Voice & Data Services

Telenet

By using the ICN's voice services, the Iowa Area Community Colleges' Teleconferencing Network has opened the door to more people with greater efficiency through the effective use of the ICN's teleconferencing system.

Prior to hooking up with the ICN, the community colleges had been using a live system with hard wire cables that went into a designated conference room. If someone wanted to conference, they would schedule the meeting, contact the participants and then go to the room with the equipment. Because it was live, anyone could go to their designated room, turn on the equipment and listen to the conversation.

Now every community college in Iowa has access to each other in a more private and personal way. The ICN has relieved the community colleges of a live system and they are also able to conference from almost anywhere, at anytime.

According to Pam Swarts, Director of Iowa Area Community College Teleconferencing Network, several projects have been able to take place because of using the ICN's voice service. "We have a network of people from 18 campuses developing a grant proposal, and because of the (teleconferencing) bridge, have been able to meet every Wednesday morning for the past 2 months," comments Swarts. "These meetings have included people who have never been able to participate because they would have to travel such long distances to get to a

Imagine That!

The fiber optic network can carry 32,000 times more telephone traffic than current copper lines.

After creating the Iowa Communications Network to provide video distance learning throughout Iowa, legislators realized they could more effectively utilize the capability of the Network by offering a central voice and data system. The centralized voice and data plan originally included only state agencies. Today, state agencies, K-12 education and higher education institutions are among the largest users of these services. This system allows users to save money and, in turn, provide Iowans with faster service.

Voice Mission & Services

The purpose of the Iowa Communications Network voice services is to provide all authorized users a statewide equalized rate. The ICN is able to do that because voice traffic from users all over the state is aggregated on a DMS 500 Switch (see page 13) and the Network is able to utilize volume discounts offered by interstate long distance carriers.

Previously, each state agencies chose a long distance phone carrier. The Capitol Complex, in downtown Des Moines, was already receiving a volume discount for its large amount of voice traffic; however, the smaller agencies in other areas of the state were not offered the discounted rates. By choosing the ICN, as their long distance carrier, the smaller agencies and offices have saved up to 50 percent on their long distance phone bills.

Presently, all authorized users (except telemedicine) may choose the ICN for their long distance carrier. Some of the current users include the Department of Revenue and Finance, Department of Human Services, Waldorf College, Allamakee Community High School, and Grimes Community Library.

Switching Service - Everyone makes long distance calls and the advantage to the ICN user is that regardless of where in the state an authorized user is located, the same services at the same rate are available. The ICN rates are very competitive in the major markets.

800 Service - The advantages of using 800 phone numbers is

Voice & Data Services

well known to authorized users providing a service to customers not in their local calling area. The use of this service has increased by 71 percent in its second year of offering.

Credit Card Service - Like other telecommunications companies, the ICN also offers credit cards to its authorized users. The number of credit card users has grown rapidly in its first full year of service. The rates for this card are very competitive when compared with cards issued by other long distance carriers.

Data Mission & Service

Data services provide our users with efficient transmission of data and information. By using frame relay switching service, the ICN can bundle all the traffic, just as in voice, and send it to the designated destination in a more timely and cost efficient manner. This allows the user to receive a lower rate for transmission of information.

State agencies use the ICN's data service to transmit such information as drivers' license applications, social security checks and voter registration. The Department of Human Services can transmit information to various offices throughout the state in a fast, cost efficient manner because the ICN provides a link to each of the offices.

Future Services

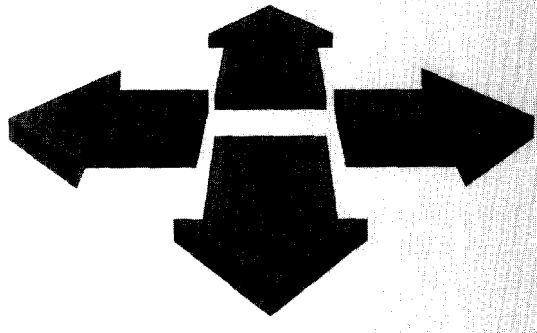
The ICN also offers dialable wideband switching (DWS) services using primary rate Integrated Services Digital Network (ISDN) which is just becoming available in Iowa in some of the metropolitan areas. ISDN lines use digital, instead of analog, protocol which is currently used for most telephone lines. ISDN allows digital connections at up to 1.5 mbps over the same twisted-pair telephone line. Voice conversations which were previously digitized in the Network, are now digitized inside the ISDN telephone set, allowing voice and data to communicate over a common interface.

Register to Vote

Voter registration has been made easier through the Iowa Department of Transportation (IDOT).

Iowans renewing their licenses this past fall were offered the opportunity to register to vote. Voter registration information was gathered at the Drivers' License Stations and with the assistance of ICN's data services, was able to be distributed to the appropriate counties. In Fiscal Year 1996, an estimated 146,000 citizens took advantage of the voter registration.

The IDOT uses ICN's Data Services for more efficient transmission of data and to offer better service to the citizens of Iowa.

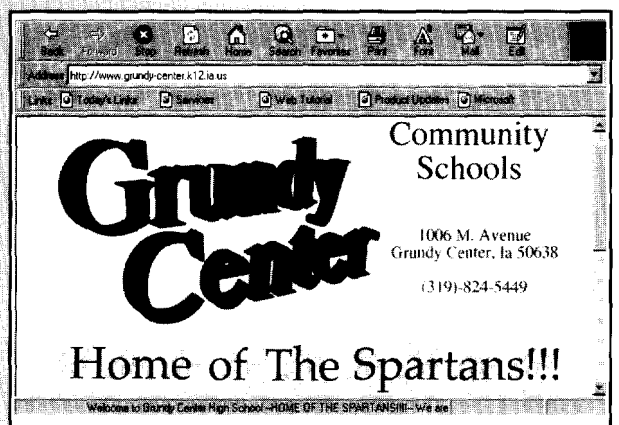


Giving $$$ Back

In FY 1996, the ICN reimbursed $3.9 million to local providers and local exchange carriers (LEC) for voice services.

The ICN also reimbursed $2.957 million to local providers for data services.

Internet Services



Grundy Center High School was one of the first schools to create their own webpage for the Internet. They have students enrolled in HTML classes; the program that turns documents into Internet material.

Students are also allowed to create their own personal webpages and according to their instructor, more and more students want to learn about the Internet, HTML and webpages.

ICN Internet Mission & Service

The Internet is the world's Information Highway. There is a world of information out there and the ICN, within its mission statement, indicates its desire to provide all authorized users the ability to communicate in the most effective and efficient manner.

The ICN got into the Internet business to assure equalized availability and rate structures for authorized users of this fast-growing form of information transfer. As the number of ICN users grew, the Universities, which had been providing the connection, felt their responsibilities had been surpassed; therefore, the ICN became an Internet provider.

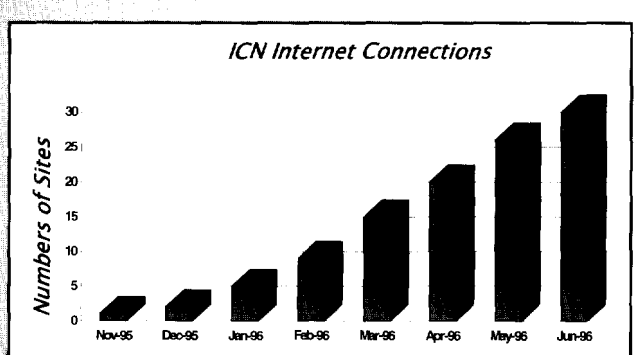
Currently the Iowa Communications Network offers only direct connection services which are described below.

Direct Connection - may be made to the Internet backbone by connecting local area networks and high speed communication lines. The Iowa Communications Network's Education Network (EDNET) has DS-3 connectivity to the Internet backbone.

Instead of using a regular phone line, which is limited to 28,800 bits per second under the best conditions, a direct connection (leased line or frame relay) connects networked computers to the Internet at speeds ranging from 56,000 bits per second to 1.5 million bits per second (that's 48 times faster than the fastest modem currently available). These connections allow multiple users to access the Internet at high speeds through a

Imagine That!

The fiber optic network can download an entire Encyclopedia Britannica to a school district server in 1.5 minutes!



Access to Worldwide Data

- Internet becomes a high priority in Iowa schools.
- Research, interaction and interactive education
- Creative new learning opportunities for students, regardless of school size and location.

Internet Services

local area network (LAN) or a wide area network (WAN) .

A direct connection allows multiple, simultaneous user access, quick access to graphics, and the capability to do audio and video conferencing/chats.

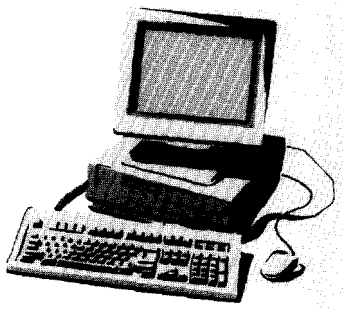
Direct Connection Using Aggregation - Besides offering each site a direct connection to the Internet, the ICN offers sites a connection to the Internet through an aggregation site. The aggregating site requires one high speed (56K or T-1) frame relay communications connection from the site to the aggregation site. Sites will aggregate to the shared router which will "route" the Internet traffic to the ICN gateway through a T-1 frame relay connection. It is the aggregation and the nature of frame relay pricing that makes this the most cost effective method for a direct connection to the Internet. In other words, the more sites that aggregate, the less the monthly charges will be per aggregated site.

ICN Internet Future

During the summer of 1996, the ITTC Commission appointed a task force to study the best approach to connecting the authorized users to the Internet when they are at their home residence.

This is a complex issue which needs to use the local and state private Internet providers to the maximum extent possible so that each local dial area has affordable quality Internet service.

A student tries out the Internet during an Internet demonstration at the Living History Farms.



Visit the ICN Website at www.icn.state.ia.us

Keeping History Alive

Clearfield history teacher, Jane Briley, uses the Internet to help teach her students as well as the rest of the world.

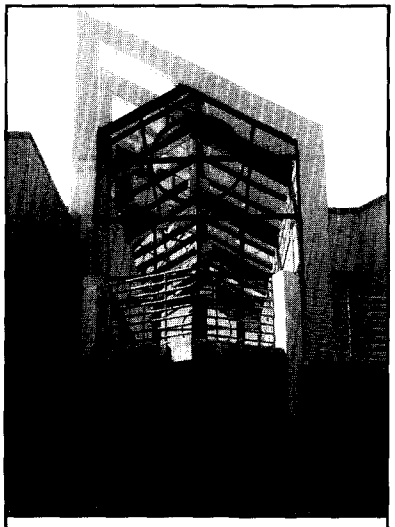
Briley has designed her own webpage to include a history about Southern Iowa. Since the Mormon Trail played such a large role in many ancestors' lives, Briley has included information on the Mormon Trail in Iowa. It even includes excerpts from diaries.

Not only can students learn about their ancestors in the classroom, but they can share this knowledge with their parents.

ICN Projects

Federal Projects
Part III
Telemedicine
Enterprise Messaging
Iowa National Guard
Telejustice

Federal Projects



Indian Hills Community College Multipurpose Video Conferencing Center in Ottumwa.

The federal government appropriated $3 million for Iowa in Fiscal Year (FY) 1995 and $6 million in FY 1996 to fund several projects. Federal 2 or FY 1996 projects included: Assistive Technology, Agriculture, Electronic Commerce, Law Enforcement/Corrections/Public Safety, Indian Hills Community College-Extension Centers, Internet Services, Social Security Administration, Telemedicine Services, and General Government Enhancements. Implementation of these projects will benefit Iowans statewide.

Assistive Technology, for example, will benefit the Iowa Braille School by allowing those with impaired sight to see an image close up in a classroom rather than on a large screen several feet away. This will be done by installing a monitor at each seat in the video classroom. Indian Hills Community College's Video Conferencing and Training Center is part of a federal pilot project to make government services more efficient. For example, an Ottumwa veteran will have increased and quicker access to information about benefits, vocational rehabilitation and GI home loans.

The federal government has proposed an appropriation of $10 million for FY 1997 for development and advancement of projects. These projects include ICN connections at regional centers, new extension centers for Indian Hills Community College, federal courthouses, Anamosa and Rockwell City prisons, a Geographic Information System, innovative law enforcement enhancements, Department of Human Services information technology, teleradiology and virtual hospital initiatives, educational instruction on Internet use for government and citizens, government-wide e-mail, and desktop video projects. Geographic Information System (GIS), for example, will be working in conjunction with the Governor's Intergovernmental Information Technology Taskforce (IITT). By using the ICN to transfer data, the GIS will be able to meet the growing needs of information technology and to serve the citizens of Iowa in a more timely fashion.

Part III Project

In 1994, the Iowa Legislature passed a bill that would expand the Iowa Communications Network. Parts I and II were designated as the backbone of the Network by placing one fiber connection in each of the 99 counties in Iowa. From there, Part III will extend a fiber connection to every school district, area education agency and library in the state of Iowa.

Exira fifth grade students interviewed children's author Joan Lowery Nixon over the ICN.
Photo courtesy of Elk Horn-Kimballton Review

By June of 1999, the Part III project will connect 474 additional sites to the ICN. Through this connection, students will be able to interact with other students over the Network. They can share classes and teachers which will allow students in smaller schools the same opportunities that are offered to the larger schools. For example, instead of just offering foreign languages at the first and second levels, students will be offered four years or the equivalent.

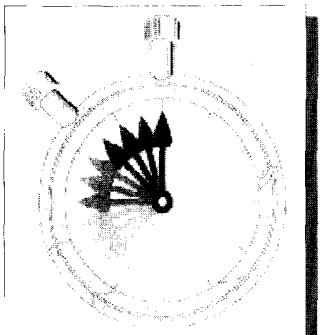
Libraries, with the help of the State of Iowa Libraries' On-line (SILO), will be able to connect with each other through the use of the Internet and will be able to research the availability of a book or reference material by accessing all libraries throughout the state. This will enable smaller libraries to be a better resource for information.

Telemedicine

Iowa Methodist Medical Center nurse uses the ICN to examine a baby.
Photo courtesy of IMMC

A nationwide effort to upgrade rural medical care prompted the ICN and Iowa Methodist Medical Center (IMMC) in Des Moines to pilot a telemedicine program. It includes both video and data transmission over the Network. In 1994, Methodist linked three rural hospitals through the ICN. IMMC developed a portable cart that could carry a full-motion video connection. Since then, IMMC has performed on-line ultrasounds and teleradiology as well as consultations and diagnosis.

IMMC is not the only hospital to take advantage of telemedicine. The Midwest Rural Telemedicine Consortium (MRTC), based out of Mercy Medical Center in Des Moines and North Iowa Mercy Health Center in Mason City has already connected 11 rural hospitals and plans to connect 10 more. MRTC's primary use for the connection is to hold video consultations and to offer special training for doctors.



The average length of a telemedicine consultation... 25 minutes

Graphic courtesy of MRTC

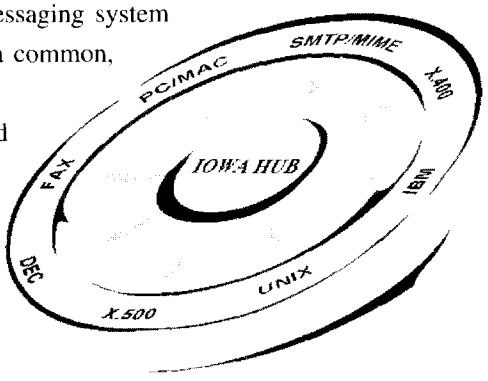
In the spring of 1994, the University of Iowa was awarded a three-year contract to develop and administer a health services telecommunications network. Hospitals across Iowa are hooked up to this network and have access to various medical databases, including the Virtual Hospital. It is a digital health sciences library and multimedia information source that is available to health care professionals and patients 24 hours a day. Virtual Hospital provides information for medical practice, continuing education and patient awareness.

Enterprise Messaging

The ICN has begun the task of implementing an enterprise-wide electronic messaging system *without* mandating that all state agencies and other authorized users subscribe to a common, centrally managed electronic messaging system.

The state of Iowa currently maintains a variety of incompatible LAN-based and mainframe-based electronic mail systems. This means that organizations cannot exchange mail among themselves. That is where the ICN can assist.

The ICN will be implementing a system called *IowaHub*. It will connect various organizations' electronic messaging system and their directories for information exchange. For example, *IowaHub* will enable an Office Vision user on an IBM mainframe to send mail to a Lotus Notes or Microsoft Exchange user on a PC LAN. By connecting the directories of these different messaging packages, *IowaHub* will provide a comprehensive directory of addresses and other information enterprise wide.



Logo courtesy of Control Data

The system will also provide the infrastructure to support electronic commerce, which is the transmission of financial data and money, and electronic data interchange across the many computing environments in state government.

The *IowaHub* electronic messaging will be available to ICN authorized users in early 1997.

Iowa National Guard

With completion of the Sioux City Armory connection, the Iowa National Guard has finished its construction of video conferencing classrooms on the ICN in early Fiscal Year 1997. A total of 57 classrooms placed in armories, air bases and aviation support facilities are currently running on the Network. The Iowa National Guard's plan to allow classroom access to local communities is operational. There are seven regional coordinators in place to support the scheduling, training and technical support needs of both soldiers and civilians. In addition to the administrative, training and educational uses of the classrooms, the National Guard has had many exciting and groundbreaking experiences with other state and federal agencies, educational and telemedicine providers.

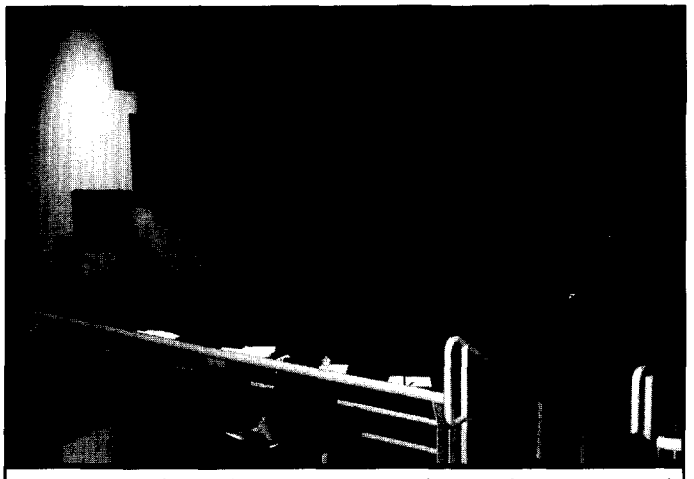
As a new initiative at the national level, the Iowa National Guard will be networked to a national ATM data system known as the Reserve Component Automation System (RCAS). This will greatly streamline the unit reporting to both state and federal levels and will increase the support to the members of the National Guard; thereby, increasing their readiness for state and federal deployment. Iowa will be designated by the Army National Guard as one of six hub sites in a national network called the National Distance Network. The National Distance Network will allow distance learning on a nationwide basis for the Guard. Each of the National Guard's headquarters in 50 states and four territories will have at least one distance learning classroom.

Telejustice

The Iowa Board of Parole and the U.S. Magistrate, Bankruptcy and District Courts are utilizing the ICN's full motion and dialable wideband video services to conduct hearings.

James Twedt, Senior Parole Judge, with the Iowa Parole Board, uses the ICN to conduct parole hearings from his office in Des Moines with inmates across the state. Prior to the ICN, Judge Twedt traveled hundreds of miles each day in order to complete parole interviews. Now he is able to conduct more hearings as well as save time and mileage for each interview.

In addition to parole interviews, the Board utilizes the ICN for their registered victim input process and parole revocation hearings. The ICN has also been used for parole education; allowing college students to study the judicial process by observing actual parole interviews.



Senior Parole Judge James Twedt conducts a parole revocation hearing over the Network. Governors' advisors from across the U.S. watch from STARC Armory.

The U.S. Courts are using the ICN as a testbed for bankruptcy, magistrate and district court sessions for many of the same reasons as the Iowa Parole Board. According to Deputy Marshal Phyliss Henry, the ICN has allowed federal judges and their support staff to minimize travel time and remain in the courtroom more often. Iowans will not have to wait as long for their court dates. Therefore, cutting down in travel time will help judges speed up the judicial process.

ICN Awards & Recognition

Although awards were not the goal of the Network, receipt of awards does indicate a measure of success. The ICN is proud to be the only state in the nation providing fiber optic connection to every county in the state. Other recognition the ICN has received includes:

- *Network World*, a newsweekly of network computing awarded the state of Iowa the 10th Annual User Excellence award in November 1994. The award is given to recognize those who have utilized network technology in a daring and different way.
- The Computerworld Smithsonian Award for heroic achievement in Information Technology was awarded to the state of Iowa in June of 1995, for visionary use of information technology in the field of "Innovator." The ICN was also recognized in December 1994, *Newsweek* magazine as well as *Business Week*, *Governing* and *PC Week*.
- Chief Operating Officer, of the ICN, Tommy Thompson, along with Ginny Wagner of Methodist Medical Center in Des Moines, attended a multimedia conference in Japan in 1995. Thompson spoke to the conference delegates about promoting integration of multimedia in education. He briefly described the Network and what will be available to Iowans through the ICN.
- Delegates from other countries have visited the ICN for tours, additional information on technology and just to see how it works. Countries which have sent delegates have included: Japan, Switzerland, Korea, New Zealand and Spain.

The Future Outlook

Technology is constantly changing and even though the ICN uses the most efficient transmission method with a DS-3 transmitter it will soon need to be updated.

Presently, the Network is set up with a series of star-on-star end points where the fiber travels from the ICN HUB-to the regional HUB-to the actual sites. In the works, is a plan to create a redundant network with a ring topology rather than star-on-star. By switching to a ring topology, the ICN main HUB will be relieved of some of the traffic of the Network; giving the regional HUBs more control of the traffic for their own merged area. It will be a more dynamic network by allowing for alternate routing in the case of a catastrophic failure.

The ICN will also be increasing the capacity of Parts I and II of the Network by updating electronics to accommodate the increasing video classrooms to over 800 by the end of FY 1999. Originally 500 classrooms were expected to be connected to the ICN. The ICN will continue to use the existing DS-3 electronics to the maximum extent possible and enhance it by upgrading the backbone to an Asychronous Transfer Mode (ATM) based system by adding ATM switches. Converting to an ATM system will be advantageous for several reasons. First, it is more cost efficient to install an ATM switch than it is to completely replace the aging DS-3 electronics on the Network. Second, an ATM based system is dynamic in the sense that it is able to provide analysis of bandwidth utilization. For example, currently, if a OC-48 has 48 circuits and 40 of them are being used and eight are not, the eight idle channels cannot be used to support other needed channels. However, with an ATM system, all capacity is available for use based on need rather than dedicated to a specific classroom. The increase in available bandwidth will allow the Network to be more responsive.

Another reason for the Network upgrade is that selected electronic components of the Network have an expected life cycle of seven years. The ICN is at the end of its fourth year in this cycle. These components will need to be replaced to assure Network responsiveness and minimize repair costs.

Finally, the ICN will be decentralizing the video scheduling. Currently, to use a full motion video classroom, one has to make a reservation through the regional scheduler. The objective is to allow video scheduling at the user level, using his/her own PC.

Appendix

Financial Review Glossary

Financial Review

(Year End June 30, 1996 - Unaudited)

Balance Sheet

Assets

Current Assets:

Cash and cash equivalents	$ 25,839,720
Net accounts receivable	6,545,480
Interest receivable	94,080
Due from other state agencies	2,103,551
Inventory	4,984,044
Short term investments	1,004,474
Total current assets	40,571,349
Investments	3,451,898
Net fixed assets	87,978,740
Prepaid expense	1,009,046
Net bond issue costs	2,184,844
Total assets	**$135,195,877**

Liabilities and Fund Equity

Current liabilities:

Accounts payable	$ 12,306,450
Due to other state agencies	612,716
Interest payable	3,203,880
Deposits held in custody for others	1,496,919
Compensated absences	92,708
Current certificates of participation	7,315,000
Total current liabilities	25,096,579

Non-Current Liabilities:

Net certificates of participation	99,381,109
Total liabilities	124,408,782

Fund Equity:

Contributed capital	26,973,669
Retained earnings	(16,186,574)
Total fund equity	10,787,095
Total liabilities and fund equity	**$ 135,195,877**

Statement of Revenues and Expenses

Operating Revenues:

Sales, rents, and services	$ 17,363,365

Operating Expenses:

Direct expenses	13,152,919
Depreciation expense	9,101,897
Other operating expense	5,313,252
General and administration expense	3,516,013
Total operating expenses	31,084,081
Operating Loss	(13,720,716)

Non-Operating Revenues (expenses):

Intragovernmental	14,239,118
Federal support	1,557,509
Interest income	1,027,329
Interest expense	(6,494,149)
Payments to subrecipients	(1,557,509)
Amortization expense	(218,603)
Total non-operating revenues (expense)	8,553,695
Net loss	**$ (5,167,021)**

Statement of Changes in Fund Equity (Deficit)

	Contributed Capital	Retained Earnings
Balances, beginning of year	$ 6,391,265	(11,754,400)
Net loss		(5,167,021)
Intragovernmental contributions	21,317,252	
Depreciation on assets acquired with contributed capital	(734,848)	734,848
Balances, end of year	**$ 26,973,669**	**$ (16,186,573)**

Financial Review

Statement of Cash Flows

Cash Flows from operating activities:

Cash received from customers	$ 11,019,439
Cash payments to suppliers	(17,411,645)
Net cash used for operating activities	$ (6,392,206)

Cash flows from non-capital financing activities:

Intragovernmental revenues	14,239,118
Federal support	1,557,509
Payments to subrecipients	(1,557,509)
	14,239,118

Cash flows from capital and related financing activities:

Acquisitions and construction of capital assets	(12,155,800)
Interest payments	(6,579,680)
Payments on certificates of participation	(6,970,000)
Contributed capital	20,582,404
Net cash used for capital and related financing activities	(5,123,076)

Cash flows from investing activities:

Interest from investments	958,370
Net cash provided by investing activities	958,370
Net decrease in cash and cash equivalents	3,682,206
Cash and cash equivalents, beginning of year	22,157,514
Cash and cash equivalents, end of year	**$ 25,839,720**

Statement of Cash Flows

Reconciliation of operating loss to net cash used for operating activities:

Operating loss	$ (13,720,716)

Adjustments to reconcile operating loss to net cash used for operating activities:

Depreciation	9,101,897
Change in assets and liabilities:	
(Increase) in accounts receivable	(5,600,793)
(Increase) in due from other agencies	(955,313)
(Increase) in inventory	(3,854,836)
Decrease in prepaid expense	44,943
Decrease in deposits held in custody for others	(131,547)
Increase in accounts payable	9,361,333
(Increase) in due to other agencies	(669,249)
Increase in compensated absences	32,077
Total adjustments	7,397,416
Net cash used for operating activities	**$ (6,392,206)**

These numbers are unaudited for the Fiscal Year ending June 30, 1996. We have not included the notes for financials. If you are interested in receiving the full report or have questions, contact Jaqueline Pullen, ICN Chief Financial Officer at (515) 323-4709.

Glossary of Terms

Asynchronous Transfer Mode(ATM)-Asynchronous Transfer Mode is a type of framing. ATM is a connection-oriented protocol that uses very short fixed-length (53 bytes) packets called cells to carry voice, data, and video signals. By using a standard cell size, ATM can switch data via hardware, which is cheaper than using software to route and switch traffic. ATM speeds are faster. They can exceed 2.5 gbps.

Backbone-Includes the HUB, the centralized switching center of the Network, interconnecting the HUB with all Part I and Part II endpoints throughout the State by digital links for two-way transmission of 45 megabit video, voice, and data for State, education, and administrative purposes as defined in Iowa Code section 8D.9. Iowa's fiber optic network is like the trunk of a tree with many branches reaching out to communication sites.

Bandwidth-A measurement of capacity which determines the rate information can be transmitted across the medium. These rates are measured in bits (bps), kilobits (kbps), megabits (mbps), or gigabits (gbps) per second. Typical transmission services are 64 kbps, 1.544 mbps (T-1), and 45 mbps (T-3/DS-3).

bps (Bits per second)-The number of binary digits transmitted per second in a data communications system.

Broadband-A facility or circuit that has bandwidth in excess of that required for high-grade voice communication.

Channel-A communication path established between two or more institutions.

Compressed Video-Compressed video is 1/28th of the ICN standard education video bandwidth. Of special importance to Iowa, telemedicine can link rural hospitals to urban counterparts for such services as physician conferences, diagnoses, consultations, and the rapid transmission of X-rays, CAT scans, and ultrasound studies. Compressed video is satisfactory for teleconferencing but limited in its use for the classroom.

DAX (Digital Exchange)-A computerized digital cross connect that allows one or more specific channels from high-capacity lines to be split out separately and redirected.

DCC-45 (Digital Cross Connect)-A switch within the Network that connects full motion video classrooms.

Dedicated Line -Permanent connections between two telephones or PBXs. The route and circuit are always available to the person who leases or owns the line and the signal does not need to be switched.

Dial-Up -The process of, or the facilities involved in, establishing a temporary connection via the switched telephone network.

Digital-In data communications, the description of the binary ("1/10") output of a computer or terminal. Modems convert the pulsating digital sounds into analog waves for transmission over conventional telephone lines.

Direct Connect Call-An agency that is directly connected to the ICN allowing calls to other direct connect agencies to be made without assistance of local exchange switching facilities. There is a savings of $.02 per minute in connecting in this manner. However, this does require a minimum of $1,000 per month in gross long-distance tolls to be cost effective.

Distance Education-Ability to establish a learning situation across wide distances. Teacher and students may be in two or more classrooms. With fiber optics capability, participants can interact in a two-way voice and video interactive environment.

DMS 500 (Digital Multiplex System)-The switching system for all of the voice, data and dialable wideband video services offered by the ICN.

DS-0-Designation for a digital signal for 64 kbps. The digital equivalent of one normal telephone line. Measures the speed information can be transmitted.

DS-1-Designation for a digital signal for 1.544 million bps. A digital transmission format in which 24 telephone line equivalents are multiplexed into one DS-1 channel. A DS-1 and a T-1 are equivalent. Measures the speed information can be transmitted. Video transmitted at this speed is 1/28th of the DS-3 which approximates full motion.

DS-3-Designation for a digital signal for 44.736 million. A telephone term describing the 44.736 million bits per second signal carried on a DS-3 facility. One DS-3 equals 28 DS-1s or 672 DS-0s. Measures the speed information can be transmitted. A DS-3 and a T-3 are equivalent. Video transmitted at this speed approximates full motion.

Equal Access-The ability to choose between the different carriers for a long distance provider. Some LECs are serviced by only a single long distance carrier.

Exchange-A switching center, or the area where a common carrier furnishes service at the exchange rate and under the regulations applicable in that area as prescribed in the carrier's filed tariffs.

Fiber Optics-The use of thin strands of glass to propagate transmission signals. The maximum bandwidth at which a fiber optic cable can transmit signals has yet to be determined.

FOTS (Fiber Optic Terminal System) -Each site has a FOTS room where fiber enters the building. Signal regeneration equipment that recognizes and interprets the incoming light signal into new, stronger pulses of light is often found in the FOTS room.

Frame Relay-A communications method for connecting computer systems (Local Area Networks) via data routers and switching data more efficiently by use of the Cascade Switch. The data is divided and compressed into packets of information allowing more than one person to access the same physical circuit simultaneously.

Full Motion Video-An industry standard video channel 44.736 megabits wide. This standard channel bandwidth was adopted by the Narrowcast Advisory Committee on behalf of the State's educational community.

HUB-The centralized switching center of a network. The ICN HUB is located at the STARC Armory.

ICN-Iowa Communications Network.

IEC or IXC (Interchange Carrier)-Any carrier since divestiture registered with the FCC authorized to carry customer transmissions between LATAs interstate. In addition, if approved by a state public utility commission, intrastate which includes carriers such as AT&T Communications (formally AT&T Long Lines), MCI and US Sprint

Interactive-Identifies live communications with either two-way audio and video or two-way audio and one-way video, providing for question-and-answer interactivity.

Interactive Video-The capability to transmit and receive two-way (full duplex) video transmissions between originating site and remote classrooms.

Glossary of Terms

Internet-The largest international computer network. Internet is a network of computer networks, linking computers from colleges and universities, government agencies, institutions and commercial organizations worldwide. Owned by the U.S. Government, it is used primarily for research and educational purposes.

IPTV-Iowa Public Television.

ISDN (Integrated Services Digital Network)-A service that allows a variety of switched digital data and voice transmission to be accommodated simultaneously. It is a networking concept that provides subscribers with end-to-end fully digital communications.

ITTC (Iowa Telecommunications and Technology Commission)-Established by Senate File 2089 during the 1994 Legislative Session. The governing body of the ICN. Made up of five-members appointed by the Governor and confirmed by the Senate, plus the State Auditor.

LAN (Local Area Network)-A user-owned, user operated, high volume data transmission facility connecting a number of communicating devices (computers, terminals, printers, etc.) within a single room, building or campus.

LEC (Local Exchange Carrier)- Carrier providing local services to customers within a LATA. LECs have monopolies with LATAs.

Mbps (Mega Bits per Second)-A measure of the number of bits of data transmitted in a second, where Mega (m) is slightly more than one billion bits.

Multiplexer/Mux-A piece of equipment that allows two or more signals to pass over and share a common transmission path.

Narrowcast -Transmission of programs to a specifically defined audience normally using the newer technology delivery systems. Sometimes referred to as a target audience, a limited audience, or a "narrow" audience, hence the name "Narrowcast."

Network-The Iowa Communications Network consists of the HUB (STARC Armory); interconnecting the HUB with all Part I endpoints (regional switching centers, Regents Institutions, and other Part I endpoints); Part II endpoints (secondary switching centers); and by the end of FY 1999 479 additional schools, libraries and AEAs. It includes state and federal government administration sites.

Part I-Involved the installation of a Network Control Center at the STARC Armory in Johnston and the linking of Iowa's three Regents Universities, 15 community colleges, Iowa Public Television, and the State Capitol Complex.

Part II-Involved linking the 15 community colleges with points of presence in each of the remaining Iowa counties.

Part III-Consists of expanding the Network to other authorized users within the counties, such as schools, libraries, area education agencies involving 474 sites.

Point-to-Point-Used to describe a circuit that connects two points directly. There are generally no intermediate processing nodes or computers, although there could be switching facilities (i.e., a phone line circuit that links two and only two logical entities).

Real Time-The capture, processing and presentation of data at the time the data is originated.

Regional Switching Centers-The Part I endpoints providing interconnectivity for Part II endpoints and Part III endpoints.

Router-A sophisticated, protocol-specific device that passes data between LANs by examining the data and selecting the most efficient of all available routes.

SONET (Synchronous Optical Network)-An American and international optical interface utilizing a 5.148 Mbps digital signal as a root base for developing other SONET signals.

Switch-Computers or electromechanical devices that connect calls to their destination points.

Telecommunications-Any communication process that allows the transmission of information from a sender to a receiver by means of an electromagnetic or lightwave medium.

Teleconferencing-A conference of more than two sites linked by telecommunications. It can be audio only; video one way and audio the other; or video both ways.

Telejustice-Using fiber optics to hold hearings, revocations and other pilot projects throughout the Department of Justice. Judges and support staff do not have to travel as many miles to hold the hearings.

Telemedicine-Using a fiber optics telecommunications system for purposes of health care. Of special importance to Iowa, telemedicine can link rural hospitals to urban counterparts for such services as physician conferences for diagnoses and the rapid transmission of X-ray film, CAT scans, and ultrasound studies.

Token Ring-A local area network access mechanism and topology in which a supervisory frame or token is passed from station to adjacent station sequentially. Stations wishing to gain access to the network must wait for the token to arrive before transmitting data. In a token ring, the next logical station receiving the token is also, the next physical station on the ring.

Topology-Refers to the overall configuration of a network.

Traffic-The volume and intensity of transmitted signals on a communications channel.

Transmission-The sending and receiving of a telecommunications message over a data communications channel.

Video Conferencing-Real-time, usually two-way, transmission of digitized video images between two or more locations. Teleconferencing requires a wide band transmission facility (frequently satellite) and bandwidths from 56 Kbps (freeze frame) to T-1 rates (full motion).

Virtual Circuit-In packet switching, network facilities that give the appearance of an actual end-to-end circuit. A dynamically variable network connection where sequential user data packets may be routed differently.

WAN (Wide Area Network)-A network of computer devices separated by a large geographical area.

Iowa Communications Network
PO Box 587
Johnston, Iowa 50131-0587

BULK RATE
U.S. POSTAGE
PAID
DES MOINES, IA
PERMIT N0
1195.

PRINTED ON
RECYCLED PAPER