that receive RATNET and television from at least one other source:

Adak
Akiachak
Akutan
Alakanuk
Ambler
Anaktuvuk Pass
Angoon
Aniak
Atqasuk
Barrow
Bethel
Brevig Mission
Buckland
Chevak
Cooper Landing
Copper Center
Cordova
Craig
Deering
Delta Junction
Dillingham
Diomede
Dot Lake
Eek
Elim
Emmonak
Fort Yukon
Galena
Gambell
Glennallen
Haines
Healy
Hoonah
Hooper Bay
Hydaburg
Kake
Kaktovik
Kasigluk
Ketchikan
Kiana
King Cove
King Salmon
Kipnuk
Klawock
Kodiak
Kongiganak
Kotlik
Kotzebue
Koyuk
Kwigillingok
Kwethluk
Lower Kalskag
Manley Hot Springs
Manokotak
McGrath
Mekoryuk
Metlakatla
Minto
Mountain Village
Naknek
Napakiak
Napaskiak
Nenana
Nilolai
Nome
Noorvik
Nuiqsut
Nunapitchuk
Old Harbor
Paxson
Petersburg
Pilot Station
Point Hope
Point Lay
Port Lions
Quinhagak
St. George
St. Mary's
St. Michael
Savoonga
Scammon Bay
Selawik
Seward
Shishmaref
Shungnak
Skagway
South Naknek
Stebbins
Sterling
Tanana
Thorne Bay
Togiak
Tok
Toksook Bay
Tuntutuliak
Tununak
Unalakleet
Unalaska
Valdez
Wainwright
White Mountain
Whittier
Wrangell

RATNET

Communities that rely on RATNET as the only source of television:

Akhiok
Akiak
Aleknagik
Allakaket
Anvik
Arctic Village
Atka
Atmautlauk
Beaver
Bettles
Birch Creek
Cantwell
Cape Pole
Central
Chalkytsik
Chefornak
Chenega Bay
Chignik Bay
Chignik Lagoon
Chignik Lake
Chistochina
Chitina
Chuathbaluk
Circle
Circle Hot Springs
Coffman Cove
Cold Bay
Council
Crooked Creek
Dutch Harbor
Eagle
Eagle Village
Egegik
Ekuk
Ekwok
Elfin Cove
English Bay
Ernestine
False Pass
Freshwater Bay
Gakona
Golovin
Goodnews Bay
Grayling
Gustavus
Halibut Cove
Hobart Bay
Hollis
Holy Cross
Hughes
Huslia
Hyder
Igiugig
Iliamna
Ivanof Bay
Kalskag
Kaltag
Karluk
Kasaan
Kivalina
Klukwan
Kobuk
Kokhanok
Koliganek
Koyukuk
Labouchre Bay
Larsen Bay
Levelock
Lime Village
Long Island
Marshall
Metasta Lake
Meshik
Meyers Chuck
Minchumina
Moose Pass
Mosquito Lake
Naukati Bay
Nelson Lagoon
New Stuyanok
Newhalen
Newtok
Nightmute
Nikolski
Noatak
Nondalton
Northway
Nulato
Oscarville
Ouzinkie
Pedro Bay
Pelican
Perryville
Pilot Point
Pitkas Point
Platinum
Point Baker
Port Alice
Port Alsworth
Port Graham
Port Moller
Port Protection
Portage Creek
Rampart
Red Devil
Rowan Bay
Ruby
Russian Mission

RATNET

(Cont.) Communities that rely on RATNET as the only source of TV:

St. Paul
Sand Point
Shageluk
Shaktoolik
Slana
Sleetmute
Sparrevohn
Stevens Village
Stoney River
Takotna
Talkeetna
Tatitlek
Telida
Teller
Tenakee Springs
Tetlin
Tonsina
Trappers Creek
Tuluksak
Twin Hills
Venetie
Wales
Whales Pass
Womans Bay
Yakutat