

Appendixes

Distance Education Activities Across the Nation: A State-by-State Profile

The number of distance learning projects operating or being planned in the United States has grown from only a handful to many. Today, virtually every State is interested in using telecommunications to serve education, actively planning for distance education, already administering a statewide plan or system, or has local distance learning projects in place. Activity in distance education varies. A few States have coordinated plans, while others are just beginning. Some efforts involve only local schools and districts, others also involve various postsecondary institutions such as the State's community colleges and universities, while still others bring in various agencies of the State government such as the Department of Education or the State telecommunications agency. States are also beginning to look beyond their borders to share resources and respond to national programs.

The following State profiles are based on information from surveys conducted by the Council of Chief State School Officers¹ and the California Postsecondary Education Commission.* Additional information was provided by the U.S. Department of Education, representatives from various State agencies, local educators and administrators, and private business. Supporting material was also gathered from OTA contractor reports,³ OTA site visits, and participation in various distance education conferences and workshops around the country.

Because efforts in K-12 distance education are so recent and so varied, the information in this appendix is neither final nor complete. Rather, the following profiles represent a first attempt to outline the range of distance learning projects and plans unfolding across the Nation. Many efforts that now serve only higher education or State government, but could be expanded to include the K-12 community as well. Some local projects could also be expanded to include more sites or to connect clusters of sites. Many States have begun to plan for the future, and this information is included as well.

Alabama

State planning⁴—The Alabama Commission on Higher Education (ACHE), with Alabama Educational Television (AETV), completed a study on State educational telecommunications systems.

Description of State/local efforts⁵:

- **AETV distributes K-12 supplementary programming** over the State's public television stations.
- Alabama is a member of the Satellite Educational Resources Consortium (SERC) Star Schools project; the University of Alabama at Tuscaloosa produces programming for the Texas Interactive Instructional Network (TI-IN) Star Schools project; and the University of Alabama at Birmingham is a member of the Midlands Star Schools Consortium.

Future/planned activities---ACHE is studying activities in other States to guide Alabama distance education policymaking.

Alaska

State institutions involved in planning⁶--Governor's Telecommunications Council, University of Alaska, Alaska Public Broadcasting Commission (APBC), State agencies, courts.

State/local efforts:

- The University of Alaska operates the Alaskan Teleconferencing Network and the University of Alaska Computer Network (UACN). Local school districts use these systems for electronic mail and audioconferencing; some instructional resources are delivered over the networks.
- The State Department of Administration operates the Rural Alaska Television Network (RATNET), a satellite service that delivers some educational programming (both instructional television—ITV—series and live interactive), but is primarily devoted to news and entertainment programming.

¹Council of Chief State School Officers, "State Survey on Distance Education Networks," unpublished document, February 1989.

²California Post-Secondary Education Commission, "Statewide Projects and Planning Efforts in Educational Telecommunications," unpublished document. Jan. 17, 1989.

³See especially Bruce Barker, Texas Tech University, "Distance Learning Case Studies" OTA contractor report, June 1989; and Richard Hezel, "Matrix of State Planning, Coordination, and Operations of Distance Learning Technologies," OTA contractor report, June 1989.

⁴State planning refers to statewide planning efforts in distance education, educational telecommunications, and/or other telecommunications systems that may serve education.

⁵Except where otherwise noted, descriptions of State and local projects include the transmission of courses for students and/or teacher training and staff development programs.

⁶Planning that is regional or local, not statewide. Planning that is informal; no State mandate or document exists that establishes central statewide planning authority.

⁷SEA is a generic term used to refer to the State education agency, such as a Department of Education or the Office of Public Instruction.

- The Office of Instructional Services of SEA⁷ uses RATNET and UACN to provide K-12 resources and staff development on a limited basis.
- The University of Alaska operates an audiographics project that serves 10 villages. Courses are taught from the hub in Kotzebue, or from campuses at Fairbanks, Anchorage, or Juneau.

Future/planned activities—No new projects are currently planned, although RATNET may be reorganized to provide more education services. APBC hopes to form a consortium with the University of Alaska and SEA to provide instructional radio services to schools.

Arizona

State planning—The Arizona Educational Telecommunications Cooperative (AETC), composed of the three State universities, the community colleges, SEA, and the State Department of Administration (SDA), is conducting an assessment of educational telecommunications needs and available technology resources to be completed in December 1989. SEA completed the “Arizona Telecommunications Survey Report” in 1988; the survey included recommendations for distance education.

Other institutions involved in planning—Board of Regents, public television stations, community colleges, Arizona School Services through Educational Technology (ASSET).

Legislation—The State legislature added \$80,000 to the current needs assessment under way.

Current State/local efforts:

- In September 1989, AETC held its first statewide satellite teleconference that reached an estimated 22 sites.
- The University of Arizona has recently been granted 19 Instructional Television Fixed Service (ITFS) licenses.
- Arizona State University uses ITFS and compressed video to reach 17 sites. The University is also one of the partners in the Technical Education Research Centers (TERC) Star Schools project, and serves as 1 of TERC’s 10 teacher training centers.
- Some Arizona schools receive programming from TI-IN, while others get programming from Oklahoma State University’s Arts and Sciences Teleconferencing Service (ASTS).
- The Peach Springs project involves a K-8 school on the Hualapai Reservation. Each classroom has computers, TV monitors, and telephones, and is connected to a closed circuit cable network with access to satellite programming. Students run the system.

- Maricopa County Community Colleges have a 10-site digital microwave network that links all campuses for audio and data applications; videoconferencing has been tested on the system. A separate audioconferencing system, SunDial at Rio Salado Community College, provides audioconferencing services for the county, reaching remote class sites as well as homebound students.

Future/planned activities:

- SDA is planning the Educational Telecommunications Network, a statewide microwave network that will serve higher education and State agencies. The plan includes local ITFS systems to extend the microwave backbone to deliver K-12 and college credit classes to each community along the microwave route.
- A fiber optic system linking seven community centers (including elementary and secondary schools) and one high school is being built on the Gila River Indian Reservation. The system may also link four high schools outside the reservation and Arizona State University.
- The community of Spriggerville is developing a technology-based learning center linked with the local community college for course sharing, training, and videoconferencing.

Arkansas

State planning—A State plan developed by the Governor’s Task Force on Telecommunications in 1985. Instructional Microcomputer Project for Arkansas Classrooms (IMPAC), a nonprofit corporation, is responsible for technology dissemination in K-12 classrooms, including distance education technologies. Arkansas Educational Television Network (AETN) Commission oversees educational/public television programming.

Other institutions involved in planning—SEA, State universities.

Legislation—Established guidelines for satellite-delivered distance education and use of educational technology.

Current State/local efforts:

- Twenty-seven schools have received satellite programming and K-12 courses from Oklahoma State University’s ASTS, Utah Office of Education, and TI-IN. Schools pay all costs except for maintenance of equipment, which is provided by IMPAC.
- The Malvern High School Communications Link connects two local high schools and Henderson State University via computer, two-way television, and radio.

⁷SEA is a generic term used to refer to the State education agency, such as a Department of Education or the Office of Public Instruction.

- . The State is a participant in the SERC Star Schools project.

Future/planned activities:

- . IMPAC has purchased an uplink, and plans to provide staff development programs.

California

State planning—Educational Technology Committee, California Postsecondary Education Commission (CPEC).

Other institutions involved in planning—SEA, Governor's Office, legislature, University of California system, the California State University (CSU) system.

Legislation—Legislation to establish funding for distance education has been introduced. In September 1989, legislation created a Commission for Educational Technology and charged the Commission with developing a statewide plan for educational technology, including telecommunications.

Description of State/local efforts:

- CSU-Chico transmits staff development courses to 16 sites via an ITFS/microwave network, and has a satellite uplink to deliver programming to these and other California sites, Chico also produces programming for the TI-IN Star Schools project.
- CSU-Stanislaus uses ITFS to transmit courses from three originating sites to eight sites in five central California counties. A courier system is used to transport course materials.
- Fifteen of nineteen CSU campuses operate or have access to ITFS systems, and many provide inservice staff development. All CSU campuses are connected via CSUNET, a computer telecommunications network.
- The Los Angeles County Office of Education operates the Educational Telecommunications Network (ETN). ETN transmits staff development courses to 55 sites in California via satellite.
- The Los Angeles Unified School District (LAUSD) operates a "homework hotline" in conjunction with live broadcasts from KLCS Channel 58, a PBS station owned and operated by LAUSD. Students phone in questions in a variety of subject areas, and the questions are answered either by telephone tutors or by a teacher on television.
- California Polytechnic State University in Pomona uses satellite and ITFS to deliver college credit courses to 18 high schools in 3 counties. Students attend the live classes before school, and use WATS lines to call in questions during the class. Materials are delivered by courier.
- Pepperdine University is 1 of 10 teacher training centers for the TERC Star Schools project.
- Fifteen schools receive programming from the TI-IN Star Schools project.

- . Some schools in the State also receive programming from Oklahoma State University's ASTS.

Future/planned activities:

- Current planning efforts may lead to the development of a statewide telecommunications network. Education agencies and institutions may participate in such a network or may develop their own dedicated network.
- . The San Francisco School District has joined a consortium with the Chicago, Dallas, New York City, and Philadelphia school districts to develop a satellite network for urban schools.

Colorado

State planning—The Colorado State Telecommunications Advisory Commission, made up of representatives from K-12, higher education, industry, and public television, is conducting an assessment of educational telecommunications resources and needs. Survey results and recommendations will be presented in December 1989. The University of Northern Colorado Educational Technology Steering Committee has prepared a report, the "University of Northern Colorado Statewide Telecommunications System."

Other institutions involved in planning—SEA, Department of Administration, local Boards of Cooperative Services (BOCS), universities, community colleges, public television stations, State legislature, US West.

Current State/local efforts:

- Boulder Valley Distance Learning Project uses audiographics to offer Advanced Placement courses taught at one urban high school to seniors in a remote mountain high school.
- Intermountain Community Learning and Instructional Services, based at Utah State University, uses audiographics to deliver instruction to high school students and teachers in four schools in each of Montana, Wyoming, Utah, and Colorado.
- Morgan Community College uses audiographics to teach astronomy to high school students.
- An interactive television network using local cable television facilities connects Poudre, Fort Collins, and Rocky Mountain high schools with their District Media Center.
- Four campuses of the Colorado University System are connected via fiber optics for telephone and data communications.
- Biological Science Curriculum Study in Denver is 1 of 10 TERC Star Schools teacher training centers.
- Some schools in the State also receive programming from TI-IN and Oklahoma State University's ASTS, and some participate in the TERC Star Schools project.

Future/planned activities:

- Jefferson County plans to link three high schools to share courses, deliver inservice training to teachers, and hold teleconferences.
- Several local BOCS are involved in planning: the South West BOCS is conducting a needs assessment, and plans to link seven districts and local institutions of higher education in an interactive audio/video network that will provide high school courses and staff development programming. San Luis BOCS plans a digital microwave system that will link local schools for course sharing and may also reach out to local businesses and social service agencies.
- The Western Cooperative for Educational Telecommunications, based in Colorado, with institutional members in 15 States, will help plan K-12 and higher education distance learning activities. The cooperative will provide information on available resources, aid in developing staff training and inservice programming, help identify funding sources, and facilitate cooperation among schools and States.
- The University of Northern Colorado plans a statewide telecommunications system that will link 13 sites in the State with compressed video for college and K-12 teacher courses and teleconferences. Three sites will be completed by the end of 1989, with all sites connected by 1991,

Connecticut

State planning—The Joint Committee on Educational Technology, a standing committee of the Board of Education and the Board of Governors for Higher Education, coordinates educational telecommunications and is responsible for long-range planning and development of educational technologies for all levels of education. In 1989, the Board of Education released a report prepared by SEA, "A Guide to Learning Resources and Technology," that included a section on distance learning.

Other institutions involved in planning—Southern New England Telephone (SNET), Department of Community Colleges, universities.

Legislation—Legislation established the Joint Committee on Educational Technology in 1982. Subsequent legislation created the Telecommunications Incentive Grant Program in 1986. Legislation requires cable companies to provide an educational access channel.

Current State/local efforts:

- SEA administers the Telecommunications Incentive Grant Program to seed local distance learning projects for up to 3 years. Grants total \$85,000 per year, shared among eight or nine applicants.
- Links to Learning is a joint project between SEA and SNET. Approximately 30 schools use voice messag-

ing, computer database access, or compressed video in a variety of applications. Ten additional schools are expected to join the project next year.

- Area Cooperative Educational Services in Hamden coordinates a fully interactive fiber optic system linking five schools. Fourteen courses will be offered during 1989-90.
- Talcott Mountain Science Center transmits science enrichment programming via satellite to over 300 schools in 35 States. Audio interaction is possible.

Future/planned activities:

- SEA is building a two-channel ITFS system that will reach most schools and colleges in the State by 1992.
- StateNet is being built for the Office of Planning and Management, and will serve all State agencies, including education, with voice and data services,

Delaware

State planning—SEA, Office of Information Systems. No State plan or documents.

Other institutions involved in planning—State agencies, colleges.

Current State/local efforts:

- Project Direct is a statewide K-12 electronic network that is used primarily for administration.
- Ten high schools have satellite dishes.

Florida

State planning—SEA.

Other institutions involved in planning—Universities, community colleges.

Legislation—Legislation endorses the use of computers, educational television, and radio for the improvement of education in the State.

Current State/local efforts:

- SEA runs Florida Information Resources Network, a data communications network used for computer conferencing, database access, and support of computer-based courses in K-12 and higher education. The system connects all of the State's K-12 districts, 25 of 28 community colleges, and all public universities.
- The State Satellite Network, operated by SEA in conjunction with the Department of General Services, links 28 sites. While education is given priority, the system can be used by anyone in the State.
- Florida has extensive ITFS facilities. The Marion County Instructional Television Program, for example, uses ITFS to link 5 high schools, 1 community college, and 29 elementary and middle schools.
- The State is a member of the SERC Star Schools project; 12 schools in the State receive SERC programming.

Georgia

State institutions involved in planning—SEA, Georgia Public Telecommunications Commission, colleges and universities.

Current State/local efforts:

- . The Georgia Public Telecommunications Commission in cooperation with SEA, operates an educational television network that supplies instructional video materials to K-12 and higher education. The commission may extend the reach of programming via microwave.
- . The State is a member of the SERC Star Schools project.

Hawaii

State planning—"The Distance Learning-Technology Plan" was prepared in August 1988 by SEA, the Department of Labor and Industrial Relations, and the University of Hawaii. It details a framework for using all types of telecommunications for education. The plan also established an Educational Technology branch within SEA. The Superintendent's Office is working to obtain a cable access channel dedicated to education.

Other institutions involved in planning—Universities and community colleges.

Legislation-Preparation of a plan for distance learning was authorized by the legislature in 1987; subsequent legislatures have authorized \$590,000 through 1989 for implementation.

Current State/local efforts:

- . **TELEclass Project links students** in Hawaii and those in Japan and Australia with voice and video exchanges.

Future/planned activities:

- . Interactive statewide networks will use a combination of ITFS, cable television access, fiber optics, and microwave for video distribution and voice/computer links for audio and computer conferencing.

Idaho

State planning—SEA; the Telecommunications Council, comprised of SEA, the Board of Regents, and the Idaho Educational Public Broadcasting System (IEPBS), coordinates telecommunications delivery of education services.

Other institutions involved in planning—Board of Higher Education,

Current State/local efforts:

- . **The Idaho Rural Education Delivery System,** operated by SEA in cooperation with Boise State University's Simplot/Micron Center, Boise School

District, and IEPBS, involves five rural high schools and consists of live video broadcast by IEPBS with two-way audio interaction.

- Both Boise State and the College of Southern Idaho operate ITFS systems.

Illinois

State planning—The Governor's Task Force; the "Strategic Communications Network Plan" outlines options for a statewide telecommunication system to serve State agencies; some capacity allocated to higher education.

Other institutions involved in planning—Northern Illinois Learning Resources Cooperative, universities and colleges, implementation task forces for State plan.

Current State/local efforts:

- K-12 electronic network links SEA with 18 regional education centers.
- The North Central Regional Educational Laboratory produces staff development telecourses distributed via satellite by PBS.
- Several institutions of higher education, including Triton College and Waubensee Community College, have ITFS systems. Waubensee also operates an interactive microwave system that links the community college to a downtown college and four local high schools.
- SEA is a partner in the TI-IN Star Schools project. Western Illinois University provides mathematics and science programming for TI-IN, and 52 schools in the State have received equipment and courses under the TI-IN Star Schools project.
- Some schools in the State also receive programming from Oklahoma State University's ASTS.

Future/planned activities:

- The Strategic Communications Network Plan calls for a fiberoptic backbone system to carry voice, data, and eventually video traffic for various applications including distance learning.
- Illinois Central College is planning a system that would link the college to eight local high school districts.
- The Chicago School District has joined with the Dallas, New York City, Philadelphia, and San Francisco school districts to develop a satellite network for linking urban schools.

Indiana

State planning—Indiana Higher Education Telecommunications Services (IHETS), Intellenet is a statewide fiber optic/microwave network that provides telecommunications services to State agencies as well as education.

Other institutions involved in planning—State agencies (Intellenet), SEA.

Legislation-IHETS created in 1967.**Current State/local efforts:**

- IHETS statewide fiber optic backbone (leased from Intellenet) delivers three channels of one-way video, two-way audio interactive university courses to both secondary and postsecondary students in 14 sites served directly by fiber. Twenty-five local ITFS systems (four channels) extend the programming on the fiber system to over 200 additional sites.
- Some schools in the State receive programming from Oklahoma State University's ASTS.

Future/planned activities:

- IHETS is considering expanding K-12 programming.

Iowa

State planning—Iowa Public Television; the Narrowcast Advisory Committee acts as a statewide educational telecommunications coordinating body with representation from Iowa community colleges, SEA, and the Board of Regents.

Other institutions involved in planning—Department of Economic Development, legislature, higher education.

Legislation--Legislation in 1986 authorized development of a statewide educational telecommunications plan that was completed in 1987. The legislature voted \$50 million to fund the plan.

Current State/local efforts:

- The Fiber Optic Communication Instruction System is an interactive television network connecting five local high schools to a magnet school campus in Des Moines.
- The Kirkwood Community College Telecommunications System uses a combination of satellite, ITFS, microwave, and cable to serve 14 high schools in 7 districts.
- Iowa is a member of SERC, but did not participate in the Star Schools grant awarded to SERC.

Future/planned activities:

- The State is planning to build a statewide telecommunications network to serve all levels of education. The system will use a combination of fiber optics, microwave, and ITFS to deliver educational programming and voice, data, and video services.

Kansas

State institutions involved in planning—Board of Regents, Division of Information Systems, colleges and universities.

Current State/local efforts:

- University of Kansas and Kansas State University produce programming for the Midlands Consortium

Star Schools Project, and several sites in the State will receive programming.

- Some schools in the State also receive programming from Oklahoma State University's ASTS.

Kentucky

State planning—Kentucky Educational Television (KET).

Other institutions involved in planning—SEA, Council on Higher Education.

Legislation-In 1987, the Kentucky General Assembly voted \$11.4 million to construct the Star Channels system. A proposal has been written to create the Kentucky Educational Networking System to link all school districts, schools, and SEA for administrative and instructional support purposes.

Current State/local efforts:

- The KET Star Channels system, a statewide educational satellite network is being constructed, and will include a central transmitting site serving downlinks at each of the State 1,300 elementary and secondary schools. The system will carry live interactive (audio and data) student courses, enrichment, and staff development programming.
- The Tennessee Valley Authority supports a distance learning project that connects three local districts in Hickman and Fulton counties with fiber. Paducah Community College and Murray State University are linked by microwave, and are trying to link to local districts.
- Kentucky is a member and a course producer in the SERC Star Schools project. Twenty-four schools across the State receive SERC programming.

Louisiana

State planning—Office of Telecommunications Management.

Other institutions involved in planning—Louisiana Educational Television Authority, Louisiana State University.

Current State/local efforts:

- The Louisiana Educational Satellite Network (LESN) broadcasts interactive video programming to 16 pilot sites in the State. LESN operates out of Southern University, Shreveport, and offers many programs in collaboration with the National Aeronautics and Space Administration Regional Teacher Resource Center.
- Two parochial schools, Breaux Bridge and St. Martinville, are connected to a local public school via fiber optics, allowing the parochial school students access to the public school's Integrated Learning System.
- Louisiana is a member of SERC and a Star Schools participant.

Maine

The State planning—The University of Maine at Augusta prepared the Plan for a Community College of Maine/Telecommunications System, and coordinates operation of the system.

Other institutions **involved in planning**—University of Maine System, SEA, Maine Public Broadcasting Network, Maine Technical College System.

Legislation—The legislature appropriated \$2.2 million for the Community College of Maine/Telecommunications System.

Current State/local efforts:

- The Community College of Maine/Telecommunications System uses a combination of fiber optics, ITFS, and satellite to deliver courses and programming. The seven campuses of the University of Maine System are connected by fiber optics, while the Technical Colleges, the Maine Maritime Academy, and 12 off-campus university centers receive programming via ITFS. Eventually, these sites will be connected to the fiber optic backbone. Twenty high schools also receive programming via ITFS, and eventually all high schools will be connected when the system is completed in 1993.
- Some schools in the State also receive programming from Oklahoma State University's ASTS.

Future/planned activities:

- Universities in Maine, New Hampshire, and Vermont are working with New England Telephone to create a Northern Tier Network that would use fiber optics and satellite capabilities to allow the States to share programming.

Maryland

State planning—SEA/Division of instructional Technology has a "Strategic Plan for Educational Technology" that includes goals for distance education. A 2-year "Action Plan" guides the design and development of interactive television networks around the State; SEA is developing a new 5-year strategic plan that will extend present planning.

Other institutions involved in planning—Maryland Public Television.

Current State/local efforts:

- In addition to the State plan, some counties and districts have begun their own systems:
 - Anne Arundel County links 12 high schools using local cable television facilities. The fully interactive system allows two-way audio and video communication.
 - The Prince George's County Interactive Television Network uses interactive cable television facilities to connect six high schools, a community college,

and the district's media center. The two-way system delivers instruction during school hours, after school, and on the weekends.

- Carroll, Washington, and Montgomery Counties use cable systems to connect some of their high schools for course sharing.
- Baltimore County has linked two schools with cable and plans to connect four more in 1990.
- SEA offers K-12 instructional television and staff development programming over public television, and Maryland Public Television in conjunction with the College of the Air offers college-level courses.
- The University of Maryland offers advanced graduate courses (leading to a Master's Degree) and some undergraduate courses to business and industry over its ITFS system. The University also produces satellite-delivered courses for the National Technological University.

Future/planned activities:

- SEA plans to create and ultimately connect local two-way interactive television networks. School clusters will also be able to receive satellite programming.
- Seventeen community and junior colleges are planning a compressed video network that will allow them to share courses and coordinate administrative activities.
- The Maryland Higher Education Commission has proposed a satellite system that would deliver programming to higher education institutions all over the State.

Massachusetts

State planning—Massachusetts Corporation for Educational Telecommunications (MCET).

Other institutions involved in planning—SEA, colleges and universities.

Legislation—MCET was formed by legislation in 1982.

Current State/local efforts:

- The Cambridge Teleteaching Group uses audio-graphics to deliver courses to local high schools. The project was funded by Annenberg/Corporation for Public Broadcasting, AT&T, and MCET.
- Kids Interactive Telecommunications Project by Satellite is a satellite-based system operated by the University of Lowell, which allows two-way video and computer conferencing between three schools in the State and a school in West Germany. The University also serves as the coordinator of a network that uses interactive cable television and microwave to link eight local districts.
- South Berkshire Educational Collaborative uses a two-way interactive cable television system to link four schools.

- TERC, a federally funded Star Schools project, is based in Cambridge, and many schools in the State participate in the TERC project. The Boston Museum of Science and Tufts University are 2 of TERC's 10 teacher training centers.

Michigan

State planning—Department of Education, Governor's Telecommunication Task Force. The State Board of Education prepared an "Inventory of Instructional Telecommunications Systems in Michigan" in March 1989.

Other institutions involved in planning—Michigan Community College Association, Public Service Commission.

Current State/local efforts:

- Michigan Statewide Telecommunications Access to Resources (M* STAR) provides instructional television programming to all K-12 schools, intermediate school districts, and regional educational media centers.
- The Merit Computer Network links Michigan's universities in a statewide network. The University of Michigan manages the system.
- Providing Academics Cost Effectively (PACE) is an interactive television project linking 4 intermediate school districts, 39 local districts, 2 community colleges, and 1 university. The system uses a combination of cable television and microwave facilities to provide courses to participating schools.
- Many projects use cable television and microwave facilities to deliver interactive television courses to local districts:
 - Dearborn Public Schools Cable Utilization Project links six schools;
 - in the Oakland Intermediate School District Telecommunications Project, 75 schools use the system to transmit data, and plans call for a 14-channel audio, video, and data system linking 28 districts;
 - eight high schools are linked to Kirtland Community College;
 - the Saginaw County Interactive Television for Schools system links 13 school districts with 2 institutions of higher education;
 - the Shores Interactive Video Project links three high schools and the local public library;
 - two high schools are connected in the Walled Lake Schools Telecommunications System; and
 - the Two-way Interactive Delivery System for Schools uses two-way cable, microwave, and fiber optics to link 12 school districts and the local community college. Plans call for linking additional schools and Michigan State University.
- The Archdiocese of Detroit operates a four-channel ITFS network, reaching over 300 Catholic parishes.

The system also connects with local cable companies to provide instructional programming to K-12 students in southeastern Michigan.

- Eight Detroit high schools use ITFS for local programming and to bring in M*STAR programming.
- The University of Michigan is 1 of TERC's Star Schools partners and serves as 1 of the 10 regional teacher training centers.
- Detroit is one of the four associate members of SERC.

Future/planned activities:

- The Michigan Community College Telecommunications Network, under construction, will place satellite dishes at each of the State's 29 community colleges, allowing the colleges to deliver interactive educational services to students, local businesses, and community groups.
- The Upper Peninsula-Wide Telecommunications Network will use microwave to reach 33 schools and 4 postsecondary institutions in the remote upper peninsula of the State.
- The Michigan Information Technology Network is a satellite delivery system being developed to provide advanced engineering courses to business and industry in the State. The system will involve four universities, all community colleges, and local businesses.

Minnesota

State planning—State Planning Agency, State Telecommunications Access and Routing System (STARS) Advisory Council, SEA, Department of Administration Information Policy Office.

Other institutions involved in planning—Minnesota State University System, State Board of Vocational and Technical Education, Minnesota Coordinating Board for Higher Education.

Legislation—In January 1988, a Task Force on Instructional Technology was created to study instructional uses of telecommunications. The Task Force's "Report to the Minnesota Legislature" (December 1988), included recommendations for funding educational telecommunications systems. The legislature has authorized STARS, a statewide telecommunications system. The State Senate has placed a moratorium until 1990 on spending for new higher education distance learning projects in the State.

Current State/local efforts: One-third of the State's school districts have some form of interactive distance learning capabilities. Some of these include:

- the Des Moines River Tele-Media project linking 12 school districts with fiber optics;
- the East Central Minnesota Educational Cable Cooperative (ECMECC) using two-way cable tele-

- vision and microwave to link seven districts;
 - five local school districts, Mankato State University and Technical Institute, South Central Education Service Center, Region 5 Computer Service Unit, and Regional Interlibrary Exchange are linked in the Knowledge Interactive Distribution System (KIDS). KIDS uses microwave, computers, teleconferencing, and ITFS to bring courses to the schools;
 - the Mid-State Educational Telecommunications Cooperative links seven districts in a fully interactive fiber optic system;
 - the Minnesota Valley Tele-Network uses microwave and local public television stations to link nine districts;
 - the Northwestern Minnesota Fiber Optics Project links the University of Minnesota at Crookston, two technical institutes, and nine local school systems;
 - eight districts in the Sherburne-Wright Educational Technology Cooperative are linked via cable and microwave. The cooperative also uses satellite-delivered material and is a member of Classroom Earth, a national educational satellite users organization;
 - in the Sibley County Cooperative Interactive Television project, four districts are connected by two-way cable, computers, and facsimile;
 - 10 school districts in the Southwest Minnesota Telecommunications project are linked by microwave; and
 - the Wasioja Education Technology Cooperative uses fiber optics to link five schools, their central district offices, and between the central offices.
- . Schools in the State participate in TERC and some schools receive programming from TI-IN; and
 - . Minnesota Educational Computing Consortium is 1 of 10 TERC Star Schools teacher training centers.

Future/planned activities:

- . **STARS is a statewide broadband information network that will serve primarily higher education and business. K-12** schools will gain access through local higher education institutions.

Mississippi

State planning—The Central Data Processing Authority coordinates all telecommunications resources in the State, and is planning a statewide telecommunications network to serve government agencies, especially education. SEA is doing educational planning.

Other institutions involved in planning—Mississippi Authority for Educational Television.

Current State/local efforts:

- . **The Mississippi Authority for Educational Television** operates a statewide network that delivers

instructional video materials.

- Some schools in the State receive programming from Oklahoma State University's ASTS.
- As a member of the SERC Star Schools project, 11 schools have downlinks and receive programming.
- The University of Mississippi is a member of the Midlands Consortium. Sixty-five schools will receive satellite downlinks from Midlands.
- Mississippi State University at Starksville produced inservice training programs in mathematics and science for the TI-IN Star Schools Network. Thirty-one schools have received downlinks from TI-IN.

Future/planned activities:

- . **Fifty-six** school districts, SEA, and Apple Computer are cooperating in a pilot project using electronic mail.

Missouri

State planning—**Missouri Education Satellite Network (MESN), an organization of the Missouri School Boards Association (MSBA)**, coordinates educational telecommunications in the State.

Other institutions involved in planning—SEA, Coordinating Board for Higher Education, Chamber of Commerce, State agencies.

Legislation—**A tax** on videotape rentals for 5 years. Revenue will fund distance learning projects in the state.

Current State/local efforts:

- MESN is a satellite delivery network; 70 sites now participate. MESN produces staff development programming for the Midlands Consortium Star Schools Project, and also brokers K-12 courses and staff development programming from Oklahoma State University, Kansas State University, and STEP (see Washington),
- Kansas City is one of the four associate members of SERC.
- MSBA is a member of the Midlands Consortium Star Schools project.

Montana

State planning—**Montana Telecommunications Cooperative.**

Other institutions involved in planning—SEA, Commissioner of Higher Education; Department of Administration; State Board of Education.

Legislation—**In 1987, a Task Force**, comprised of K-12, higher education, and business representatives, was created to consider development of a statewide telecommunications network. After an assessment of educational needs and available resources, the legislature appropriated \$200,000 in 1989 for a technical plan,

An additional \$300,000 was appropriated for expansion of existing educational telecommunications facilities.

Current State/local efforts:

- The Big Sky Telegraph network serves 114 schools in Montana with a computer network providing both K-12 courses and teacher training. The West Educational Support Team (National Diffusion Network State facilitators) uses Big Sky to link education leaders in the 15 Western States (and soon the Trust Territories of the Pacific). The group has received a grant to add 5 rural districts in each of the 15 States to the network.
- Edunet is a private nonprofit company that produces courses and provides computer networking services such as electronic mail to schools in Montana, Idaho, Oregon, and Wyoming.
- Some 75 school districts, 2 community colleges, a tribal school, Montana State University, the University of Montana, and Western Montana University use satellite dishes to receive programming from around the country.
- Approximately 300 sites receive computer-based instructional materials through Big Sky, Edunet, and Goliath, the State network for science and mathematics teachers.
- The Intermountain Community Learning and Instructional Services project, operating out of Utah State University, uses audiographics to deliver instruction to high school students and teachers in four schools in each of Montana, Wyoming, Utah, and Colorado.
- Some schools in the State receive programming from TI-IN.

Future/planned activities:

- A satellite uplink is being built at the University of Montana at Missoula for distribution of high school courses and industry training.

Nebraska

State planning—Nebraska Educational Telecommunications Commission.

Other institutions involved in planning—University of Nebraska, SEA, Governor’s Office.

Legislation—Legislation authorized funds for the Nebraska Educational Telecommunications Commission and development of a statewide telecommunications network.

Current State/local efforts:

- Nebraska is a member of the SERC Star Schools project, and Nebraska Educational Television produces programming for SERC.

- The University of Nebraska has an ITFS system, which that will be expanded to include secondary and postsecondary courses.

Nevada

State planning—Office for Telecommunications.

Other institutions involved in planning—University of Nevada, SEA.

Current State/local efforts:

- Some schools in the State receive programming from TI-IN.

New Hampshire

State planning—No formal statewide planning.

Other institutions involved in planning—University System of New Hampshire.

Current State/local efforts:

- Keene Junior High School Project uses microwave to link with five local high schools and a vocational center.
- Manchester School District Instructional Television Network links three schools with fiber optics, allowing the schools to share two-way interactive video/audio courses.

Future/planned activities:

- **Universities in New Hampshire, Maine, and Vermont, are working with New England Telephone to create a Northern Tier Network that would use fiber optics and satellite capabilities to allow the States to share programming.**

New Jersey

State planning—The Office of Telecommunications and Information Systems (OTIS) coordinates statewide telecommunications resources. SEA’s “Educational Technology in New Jersey: A Plan for Action” (May 1986) does not specifically address distance learning, but guides educational technology applications.

Other institutions involved in planning—SEA, Department of Higher Education, State agencies, Office of Management and Budget.

Current State/local efforts:

- The Educational Technology Network is a computer network serving more than 350 districts in the State. It is used for administrative and some instructional purposes.
- The Millford and North Valley school districts are operating a pilot project that links the two districts via cable television.
- St. Peter’s College provides staff development programming to 10 school districts via satellite.
- The Union Township district has a downlink and an ITFS system to deliver teacher training produced by the New Jersey Institute of Technology and to offer

educational programming such as the Discovery Channel to an estimated 15 districts in the New York City metropolitan area.

- . The State is a member of SERC and a participant in the Star Schools project. In the State, 25 districts receive SERC programming, and the State plans to install 15 to 20 additional downlinks by 1990.
- . Some schools in the State also receive programming from Oklahoma State University's ASTS.

Future/planned activities:

- . Bergen County is planning a county-wide fiber optic system that will connect 46 high schools and 2 community colleges. Sixteen schools are expected to be connected by September 1990, with the remaining schools connected within 5 years. Teacher inservice programming, adult education, and college courses will eventually be offered over the system.

New Mexico

State planning—In 1986, the instructional Television (ITV) Group, consisting of representatives from education, business, and the military, began a needs assessment for instructional television throughout the State. The group's report, "An Instructional Television Network for New Mexico," released in November 1988, outlines plans for a statewide ITV network.

Other institutions involved in planning—SEA, Higher Education Commission, University of New Mexico, universities and colleges, US West.

Legislation--Legislation in 1987 requested the ITV Group to conduct an assessment of educational telecommunications needs and produce a plan for instructional television. Subsequent legislation that created the State's ITV network also authorized and appropriated \$100,000 in annual funding for K-12 distance education to be distributed through SEA.

Current State/local efforts:

- A statewide data communications network connects 15 school districts and several institutions of higher education. The system will eventually serve all public education institutions in the State.
- A fiber optic network connects the Los Alamos National Laboratory, the State Capitol Building, the University of New Mexico, Sandia National Laboratory, the New Mexico Institute of Mining and Technology, and New Mexico State University at Las Cruces for voice, data, and video transfer. College courses are being shared; K-12 courses will begin in January 1990.
- The State's three public television stations maintain a microwave network.
- Three of the University of New Mexico's campuses have ITFS systems. Eastern New Mexico University, for example, has an 8-channel system that is used to

broadcast 50 to 60 college credit courses per year. The university also does K-12 programming reaching 35 school districts.

- Schools in the State receive programming from TI-IN.

Future/planned activities:

- A statewide instructional television (one-way video, two-way audio) network is being constructed to serve business and education. The network will incorporate the fiber optic network linking the State universities, the Capitol, and the two national laboratories, and will reach at least 40 sites when it is completed in 1991. The system is expected to cover 85 percent of the State.
- Luna Vocational Technical Institute will offer courses to five local school districts via ITFS beginning in January 1990.

New York

State planning—in 1988, SEA completed a "Profile of Operating Distance Learning Projects in New York State." The New York State Legislative Commission on Science and Technology completed a report, "Distance Learning: The Sky's the Limit," in September 1988. A Board of Regents Task Force is studying educational technology applications including distance learning. The Governor's Task Force on Telecommunications is considering a statewide data network that could be used by education.

Other institutions involved in planning—State University System, Bureau of Cooperative Educational Services (BOCES).

Current State/local efforts:

- The State University of New York (SUNY) Satellite System (SUNYSAT) is piloting adult and continuing education programming to the 64 SUNY campuses. The system also serves as the hub for public television delivery of instructional programming.
- Technology Network Ties is a statewide K-12 computing network that connects local districts, regional computing centers, libraries, and SEA. The network serves administrators, but also has electronic mail and some instructional applications.
- There are more than 100 local distance learning projects operating in New York, primarily in K-12 and rural settings. Some projects include:
 - Delaware-Chenango BOCES uses audiographics to link 10 schools;
 - Erie 1 BOCES operates an audiographics system that links six districts, Houghton College, and the Cattaraugus-Allegany BOCES;
 - in the School/College Key Program, Rochester Institute of Technology, the Livingston-Steuben-Wyoming BOCES, and three districts are linked via audiographics;

- the Interactive Television Cable Project uses two-way cable to link eight schools in two districts in Pleasantville;
- the Islip Union Free School District 2 Computer Conferencing project links students from the district through a host computer operated by New York Institute of Technology;
- the Rensselaer-Columbia-Greene BOCES uses microwave and computer conferencing to link five districts and two community colleges with voice and computer conferencing for foreign language instruction. Private industry is also involved;
- the St. Lawrence-Lewis BOCES Interactive Telecommunications Network links 19 schools in 3 districts via ITFS and microwave;
- the Steuben-Allegany BOCES Long Distance Teaching project links nine school districts with ITFS and computers for course sharing. UHF radio connects schools to a central teaching studio;
- Teaching Via Television links Brocton Central High School via cable to SUNY-Fredonia for live interactive audio/video high school courses;
- Community School District #24 in Queens uses audiographics to teach homebound students;
- five districts and the Rensselaer-Columbia-Greene BOCES are linked by microwave and computers in the Telecommunications Network for Instructional programs and Administrative Data Processing;
- the Video Interactive Teaching and Learning project connects six school districts and Fulton Montgomery Community College. The one-way video, two-way audio cable/microwave system is used to bring K-6 health education to the local districts; and
- four schools on Long Island are connected by fiber optics, allowing them to share interactive audio/video classes and data communication. Plans include adding seven new sites.
- Some schools in the State receive programming from Oklahoma State University's ASTS.
- City College of New York is 1 of the 10 TERC Star Schools teacher training centers.
- New York City is an associate member of SERC.
- Some schools receive programming from TI-IN.

Future/planned activities:

- New York City Public Schools have joined with the Dallas, Philadelphia, San Francisco, and Chicago school districts to develop a satellite network for linking urban schools.

North Carolina

State planning-SEA.

Legislation-The Agency for Public Telecommunications was created to serve the video and distance learning needs of State agencies.

Current State/local efforts:

- The Distance Learning by Satellite system delivers instruction and inservice training to 146 sites in each of the State's 100 counties.
- In the Downeast Instructional Telecommunications Network, East Carolina University uses audiographics to teach students in six rural schools.
- All 58 of the State's community colleges are linked in a microwave network.
- Five of the State's 16 public universities provide courses over a microwave network. Some institutions, including the North Carolina Microelectronics Center and North Carolina State University, operate ITFS systems.
- The State is a member of the TI-IN and SERC Star Schools projects. The State produces programming for TI-IN, and most of the 146 receive sites in the State receive TI-IN programming.

Future/planned activities:

- SEA is implementing a statewide electronic network that eventually will link all the State's schools.

North Dakota

State planning—An Educational Telecommunications Council (ETC), including representatives from higher education, K-12, public television, and business, has been established to coordinate broadcast, voice, and data services.

Other institutions involved in **planning—Prairie Public Television, SEA,** Higher Education Telecommunications Advisory Committee, Board of Higher Education.

Legislation-Established the Educational Telecommunications Council.

Current State/local efforts:

- As part of a U.S. Department of Agriculture grant to provide rural health courses to remote hospitals and university campuses, a pilot project has been initiated that connects the University of North Dakota (UND), North Dakota State University (NDSU), Jamestown State Hospital, and the Barrington Extension Research Center of NDSU via fiber optics.
- The communities of Hazen, Beulah, Stanton, and Center are linked via fiber optics. Eventually, the schools would like to bring in inservice and staff development courses over a proposed State backbone network.
- The Decisions About Technology system uses audiographics to link seven districts. Courses originating in Bismarck go to the six rural districts.
- The Red River Valley Telecommunications Consortium consists of 10 school districts and Mayville State University. Sites receive satellite programming from national instructional providers such as Oklahoma State University's ASTS.

- The Riverdale school district is connected by audiographics to Mansfield University in Pennsylvania.
- North Dakota is a member of SERC Star Schools project.
- Some schools in the State receive programming from TI-IN.

Future/planned activities:

- . ETC, the Higher Education Telecommunications Advisory Committee, and the participants in the UND pilot project have begun planning a statewide telecommunications backbone. The goal is to connect 10 sites (mostly higher education institutions) by 1990. Eventually all higher education institutions and local districts will be connected.
- . The Souris River Project will link schools in Sawyer, Velva, Karlsruhe, and Towner with fiber optics,

Ohio

State planning—SEA. A Task Force on the Classroom of the Future has established an Educational Technology Advisory Commission to study delivery systems for educational telecommunications.

Other institutions involved in planning—Ohio Educational Broadcasting Network; Board of Regents.

Current State/local efforts:

- . **The Ohio Education Computer Network is being implemented to link K-12 school districts** for administrative purposes.
- . The State is a member of SERC.
- . Some schools in the State also receive programming from Oklahoma State University's ASTS.

Oklahoma

State planning—The State Regents for Higher Education completed a "Report on Development of an Educational Telecommunications Network," which recommended expanding existing higher education telecommunications facilities,

Other institutions involved in planning—SEA, Oklahoma State University (OSU).

Current State/local efforts:

- Oklahoma State University's ASTS delivers high school and staff development courses to 250 schools in 20 States. At least 200 Oklahoma schools receive these interactive courses. OSU is also the home of the Midlands Consortium Star Schools project, and the Oklahoma SEA serves on the Midlands Board of Directors.
- The Panhandle Shar-Ed Video Network is a digital fiber optic system, built in cooperation with the local telephone cooperative, that links four schools.
- The Regents Network delivers programming throughout the State via microwave and cable.

Oregon

State planning—A statewide telecommunications network was outlined in "Oregon Ed-Net: A Report on the Feasibility of a Statewide Telecommunications Network" (July 1988). The Ed-Net Planning Committee represents K-12, community colleges and higher education, various State agencies, public television, and the private sector, The State Board of Education sets State policy for distance education.

Other institutions involved in planning—SEA, K-12 Educational Technology Advisory Committee, universities, Oregon Public Broadcasting, libraries, the legislature, the Governor's Office.

Legislation—The Ed-Net Planning Committee was created in 1987; in 1988, the legislature approved \$8 million to begin Ed-Net.

Current State/local efforts:

- The Northwest Regional Education Laboratory is 1 of 10 teacher training centers for the TERC Star Schools project.
- Portland Community College and Chemekita Community College operate ITFS systems.
- Some schools in the State receive programming from TI-IN.

Future/planned activities:

- . Ed-Net is a statewide telecommunications network (emphasis on satellite delivery) under development for all sectors of education as well as business and industry, State agencies, and community organizations.

Pennsylvania

State planning—SEA, Pennsylvania Public Television Network.

Other institutions involved in planning—Pennsylvania State University (PSU).

Current State/local efforts:

- The Pennsylvania Teleteaching Network, operated by Mansfield University, is an audiographics network that links 48 sites in Pennsylvania, Utah, South Dakota, North Dakota, and Mexico.
- Penn-Link is a statewide K-12 computer network offering data exchange, bulletin board services, and electronic mail.
- PSU and Mind Extension University are cooperating to offer professional development programming to educators via cable television. PSU also uses public television, cable television, microwave, and satellites to deliver programming statewide.
- The Philadelphia School District is wiring 16 schools for complete cable television access.
- Some schools in the State receive programming from Oklahoma State University's ASTS.

- . The State is a member of SERC.

Future/planned activities:

- . The Philadelphia School District has joined with Dallas, San Francisco, Chicago, and New York City school districts to develop a satellite network for linking urban schools.

Rhode Island

State planning—None at the K-12 level.

Other institutions involved in planning—office of Higher Education, public television, SEA.

South Carolina

State planning—South Carolina Educational Television (SCETV) coordinates educational telecommunications for the Department of Education.

Other institutions involved in planning—SEA, University of South Carolina, State agencies.

Current State/local efforts:

- . SCETV uses broadcast television and an extensive ITFS network to transmit programming (primarily instructional television series and staff development) to public schools. SCETV also conducts teleconferencing via satellite and microwave with audio bridges. SCETV is a major producer of programming for SERC.
- . The eight campuses of the University of South Carolina and South Carolina State College collectively offer more than 90 college credit classes over broadcast television.
- . The SERC Star Schools project is based in South Carolina. This project delivers live interactive instruction via satellite to students and teachers in 19 States and 4 associate cities.

Future/planned activities:

- . University of South Carolina and Mind Extension University are planning a professional development program for library media specialists.

South Dakota

State planning—The Interactive Telecommunications Committee was formed in January 1989 with representatives from K-12, higher education, State government, and US West. The committee completed a needs assessment for telecommunications and is preparing a feasibility study for the State. The Board of Directors for Educational Television, an agency of SEA and Department of Cultural Affairs, is also involved in planning.

Current State/local efforts:

- . **The Technology in Education** project is a statewide telecommunications consortium of school adminis-

trators exploring the uses of telecommunications for delivering foreign language and other instruction. Five sites are operating.

- Several schools in the State have participated in the Pennsylvania Teleteaching Project, which connects schools via audiographics.
- Some schools in the State receive TI-IN programming.

Future/planned activities:

- . The Interactive Telecommunications Network being developed will provide compressed video, audio, and data services to K-12, higher education, and State government agencies. Eventually, services will be extended to business and industry.

Tennessee

State planning—SEA.

Other institutions involved in planning—Board of Regents, Public Utilities Commission.

Current State/local efforts:

- Sixteen districts in six northeastern counties have formed the Upper East Tennessee Educational Cooperative. The system will use microwave, cable television, and satellite to link schools and off-campus centers in the counties with East Tennessee State University. Future plans are to serve local business, the Department of Corrections, and the University's Medical School. Funds for the system have been provided by the State, the U.S. Department of Commerce Public Telecommunications Facilities Program, and the Tennessee Valley Authority.
- Some schools in the State receive programming from Oklahoma State University's ASTS.

Future/planned activities:

- SEA is planning a statewide needs assessment and inventory of educational telecommunications resources.
- State funding will be used to install satellite receiving equipment at 14 sites. These sites and others will receive programming from TI-IN. SEA plans to have a satellite dish in every school system to deliver courses and staff development.

Texas

State planning—SEA, State Board of Education, Coordinating Board for Higher Education. The 1988-2000 *Long-Range Plan for Technology*, completed in 1988, includes a needs assessment and recommendations for

distance education.⁸ The Automated Information and Telecommunications Council oversees the development and operation of the State's telecommunications facilities.

Other institutions involved in planning—Education Service Centers (ESC), TI-IN, universities.

Legislation-Required and funded the development of the 1988-2000 *Long-Range Plan for Technology*. The Public Education Technology Act of 1989 (proposed) requests \$16.65 million to implement the plan.

Current State/local efforts:

- The InterAct Instructional Television Network, operated by the Region IV Education Service Center in Houston, uses ITFS/microwave and telephone to deliver courses and programming to students and teachers in 38 districts.
- The South Oak Cliff Project uses audiographics to deliver courses to students in the Dallas Independent School District.
- The Region 9 ESC in Wichita Falls uses prerecorded videotapes supplemented by audio exchange to deliver instruction.
- The Dallas Independent School District (DISD) is wiring all classrooms for cable television, computer, and phone access.
- TI-IN, in collaboration with ESC Region 20. (San Antonio), provides live satellite-delivered courses to students and teachers at over 700 sites in 32 States. TI-IN also operates the TI-IN United Star Network, one of the four federally funded Star Schools projects.
- Texas is a member of SERC.
- Some schools in the State receive programming from Oklahoma State University's ASTS.

Future/planned activities:

- The State's plan for educational technology recommends increased funding for modems, computers, and connect time to put all districts on an electronic network. The plan also requests 200 new satellite downlinks and funding for educational program development.
- DISD has joined with the school districts in New York City, Chicago, Philadelphia, and San Francisco to develop a satellite network to serve urban schools.

Utah

State planning—SEA; the Utah Telecommunications Cooperative includes representatives from the major universities, SEA, the State Board of Regents, and several State agencies. The cooperative coordinates telecommunications planning for the State. Educa-

tional programming delivered via telecommunications is coordinated by the State Educational Telecommunications Organizing Center (SETOC).

Other institutions involved in planning—Utah Higher Education, Regional Educational Service Centers, Board of Regents, colleges and universities.

Current State/local efforts:

- EDNET, the State's microwave system, provides two-way audio/video instruction to high school and college students and teachers around the State. The system is also used for teleconferencing and data communication.
- The Intermountain Community Learning and Instructional Services project, operating out of Utah State University, uses audiographics to deliver instruction to high school students and teachers in four schools in each of Montana, Wyoming, Utah, and Colorado.
- The Carbon County School District Distance Learning Project links one elementary school, one junior high school, two high schools, and the College of Eastern Utah in a fully interactive two-way cable/microwave system with data transmission capabilities.
- The Central Utah Educational Services project transmits an Advanced Placement (AP) English class from Richfield High School via microwave to KUED-TV, where it is broadcast live to five high schools.
- Davis County uses audiographics to deliver an AP physics class to three high schools.
- The Mansfield-Utah Tele-teaching Project links the Garfield County School District with Mansfield University and the Southern Tioga School District in Pennsylvania via audiographics.
- The Northeastern Utah Educational Service Tele-teaching Project connects five high schools and a vocational center with audiographics delivered via the State's microwave backbone (when possible) and the phone system.
- In the San Juan School District Techno-teaching Project, four high schools serving Native American students are linked together by two-way microwave.
- The Tele-teaching in the Great Basin project links eight high schools in four districts using audiographics,

Vermont

Mate planning--Governor's Educational Technology Committee, Vermont Technical College.

Other institutions involved in planning—University of Vermont, SEA, New England Telephone.

⁸In 1987, prior to the completion of the long-range plan, the Texas Education Agency prepared a *Guide to Distance to Distance Learning as an Alternative Procedure* (Austin, TX: 1987) and a companion document, the *Distance Learning Proposal* (Austin, TX: 1987).

Current State/local efforts:

- The Northeast Kingdom Rural Telecommunications Cooperative brings together eight elementary and three high schools with cooperation from the two local electric cooperatives. Live interactive audio/video instruction can originate from any site and is transmitted via satellite to other schools.
- Vermont Interactive Television is a joint venture involving Vermont Technical College, the Vermont State Colleges, SEA, the North County Area Vocational Center, New England Telephone, and various State agencies. The system uses fiber optics to connect 6 sites around the State; 16 more sites are planned for next year. The system offers interactive audio/video services to education and business.
- Some schools in the State also receive programming from Oklahoma State University's ASTS.

Future/planned activities:

- Universities in Vermont, Maine, and New Hampshire are working with New England Telephone to create a Northern Tier Network that would use fiber optics and satellite capabilities to allow the States to share programming.

Virginia

State planning—The Division of Educational Technology in the Department of Information Technology coordinates all educational telecommunications. SEA is developing a 5-year plan for educational technology; a needs assessment is being conducted. The Council of Higher Education's Task Force on Telecommunications issued a "Report on Telecommunications" in September 1987.

Other institutions involved in planning—Public television stations, Public Telecommunications Council.

Current State/local efforts:

- Fairfax County is involved in several projects. Local students participated in a teleconference with students in China. The county produces over 100 hours of live interactive broadcast instructional series, and produces science seminars for the SERC Star Schools project.
- The University of Virginia (UVA) operates Teacher Link, a local computer bulletin board service that links student teachers with their professors and peers. The system serves 80 teachers and 40 student teachers in two districts, and by 1990 will serve all student teachers in 7 districts. UVA is also a partner in the TERC Star Schools project, serving as 1 of 10 regional teacher training centers.
- The Varina High School Electronic Classroom is a cooperative project between SEA and the Henrico County School System. Live courses are transmitted

through a combination of cable, microwave, and ITFS from the classroom at Varina to 30 school districts.

- WHRO-TV (public television) in Norfolk is constructing a regional ITFS network that will serve education and business, and is connected to Old Dominion University by fiber optics. The station also has satellite transmitters and receivers and microwave facilities that are used for education.
- Virginia is a member of SERC Star Schools project.

Future/planned activities:

- SEA Plans to have a satellite downlink at every secondary school by September 1989, and plans to build another electronic classroom.

Washington

State planning—SEA and the Higher Education Coordinating Board (HECB). A joint "Educational Telecommunications Plan for K-12/Higher Education" was completed in October 1988, and a "Report to the Legislature on Linking for Learning: K-12 Educational Telecommunications Plan" was presented to the legislature in January 1989. The Department of Community Development (DCD)/Department of Information Services (DIS) has produced a report on statewide video telecommunications needs and resources, and SEA, HECB, and DCD/DIS are cooperating on a Statewide Telecommunications Network Plan.

Other institutions involved in planning—DIS coordinates statewide planning for telecommunications.

Legislation--Legislation in 1987 required SEA and HECB to develop a joint plan for a statewide educational telecommunications network by June 1989. Separate legislation enacted the Washington State Video Telecommunications Project requiring DCD to conduct a needs and resource assessment for a statewide video telecommunications system by January 1989.

Current State/local efforts:

- The Satellite Telecommunications Educational Programming (STEP) project is operated by Education Service District 101 in Spokane. STEP delivers live instruction via satellite (one-way video, two-way audio) to high school students and teachers in more than 100 districts in 8 States.
- Some schools in the State receive TI-IN programming.
- Some schools in the State also receive programming from Oklahoma State University's ASTS.

Future/planned activities:

- The proposed K-12 telecommunications system will provide every district, the nine educational service

districts, and **SEA with satellite receiving equipment, and will provide** funds for student and teacher programming.

West Virginia

State planning—SEA is conducting a telecommunications needs assessment and is preparing a technology survey of teachers and administrators.

Other institutions involved in planning—**Superintendent's Technology Study Group, West Virginia Distance Learning Users' Group, West Virginia Public Broadcasting Authority, Board of Regents, West Virginia University.**

Current State/local efforts:

- . **In the State, 79 schools receive programming via satellite from a variety of sources including** TI-IN, SERC, and Oklahoma State University.
- . Two computer networks, WVMEN and WVNET, serve K-12 schools and higher education.
- . The State is a member of SERC.

Wisconsin

State planning—The Wisconsin Educational Communications Board (WECB) coordinates telecommunications planning. The Council on Instructional Telecommunications, appointed by SEA, has developed policy recommendations for the State.

Other institutions involved in planning—SEA, University of Wisconsin has completed a review of educational telecommunications needs for the 26 campus system, vocational-technical institutes.

Current State/local efforts:

- . The Wisconsin Rural Reading Improvement Project is a collaborative effort between SEA, Wisconsin Public Radio and Television Networks, three Cooperative Educational Services Units, Viterbo College, and 18 local districts. Programming and services (including inservice and computer networking) are delivered via television, radio, ITFS, and the telephone system.
- . WECB operates a statewide educational television broadcast network and is constructing ITFS systems

for program delivery to campuses of the University of Wisconsin system, elementary and **secondary** schools, and vocational-technical schools.

- The University of Wisconsin operates the Educational Teleconferencing Network.
- The State vocational-technical institutions have an ITFS network.
- The State is a member of SERC.
- Some schools in the State receive programming from TI-IN.
- Some schools in the State also receive programming from Oklahoma State University's ASTS.

Future/planned activities:

- . **WECB is planning to develop a satellite** delivery service for statewide educational programming that may also reach other States.

Wyoming

State planning--Governor's Telecommunication Division. State policy permitting distance learning took effect last year, and a report to the legislature by the Education Policy Implementation Committee is due in December 1989.

Other institutions involved in planning—University of Wyoming, State agencies, colleges and universities.

Current State/local efforts:

- The Governor's Telecommunication **Division operates** a statewide computer conferencing network that uses audiographics to reach eight sites. Plans call for the system to be extended to all 23 counties in the State. The University of Wyoming may use the system to teach college courses, while various State agencies may do employee training.
- The Intermountain Community Learning and Instructional Services, operating out of Utah State University, uses audiographics to deliver instruction to high school students and teachers in four schools in each of Montana, Wyoming, Utah, and Colorado.
- Six districts receive programming from TI-IN.