Technology in Education

TIPS

Telecommunications Infrastructure Project Statewide

Volume 1 Issue 1 CALIFORNIA COMMUNITY COLLEGES November 1997

A Message From the Chancellor's Office

Lebaron Woodyard, Dean of Technology and Communications

*This is **Part One** in a three part series on the expansion of the California Community Colleges Telecommunications and Technology Infrastructure Program.*

The community college system is growing.In a 1992 report, the California Department of Finance predicted 400,000 new students will be in the California Community College (CCC) system by the year 2005. The report stated that this will require eight new colleges, 13 new satellite centers, and more than $2 billion dollars in new capital needs.

Technological change is producing profound, but ambiguous changes in society. Like most other states, California is undergoing rapid social change. A so-called network society is beginning to emerge in which more skilled workers are becoming independent contractors, rather than traditional employees. More and smaller firms use temporary joint ventures like partnerships and alliances to accomplish their work. Corporate acquisitions and mergers are increasing in frequency. From this changing environment emerge potential students whose leaning styles and needs are quite different than those of students in earlier generations. Flexibility and rapid response should enable community colleges to accommodate these changing educational needs.

The California Community Colleges, Chancellor's Office (CCCCO) has implemented 4CNet, a statewide telecommunications network connecting all colleges, to assist the colleges to respond to these changing educational needs. All colleges will be able to facilitate connectivity throughout the state via comprehensive intra-

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CSU and 4CNet

Mike McClean, Customer Support, 4CNet

The California State University (CSU) is currently involved with the California Community Colleges (CCC) Telecommunications Technology Infrastructure Program (TTIP) as the major provider of data connectivity for all 106 CCC campuses and 19 administrative centers. Enabling legislation for TTIP mandated the establishment of the necessary infrastructure capability for connection to the Internet, video conferencing, and satellite downlink. CSUnet was identified as the provider for Internet services. To implement this mandate, the CSU and CCC established a collaborative relationship to create 4CNet, the California State University and California Community Colleges Network.

4CNet is an expansion of CSUnet, which was established in 1984 by the California State University (CSU) system as a dedicated data network linking each of the campuses of the CSU. The network was created as one of several efforts to meet the increasing information technology demands of the University system and its campuses throughout the state. The addition of the Community Colleges to the network will afford both systems a resource to serve their academic and administrative mission, goals, and objectives in ways that capitalize on centralized and distributed information resources.

4CNet will provide a T-1 data connection from each community college site to a node on the 4CNet backbone. The 4CNet backbone is designed us-

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•In This Issue•

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•TIPS is a monthly publication sponsored by the California Community College system and is dedicated to the sharing of information relating to state-funded projects, statewide meetings, educational innovation, individual recognition, and future opportunities for applying technology in education. It is distributed statewide to all community colleges, the State of California Legislature, and to other interested groups and individuals.

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•Articles appearing in this newsletter plus other relevant news may also be accessed on the World Wide Web at:
<http://video.4c.net/TIPS>.

Introduction...

Chris Palmarini, Editor

As the individual recently hired for the position of Editor and Web Site Technician for the TIPS (Technology Infrastructure Program Statewide) newsletter/web site, I want to introduce myself to those of you who are either involved in 4CNet and related projects or otherwise interested in their progress and applications.

I am located in the Media and Distance Learning Department at Butte Community College near Oroville, in the northeastern region of the Sacramento Valley.

It is with great excitement that I come into this newly created position of TIPS Newsletter/Web Page Technician. I am anxious to combine my skills in web site design and page layout with my interest in the Internet and distance education, and I would welcome any feedback, questions, or comments as the project grows.

...and Welcome!

Welcome to the first edition of the TIPS newsletter! This monthly newsletter and a corresponding web site (http://video.4c.net/TIPS) are projects funded as a part of the $2,493,000 two-year grant awarded by the California Community College Chancellor's Office (CCCCO) to Butte Community College for coordination of 4CNet, a statewide Internet upgrade project.

The purpose of the newsletter and web site is to provide both a hard copy and an online resource which will disseminate information on the progress of the upgrade and other CCCCO projects.

Materials for upcoming editions should be submitted to the Editor no later than the 15th of each month.

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Distance Education Issues

Cristina Mora-Lopez, Distance Education, CCCO

The Title 5 regulations of the California Education Code, as per the March 1994 amendments, currently require that each California Community College District offering distance education courses report annually to their Board of Trustees (BOT) and submit a copy to the Chancellor's Office (CO) on July 1 (Sections 55317 b). The regulations also stipulate that courses offered for transfer require instructor and student to have "regular personal contact" (Section 55376 (a) & (b)). The regulations also established a Distance Education Technical Advisory Committee (DETAC) to review the work in progress and recommend necessary changes to the Chancellor.

Title 5 Revisions

The DETAC is recommending three revisions to the current Title 5 regulations during the remaining distance education study period. The revisions would change the due date for Districts to report to their BOT and the CO, extend the length of time for the distance education evaluation period, and eliminate "regular personal contact" for Distance Education transfer courses. The proposed revisions would take effect on June 1, 1998. Consequently, the proposed changes are for a two-year and six-month period until the final recommendations are advanced by the committee in its full report to the BOG scheduled for March and May 2000.

The committee reviewed the reports prepared for the past three years and has concluded that the reports still have substantial variability in format, content, and documentation and

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Visit the TIPS web site at:

http://video.4c.net/TIPS

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that definitive statements could not be made of distance education systemwide.

Survey Instruments

The DETAC is in the process of developing three survey instruments (Institution, Student, and Faculty Satisfaction) to be disseminated to each District. The Chancellor's Office hopes to forward the surveys to each district by mid-October or early November. Each District has also appointed a Distance Education Coordinator. The coordinator is the liaison between the Chancellor's Office and their respective campuses. A list of the Distance Education Coordinators will be provided on the TIPS web site (http://video.4c.net/TIPS) for information on district, names, and e-mail. If you have any questions, contact Cristina Mora-Lopez at the Chancellor's Office (916-322-4055).

Distance Education Technical Advisory Committee

Academic Senate
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Santa Barbara College
Ric Mathews
San Diego MiraMar
Dave Megill
MiraCosta College

CEO
Barbara Beno
Vista College

CIO
Barbara Hollowell
Coastline College

Consortia
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Long Beach City College
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Executive Director, Consortium for Distance Learning

LARRC Researcher Group
Brian Haley
Sierra College
Ling Song
College of Marin

Chancellor's Office Staff
Lebaron Woodyard
Cristina Mora-Lopez

Chancellor's Office Awards $1.0 Million to Colleges for Technology Model Application Projects

Jose Michel, Specialist, Telecommunications, CCCO

The Chancellor's Office awarded 23 grants to community colleges for the initial phase of the Telecommunications Model Applications Pilot Projects (TMAPP). The initial phase related to three areas of competition: (1) On-Line Student Counseling and Advising; (2) Electronic Transcript Exchange, and (3) Telecommunication Planning Mini-Grant.

The projects were selected based on their ability to develop and offer computing and electronic information resources and services to students, faculty, staff and the greater community including business and industry. These projects will develop test applications which can be utilized on the statewide 4CNet which will provide access to the existing and ever expanding databases of machine-readable electronic information in the state, the nation and the world.

The concepts and information developed by the projects will facilitate the development and implementation of quality instruction and services to the constituents of the community colleges. It will also help the system retrain workers and prepare the workforce of tomorrow making the State of California competitive in a global economy.

CCCCO TMAPP GRANT AWARDS

On-Line Student Counseling and Advising	Amount Awarded
Shasta College	$79,000
Rancho Santiago College	$61,392
Los Angeles CCD	
$71,000	
Yosemite CCD	$80,000
Coastline College	$80,000
Contra Costa College	$85,000
Category Sum	**$456,392**

Electronic Transcript Exchange	Amount Awarded
Santa Barbara City College	$101,250
Southwestern College	$113,843
Napa Valley College	$27,429
College of the Redwoods	$57,902
San Joaquin Delta College	$25,000
Category Sum	**$325,424**

Telecommunications Planning Mini Grant	Amount Awarded
Allan Hancock College	$24,983
College of the Siskiyous	$25,000
Hartnell College	$25,000
LA Trade-Tech College	$23,128
College of Marin	$25,000
Napa Valley College	$25,000
Peralta CCD	$24,000
College of the Redwoods	$24,041
Santa Barbara City College	$25,000
Shasta College	$25,000
Ventura College	$25,000
Victor Valley College	$25,000
Category Sum	**$296,152**
Total Sum	**$1,077,968**

Message

(continued from page 1)

college connectivity, to effectively carry out its mission as the third system of higher education in the State of California. Such a statewide telecommunications system and local infrastructure for the CCC will help accomplish the following:

- Improve curriculum development
- Improve instructional support services
- Improve student support services
- Improve administrative coordination
- Accommodate system growth

4CNet, a collaborative network with the CSU system network, connects the 106 California community colleges and 17 administrative offices that are not co-located on college campuses with all 23 California State University campuses. This network has distinct benefits to the colleges within the system and to the system as a whole. The deployment of this telecommunications network allows colleges to share resources and information in the delivery of instruction and provide support services to faculty, students, and administrators. Access to improved instructions, resources, and support will improve learning outcomes of students.

The establishment of 4CNet allows the CCC system to develop and sustain a competitive edge in providing training for California business and industry, meet the needs of today's adult learner, and have a positive impact on the physical environment of the State in the areas of air quality, fuel consumption, and transportation system (traffic congestion).

In 1998 the network will be entering its third year of operation and its first full year of deployment. The development of the network and connections to it was accomplished over a two-year period. The network must expand to continue to meet the needs of the CCC system. The implementation of the Technology and Telecommunications Infrastructure Project (TTIP) has provided leadership and direction to the system in the area of telecommunications and technology. While the accomplishments have been good with the funds available, it has only been a beginning. The 4CNet system is an extremely large and complex system. The size of the system makes it difficult to move at a significant pace.

The ability of the system to respond to these challenges will depend on the full deployment of resources throughout the college facilities. Year-one funding began the process of inter-connecting the colleges. The augmentation received in year two will allow for the full deployment of inter-college connectivity at the appropriate broad bandwidth required to meet the needs of the colleges and facilitate the beginning process for intra-college connectivity. The third and subsequent years of funding proposed to the Legislature will provide colleges with a basic level of resources required to distribute connectivity to faculty, students, and administrators.

The overall strategy for telecommunications is long term, not short term. The base strategy is inter-college connectivity first, and intra-college connectivity second.

(Part Two will address enhancements, satellite uplink, library automation, and other areas.)

Northeastern California Video Conferencing Project

Robert Ellsworth, Coordinator for Media and Distance Learning, Butte College

Lassen, Shasta, Siskiyou and Butte Community College Districts recently joined together to assist the remote areas of northeastern California with the creation of a video conferencing network. In a joint effort, the colleges applied to the U.S. Dept. of Agriculture Rural Utilities System (RUS) for a grant to assist in the building of the infrastructure. The grant consisting of $336,000 was received on February 18, 1997.

The purpose of the video conferencing network is to provide connectivity between colleges, schools, libraries, and medical entities, permitting distance learning, medical use, and other related activities. Each college will develop courses to meet their individual needs and will connect with end-users at specific locations established throughout their district. Time will be reserved on the network for staff development and administrative meetings. Medical hospitals and clinics may also access the network for training and other related needs.

The colleges are also working with the North State Cooperative Library System (NSCLS) to extend its library services.

The network is comprised of a video bridge at each college and 32 end-user sites, all connected together via Integrated Systems Digital Network (ISDN). Where qualified, each end-user site will use Pacific Bell's Education First to assist in making ISDN connections. Installation of the video bridges should be completed this fall. The installation of end-user video codecs and needed ISDN lines will continue throughout the spring. Full operation of the network is anticipated by May 1998. Each college is cooperating in the management of the network.

Each of the four college sites will use Picturetel video conferencing systems provided through funding from the California Community College Telecommunications Infrastructure Grant to connect through the video bridges to other video users statewide.

The RUS network will ultimately be connected with the statewide 4CNet digital network by means of a video node at California State University, Chico.

California Community Colleges Choose PictureTel Videoconferencing

Jose Michel, Specialist, Telecommunications, CCCCO

The Chancellor's Office, California Community Colleges, selected PictureTel to establish a systemwide videoconferencing network of more than 120 sites throughout the state. The selection of the PictureTel Corporation represents over $3 million in business, and gives the company its largest contract on the West Coast.

The California Community Colleges (CCC) will deploy 126 PictureTel Venue 2000TM group videoconferencing systems and a 16-port Montage™ multipoint conferencing unit. In addition, the colleges have purchased PictureTel's enterprise services and bridge management to administer the videoconferencing network.

"Distance learning is one of the most prominent and important uses of PictureTel videoconferencing. California Community Colleges' investment in videoconferencing will expand the students' access to valuable resources that may not have been available in the past with so many campuses spread across such a large state," said Dom LaCava, President and COO of PictureTel. "The global nature of videoconferencing will open up a world of collaboration and information to both students and faculty members. As the world leader in videoconferencing used for distance learning, we are proud that the country's largest, most diverse community college system chose PictureTel videoconferencing for its new network. "

PictureTel has approximately 7,000 systems used every day by customers around the world for distance learning activities in higher education, K-12 schools, and corporate training departments. PictureTel videoconferencing will bring together the more than 1.3 million students and 16,000 faculty members at 106 CCC campuses. According to statistics from the U.S. Department of Education, 10 percent of all college students in the United States and 27 percent of all community college students in the United States attend a California Community College.

> *PictureTel videoconferencing will bring together the more than 1.3 million students and 16,000 faculty members at 106 California Community College campuses.*

"We are impressed with PictureTel's experience and reputation in distance learning and product support," said Jose Michel, Coordinator of Educational Technology for the California Community Colleges. "We plan to construct our videoconferencing network to promote activities in distance learning, staff development, and economic development to take full advantage of the vast resources of the California Community Colleges system."

PictureTel Corporation is the world leader in developing, manufacturing, and marketing a full range of videoconferencing solutions. The company's systems meet customers' videoconferencing needs from the desktop to the boardroom. PictureTel also markets network conferencing servers and a comprehensive portfolio of enterprisewide services. Additional PictureTel information is available on the Internet at www.picturetel.com.

4C@ONE Project Funded At De Anza College

Roberta Baber, Information Systems Instructor, Fresno City College

Community college instructors in all disciplines received help from the state in bringing technology into their classrooms. De Anza College in Cupertino received a $1 million grant for a two-year effort to create an infrastructure among the community colleges in California to train educators in the use of instructional technology. The grant is part of the State Chancellor's Office Telecommunications and Technology Infrastructure Program.

The 4C@ONE (Center for California Community Colleges at Outcomes Network) project is comprised of 10 faculty, one from each of the 10 partnering community colleges and personnel from CSU and UC campuses as well. The 10 community colleges involved are Butte College, Los Positas, LA Trade-Tech, College of Marin, Rancho Santiago, San Diego Miramar, Santa Barbara City College, Santa Monica College, Fresno City College, and De Anza. The project will be completed under the leadership of De Anza's Ann Koda, with assistance from consultant Catherine Ayers. Policy direction will come from an advisory committee of high-level industry and education leaders, including FACCC and statewide Academic Senate leadership.

The project will determine training needs, identify skills and knowledge needs of faculty, and point out obstacles that can be solved with policy decisions. Support of the training and self-directed learning of faculty will come from databases of software, training options, and support products. Web sites, listserv, and chat rooms will also be developed and supported for additional access by faculty anywhere in the state or elsewhere.

Technology Standards Recommended For Libraries and Learning Resources

Carolyn Norman, Coordinator, Libraries and Learning Resources Programs, CCCO

The Technology and Telecommunications Ad Hoc Committee of the Library and Learning Resources Programs have recommended technology standards to improve the accessibility and quality of the college systems Library and Learning Resources Programs.

The recommended technology standards are an expansion of the initial recommendations included in the systemwide Telecommunications Technology Infrastructure Program. This program was funded by the 1996 State Budget Act. The program calls for: (1) acquisition and installation of equipment, lease of communications lines, software and other costs associated with connecting to 4CNet; (2) local telecommunication planning and the development and expansion of local area networks, including satellite systems components; (3) local planning and development for improving library technology, including connections to local area networks; (4) planning and development of district wide area networks for interconnecting multiple campuses and off-campus centers with a district; (5) development, implementation, and or evaluation of local technology applications for student learning and instruction, students, and administration services; (6) Human Resources Training Center for faculty, students, and staff; and (7) testing of application pilots in instructional services, student services, and administrative services.

In its first year of implementation, the system's efforts were to link all community colleges in three modes: (1) data via connection to 4CNet; (2) video-conferencing at each college and district; and (3) dual satellite downlink capacity (digital/analog/C-Ku Band) for each college and district. Local planning and development for improving library technology, including connections to local area networks, is mandated for year two of the telecommunications program funding.

According to the Library Technology Ad Hoc Committee, the primary focus of the library and learning resources technology and electronic resources initiatives are to provide faculty and student access to the resources in the college systems libraries and learning resources programs. The 1997-98 State Budget Act allocated approximately $3.3 million for the initial phase of the project.

Based on the results of the Library and Learning Resources Automation Survey administered in August 1997, the preliminary standards adopted in the Fall of 1996, and national information industry standards to access and retrieve information, the Technology and Telecommunications Ad Hoc Committee of Library and Learning Resources Programs recommended required and optional standards for the college systems libraries.

Required Areas

• *MARC Conversion*- That community colleges convert no less that 75% of their college library collection to U.S. MARC cataloging standard.

MARC is the foundation for library technology and electronic resources. It is the universal format for the conversion of library collections into a machine readable format. Therefore colleges must spend funds to convert and or shift their records to the U.S. MARC format.

• *A fax machine in the library (Group IV or higher)*- Fax machines are essential for borrowing and lending information within the community college system.

• *The signature of the library dean/director or head librarian on the college's Telecommunications Technology Infrastructure expenditure plan.*

Optional Areas

When a college has met the three required initiatives, the telecommunications funds may be spent in any of four optional library areas.

• *Library Automation System and directly related costs.* The library automation system must adhere to the Z39.50 ANSI protocol. The initial modules to be acquired and/or upgrade are Cataloging, Electronic Public Catalog (OPAC), and Circulation.

If an existing automation system does not meet the Z39.50 ANSI protocol and the college has not committed funds to upgrade to the Z39.50 protocol within one fiscal year, the system must be upgraded to this protocol before funds can be expended in other areas. (Documentation to this effect must be included with the expenditure plan.)

• *Electronic Resources and Databases.* No more than 10 percent of the college's total allocation can be spent on electronic resources and databases until the following criteria are met:

-An automation system with the Z39.50 ANSI protocol; a minimum of five public access points (terminals) in the library; remote access capability for a minimum of five simultaneous users.

• *Internet Connectivity and Access.* Every library should have a degree of Internet connectivity and access which should include: web access to staff and public users; e-mail access from outside users to the library; telnet access to the online catalog.

• *Library Technology Plan.* Every college should have a Library and Learning Resources Technology Plan and funds from this grant can be used for this purpose. Workshops and model frameworks coordinated by the Library and Learning Resources Telecommunications Committee will be forthcoming.

Butte College to Lead State Telecommunications Project

Susan Bagby Matthews, Director, Public Relations and Marketing, Butte College

The Chancellor's Office for the California Community Colleges awarded a statewide computer upgrade coordination grant in mid-June to Butte Community College located in Oroville in Northern California. The $2,493,000 two-year grant will integrate all 106 community colleges in the 71 district California Community College (CCC) system with California State University's (CSU) existing electronic network.

> *"Several of the key benefits include improved student grades, reduced student costs, enhanced course delivery to students, and expanded access to instructional resources. Faculty statewide will increase their use of electronic media and communication between colleges and districts in the California Community College system will be strengthened."*
>
> ***Dr. Fred Sherman***

Selected as the grant award recipient among significant competitors, "Butte's comprehensive history as a provider of distance education throughout its rural district and its historically strong collaborative partnership with California State University, Chico were critical factors in the decision to award the grant to the college," emphasized Lebaron Woodyard, Dean for Instructional Technology at the CCC Chancellor's Office in Sacramento. "We are very pleased to have been chosen for this unprecedented project, and are confident in our ability to align both systems to enhance higher education throughout California," comments Project Director, Dr. Frederick Sherman, Vice President of Information and Technology at Butte College.

Butte will coordinate the development of the expanded computer network system and act as an intermediary between CCC's Chancellor's Office and the CSU system. Following the installation and testing of the equipment, Butte College will select several partners from across the state to pilot test the system's video teleconferencing capabilities. Once the pilot tests are conducted, every California community college will be linked via video through CSU's Internet connection. The systemwide connection will enable all California community colleges to simultaneously transmit full video and audio data in real-time as well as computer data over the new 4CNet computer network backbone.

"Such a system will open the full potential of distance education and the Internet to every community college in California," noted Woodyard when he announced the grant award. Added Butte College's Dr. Sherman, "It will certainly place California colleges and the CSU system squarely at the center of the rapidly evolving national distance education market. Very soon we will be able to compete against other community college distance education systems, such as Miami-Dade in Florida and the Maricopa Community College system in Arizona."

The dramatic changes in California's educational system and workforce point to the necessity of better preparing students for the highly competitive global economy. The 4CNet grant will allow Butte College to serve California residents anytime, anyplace through the provision of high quality, cost-effective, and large-scale distance education instructional opportunities. "The upgraded system will enable us to achieve many important outcomes," stresses Dr. Sherman. "Several of the key benefits include improved student grades, reduced student costs, enhanced course delivery to students, and expanded access to instructional resources. Faculty statewide will increase their use of electronic media and communication between colleges and districts in the California Community College system will be strengthened."

The network upgrade project was initiated two years ago when the CCC Chancellor's Office and Woodyard, a longtime supporter of computer-based and distance education, convinced the legislature to fund a project that upgrades the Internet backbone in California. The California State University volunteered to expand its existing Internet backbone to provide connection of the entire community college system to the CSU system. The arrangement with CSU significantly reduced the cost to the community colleges and negated the need for an independent network dedicated to community colleges. CSU's Networking and Computing Services Manager Michael McClean indicates that "We know that once we expand the backbone, users will definitely utilize it." However, he further observes that, "The system will not be able to support the full community college system without seriously slowing down the entire CSU system, thus the need to begin planning for an immediate expansion of the system again."

The upgrade project is expected to last for two years, with the additional expansion planned in 1999. Initially, the system will bring all community colleges online with high-speed T-1 data connections, which allow data transmission at 1.5 million bits of information per second. It is anticipated that further expansion will increase transmission to 625 million bits per second when newer technology is employed.

CSU and 4CNet

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ing ATM and DS-3 connections among each of 10 network nodes placed at CSU campuses and administrative centers throughout the state. The planning and design of the new network includes the interconnection of high speed circuits throughout the state from Pacific Bell, GTE, Sprint, MCI, and TCG. The primary telecommunications equipment is from FORE for the Asynchronous Transfer Mode switches at the hub sites and from Cisco for the hub and individual site routers. Installation of 4CNet sites began the first week in April 1997, and it is expected that all participating Community College sites will be completed as early as the end of the 1997 calendar year.

The preliminary model for connection of community college sites called for individual connections to 4CNet for each campus. As the planning for the project progressed, many of the 19 multisite community college districts expressed a desire to serve as hubs for their constituent campuses in order to better fit with districtwide technology plans. Consequently, many of those 19 districts have been identified as 4CNet hub sites and are being provided with a higher level of service, such as multiple T-1 connections and larger routers. The districts will in turn provide connections to their constituent campuses. Such a model not only provides Internet connection for campuses, but, of equal importance, utilizes and enhances the intra-district communications network.

By September 30, 1997, 59 out of 92 Community College sites were already connected to 4CNet. Installations have proceeded for the most part on schedule. As with any project of this size, there have been some delays and schedule shuffling usually due to circuit availability either for the backbone or for local campuses. Networking at the service level guaranteed by 4CNet throughout the state has provided some difficult provisioning problems for our providers in many areas. This is due to both the high demand for circuits and the limited availability of circuits in many areas. Overall, the providers have proven to be strong partners in this networking effort. They have done everything possible to meet 4CNet's aggressive installation schedules.

Even with the expected delays, it is anticipated that all Community Colleges will be connected to 4CNet by the end of the 1997 calendar year, well ahead of the CCC Chancellor's Office target of April 1, 1998.

TIPS Newsletter
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