

MINUTES OF THE HOUSE COMMITTEE ON EDUCATION.

The meeting was called to order by Chairperson Representative Ralph Tanner at 9:00 a.m. on January 24, 2000 in Room 313-S of the Capitol.

All members were present except: A quorum was present.

Committee staff present: Avis Swartzman, Revisor of Statutes
Ben Barrett, Legislative Research Department
Carolyn Rampey, Legislative Research Department
Linda Taylor, Committee Secretary

Conferees appearing before the committee: Doug Heacock, Executive Director, KANREN

Others attending: See Attached List

The joint meeting of the House Committees on Education and Utilities was called to order by Representative Ralph Tanner, Chairman. Chairman Tanner explained that **HB 2591**- State education technology network (KAN-ED) established, is the bill we will be considering.

Representative Tanner welcomed members of the House Utilities Committee, then introduced Doug Heacock, Executive Director of Kansas Research and Education Network.

Mr. Heacock proceeded with a slide presentation explaining the need for a technology network in the state of Kansas. He presented an overview of the proposal, pointing out the major aspects of the proposed KAN-ED bill. (Attachment 1) Benefits of the program are a higher quality of education, an industrial competitive edge, the possibility of better paying high skilled jobs, equal access to electronic information, and a support tool for lifelong learning. He explained the process which produced the proposal, beginning with a Task Force that was formed in 1998. He stated that the major challenge to creating such a network is funding. He thanked the committee and offered to stand for questions.

Questions and concerns among the committee members included who would pay for the project and the technical aspects of building such a network.

Lynne Holt, Principal Analyst for the Kansas Legislative Research Department gave the committees a copy of the full text of **HB 2951**, a section by section briefing on the content of the bill (Attachment 2), a copy of a memorandum from the Legislative Research Department about the development of a state technology network (Attachment 3), and a report prepared by the Special Committee on Education (Attachment 4). She presented testimony showing why Kansas would benefit from a technology network, what the benefits would be, and the conclusions of the Special Committee on Education.

Representative Tanner thanked the conferees for appearing before the committee. He announced that he had appointed a five-member sub-committee to study the bill and report back to the committee. The members of the sub-committee are Representative Morrison, chairman, Representative Crow, Representative Light, Representative Mason, and Representative Phelps.

The next meeting is scheduled for January 25, 2000.

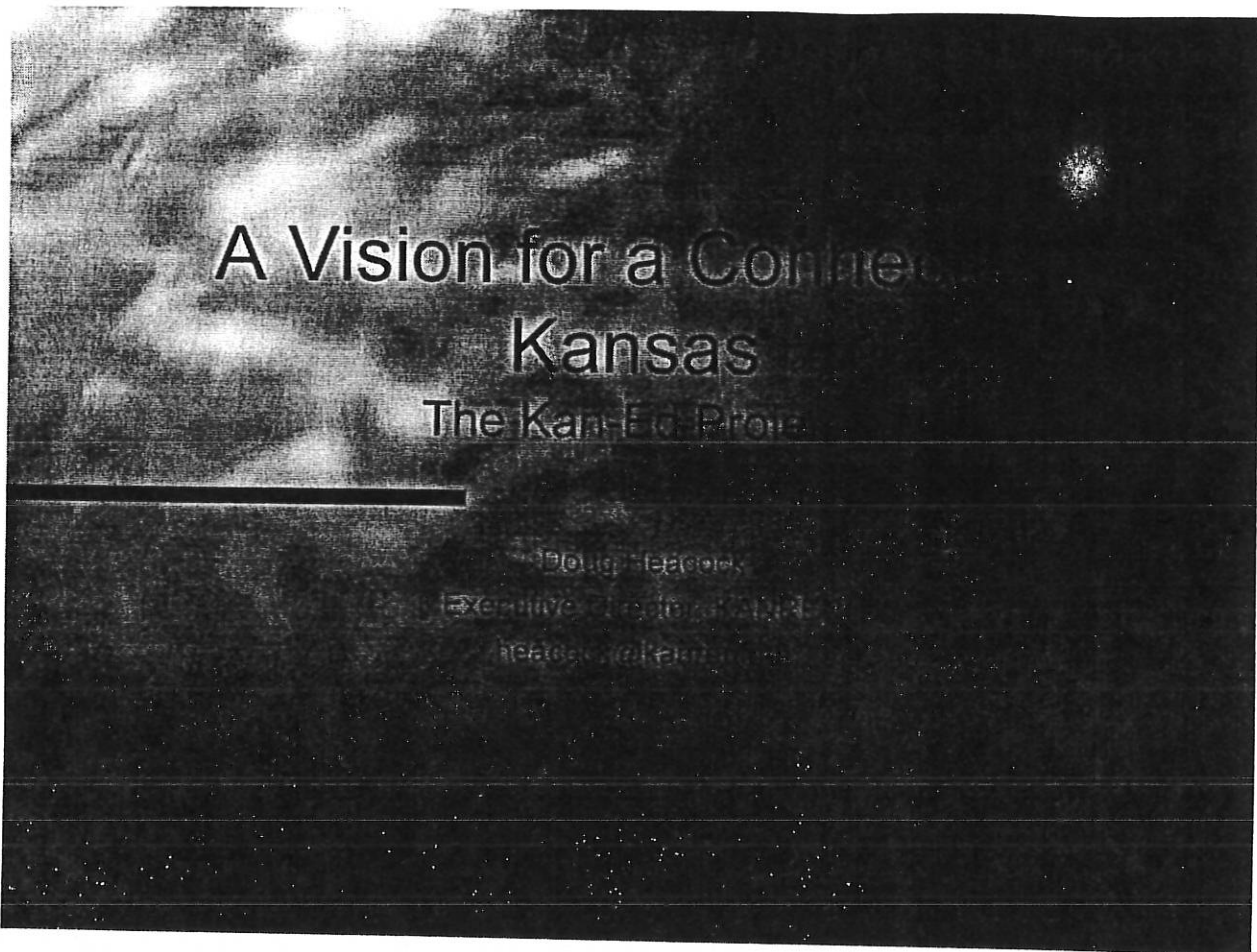
The meeting was adjourned at 10:50 a.m.

HOUSE EDUCATION COMMITTEE

GUEST LIST

DATE: January 24

NAME	REPRESENTING
Denise Axt	USA / KCR
Susan Bechard	ALLTEL
Chris Wilson	KGC
Ladner Cole	Sen. Byron Dutton
Mark Desetti	KNET
Craig Grant	KWEA



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Attachment 1



Overview

- The vision
- The process: How Kan-Ed was developed
- The Kan-Ed proposals
- The Kan-Ed bill
- How Kan-Ed might evolve
- The challenges ahead
- Other proposals

The vision

"As we enter the 21st century, every citizen of Kansas should benefit from the global digital revolution in information technology. To achieve this vision, all Kansans should be provided with the opportunity, training and resources to use and exploit electronic information and technologies for their betterment now and in the future."

The vision

Higher quality education for all Kansans
Greater competitive position for Kansas
Better-paying, high-skill jobs for Kansans
Equal access to electronic information services
Support for lifelong learning

The process

Fall 1998: a network infrastructure task force

- Nearly 30 members, mainly from education
- DISC and KANREN collaborated on a network proposal

Early spring 1999: a proposal submitted to the legislature by the Department of Education

The process

Late spring 1999: the original Kansas proposal was dropped from the Legislature's omnibus bill

Summer 1999: two new groups were formed to tackle the issue again

- Kansas Information Technology Action Committee (KITAC)

- Kansas Education Technology Advisory Board (KETAB)

The process

August 1999: Presentation to the legislative Special Committee on Education

- Existing network resources
- Technology needs for the state

The committee requested a formal proposal

Prepared over three weeks by various subcommittees

The process

September 1999: Kan-Ed proposal presented to the Special Committee

The committee requested that a bill be drafted

- We worked with the Legislative Research department on this

November 1999: the draft bill was sent to the Special Committee for review

The process

The Special Committee reviewed the project and voted to introduce it in the current legislative session (HB 2591)

If funded, the project will be implemented beginning on July 1, 2000

The proposal

Requests \$17.5 million in state appropriations for the first year (including start-up costs)

Requests \$13 M per year thereafter

Provides for training staff to support educational networking

Provides for statewide online database licenses

The proposal

- Provides a T1 to every school district
- fractional-T1 to every public library
- Provides high-bandwidth connections to 25 school districts and 20 libraries
 - For R&D, advanced networking applications
- Provides for much-needed staff development

The bill

DISC will implement the backbone
KANREN will provide staff development
training, consulting, and related network
services

The State Library will coordinate the
acquisition of statewide licenses for
text online content

How Kan-Ed will evolve

DISC and KANREN will collaborate on network design

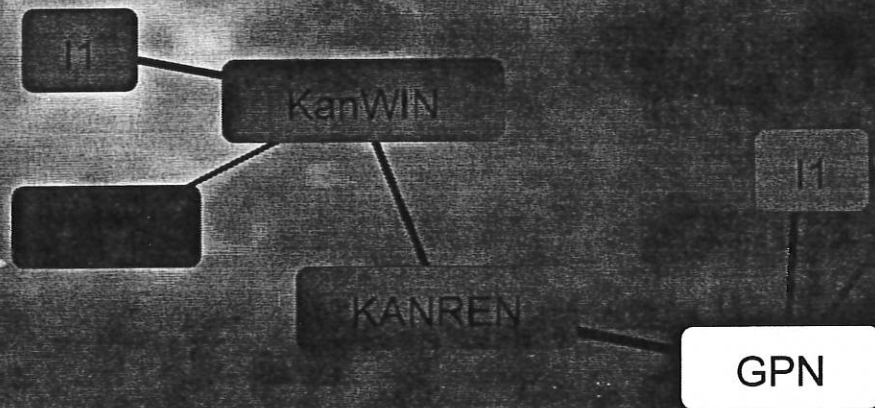
The implementation will likely begin by interconnecting KANREN, KanWIN, and other existing state-wide network resources (via "gateways")

ATM-based, high-bandwidth backbone network is the ultimate goal

Multi-service, multi-protocol environment

Kan-Ed backbone concepts

Interconnection of existing networks



Kan-Ed backbone concepts

Shared, high-bandwidth, ATM
(asynchronous transfer mode)
backbone

- Bandwidth would be divided among government, education, and libraries

Variety of “last mile” options: Frame Relay, DSL, etc. (FR is dominant now)

The backbone should...

Have sufficient bandwidth to distribute Internet connectivity to all districts and libraries

Allow for a variety of protocols

Provide a means to interconnect existing IDL networks in Kansas

Be robust and reliable

Be scalable

Other Kan-Ed features

Staff development

- Inservice training and other workshops
- Technical conferences
- Online training resources

Consulting services

Networking monitoring

24 x 7 NOC

Help desk

Benefits

We'll keep Kansas traffic in Kansas
We'll leverage existing resources
We'll provide statewide access to
electronic resources and information
Staff development: students will benefit
sooner if teachers are adequately
trained

Benefits

Development and sharing of online education resources (e.g., lesson plans, online coursework, etc.)

Sharing of instructors in some cases

Aggregation of demand and increased purchasing power will help keep costs low

Challenges

Funding

Increasing need for bandwidth

Technical design that includes existing networks, consortia, IDL, etc.

Time keeps ticking away...

Questions? Comments?

For more information:

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785-864-0422

<http://www.kan-ed.net>

EXPLANATION OF KAN-ED BILL

Brief

HB 2591 authorizes establishment of a state education technology network—KAN-ED. This network is an expansion of the state's high-speed backbone network which currently is managed by the Division of Information Systems and Communications (DISC) in the State Department of Administration. KAN-ED would provide Internet connectivity for all school districts, school district cooperatives and interlocal cooperatives, and public libraries in Kansas. HB 2591 establishes a mechanism for developing a connectivity plan and for approving and funding the hardware, software, and technical support needed to implement the project objectives outlined in the plan.

A brief synopsis of each section of the bill follows.

Section 1 establishes KAN-ED—a state education technology network designed to provide Internet connectivity and promote technology integration for all school districts, school district cooperatives and interlocal cooperatives, and public libraries in Kansas. This network is an expansion of the existing high speed state backbone managed by DISC. The services and applications provided through KAN-ED are outlined.

Section 2 requires the State Department of Education and the State Library to jointly submit an information technology project plan to the Chief Information Technology Officer (the Director of DISC). The plan is subject to all relevant provisions concerning oversight of information technology projects, including legislative oversight.

Section 3 establishes the three-member KAN-ED Information Technology Committee within the State Department of Education. This Committee includes representation from the State Department of Education, the State Library, and the State Board of Regents. The Committee is responsible for collaborating on development of an information technology project plan which will address the services and applications specified in Section 1 and will specify any technical support needed to make efficient use of these services and applications. The Committee also may meet, as needed, on other education-related initiatives involving collaboration.

Section 4 establishes the KAN-ED school fund in the state treasury. This fund is subject to appropriations from state revenues or other revenue sources. The fund is administered by the State Board of Education. Expenditures are subject to appropriations and are conditioned upon the DISC Director's approval of the objectives of the information technology project included in the plan submitted by the State Department of Education and the State Library.

Section 5 establishes the KAN-ED library fund in the state treasury. This fund is subject to appropriations from state revenues or other revenue sources. The fund

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is administered by the State Library. Expenditures are subject to appropriations and are conditioned upon the DISC Director's approval of the objectives of the information technology project included in the plan submitted by the State Department of Education and the State Library.

Section 6 authorizes the Director of DISC to enter into a service-level agreement with the Director of the Kansas Research and Education Network (KANREN). Under the agreement, KANREN would provide staff inservice training and technical support to schools and libraries throughout Kansas. The service-level agreement is contingent upon DISC's approval of the information technology plan which would specify the State Department of Education's and State Library's technical support needs, among other matters.

Section 7 subjects all contracts for KAN-ED telecommunications services to the statutorily-authorized contractual procedures governing DISC's acquisition of telecommunications services. Proposals may be submitted by all types of telecommunications providers. (The definition of "telecommunications services" in KSA 75-4710 is very broad.)

Section 8 makes the Act effective on July 1, 2000.

Background

HB 2591 was requested by the Special Committee on Education following Committee review and deliberations on Topic No. 2, related to connecting school districts and other institutions and agencies to a state technology infrastructure backbone. As part of its review, the Committee heard presentations describing two education networks—the Missouri Research and Education Network and Washington's K-20 Network.

The Committee also considered a proposal for an education technology network which was crafted by various representatives of the education and information technology community, including the Commissioner of Education, the State Librarian, the Director of KANREN, the Director of DISC, the Assistant Vice Chancellor for Information Services, University of Kansas, and the President of the Kansas Technology Enterprise Corporation. It was this proposal that became the basis for HB 2591. The proposal establishes the KAN-ED network which would provide Internet access to 304 school districts, 330 public libraries, and 28 education service centers (school district interlocal cooperatives and school district cooperatives) in Kansas and would make available state-of-the-art high bandwidth technology to 25 schools and 20 libraries for research and development.

The proposal requires DISC, through its Bureau of Telecommunications, to provide administrative services, engineering services, the Network Control Center, backbone circuits, and contract management. The proposal also requires DISC to partner with KANREN for technical support to the schools and libraries. KANREN is an education consortium of 64 nonprofit members consisting of all the Regents institutions and the KU Medical Center, 12 private colleges and universities, 12 community colleges, 17 school districts, 11 public libraries, and five other education and research-based nonprofit organizations. This consortium currently provides Internet access, consulting, network monitoring and diagnostics, and training and technical support to its members.

Preliminary estimates for investments in the proposed KAN-ED network total \$17.5 million for the first year and \$13 million in subsequent years. (Note that HB 2591 establishes the funding

mechanism but provides that the network is subject to appropriations and does not specify an amount or revenue source.) The Governor recommended for FY 2001, \$4.5 million from the Children's Initiatives Fund for KAN-ED in the Department of Education's budget.

Proposed KAN-ED legislation was reviewed and approved by those parties who developed the KAN-ED proposal. At its meeting on November 18, 1999, the Special Committee on Education recommended the introduction and passage of what is now HB 2591.

September 20, 1999
Revised December 13, 1999

To: Special Committee on Education
From: Lynne Holt, Principal Analyst
Re: Topic No. 2—Statewide Education Network for Voice, Data, and Video Services

This memorandum does the following:

- Summarizes the existing “landscape” of technology-based networks in Kansas for secondary and postsecondary education;
- Describes salient features of Missouri’s MOREnet Network and Washington’s K-20 Network;
- Identifies benefits that could be derived from a statewide education network; and
- Identifies potential impediments associated with development of a statewide network.

THE EXISTING “LANDSCAPE” OF TECHNOLOGY-BASED NETWORKS IN KANSAS FOR SECONDARY AND POSTSECONDARY EDUCATION

Profile of the Existing Landscape

There are several networks connecting educational institutions in Kansas but no statewide network which links all the educational institutions to a single fiber-optic backbone.¹ At its meeting on August 26, the Committee heard presentations on several networks which are summarized below. The policy issue before the Committee is on the advisability of funding the establishment and maintenance of a statewide network that would provide most or all Kansas educational institutions voice, data, and video services through access to a high-speed, high-bandwidth fiber optic backbone. Several states, including Missouri and Washington (both of which are discussed below), Utah, Kentucky, Minnesota, Maine, and Iowa have such networks. As part of its review, the Committee will be asked to evaluate a proposal which identifies the need, vision, services, investment, and benefits associated with development of a statewide education network.

¹A backbone is a network arrangement designed to interconnect lower-speed channels or dispersed users. Fiber optics is a high-speed transmission technology in which information is transmitted over hair-thin fibers of glass. Lasers produce light pulses that carry information over this medium.

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A statewide network would provide each school district and library high bandwidth connectivity to a statewide backbone. The benefits and difficulties associated with such an undertaking are outlined below and will be discussed in ensuing presentations. The policy of developing a statewide network is not to be confused, however, with policies involving internal wiring of and between schools within a school district, such as Auburn-Washburn, USD 437. The installation and maintenance of wide area network configurations and networks within a USD's school buildings would remain the proper domain of local school boards. Many Kansas school districts have been providing some level of Internet connectivity and video services to students, teachers, and administrators through contractual arrangements with telephone and cable companies for several years and school districts would continue to be responsible for such arrangements. A list of schools served by various telephone and cable companies illustrates those arrangements (Attachment 1).

Kansas Networks

A. KANS-A-N Network

Bureau of Telecommunications. The Division of Information Systems and Communications (DISC) manages the KANS-A-N network through one of its five bureaus—the Bureau of Telecommunications. The Bureau of Telecommunications provides, monitors, and manages local and long distance services for all state agencies and units of local government. Services include, but are not limited to, voice, data, video, image facsimile, and wireless services. In addition, the Bureau provides technical assistance to state agencies regarding the design, configuration, and use of telecommunications systems, facilities, and services. The Bureau coordinates the selection, procurement, and installation of telecommunications systems and equipment.

History of KANS-A-N. The KANS-A-N network was established in 1974 as a statewide telecommunications network for state agencies and Regents universities. The network was significantly enhanced in 1989 with bandwidth added between major nodes in the network to allow for a statewide multi-protocol data communications network. In 1992, the Legislature enacted H.B. 2682, which authorized DISC to provide telecommunications services to any county, municipality, or school district in Kansas.

KANS-A-N Services. The KANS-A-N network consists of:

- KANS-A-N voice with 45,000 phones,
- KANS-A-N video with 40 sites, and
- KAN-WIN (data) with 18,000 connection points.

A map of the present backbone network is Attachment 2.

KAN-WIN is a collection of circuits, routers, and other communications equipment that enable computers and their users to exchange data across Kansas and the world using standard protocols. KAN-WIN supports point-to-point (dedicated) and frame relay connections with up to T-1 speeds. The KAN-WIN network has a node in each county in Kansas that provides access to data services for interested governmental entities.

Video services are also a feature of the KANS-A-N network. Six distance learning networks in Kansas (including the four operated by Southwestern Bell) are connected to the state backbone and use fiber optic connectivity with fractional T-1 capacity. These networks are:

- Southeast Kansas (Greenbush), which serves 25 school districts;
- South Central Kansas, which serves 11 school districts;
- Southwest Kansas, which serves 14 school districts;
- North Central Kansas, which also serves 14 school districts;
- Northwest Kansas Educational Network, which serves nine school districts; and
- High Southwest Plains Network, which serves 16 school districts.

In addition, the KANS-A-N video network provides connectivity to 40 compressed video sites (Attachment 3). Agencies are charged \$40 per hour in transmission charges for connectivity and there is an additional transmission charge per site for multipoint conferences. (This charge does not include room rentals.)

Aggregation Capability. The KANS-A-N network is funded on a fee-for-service basis. DISC aggregates demand from all state agencies, universities, and other governmental entities and contracts, on behalf of its network service users, with vendors to lease the necessary components of the network. If agencies were to negotiate for these components individually, it arguably would not be as cost-effective. DISC is also able to average-cost its services, thus making it more affordable for smaller governmental units or governmental units in remote geographical locations to access network services. Finally, centralized purchasing presumably results in less duplication of services among agencies. With respect to voice telecommunications, DISC is able to contract with one vendor (presently, AT&T) for backbone services. AT&T, in turn, will handle local telephone connections upon DISC's request. If state agencies were to contract for such services, they would not realize the economy-of-scale benefits accrued to DISC and they would have to contract separately for local service connectivity and long-distance services.

Support Assistance. A network control center, staffed by DISC personnel, provides a 24-hour-per-day, seven-day-per-week help desk and network monitoring and provides remote diagnostic services for problem resolution.

B. Southwestern Bell's Broadband Education Service —Interactive Distance Learning

The Broadband Education Service-Interactive Distance Learning (BES-IDL) network was established as a result of TeleKansas 2 and is managed by Southwestern Bell. TeleKansas 2 resulted from legislation enacted in 1994, which provided for a freeze on local rates in exchange for a commitment by Southwestern Bell to spend \$64 million above normal expenditures to provide distance learning to schools in Kansas at a discount.

The BES-IDL network consists of four clusters. They are:

1. Southeast Kansas (Greenbush), which serves 25 school districts;

2. South Central Kansas, which serves 11 school districts;
3. Southwest Kansas (A+), which serves 14 school districts; and
4. North Central Kansas, which also serves 14 school districts.

In addition, the Southwest Kansas cluster is directly connected to Pioneer Telephone's High Southwest Plains Network which serves another 16 school districts. All four clusters receive full-motion two-way interactive video services. (Data connectivity is also available for school districts' use, at an additional cost, but is not being used.) These clusters are connected so that schools in one cluster can communicate with schools in any other cluster. The network is private having OC3 (155.520 Mbps) connectivity to the broadband backbone. The backbone connecting the clusters is also OC3 based. Although BES-IDL and KANWIN, which is managed by DISC, are two separate networks, they share the same technology using the same connectivity in the same locations monitored by the same people.

Among its management responsibilities to the network, Southwestern Bell provides centralized network management, scheduling support, and technical support. The entire network is monitored on a seven-days-a-week, 24-hours-a-day basis from the Kansas City Network Operations Center (NOC). A single point of contact is available in the NOC for each cluster on the network. A scheduling system is in place which allows educators to schedule their own sessions within each cluster, or between clusters. In cases of network trouble, trained technicians are available on a local basis. Dispatch of local technical support is performed by the NOC.

C. KANREN

The Kansas Research and Education Network (KANREN) is a consortium of 59 nonprofit members consisting of all the Regents institutions and the KU Medical Center, 12 private colleges and universities, 12 community colleges, 17 USDs, six public libraries, and five other education and research-based nonprofit organizations (Attachment 4.) (After this memorandum was written, KANREN added five libraries, thus bringing total membership to 64 nonprofit organizations.) This consortium is staffed by 3.0 FTE positions with an FY 2000 budget of \$860,000. KANREN was originally funded with National Science Foundation grants but is now self-supporting through membership fees. The KANREN backbone currently provides Internet 2 (very high speed) access for the University of Kansas, Kansas State University, and the KU Medical Center. KANREN's main backbone hubsites are at Manhattan, Lawrence, Kansas City, and Wichita. Currently, more than 24 Mbps of Internet connectivity is distributed among those sites. KANREN's member sites are connected to this high-speed backbone via frame relay links which are mostly at the fractional T-1 level. (Frame relay is a high-speed transmission service that moves data in units at access speeds of up to 1.544 Mbps.) One advantage of the KANREN backbone network is that it keeps traffic between members off of the Internet.

KANREN's services include: network monitoring; Usenet News service; domain name service; consulting; intranet design and implementation; various Web support services; and training. KANREN provides on-site training in many areas (13 standard workshops). Customized training also is available. In addition, KANREN develops and disseminates training materials for members and hosts a technical conference annually for site representatives.

D. Great Plains Network

The Great Plains Network is a consortium of Great Plains states dedicated to supporting scientific research through the use of networking technology. The consortium has constructed a high speed network connecting the educational state networks in Arkansas, Kansas, Nebraska, North Dakota, Oklahoma, and South Dakota. (Minnesota and Missouri are expected to become members shortly.) KANREN provides Kansas participants with connectivity to the Great Plains Network.

Earth Systems Science was chosen by the consortium as a prototypical research area for exploring applications useful for supporting research activities. Each of the member states hosts at least one institution focusing on some area of earth systems science.

The Great Plains Network is managed by two FTE positions and is funded through a two-year grant of \$1.5 million from the National Science Foundation EPSCoR program, with state matching support from participating institutions. In Kansas, the matching support came from KTEC, KANREN, and the University of Kansas. The Great Plains Network has an OC-12 link (622 Mbps) to the Internet 2 network which connects 150 universities in the United States. The intent of Internet 2 is to ensure that researchers have access to high performance networking and that tools are developed for the next generation of networks. Kansas State University, the University of Kansas, and the KU Medical Center participate in the Internet 2 project.

Examples of Missouri and Washington Education Networks

The examples of the Missouri and Washington networks illustrate two approaches to state education networks. Missouri's network was described to the Special Committee on Education on August 26, 1999. The MOREnet network is an expansion of an education consortium, similar to KANREN, and has proceeded over time to include the majority of state educational institutions and libraries. This network did not stem from enabling legislation but rather has evolved by availing itself of various funding and contractual opportunities. By contrast, the Washington K-20 network was established statutorily to connect all levels of education, kindergarten through graduate school, offering Internet, intranet, satellite-delivered "distance learning" programs, and videoconferencing capabilities. The legislation, summarized below, articulates legislative intent, outlines the process for governance, development and implementation of the network, and provides for a dedicated funding mechanism to realize legislative objectives.

Neither Missouri's nor Washington's education network can be adopted in Kansas without accommodation to Kansas' network development. For example, MOREnet is proceeding to establish a statewide virtual private video network to enable existing video sites to communicate with each other. In Kansas, some of this effort was already realized through TeleKansas II, although many school districts still have no access to full motion video services or other type of interactive video service. In another example, Washington's K-20 network had, as its first phase, the connectivity of all the public university and community college campuses. The Regents institutions in Kansas are already connected to the state backbone and many, but not all, of the Kansas community colleges are part of KANREN's consortium. The importance of these two models for Kansas policymakers resides less in the specific features of Missouri's and Washington's network initiatives and more in these states' emphasis on: the coordinated use of shared infrastructure; providing all public educational institutions, regardless of location, access to data, and video services; the aggregation

of high-volume purchases; uniform network standards; geographically dispersed access to technical support and consultation; and centralized network monitoring and quality control capability.

A. MOREnet

Like KANREN (described above), the Missouri Research and Education Network (MOREnet) has its origins as a consortium of public higher education institutions initially funded by the National Science Foundation. This education network has expanded since its formation in 1991 to serve independent postsecondary institutions, almost all Missouri school districts, most of Missouri's public libraries, state agencies, and Missouri communities. Like KANREN and DISC, MOREnet purchases services from various vendors and the state does not own the network infrastructure.

MOREnet's services include: Internet access through a high-speed statewide backbone connecting 950 sites, and technical and operations support. This support includes 24-hour, seven-day-a-week monitoring of the network, operating a reference desk, consulting, centralized purchasing of shared electronic resources, offering security services, central and regional training, and grant assistance. MOREnet is currently in the process of developing a statewide virtual private video network to enable existing video sites to communicate with each other. MOREnet's involvement with public schools began with a contract with the Missouri Department of Elementary and Secondary Education during the 1993-1994 school year. MOREnet was selected to develop and implement the Department's Technology Network Project. MOREnet currently provides network services, technical support, training, and other services to 510 of the 525 school districts in the state. In addition, MOREnet, with support from Southwestern Bell, made possible the Multimedia Interactive Networked Technologies Project, which involves participation of 13 classrooms in six school districts in St. Louis County, Missouri. This project trains teachers, delivers a high-speed Internet connection via MOREnet to the classrooms, and places technology on the teacher's and students' desks. The project's intent is to determine whether elimination of the technology barriers schools traditionally experience can change teaching styles and strategies and improve student performance.

MOREnet's FY 2000 request is approximately \$21 million (90 percent state funding) and its budget supports 100 positions. According to Bill Mitchell, a conferee at the Committee's meeting in August, two major advantages of a centralized network, such as MOREnet, are that it can average the pricing of its services and control quality of network operations and services throughout the state.

Mr. Mitchell outlined several advantages of leveraging funding through a statewide consortium, such as MOREnet:

- Collaboration creates critical mass in terms of buying power, ability to retain and recruit information technology staff, and coordinate requests for state information technology appropriations;
- Research and development of emerging technology and applications, volume purchases, and training and consulting can be undertaken by the consortium for the benefit of all members;
- One centrally located and managed library automation system is available for postsecondary institutions;
- Savings are realized from shared electronic databases and centralized e-rate discount applications;

- Benefits accrue from the operation of a high capacity multimedia network with Internet 2 transport capability; and
- Benefits accrue from a statewide interactive video network with standards established for interoperability and future growth.

B. Washington's K-20 Network

Legislation. The 1996 Legislature enacted legislation which articulated legislative intent of "creation of a K-20 education network for the coordinated expansion of current technology and the development of new technologies that support an integrated and interoperable educational technology network serving kindergarten through higher education and promoting access for Washington citizens." A major factor leading to enactment of this legislation was the concern that children and adults in rural areas of the state lacked equal access to learning opportunities through technology.

The bill further:

- Established the K-20 Telecommunications Oversight and Policy Committee to: adopt policy goals and objectives for the state network, adopt a network design and implementation plan, and authorize release of funds for network purposes.
- Required that on April 15, 1996, the Department of Information Services convene the Committee to approve a design and implementation plan. Committee members included the following eight voting members or their designees: the Governor, four legislators (two from each house and party), the Superintendent of Public Instruction, the Chair of the Higher Education Coordinating Board, and the Chair of the Information Services Board. Nonvoting members included specified representation from various sectors of the educational and library community and the computer or telecommunications industry.
- Outlined the objectives of the design and implementation plan:
 - Provide optimum geographic and social distribution of the benefits of a network;
 - Minimize duplication of technology resources and education programs or degrees at public institutions of postsecondary education;
 - Maximize existing networks and video telecommunications resources owned or operated by the state;
 - Consider the benefits of purchasing additional hardware to expand the current telecommunications network versus leasing network services from the department of information services or from private sector providers;
 - Foster partnerships among public, private, and nonprofit entities, including independent nonprofit baccalaureate institutions of higher education, libraries, and public hospitals;

- Ensure that each network site is designed to maximize utilization by the institutions of postsecondary education and public schools;
 - Provide for future access by public entities on a no-cost or low-cost basis; and
 - Ensure that the network can be expanded and upgraded, is based on an open-architecture model, and connects to national and worldwide information infrastructures.
-
- Required the Superintendent of Public Instruction to submit to the K-20 Telecommunications Oversight and Policy Committee a proposed location plan of public education delivery sites proposed for connection to the K-20 education network. The same requirement governed the Higher Education Coordinating Board for higher education delivery sites.
 - Required the Superintendent of Public Instruction and the Higher Education Coordinating Board to recommend to the K-20 Telecommunications Oversight and Policy Committee a network governance structure.
 - Established the K-20 Technology Account in the State Treasury. Expenditures from that account may be expended solely for the K-20 network approved by the Committee.
 - Established the Education Technology Revolving Fund. Expenditures must be authorized by the Director of the Department of Information Services or designee, to be used to fund the acquisition of equipment, software, supplies, and services for shared educational information technology services, telecommunications, and systems.
 - Required the Information Services Board to prepare a technical plan for the design and construction of the K-20 network. This plan had to be developed in phases:
 - Phase 1 had to provide a telecommunication backbone connecting educational service districts, the main campuses of public baccalaureate institutions, the branch campuses of public research institutions, and the main campuses of community colleges and technical colleges.
 - Phase 2 had to provide for:
 - connection to the network by entities that included, but was not limited to: school districts, public higher education off-campus and extension centers, branch campuses of community colleges and technical colleges, and independent nonprofit baccalaureate institutions, as prioritized by the K-20 Telecommunications Oversight and Policy Committee; and

- distance education facilities and components for eligible educational institutions.
- o Subsequent phases may include, but need not be limited to, connections to public libraries, state and local governments, community resource centers, and the private sector.

Status. Currently, the main campuses of Washington's nine educational service districts, six universities and branch campuses, 32 community and technical colleges, and 289 of 296 school districts are connected to the state network. (Seven school districts in very remote, rural parts of the state have yet to be connected but are scheduled to be by the end of 1999.) The first two phases of the K-20 Network will be completed at a cost of \$55 million, approximately \$7 million under the appropriated amount of \$62.1 million for the biennium which ended June 30, 1999. Included in the \$55 million budget was a one-time expenditure of \$8 million for satellite communications. The 1999 Legislature appropriated \$24.8 million for the biennium (\$12.4 million per year) ending June 30, 2001, for transport and operations of the network. Each USD and postsecondary institution pays \$2,500 per T-1 per year for connectivity to the network and the state subsidizes the remaining amount (\$24.8 million). It costs approximately \$30 million for the network's operations and transport for the biennium and the educational institutions' co-payment assessments total approximately \$5 million. Internet access costs an additional \$1,600 per T-1 per year for each educational institution (some USDs only need half a T-1 and pay \$800 per year). Libraries will be linked to the network in Phase III if the Legislature appropriates funds and discussions are currently underway on that issue. Training has been provided to community colleges and some school districts on use of video technologies in the classroom.

In May 1996, the K-20 Telecommunications Oversight and Policy Committee adopted minimal technical standards for Internet/intranet services, videoconferencing and circuit switched infrastructure, and video distribution. Staff are available at each educational service district to assist school districts with data and video issues related to the operation of the K-20 network.

In 1999, the Washington Legislature enacted S.B. 5789, which amended the enabling legislation to create the K-20 Educational Network Board which replaced the Telecommunications Oversight and Policy Committee established in the 1996 legislation. The new Board's responsibilities became more outcome-driven, as reflected in the excerpt of the legislation (Attachment 5). The 1999 legislation also expanded the responsibilities of the Information Services Board to, in consultation with the K-20 Board, govern, operate, and oversee the technical design, implementation, and operation of the K-20 network.

Benefits Derivable From A Statewide Network

- A statewide network could encourage coordinated planning, purchasing, monitoring, and service delivery, thus maximizing state resources and expertise.
- A statewide network could encourage the adoption of uniform technical standards for interoperability and future growth of information services.
- Successful education programs can easily be expanded and offered statewide.

- Educational opportunities can be maximized through expanded video course availability and increased partnerships between educational institutions and increased sharing of curriculum and courses.
- Telecommunications costs for “the last mile” can be averaged through a state network, thus equalizing connectivity among all school districts.
- There can be interregional connectivity, as well as interlevel connectivity (K-12 through postsecondary institutions and libraries).
- Preservice teacher training and continuing education can be offered interactively throughout the state.
- Information technology staff support may be available for all users on a more equitable basis and a larger network may be better positioned to recruit and retain such staff.
- Savings might result from increased purchasing power for on-line databases and network components.
- The state’s increased leverage as a volume purchaser of telecommunications goods and services could spur investments by vendors in more sparsely populated parts of the state.
- Savings could result from centralized e-rate discount applications for network infrastructure. (Presumably, USDs would continue to apply individually for e-rate discounts to wire schools under their jurisdiction.)
- An expanded backbone could make it more affordable for many small businesses to engage in e-commerce as they would be in closer proximity to network nodes resulting from an expanded state backbone.
- “Next generation” programming services can be made available to all interconnected educational institutions as the network develops capacity for integrated delivery of voice, data, and video to the desktop (2nd Generation Network).

Challenges Associated With A Statewide Network

- Proper planning is needed to ensure that adequate bandwidth exists for the backbone and distribution systems to handle voice, video, and data services.
- There needs to be a mechanism to ensure that all educational institutions (K-12, community colleges, universities, and libraries) work collaboratively in planning cross-sector use of the network. (Initially, the greatest challenge for the Washington K-20 network was to forge this type of collaboration. Apparently, an appropriation in the budget of the Department of Information Services—an agency not affiliated with K-12, postsecondary education, or libraries—helped realize that intent.)
- There should be a commitment to initial funding, as well as to ongoing funding. Networks need continuous maintenance and upgrades.

- “Last mile” options for connectivity in certain parts of the state continue to be limited and expensive.
- A statewide network might be viewed as a threat to individual telecommunications vendors. The profit margin will generally be higher for them in transactions with smaller entities with less purchase power than in transactions with large entities.
- There needs to be a clearly defined mechanism to delineate operation and maintenance responsibilities of a state network and those of individual school districts and libraries.
- There needs to be a mechanism to ensure ongoing collaborative planning and implementation among the party responsible for the operation and maintenance of the state backbone, the party (if different) responsible for technical support and training, representatives of the telecommunications industry, and educational institutions.

ATTACHMENT 1

Revised December 13, 1999

To: Special Committee on Education
From: Lynne Holt, Principal Analyst
Re: Various Provider Initiatives to Establish Wide Area Networks
and Interactive Distance Learning Networks in Kansas

This attachment was originally presented to the Special Committee on Education at its meeting on November 18, 1999. It has been updated to include information on the deployment efforts of several independent telephone companies. Please note that this is not an exhaustive list. Moreover, it does not include Southwestern Bell's Broadband Education Service-Interactive Distance Learning Network, which is summarized in the memorandum.

- I. **Multimedia** (as of 9/3/99)
 - A. **Wide Area Network Connections from 10 Mbps to 100 Mbps (hybrid fiber optic coaxial cable system)**

Public Schools:
Wichita (most schools also have Internet connectivity through Multimedia)
McPherson
Newton (also Internet connectivity)
El Dorado (also Internet connectivity)
Great Bend
Hoisington
Pittsburg
Auburn-Washburn

Community Colleges:
Barton County
Hutchinson (Internet connectivity)

Other College:
Southwestern
 - B. **Interactive Distance Learning**

Hutchinson Community College was the catalyst for establishing a full motion video network connecting four school districts: Fairfield, Sedgwick, Burrton, and Hesston (Burrton and Sedgwick schools also have Internet connectivity through Multimedia).

C. Internet Connectivity

Multimedia uses high-speed Internet connections through use of a cable modem to schools in several school districts, several colleges, and parochial schools.

II. Classic Cable (as of 9/21/99)

A. Wide Area Network and Internet Connectivity

Public Schools:

Oberlin school district

Paola/Osawatomie school districts (one cable headend serving both school districts)

Phillipsburg school district

III. Eagle Communications (as of 9/21/99)

A. Wide Area Network and Internet Connectivity

Public Schools:

Russell school district

Hays school district

Also, free Internet connectivity is provided via cable to city public libraries in Russell and Hays.

IV. Atchison Cablecomm (as of 9/21/99)

A. Wide Area Network and Internet Connectivity

Atchison school district

V. Sunflower Cablevision (as of 9/21/99)

A. Wide Area Network

Lawrence school district, University of Kansas, Lawrence Public Library, and other municipal sites (projected for completion by spring 2000)

VI. Time Warner Cable (as of 9/21/99)

A. Wide Area Network

Public Schools:

Bonner Springs school district (100 Mbps data transmission service)

Leavenworth school district (multimedia service)

VII. Galaxy Cablevision (as of 9/21/99)

A. Interactive Distance Learning

Basehor-Linwood public schools

Leavenworth Special Education Consortium (includes seven special education sites in Tonganoxie, Basehor-Linwood, Leavenworth, and Lansing)
Wolf River Consortium (20 schools in northeastern Kansas)

VIII. Sumner Cable TV Company (as of 9/21/99)

A. Wide Area Network and Internet Connectivity (5-7 Mbps; coaxial cable system)

Wellington school district

IX. Sprint (as of 9/99)

A. Interactive Distance Learning and Internet Connectivity

High Schools:

Burlington
Lebo
Waverly
Leroy
Thayer
Richmond
Moran
Wakefield
Burr Oak

Burlington, Lebo-Waverly, and Leroy-Gridley school districts are part of the Coffey County Area Network with connectivity to high schools in these districts, as well as five public libraries, municipal and county offices, and an adult education center.

X. Independent Telephone Companies (not an exhaustive list)

A. Twin Valley Telephone, Inc. (Miltonvale)

High speed Internet connectivity; Fiber to be placed for Interactive Distance Learning

Miltonvale Junior and Senior High Schools (Southern Cloud school district)

Bennington Junior and Senior High Schools (Twin Valley school district)

Tescott Junior and Senior High Schools (Twin Valley school district)

B. Columbus Telephone (Columbus)

Fiber-based Wide Area Network and Internet connectivity over T-1 lines on this network to: schools in Columbus' service territory and Southeast Kansas Area Technical School; In cooperation with Craw-Kan Telephone Cooperative, fiber connectivity to a multi-school consortium for Interactive Distance Learning, managed by Greenbush.

C. Epic Touch Co. (Elkhart)

Full motion DS3 based Interactive Television for Elkhart school district and the neighboring school district

Wide Area Network (10Mbps) for data transmission – Elkhart school district

Internet connectivity – 2.5 Mbps by 1 Mbps ADSL-based connection to the library

D. Haviland Telephone Company (Haviland)

Analog ITV to Conway Springs and Argonia public schools (credited SWBT for this capability), as well as Haviland and Mullinville schools on the A+ Network Internet connectivity – 128 Kbps access delivered jointly with SWBT via ISDN to Conway Springs and Mullinville. Haviland and Norwich schools (Kingman-Norwich school district) are currently provided dial-up Internet access. The company is planning to provide high-speed Internet using DSL to Conway Springs and Argonia and possibly 255 Kbps Internet access to the Haviland school district via DSL technology.

E. S&A Telephone Company (Allen)

Interactive Distance Learning – Northern Heights High School (North Lyon County school district)

Internet connectivity – Free 128 Kbps frame relay circuit – Northern Heights High School; free 56 Kbps digital dial-up to Admire and Reading schools (K-8) (North Lyon County school district); Wide Area Network and Internet connectivity circuit to Scranton Attendance Center (Santa Fe Trail school district); free 56 Kbps digital modem dial-up to North Lyon County Library District #1.

F. United Telephone Association (Dodge City)

Interactive video – Cimarron-Ensign school district, Ingalls school district, Ashland school district, and Hanston school district. Internet connectivity via T-1 lines – Montezuma school district; Spearville school district, Ingalls school district, and Hanston school district. The company is planning to deploy DSL connectivity, where feasible, in 2000.

G. Wamego Telephone Company (Wamego)

Wide Area connections from 10 Mbps to 100 Mbps plus Internet connectivity in certain schools in Wamego school district, Mill Creek Valley school district, and Rock Creek school district.

H. Wheat State Telephone, Inc. (Udall)

ITV system used by Udall public schools, along with several surrounding schools. The company maintains the portion of the fiber system used by the public schools; is planning to rebuild the Udall CATV system to make it capable of up to 8 Mbps signaling; and will begin upgrading its system to deploy DSL service in Spring of 2000.

I. Southern Kansas Telephone Company (Clearwater)

Wide Area Network and Internet connectivity – Clearwater school district, South Central Kansas Education Service Center (Clearwater), Clearwater Public Library, and Grenola Public Library. Internet connectivity – Dexter school district and public schools in Elk Valley school district (Longton) and Flint Hills school district (Rosalia). Wide Area Network and, planned for 2000, Internet connectivity – public schools in Central school district (Burden).

J. Pioneer Communications (Ulysses)

Interactive Distance Learning Network – Pioneer Communications is the prime contractor for the High Southwest Plains Interactive Distance Learning Network and does all the switching for the network. This network is a full-motion switched

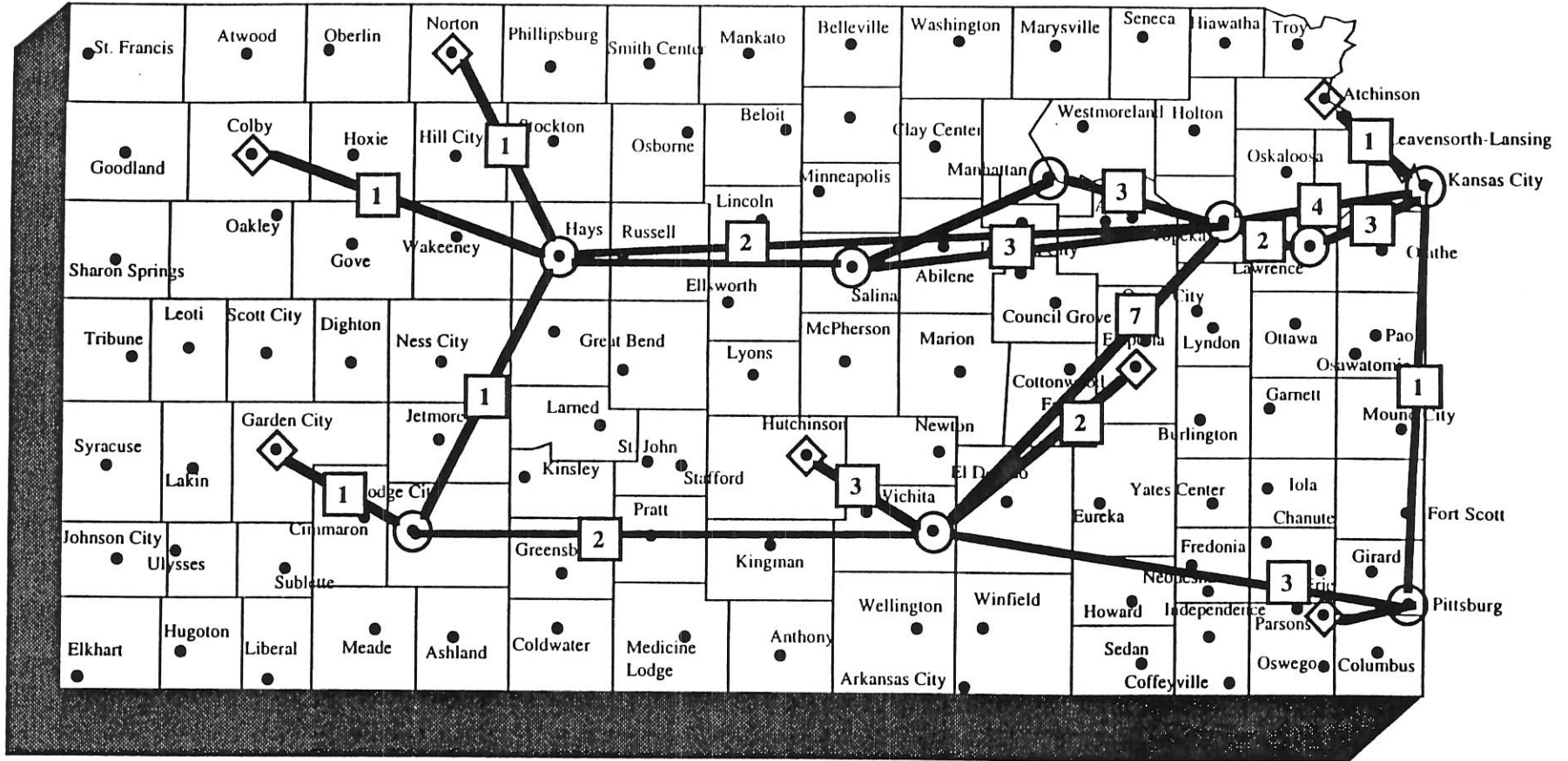
digital network providing service, in partnership with Southwestern Bell Telephone, Elkhart Telephone Company, and United Telephone Association, to 23 sites. Local Area Network and Wide Area Network fiber transport to Hugoton, Lakin, Moscow, and Ulysses school districts. Internet connectivity via T-1 lines to: Deerfield, Dodge City, Hugoton, Jetmore, Lakin, Leoti, Moscow, Rolla, Satanta, Sublette, Syracuse, and Ulysses school districts; Garden City High School and Holcomb High School; and Dodge City, Lakin, and Ulysses public libraries. Local dial-up Internet access to: Stanton County and Sharon Springs school districts; and Hugoton, Rolla, and Stanton County public libraries.

K. Moundridge Telephone Company (Moundridge)

Fiber-optic cable to all school buildings and Wide Area Network connectivity in Moundridge and Goessel school districts. Internet access via high-speed fiber optic connection to the Learning Consortium Educational Cooperative comprised of four school districts – Moundridge and Goessel (both served by Moundridge Telephone Company) and Canton-Galva and Hesston (not in the company's service area). Free fiber-based Internet access to Moundridge and Goessel public libraries. A DSL trial is currently underway; the company plans to offer DSL throughout its service area after the trial results have been evaluated.

ATTACHMENT 2

STATE OF KANSAS PRESENT BACKBONE NETWORK



- Network nodes with dynamic bandwidth control
- ◇ Network points with digital network termination capabilities
- 2 Number of backbone T1.5 circuits
- T1.5 Digital circuits

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ATTACHMENT 3

BELOIT Mitchell County Hospital Deb Beam Voice: 785-738-2266 FAX: 785-738-9460 860/9100	CLEARWATER South Central Kansas Education Service Center Kathy Reynolds Voice: 316-584-3300 FAX: 316-584-3307 887/3100	DCCC A-Plus Network-Dodge City Community College Debi Pippitt Voice: 316-873-2524 FAX: 316-873-2391 860/3100
DISC Division of Information Systems and Communications Sandy Lawrence Voice: 785-296-5098 FAX: 785-296-1951 173/8283	DISC2 Division of Information Systems and Communications Sandy Lawrence Voice: 785-296-8131 FAX: 785-296-1951 173/8283	EDUCATION Kansas State Board of Education Linda Grindol Voice: 785-296-4961 FAX: 785-296-7933 652/0000
ESU Emporia State University Kay Shireman Voice: 316-341-5748 FAX: 316-341-5894 379/0000	GEARY HOSP Geary Community Hospital Audrie Arends or Steve Rippert Voice: 785-762-5140 FAX: 785-238-5278 831/9100	GIRARD HOSP Hospital District #1 Donna Richett-Shireman Voice: 316-724-8291 FAX: 316-724-6332 683/0601
GOODLAND Northwest Regional Medical Center Sondra Krayca Voice: 785/899-6025 FAX: 785-899-7209	GREENBUSH, GREENBUSH2 Southeast Kansas Educational Service Center Carol Woolbright Voice: 316-724-6281 FAX: 316-724-6284 819/3100	HAYS AHEC Area Health Education Center Bev Brungardt Voice: 785-628-6128 FAX: 785-628-6034 683/0901
HERINGTON Teen-Technology Excellence in Education Network Dr. Sharon Tatge Voice: 785-258-2288 FAX: 785-258-3552 821/3100	HUTCHINSON CC Hutchinson Community College Janet Hamilton Voice: 316-665-3551 FAX: 316-665-3310 878/6100	KCPT Kansas City Public Television Susan Lenox Voice: 816-756-3580 FAX: 816-913-2500 768/0000
KCT KSU - Salina Deborah Mesz Voice: 785-826-2628 FAX: 785-826-2937 368/0000	KHU, KHU2 Fort Hays State University Ron Hart Voice: 785-628-4482 FAX: 785-628-4043 246/0000	KSU Kansas State University Susan Jagerson Voice: 785-532-7041 FAX: 785-532-7355 367/0306
KULDOLÉ, KUL ELLSWORTH University of Kansas Jack Proctor Voice: 785-864-9352 FAX: 785-864-9330 682/0001	KUMTM, KUMDE1, KUMDE1, KUMFM University of Kansas Medical Center Catherine Kinsey Voice: 913-588-7371 FAX: 913-588-7364 683/0301	LAKIN Kearny County Hospital Dawn Lee Voice: 316-335-7111 FAX: 316-355-6091 683/0701

<p>LARNED Larned State Hospital Doug Simmons Voice: 316-285-4126 FAX: 316-285-4399 410/0000 Larned Correctional Mental Health Facility 408/0000 Larned Juvenile Correctional Facility 412/0000</p>	<p>LIBERAL MED C Southwest Medical Center Gary Obermueller Voice 316-629-6290 888/9100</p>	<p>LOGAN HOSP Logan Community Hospital Eric Kohn Voice: 785-672-3211 FAX: 785-672-8184 855/9200</p>
<p>OAKLEY Northwest Kansas Educational Service Center Judy Rogers Voice: 785-672-3125x181 FAX: 785-672-3175 855/9100</p>	<p>OLATHE Olathe District Schools Jennifer Cutler Voice: 913-780-7006 FAX" 913-780-8150 846-3300</p>	<p>OSAWATOMIE Osawatome State Hospital Ella Everette Voice: 913-755-7210 FAX: 913-755-6808 494/0000</p>
<p>PARSONS Parsons State Hospital and Training Center Cynthia Willey Voice: 316-421-6550 x1734 FAX: 316-421-6550 x1791 Hospital 507/0000 KS-Training Center 682-0011</p>	<p>PITTSBURG Pittsburg State University Becky Krause Voice: 316-235-4601 FAX: 316-235-4545 385/0000</p>	<p>PRATT CC Pratt Community College Joyce Stratford Voice: 316-672-5641 FAX: 316-672-5288 872/6100</p>
<p>REGENTS CENTER Michael Henry Voice: 913-897-8410 FAX: 913-897-8490 Connected via microwave through KUL ELLSWORTH</p>	<p>SEWARD CO CC Seward County Community College Doug Brown Voice: 316-629-2665 FAX: 316-629-2725 888/6100</p>	<p>SHAWNEE Center for International Studies David Wolfe Voice: 913-993-9600 FAX: 913-993-9699 846-3200</p>
<p>ST ANTHONY Hays Medical Center - St. Anthony Campus Gary Good Voice: 785-625-7301 FAX: 785-623-5518 683/0501</p>	<p>ST CATHERINES & ST CATH-ER St. Catherine Hospital Patty Woods Voice: 316-272-2322 FAX: 316-272-2566 828/9100</p>	<p>SUBLETTE High Southwest Plains Network-HSPN Jerry Walters Voice: 316-675-2241 FAX: 316-675-8396 841/3300</p>
<p>UMKC University of Missouri at Kansas City Pat Fetters Voice: 816-235-1267 FAX: 816-235-1170</p>	<p>WASHBURN Washburn University Brenda White Voice: 785-231-1010 x1506 FAX: 785-231-1070 889-6300</p>	<p>WSM Wichita School of Medicine University of Kansas Cheryl Freeman Voice: 316-261-2605 FAX: 316-261-2628 683/0201</p>

WSU & WSU2 Wichita State University Tom Brock Voice: 316-978-3575 FAX: 316-978-3560 715/2329		
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TELENET 2

TELENET 2 is a statewide videoconferencing network which includes live videoconferencing and other instructional technology tools. The classrooms are located throughout Kansas and are equipped with a high powered personal computer, video camera, speaker phone, and state-of-the-art software-all linked together via Integrated Services Digital Network (ISDN) circuits. Local TELENET 2 staff assist students, handle course materials, order textbooks and operate the equipment.

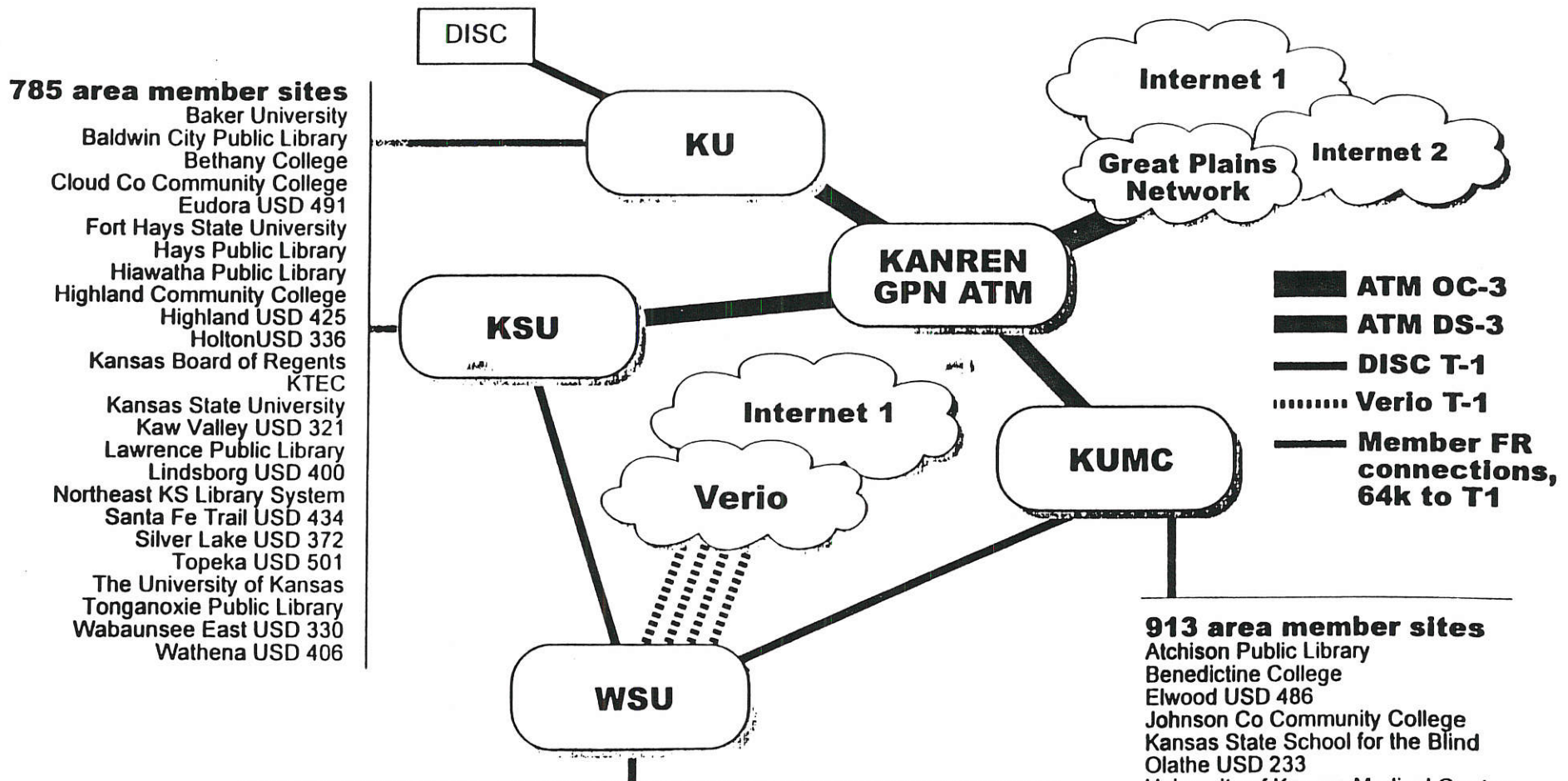
TELENET 2 locations are in:

Arkansas City	Emporia	Lawrence	Pratt
Belleville	Garden City	Liberal	Sabetha
Chanute	Great Bend	Manhattan	Salina
Colby	Hays	Marysville	Stockton
Concordia	Hutchinson	Norton	Sublette
Dodge City	Independence	Overland Park	Topeka
El Dorado	Kansas City	Pittsburg	Wichita

This page was last updated Monday, July 26, 1999
 For comments or suggestions contact [Linda Montgomery](#)

[Training Catalog Home](#) | [HR Home](#) | [SRS Home](#)

Kansas Research and Education Network KANREN



785 area member sites

- Baker University
- Baldwin City Public Library
- Bethany College
- Cloud Co Community College
- Eudora USD 491
- Fort Hays State University
- Hays Public Library
- Hiawatha Public Library
- Highland Community College
- Highland USD 425
- HoltonUSD 336
- Kansas Board of Regents
- KTEC
- Kansas State University
- Kaw Valley USD 321
- Lawrence Public Library
- Lindsborg USD 400
- Northeast KS Library System
- Santa Fe Trail USD 434
- Silver Lake USD 372
- Topeka USD 501
- The University of Kansas
- Tonganoxie Public Library
- Wabaunsee East USD 330
- Wathena USD 406

913 area member sites

- Atchison Public Library
- Benedictine College
- Elwood USD 486
- Johnson Co Community College
- Kansas State School for the Blind
- Olathe USD 233
- University of Kansas Medical Center

316 area member sites

- | | |
|---------------------------------------|--|
| Associated Colleges of Central Kansas | Hesston College |
| Bethel College | Kansas Law Enforcement Training Center |
| Barton Co Community College | McPherson College |
| Bucklin USD 459 | Pittsburg State University |
| Butler Co Community College | Pittsburg USD 250 |
| Central College | Pratt Community College |
| Coffeyville Community College | Seward County Community College |
| Cowley Co Community College | Southwestern College |
| Emporia State University | Sterling College |
| Fort Scott Community College | Sterling USD 376 |
| Frontenac USD 249 | Tabor College |
| Garden City Community College | Wichita State University |

Other members

- Colby Community College
- Friends University
- Washburn University

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ATTACHMENT 5

The K-20 board has the following powers and duties:

- (1) In cooperation with the educational sectors and other interested parties, to establish goals and measurable objectives for the network;
- (2) To ensure that the goals and measurable objectives of the network are the basis for any decisions or recommendations regarding the technical development and operation of the network;
- (3) To adopt, modify, and implement policies to facilitate network development, operation, and expansion. Such policies may include but need not be limited to the following issues: Quality of educational services; access to the network by recognized organizations and accredited institutions that deliver educational programming, including public libraries; prioritization of programming within limited resources; prioritization of access to the system and the sharing of technological advances; network security; identification and evaluation of emerging technologies for delivery of educational programs; future expansion or redirection of the system; network fee structures; and costs for the development and operation of the network;
- (4) To prepare and submit to the governor and the legislature a coordinated budget for network development, operation, and expansion. The budget shall include the recommendations of the K-20 board on (a) any state funding requested for network transport and equipment, distance education facilities and hardware or software specific to the use of the network, and proposed new network end sites, (b) annual copayments to be charged to public educational sector institutions and other public entities connected to the network, and (c) charges to nongovernmental entities connected to the network;
- (5) To adopt and monitor the implementation of a methodology to evaluate the effectiveness of the network in achieving the educational goals and measurable objectives;
- (6) To authorize the release of funds from the K-20 technology account under RCW 28D.02.060 (as recodified by this act) for network expenditures;
- (7) To establish by rule acceptable use policies governing user eligibility for participation in the K-20 network, acceptable uses of network resources, and procedures for enforcement of such policies. The K-20 board shall set forth appropriate procedures for enforcement of acceptable use policies, that may include suspension of network connections and removal of shared equipment for violations of network conditions or policies. However, the information services board shall have sole responsibility for the implementation of enforcement procedures relating to technical conditions of use.

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SPECIAL COMMITTEE ON EDUCATION

NEW METHODS OF DELIVERING INSTRUCTIONAL MATERIALS AND SERVICES TO K-12 STUDENTS AND CONNECTING SCHOOL DISTRICTS TO A STATE COMMUNICATIONS BACKBONE*

CONCLUSIONS AND RECOMMENDATIONS

The Special Committee on Education makes recommendations on two of the topics assigned to it in this report. With respect to one topic (new methodologies of delivering instructional services to K-12 students), the Committee recommends that there be an ongoing dialogue with the State Board of Education on the issues raised in the Distance Learning Task Force's preliminary report on virtual or online education. With respect to the second topic (connecting school districts to a state communications backbone), the Committee recommends the introduction and passage of a bill to establish a state education technology network (KAN-ED).

BACKGROUND

The Special Committee on Education was charged to review two topics that, due to their interrelated nature, are addressed together in this report.

- The first topic was requested by the Chairman of the House Committee on Education. This topic addresses new methods of delivering instructional materials and services to K-12 students, including, but not limited to, infrastructure requirements, curriculum issues, instructional skill requirements, and school funding formula implications.
- The second topic has its origin in a task force proposal to the Kansas State Board of Education which was considered by the Appropriations Subcommittee assigned to the FY 2000 budget of the Kan-

sas Department of Education. The proposal requested funding for an education network to connect all the school districts and interlocal cooperatives in Kansas to a state backbone for purposes of Internet access. (A backbone is a high-speed connection within a network that connects shorter, usually slower circuits.) A portion of the requested funding would provide greater bandwidth (capacity of a medium to transmit a signal) and enhanced services to 25 Kansas school districts. The House Appropriations Subcommittee recommended this proposal be considered further by an interim committee. In addition, both the House Education Committee and the House Utilities Committee requested interim consideration of this topic.

* HB 2591 was recommended by the Committee.

COMMITTEE ACTIVITIES

The Special Committee on Education devoted two meetings in August and September to a review of issues related to delivery of instructional services using technology and connecting of educational institutions to a statewide backbone. The first topic focuses on deployment of technology within and between schools in a school district. The second focuses on the means of expanding the applications of that technology and number of users of those applications through connection to the state backbone network. These topics are interrelated because the value of a network increases with use. If students and teachers have access to technology and training that enables them to more extensively use the network's services, they will benefit more from school district connection to the state's high-speed backbone. If they have in their classrooms and labs access to needed hardware, software, and technical support, they can make optimal use of the statewide network.

Delivery of Instructional Services

At its August meeting, the Committee heard a panel discussion on why creative thinking is needed in order to modify existing methods of delivering instruction in schools. Panelists included: the State Board of Education's Commissioner, the President of the Kansas Technology Enterprise Corporation (KTEC), the Superintendent of the Haven school district, and the Superintendent of the Basehor-Linwood school district. Other presentations addressed the impact of new technologies on:

- School buildings and classrooms (the Interactive Distance Learning Network Coordinator of the Southeast Kansas Distance Learning Network—Greenbush; the Assistant Superintendent and Director of Instructional Computing, Lawrence school district);

- Curriculum issues, such as how to incorporate technology into school curricula (a teacher and students from Uniontown High School and an elementary school teacher from Topeka);
- Instructional skill development and support (faculty of the University of Kansas and Emporia State University); and
- Library support for K-12 education (librarians from Holcomb and Salina's Instructional Media Center).

Specifically, the Committee heard presentations on the use of technology, as it affects:

- ***Employment Growth and Career Choices in Kansas.*** From 1991-1997, information and communications led other industry sectors in terms of employment growth. In Year 2000, 65 percent of the labor market is projected to be in the information technology area. Moreover, there are currently 2.3 million Internet-related jobs and 346,000 unfilled information technology jobs. Despite the recent and projected growth in information technology employment, Kansas ranks only 36th in the nation on percent of classrooms with Internet access. This finding raises the concern about the preparation of K-12 students for future employment in the fastest growing sector of the economy.
- ***New Methods of Instruction.*** The Committee heard two presentations providing examples of how technology can be used for distance learning.

Virtual Schools and Report on Virtual Schools. Technology can make a class lecture, a teacher's assistance to students, or library resources available 24 hours a day in a virtual or online school. Through this type of instruction, the concept of schools is no longer confined to bricks and mortar. For example, the Basehor-Linwood Virtual Charter School offers

online home-based instruction to over 325 K-12 students in 30 counties in Kansas. Each student has an iMac computer at home and access to a password protected website for instruction, homework, and collaboration with staff and other students. In addition, students can access educational facilitators and support staff online, as well as enrichment materials, activities, and field trips. Students enrolled in the virtual school receive either the school district's curriculum or a personalized curriculum, career counseling services, and standardized testing and pre- and post-assessments administered by the Basehor-Linwood school district.

The Committee received a preliminary report on virtual schools prepared by the Distance Learning Task Force established by the Commissioner of Education. The report includes a statement of philosophy and responds to questions concerning student enrollment and credits, monitoring attendance, monitoring the quality of instruction, determining student mastery, and determining sources of payment and funding for online courses.

Interactive Video. Technology enables students to learn through interactive video presentations in or outside of classroom settings. For example, students served by the Southeast Kansas Education Service Center (Greenbush) have had interactive video conferences with: NASA astronauts at Johnson Space Center, high school students and teachers in Russia and Japan, Congressional Representatives in Washington, D.C., and state elected officials. Instruction using full motion, two-way interactive video services requires investments in classroom and network equipment, availability of technical support, and ongoing scheduling to coordinate use of equipment and staff.

- ***Wiring Classrooms and Buildings.*** Wiring classrooms and buildings in school

districts affects infrastructure planning and technical support, as was discussed in a presentation by the staff of the Lawrence school district. Wiring initiatives also affect teachers' and administrators' classroom responsibilities, policies on computer use, and assessments of student achievement, as explained by administrators, teachers, and staff of the Auburn Washburn school district.

Methods of Connecting Facilities. School districts have been using various methods of connecting their facilities to Internet service providers. Historically, the most prevalent form of connection has been through dial-up modems which have a limited bandwidth. Nearly one-third of Kansas school districts still rely on this type of connection to some extent. Modems can be used by only one person at a time. Moreover, they cannot be used for transferring large data files and arranging video conferences. In recent years, schools wanting high-speed Internet access for their teachers and students have relied increasingly on wire line connections using enhanced services provided by telephone companies. However, cable modems used by 32 Kansas school districts are rapidly becoming viable competitors to telephone line-based connectivity services and wireless connectivity used by 34 Kansas school districts also is becoming more prevalent. (See the Fall 1999 survey by the Kansas State Department of Education for data on connectivity in Kansas school districts.)

E-Rate Funding. Due to availability of federal E-rate funding, certain school districts have invested in internal wiring and connections. E-rates have enabled school districts meeting certain criteria to receive discounts for those investments, in addition to discounted rates for Internet access and telecommunications services. For the 1998-1999 school year, 202 Kansas school districts received E-rate funds that totaled just under \$9.7

million. Of that amount, \$1.75 million was applied to internal wiring and connections.

Lawrence. The Assistant Superintendent of the Lawrence school district, together with the Director of Instructional Computing, described the development of the district's network. In 1996, after four years of planning, the Lawrence school district adopted a technology plan. The school district contracted with Sunflower Cablevision for fiber connections. The school district faced challenges in networking its schools given the age of some of the buildings, their architectural design, and the presence of asbestos. Based upon their experiences, the conferees recommended that school districts implementing technology plans consider: changing technologies to ensure the best connection for the money; needed investments in network upgrades; and ongoing technical support and training.

Auburn Washburn. The Committee visited Washburn Rural High School. The Auburn Washburn school district contracted with Multimedia Cablevision for the installation of fiber within and between its schools. Information was presented on several applications made possible through high-speed connections, including science instruction provided to 2nd grade students via the Intranet (a computer network which relies on Internet protocols and is used for the internal purposes of a school, company, or other group), and on the impact of the new technology on the school district's teacher training, curriculum development, and assessment tools.

- **Integration into the Curriculum.** Technology, which is integrated effectively into coursework, can enhance a student's or teacher's ability to research, analyze, apply information, communicate, and engage in collaborative writing. The

Committee heard examples of how technology is integrated and how such integration is encouraged through federal and state initiatives.

History Course. A student from Uniontown High School demonstrated effective use of technology by presenting a nationally-recognized documentary film she produced on the impact of the Tuskegee Syphilis Experiment. (This was an experiment conducted by the U.S. Public Health Service which denied treatment for syphilis to certain African-American men, the intent of which was to compare the effect of the disease on African-Americans and Caucasians.) Using the Internet, the student interviewed historians and participants in the study.

Technology Literacy Challenge Fund. This federally-funded program promotes technology integration through the use of local, state, and private sector partnerships. The program's goal is to ensure that all students are technologically literate by the beginning of the 21st Century. The Kansas Department of Education distributes this money through competitive grants to school districts. In the third program year (FY 1999), the Department awarded 77 grants ranging from \$15,000 to \$70,000, totaling \$3,061,000. These grants were targeted to:

- student leadership programs, such as the Generation www.Y Program, a student leadership conference, and Camp Techiwannabie;
- technology integration using the TAKE a STEP framework, which consists of standards used by teachers and students to assess their understanding of educational technologies; and
- professional development through technology-related workshops and the SRC*TEC electronic survey and mea-

surement tool, Profiler. This assessment tool, which relies on the TAKE a STEP framework, enables teachers to evaluate their competency in technology integration.

- **Preservice and Inservice Teacher Training.** One of the greatest challenges for teachers is learning how to effectively integrate technology into their courses. According to a recent article in *Education Week* (September 23, 1999), "the best integration training does more than simply show teachers where in a curriculum they can squeeze in some technology. Instead, it helps them learn how to select digital content (software tools) based on the needs and learning styles of their students, and infuse it into the curriculum rather than making it an end in itself." Surveys and studies continue to confirm that a lack of training is the most important obstacle inhibiting teachers' use of computer technology and software.

Preservice and inservice teacher training on technology integration is offered at various Kansas postsecondary institutions. For example, Emporia State University offers a course titled *Internet Uses in Education* for prospective K-12 teachers on how to use the Internet for: finding and using lesson plans; using on-line and cooperative education with students; subscribing to listserv lists in education; using ERIC online (a comprehensive bibliography of educational materials); accessing and employing web search engines in education, handling computer files; and web page design. Master's degree courses also are offered by Emporia State for practicing teachers in pre-school and K-12 who wish to apply technology and related software to teaching problems and procedures.

- **Library Resource Availability and Applications.** Online access to library resources is an important component of K-

12 technology-based instruction. For example, Auburn Washburn schools use three primary Internet resources: an online encyclopedia system; an index containing over 400 magazines; and a social issues research database containing full text magazines and newspaper articles. In addition, online college courses are offered on using automated information resources, such as those available at Auburn Washburn. A course offered at Emporia State University provides students with necessary skills to: select and develop a research topic and effective search strategy; find appropriate resources for identifying research materials; and use both library catalogs and electronic databases to locate information resources on a selected topic. These research skills could be incorporated into courses for K-12 students.

Connecting School Districts to a State Communications Backbone

There are several networks connecting educational institutions in Kansas, but there is no statewide network which links all the educational institutions to a single fiber optic backbone. (Fiber optics is a transmission technology that uses light as an information carrier and has enormous bandwidth capacity.)

The policy issue before the Committee is on the advisability of funding the establishment and maintenance of a statewide network that would provide most or all Kansas educational institutions voice, data, and video services through access to a high-speed, high-bandwidth fiber optic backbone.

Technology-Based Education Networks.

At its August and September meetings, the Committee heard presentations on several technology-based education networks:

- The KANS-A-N network, administered by the Division of Information Systems and Communications (DISC) within the Kan-

sas Department of Administration, which provides voice, video, and data services predominantly to state agencies and Regents universities;

- Southwestern Bell's Broadband Education Service—Interactive Distance Learning, which provides full-motion two-way interactive video services to four clusters of Kansas school districts;
- The Great Plains Network, which is a consortium of Great Plains states, including Kansas, dedicated to supporting research through the use of networking technology (very high speed links to the Internet);
- The Kansas Research Education Network (KANREN), which provides high-speed Internet service, consulting, network monitoring and diagnostics, and training and technical support to its 59 nonprofit consortium members consisting of all the Regents institutions and the KU Medical Center, 12 private colleges and universities, 12 community colleges, 17 school districts, six public libraries, and five other education and research-based institutions;
- The Missouri Research and Education Network (MOREnet), which is an expanded version of KANREN, providing dedicated Internet connections, network and security services, technical support, training, electronic subscriptions, and other services to public and private postsecondary institutions, almost all Missouri school districts, most of Missouri's public libraries, state agencies and Missouri communities; and
- Washington's K-20 Network, which provides high-speed connections to the state backbone for all the universities, community and technical colleges, and school districts in the state. (Libraries are scheduled for high-speed connection to the state backbone in the future.)

(These networks are described in greater detail in a staff memorandum to the Committee dated September 20, 1999.)

KAN-ED Proposal. At its September meeting, the Committee considered a proposal for a technology-based education network which was crafted by various representatives of the education and information technology community, including: the Commissioner of Education; the State Librarian; the Director of KANREN; the Director of DISC; the Assistant Vice-Chancellor for Information Services, University of Kansas; and the President of KTEC. The proposal establishes the KAN-ED network. The network is an expansion of the state's high speed backbone which is currently managed by DISC. KAN-ED would provide Internet connectivity to 304 school districts, 330 public libraries, and 28 education service centers (school district interlocal cooperatives and school district cooperatives) in Kansas and would make available state-of-the-art high bandwidth connections to 25 school districts and 20 libraries for research and development of advanced network applications.

The proposal requires DISC, through its Bureau of Telecommunications, to provide administrative services, engineering services, the Network Control Center, backbone circuits, and contract management. The proposal also requires DISC to partner with KANREN for technical support and other network support to schools and libraries. Preliminary estimates for investments in the proposed KAN-ED network total \$17.5 million for the first year and \$13 million in subsequent years.

KAN-ED Bill. Following deliberations on the proposal, the Committee requested that a bill be drafted, with input from the proposal's authors, to codify the concepts of the proposal summarized above. The key provisions of the bill are summarized in the conclusions and recommendations section of the report.

Benefits of KAN-ED. Proponents cite the following benefits of the KAN-ED network:

- KAN-ED could encourage coordinated planning, purchasing, monitoring, and service delivery, thus maximizing state resources and expertise.
- KAN-ED would increase DISC's leveraging capability as a volume purchaser of telecommunications goods and services which, in turn, could spur investments by vendors in more sparsely populated parts of the state.
- KAN-ED would enable the state to realize savings from increased purchasing power for online databases and network components.
- KAN-ED would make it possible for DISC to average telecommunications costs for "the last mile," thus equalizing connectivity rates among all school districts.
- KAN-ED might cause savings to result from centralized E-rate discount applications for network infrastructure. (Presumably, school districts would continue to apply individually for e-rate discounts to wire schools under their jurisdiction.)
- KAN-ED could make it more affordable for many small businesses to engage in e-commerce as they would be in closer proximity to network nodes resulting from an expanded state backbone.
- KAN-ED would enable successful education programs to be more easily expanded and offered statewide.
- KAN-ED would enable educational opportunities to be maximized through expanded web-based and, later, video-based course availability and would increase partnerships between educational institutions and sharing of curriculum and courses.
- KAN-ED would provide a means of offering preservice teacher training and continuing education interactively throughout Kansas.
- KAN-ED would make available, through KANREN, information technology staff support for all schools and libraries on a more equitable basis; a larger network may be better positioned to recruit and retain such staff.
- KAN-ED could encourage the adoption of uniform technical standards for interoperability and future growth of information services.
- KAN-ED would keep Kansas traffic in Kansas because the network backbone will allow data to flow from one connected site to another and the traffic will not have to go onto the commercial Internet where it could move all over the country from one national provider network to another. Therefore, transmission speed and performance could improve.
- KAN-ED funding for state-of-the-art high bandwidth connections to 25 school districts and 20 libraries should promote research and development of advanced network applications and lead to more efficient use of integrated voice, data, and video services at the desktop.

CONCLUSIONS AND RECOMMENDATIONS

With respect to the subject of new methodologies of delivering instructional services to K-12 students, the Committee recommends that there be an ongoing dialogue with the State Board of Education on the issues raised in the Distance Learning Task Force's preliminary report on virtual or online education. The report includes a statement of philosophy and responds to questions concerning student enrollment and credits, monitoring attendance, monitoring the quality of instruction, determining student mastery, and deter-

mining sources of payment and funding for online courses.

With respect to the issue of connecting school districts to a state communications backbone, the Committee recommends the introduction and passage of a bill to establish a state education technology network (KAN-ED). The bill would establish a mechanism for development of a plan to connect school districts, education service centers, and libraries to the state's backbone, and for approving and funding the hardware, software, and technical support needed to implement the project objectives outlined in the

plan. In addition, the bill would establish the three-member KAN-ED Information Technology Committee within the Department of Education. The Committee includes representation from the State Department of Education, the State Library, and the State Board of Regents. The Committee would meet in an advisory capacity to develop the connectivity plan and to engage in other education-related initiatives involving collaboration. Finally, the bill would subject all contracts for KAN-ED telecommunications services to the statutorily-authorized contractual procedures governing DISC's acquisition of telecommunications services.