

# Digital California Project

## K-12 Statewide Network



## **A Letter from *Tom West*: President/Executive Director of *CENIC***

August 2000

Dear friends and colleagues:

The power and the promise of the Internet has forever changed the face of education. Networks have not only revolutionized how we work and communicate – they have expanded the horizons of our schools, libraries, and classrooms and opened up tremendous new opportunities for educators and students alike.

The Internet, however, is maturing rapidly. Today, researchers, educators, developers, and government agencies are working together to create a new generation of high-performance networks that will extend the possibilities of our “knowledge economy” far into the next century.

Education can only benefit from these exciting advances in technology. With an advanced-services network in place to serve the special needs of the education and research community, our schools will be able to share their laboratory and human resources via live Internet collaborations. Our educators will access unparalleled new sources of content, from dynamic Internet-based curricula programs to advanced high-definition television transmissions. Our students will participate in classes, interact with educators, and collaborate with other students from every level of education and every part of the world.

We cannot deny our K-12 schools these crucial opportunities. We need to act today to build the necessary infrastructure needed to assist our California’s schools to take advantage of tomorrow’s advances in information technology.

The Digital California Project (DCP) is an effort to do just that. The DCP is an initiative funded by the State of California that will provide advanced network capability for every county and school district in our great state.

In essence, we are developing an advanced-services network to serve the entire K-20 education and research community.

It is my very great honor to present this plan to you. The Digital California Project provides us with more than a new high-performance network – it lays the foundation for a new era in K-20 education and research in California

Sincerely,

*Tom*

Tom West  
President/Executive Director  
Corporation for Education Network Initiatives in California

# The Digital California Project K-12 Statewide Network

## Section 1 Introduction and Background

CENIC designed the Digital California Project (DCP) to bring high-performance network technology to all of California's K-12 schools.

### 1.1 An Exciting Opportunity for California's Schools

Access to information resources, via networks, is now generally viewed as an effective means to reach K-12 educators and students with on-line programs and services.

Access to such a rich array of on-line resources and programs will utilize new functions that will require high capacity networking dedicated to education and research. Some of the functions will include HDTV quality transmission, interactivity, realistic virtual objects and presence, Teleimmersion and Telescience.

New generations of on-line resources can enrich and enhance education at all levels and help to ensure that California has a highly trained workforce into the future.

Higher education and industry alike are interested in the preparedness of California's students as they progress through K-12 schools to meet these future workforce needs. The vitality of California higher education and industry requires continual preparation and refreshing of a knowledgeable citizenry and a highly skilled and creative workforce.

In order to achieve this goal, higher education is actively engaged in programs with K-12 to improve academic performance and preparation for college. Industry is involved with K-12 in a number of projects to better prepare students for the workforce.

Higher education and industry believe rich educational content and quality programs and services must be made accessible to all California's K-12 educators and students, via networking.

### 1.2 The Digital California Project: CENIC's Vision for California's Schools

In August 1999, the "California Commission on Building for the 21<sup>st</sup> Century" issued an Interim Report to Governor Gray Davis that outlined the need for "the development of goals and criteria towards a common approach to accomplish universal access to information technology."

To provide this universal access, higher education and industry called for the development of the Digital California Project K-12 Statewide Network (DCP), which involves leveraging the current higher education advanced services network infrastructure, CalREN-2, to serve all K-20 education institutions statewide.

Such a dedicated education and research network infrastructure would facilitate four things:

1. Delivery of advanced education programs and services to K-12;
2. Integration of rich on-line content and resources into regular curricula and services at the K-12 level;
3. Meeting the growth in the K-12 student population;
4. Delivery of education programs and services from industry to K-12.

Last summer, in cooperation with some of its corporate partners, the Corporation for Education Network Initiatives in California (CENIC) developed a proposal to extend CENIC's advanced services network, CalREN-2, into each of the 58 California counties.



As an integral part of Internet2, CalREN-2 will help ensure access to high quality network-based resources for California's K-12 educators and learners.

The proposal for the DCP was shared with the Governor's Office in late fall. Governor Davis recommended funding for DCP in the May Re-visit. The Legislature approved an annual budget appropriation of \$31.6 million to plan, implement and operate the DCP.

## **Section 2**

### **Project Context**

One major driving force for the DCP is to strengthen the program and service relationships between higher education and K-12. These relationships embrace teacher preparation, professional development, curriculum development, student outreach, and access to library information resources.

An equally important driving force is to facilitate the sharing of programs and resources among K-12 schools across California. In fact, the DCP will enable the delivery of a wide range of programs and services, by all types of institutions and organizations, including meeting Governor Davis' commitment to provide Advanced Placement courses to all K-12 students across the state.

The DCP is part of a larger framework for accomplishing the vision of the Commission on Building Infrastructure for the 21<sup>st</sup> Century for K-12. This framework encompasses four major goals:

#### **1. Developing and Maintaining a Technology Infrastructure**

California's schools will need specific hardware, software, network access, technological expertise, and support services to keep up with the challenges of tomorrow's "knowledge economy".

#### **2. Providing for Professional Development**

Both teacher preparation and certification programs and in-service staff development programs are currently widely available via the Internet.

#### **3. Developing and Integrating Curriculum-Based Applications**

Applications using technology, especially Web-based collaborations, are being implemented to enhance the teaching-learning processes and to help students meet the educational standards set forth by the State Legislature.

#### **4. Providing Access to Library Information and Learning Resources**

Library information and other learning resources are becoming readily available electronically. These resources are vital to both teachers and students.

For the past several years, various levels of education, government and the private sector have been working on facets of this framework for California K-12 education.

Within this framework, Figure 1 represents an overview schematic of the technology infrastructure component.

In proposing DCP, CENIC recognized technology infrastructure projects were already in place or being developed by groups within the K-12 community to address the other components of K-12 infrastructure build-out. Specifically, the Digital High School Program and the Federal E-Rate Program are in place to help develop the infrastructure at each school site and to interconnect the schools in the districts and counties.

However, there was no cohesive effort to deal with statewide connectivity.

The DCP: K-12 Statewide Network, the outer

ring in Figure 1, is complimentary to the ongoing K-12 efforts.

Together they are designed to link all the K-12 classrooms, school sites, districts and counties statewide as well as to interconnect K-12 with higher education throughout California.

The CENIC universities and corporate partners believe the keystone in a comprehensive infor-

mation technology strategy is the development of a cohesive and seamless high-speed statewide network. This network will interconnect all the K-12 schools and the institutions of higher education in California and will be linked to the larger Internet and Internet2.

In many ways, access to such networking and the learning resources is a prerequisite to enable K-12 to be responsive to the demands of the 21<sup>st</sup> century.

**Overview of Network Infrastructure Needs for Instruction in California's K-12 System**

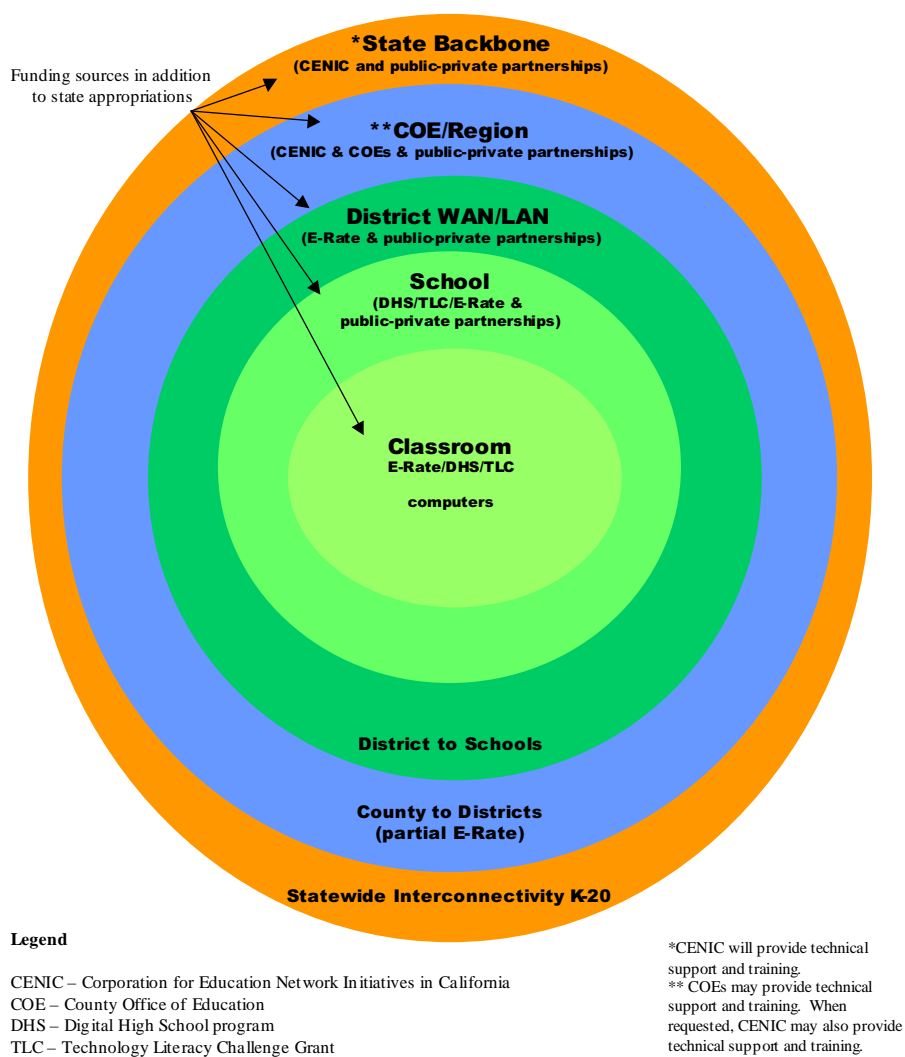


Figure 1. Overview of Network Infrastructure Needs for Instruction in California's K-12 Educational System



CENIC also recognized the other components in the framework (*i.e.* professional development, curricular applications, and learning resources) are the province of the CENIC Universities, community colleges, K-12 institutions, and private sector providers. These other institutions must ultimately drive the growth and use of this statewide network.

The DCP project is not designed to fund the development of these additional facets of the framework. However, CENIC will provide coordination among CENIC universities, community colleges, K-12 institutions, and private sector entities in identifying, providing, and demonstrating the best content, applications, practices, and new collaborative tools enabled by the K-20 statewide advanced-services network.

### **Section 3 Project Scope and Strategy**

The scope of CENIC's efforts in the DCP is focused on developing this statewide network backbone capability to serve all education, K-20.

CENIC will coordinate the planning and implementation of the DCP drawing on its own network backbone resources as well as those of the CENIC Charter Universities.

Specifically, CENIC plans to extend its own CalREN-2 network and the CSU wide-area network, 4CNet, into all 58 counties. This will result in the creation of CalREN-2/4CNet access nodes in each of the 58 counties.

K-12 schools, district offices and county offices will then be able to connect statewide and to both the commodity Internet and the larger universe of Internet2.

Planning for the DCP will be based on having

at least 25 DCP hub sites strategically located across the 11 California LATAs and as many as 200 county-based access node sites to account for population density and geographic dispersion. A conceptual layout is shown in Figure 2.

The DCP's target objective is to develop a statewide infrastructure that connects all K-20 institutions enabling them to conduct their education and research missions and programs using a dedicated advanced-services network environment.

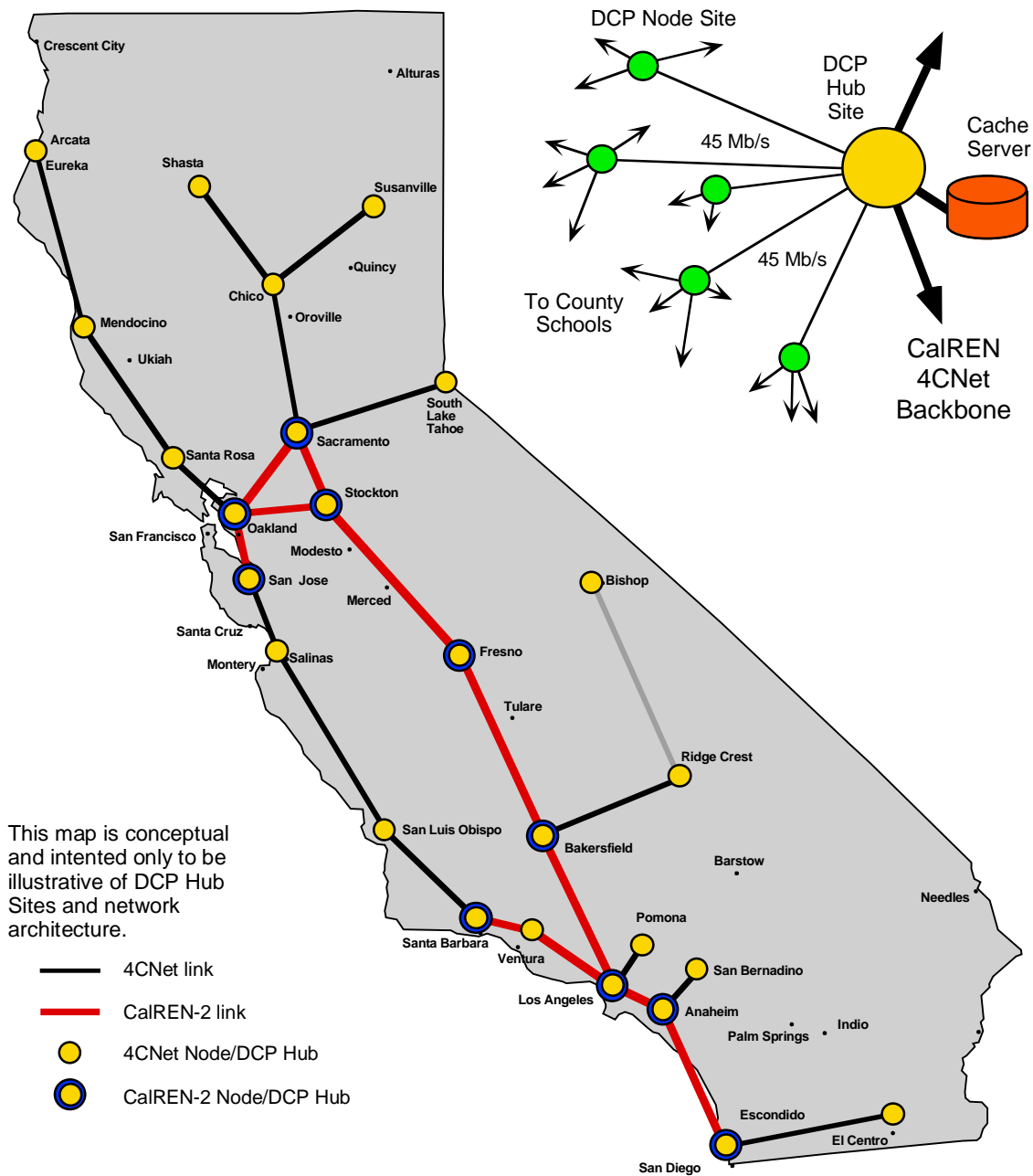
While access to the public Internet has helped K-12, it will not be sufficient to facilitate the comprehensive sharing of resources and the delivery of programs and services within the K-20 education enterprise. That is why higher education has been developing Internet2.

The DCP's strategy is to develop and extend the current CalREN-2/4CNet network infrastructure (already a part of Internet2) to provide a statewide communications backbone infrastructure that serves both higher education and the K-12 system.

The expertise and services of the CENIC Charter Universities, CENIC Founding Partner Associates, CENIC Affiliate Associates, California's community colleges, and California's K-12 systems will be engaged to plan and implement DCP.

The DCP will be developed and operated in conjunction with outreach and enrichment programs already initiated and being developed by CENIC universities, community colleges, K-12 institutions, and industry partners.

CENIC universities and other institutions, including K-12, will be concentrating on developing and implementing the programs and services they will offer to the K-12 faculty and students via the network.



WORKING DRAFT  
**Plan for the Digital California Project Network**  
 20 April 2000

Figure 2. Conceptual Diagram of the Digital California Project Network



## Section 4 Project Goals

The overarching purpose of the DCP is to enrich learning for all K-12 students and the teaching of all K-12 educators.

DCP has three foci:

**Strengthening** the existing program and service relationships between the CENIC universities, community colleges and K-12 schools in the areas of teacher preparation, professional development, curriculum development, student outreach, and information resource sharing;

**Developing** a comprehensive/integrated high speed statewide network infrastructure that will expand K-12 schools' connectivity to each other, to California higher education institutions, and to K-12 schools, universities and other organizations across the globe;

**Identifying and making accessible** a rich array of learning content and information resources from throughout the state and the world that K-12 teachers and students will find to be of value in the teaching-learning process.

In addition, the DCP has four specific goals:

**Provide** a common communications infrastructure for education in California;

**Facilitate** access to rich content resources for teaching and learning in K-12;

**Enable** the state and educators to effectively address some of the challenges of educating K-12 students to enter the knowledge economy of the 21<sup>st</sup> Century; and,

**Develop** an ongoing mechanism that will enable California education to sustain a cohesive K-20 statewide infrastructure.

## Section 5 Project Objectives

There are five components involved in planning, implementing, and managing the DCP:

1. network development
2. applications coordination
3. communications
4. project management
5. ongoing network operations and management

CENIC will engage the appropriate expertise across the K-20 education system and from private corporations to ensure successful planning and implementation of DCP.

Once the network is implemented, CENIC plans to contract with 4CNet (CSU) to provide the ongoing operations and support of this network. Currently, 4CNet provides the Network Operations Center (NOC) for CENIC's CalREN-2. The following is a brief description of each component.

### 5.1 Network Development

The overall goal of this project is to build and extend the architecture and infrastructure of CalREN-2/4CNet, as depicted in Figures 3 and 4, into all 58 counties to enable all the K-12 schools to link into the statewide K-20 network backbone.

CalREN-2 provides a high-capacity core backbone network linking the Bay Area, Los Angeles Basin and San Diego with linkages to the 36 CENIC universities.

The DCP will also utilize 4CNet, Figure 3, extensively since it provides connectivity to all the major regions of the state and links all 23 CSU campuses, 125 Community College sites and 50 K-12 schools.

4CNet interconnects with CalREN-2 in all three metropolitan areas. Los Nettos, operated by

Caltech and the University of Southern California, serves 90 organizations in the LA Basin, including many K-12 schools. It will be utilized, as appropriate.

Within 24 months of the start of the project, the DCP network provide California with 25 DCP access hubs across its 11 LATAs and 200 access nodes across its 58 counties.

CENIC, with the assistance of personnel from its Charter Universities and K-12, as well as consultants from the private sector will develop and implement the new network infrastructure.

Figures 2, 3, and 4 depict the current network architecture that the DCP will use in supplying advanced-services network technology to K-12 schools.

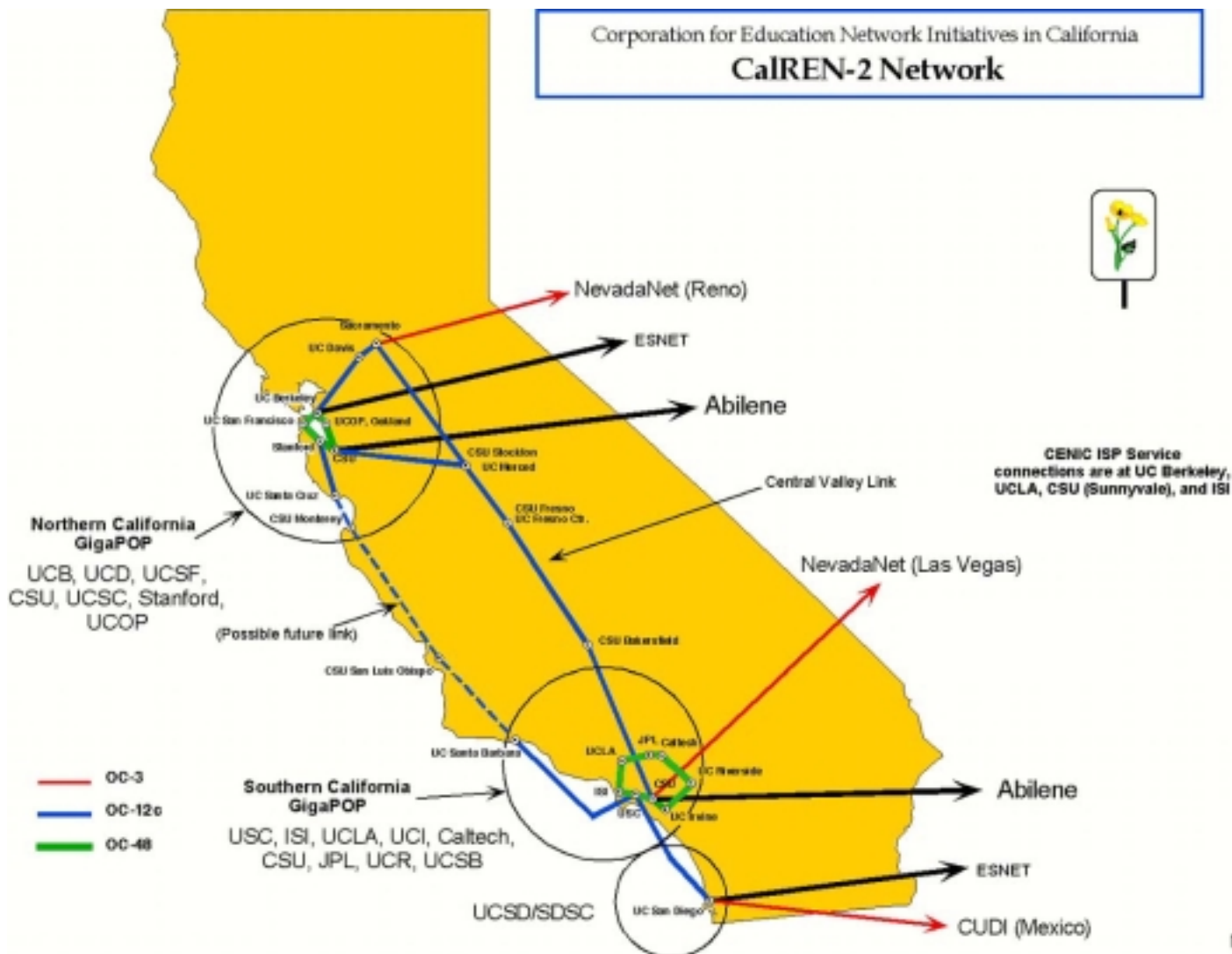


Figure 3. CalREN-2 Network Topology



# 4CNet

California State University and California Community Colleges



Dave Reese  
August 4, 2000  
dave@csu.net

Figure 4. 4CNet Network Topology

## **5.2 Applications Coordination**

There are hundreds of curriculum-based, teacher preparation, teacher/staff professional development, and student outreach and support initiatives underway at all levels of California education that focus on improving K-12 education via electronic learning.

While the DCP is not in the business of developing new applications, CENIC will focus on identifying applications and facilitating making them accessible on the network.

In essence, the challenge will be to find “best of practice” applications that are replicable and scalable by virtue of utilizing the expanded CalREN-2/4CNet advanced-services network.

Closely aligned with curricular applications and student outreach programs will be the ability to provide K-12 students and teachers access to the library information resources already being made available to higher education institutions over the network.

For the past decade, the quantity and quality of library resources in K-12 schools have suffered from lack of funds. A K-12 system without access to pertinent learning resources that enhance the teaching and learning processes cannot maintain quality.

Higher education has been under the same pressure. However, there have been significant efforts nationally and within each of the CENIC universities to deal with this crisis.

The University of California currently has an initiative called the Digital Library designed to bring vital information and knowledge to the students, faculty and researchers via the network.

The California State University has an effort called Pharos designed to electronically link the library resources of its campuses.

Likewise, Caltech, Stanford and the University of Southern California have developed electronic access to some of their very unique and special resources.

At the same time, the State Library has been working to link its resources and those of the community libraries to make them more accessible to citizens.

CENIC will work with the community colleges, other higher education institutions and the State Library to make their information resources accessible to K-12 schools, via the network.

The target objectives of this component are to provide K-12 schools access to networked curriculum-based, teacher preparation, teacher/staff professional development and student outreach and support applications as well as library information resources.

## **5.3 Communications Program**

For the DCP to be truly successful, there must be widespread “buy-in” across K-12, higher education, industry and state government. CENIC will develop a solid communications program that will continuously inform all these constituencies.

The target objective of this component is to implement and maintain an effective communication program.

## **5.4 Project Management**

The magnitude of this project demands both overall executive leadership and effective day-to-day project management. In addition, there is the need for contract/financial management and administrative support services.

The target objective of this component is to plan, implement, serve, maintain, and manage this project within specific budget and time schedules.



## **5.5 Ongoing Network Management, Operations, and Support**

Once the K-20 statewide backbone network is implemented, CENIC will contract with 4CNet (CSU) to provide day-to-day management, operations, and support for DCP.

The target objective is manage and operate the network in a manner that ensures quality services that are also cost-effective.

## **Section 6 Project Implementation**

As the driving force behind the DCP, CENIC is responsible for the entire management of this project.

### **6.1 Timetable of Major Tasks**

The development of the DCP will occur in five clearly-defined stages.

#### ***6.1.1 Phase 0 — Pre-Launch***

- Reach agreements with the State and UC Office of the President on funds flow, reporting and accountability
- Reach agreement with CSU on the role of 4CNet
- Hire Staff/Consultants
- Hire Network Planning Consultant Team
- Form the Program Steering Committee

#### ***6.1.2 Phase 1 — Planning — 6 Months***

- Develop and launch the communications plan
- Develop the overall network architecture and implementation plan
- Develop the applications coordination plan

- Develop and issue the RFPs necessary to implement network architecture plan
- Select, negotiate and sign contracts to implement network plan

#### ***6.1.3 Phase 2 — Implement First Wave of DCP Hubs and Access Nodes — 6 Months***

- Implement the first wave of the network plan installing the 25 DCP access hubs and a minimum of 100 county-based access nodes
- With 4CNet develop the ongoing operational and management plan for the network
- Continue to the communications plan
- Launch the applications coordination plan
- Select, announce and implement the first priority applications and services

#### ***6.1.4 Phase 3 — Implementation Second Wave and Launch Network Operations — 6 Months***

- 4CNet will initiate the operation of network services for the first wave implementation
- Implement the first set of priority applications and services
- Complete the implementation of the remaining County-based Access Nodes
- Continue the communications plan
- Continue the applications coordination

#### ***6.1.5 Phase 4 — Full Operation of the Network***

- 4CNet will implement the ongoing plan of operation of the network and support services
- Implement a full range of applications and services

## **6.2 Project Staffing**

CENIC believes that effective coordination of the DCP requires the creation of a series of management and liaison teams that will work together to plan, implement, and service the DCP network for the K-12 community.

### ***6.2.1 Executive Management***

The CENIC President/Executive Director will serve as executive in charge throughout the project. He will allocate 50 percent of his time to the DCP during Phase 1 and 20 percent thereafter.

### ***6.2.2 DCP Project Director***

A full-time professional will be hired as soon as possible to provide the day-to-day project management for two years. This person is expected to have the requisite project management skills and knowledge of networking and education in California.

### ***6.2.3 Contract/Financial Management Services***

CENIC will provide the contract/financial and administrative support via contractual agreements. CENIC will use its contracted financial management services firm to manage the budget, contracts and accounting.

### ***6.2.4 Network Architect and Planning Team***

A person from one of the CENIC universities will be hired to serve as the Chief Architect for DCP at 100 percent of his/her time. This person will provide the technical leadership in planning and implementing the network and be accountable to the DCP Project Director.

A team of planners will assist the Chief Network Architect and DCP Project Director in assessing current status, developing the architectural and implementation plans and overseeing instal-

lation. The Planning Team will be in place through the first three phases. CENIC will contract with a private sector firm(s) to provide this team. As appropriate, this team will be augmented by volunteer experts from the CENIC universities, CENIC Founding Partner Associates, CENIC Affiliate Associates, and K-12 schools.

### ***6.2.5 K-12 Hub and Access Node Planning Liaison Team***

CENIC will hire technology experts from the K-12 community to assist the Chief Architect and the Network Planning Team. They help facilitate the final selection of the locations of the 25 DCP hubs and the 200 County-based access nodes in each of the 58 counties. The plan is to contract for percentages of time of K-12 experts across the state, given the geographic spread of the state and the differences in needs. These planning liaisons will be individuals well respected in the local K-12 community who can act as the technical voice of the community. Their involvement will vary during the first three phases.

### ***6.2.6 Communications Program***

A communications consulting firm(s) will be hired to provide the communications management. Ideally, the firm(s) will have demonstrated an in-depth knowledge of California education and a working knowledge of technology. Most important, the firm(s) must have the requisite organizational and communications skills to deal with a wide range of constituencies and the media.

Special consultants may be needed throughout the project. The plan calls for engaging communications experts to deal with various constituencies. In addition, volunteer assistance will be sought from the Charter Associate universities and CENIC Associate Partners to augment this effort.



### ***6.2.7 Applications/Information Resources Coordination***

A person from one of the CENIC universities will be hired to serve as the Chief Applications Coordinator for DCP at 100 percent of his/her time for the first three phases of the project. Ideally, this person will have demonstrated an in-depth knowledge of the wide range of applications initiatives and projects that are available to meet K-12 needs. The individual must have the requisite organizational and communications skills to deal with faculty and administrators at all levels of the California education system.

CENIC will hire academic technology experts from the higher education community. These applications liaisons will be phased out at the end of the third phase. The liaisons will assist the Chief Applications Coordinator and the K-12 education liaison team will provide the liaison with the K-12 user and provider higher education and private sector communities. This team will be comprised of individuals from the University of California, California State University, California Community Colleges, and the independent universities of CENIC.

CENIC will hire academic technology applications experts from the K-12 community. These liaisons will serve through the third phase. They will assist the Chief Applications Coordinator and the higher education liaison team and work with the K-12 user and provider communities.

### ***6.2.8 Ongoing Network Management and Operations***

CENIC will contract with 4CNet (CSU) to provide network management and operations services.

As part of the extension of CalREN-2/4CNet advanced services network, it will be necessary to expand the 4CNet staffing to serve this new community of users. The following are rough

projections of those needs. Only after thorough planning will the final staffing needs be known.

#### *K-12 Support Services*

A special staff will be need to be created within the existing 4CNet organization to provide support for K-12.

#### *Network Operations Center (NOC)*

Staff will be added to the existing 4CNet Network Operations Center to support the additional K-12 users. The 4CNet NOC already supports CalREN-2.

#### *DCP Hub and Access Node Field Services Support*

The 25 DCP hubs and 200 Access Nodes must be maintained and supported as part of the statewide backbone. CENIC will work with 4CNet to determine how best to provide this support. One option may be to contract with one or more private sector companies to provide these support services.

## **6.3 Control, Accountability, and Project Governance**

The development of the DCP network will be subject to oversight from elements of the State Government, members CENIC Board of Directors, and representatives from the K-12 community.

### ***6.3.1 State of California and the University of California Office of the President***

CENIC was chosen to have the responsibility for the DCP for several reasons.

Because CENIC is a not-for-profit corporation, it can not receive funds directly from the State of California.

Therefore, the State funding for DCP (\$31.6 million annually) will “flow” to CENIC via the UC

Office of the President (UCOP). UCOP will act as the State’s agent to ensure CENIC delivers DCP and its outcomes.

CENIC and UCOP will develop a “Memorandum of Understanding” using this project plan to serve as the instrument to measure the progress and results of the DCP.

**6.3.2 CENIC Board of Directors**

The CENIC Board of Directors has the overall responsibility for governing the planning, implementation and management of DCP.

The CENIC Board of Directors will provide the governance and oversight for the management

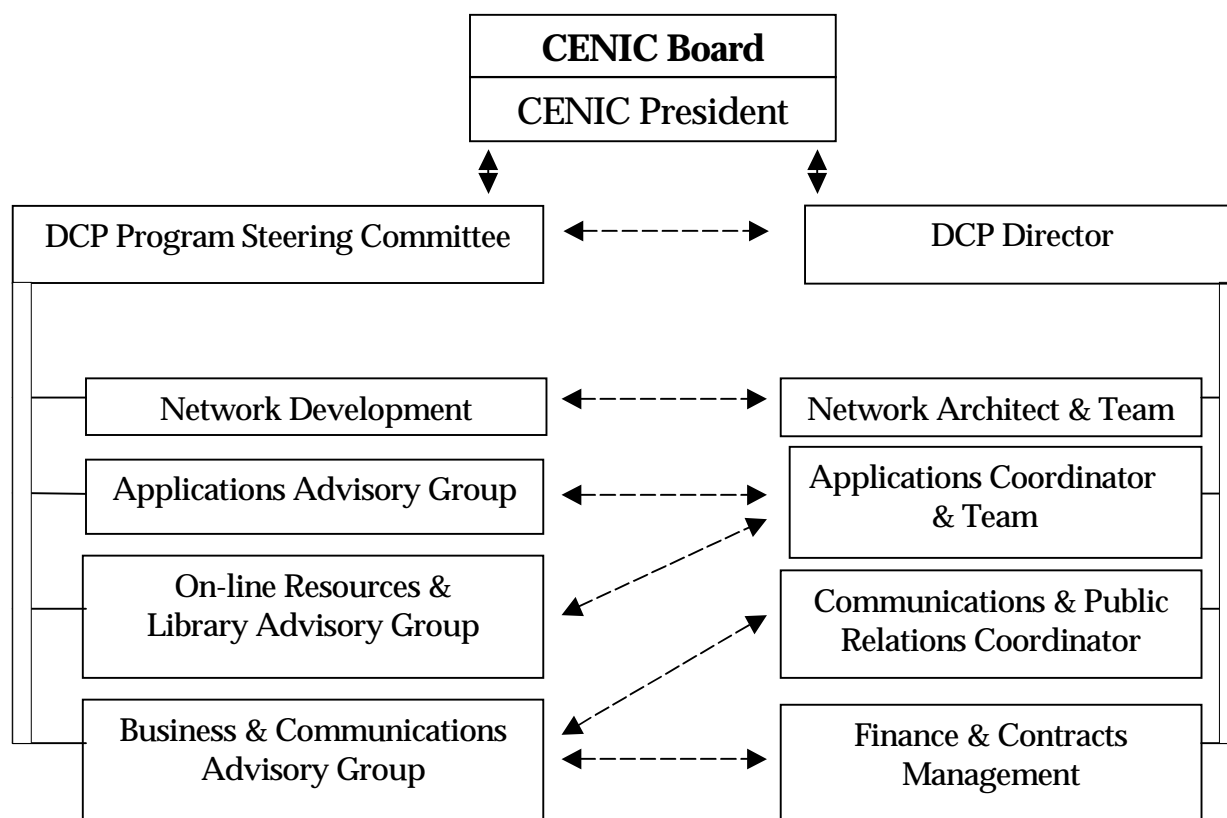


Figure 5. Project Oversight for the DCP



of DCP, as it currently does for CalREN-2.

The CENIC Board will act as the single policy and decision making body for planning, implementing, operating, quality control, and resource expenditures for DCP.

The CENIC Board will be accountable to the State of California, via UCOP, and report annually.

### **6.3.3 DCP Program Steering Committee**

The CENIC Board of Directors has elected to establish a broadly representative Program Steering Committee (PSC) to formulate and oversee the execution of the specific strategies and tactics involved in planning and implementing the DCP.

In essence, the CENIC Board of Directors will rely solely on the PSC to work with the CENIC President and the DCP Director to make all of the strategic and tactical decisions for the DCP, within the policies and guidelines of the CENIC Board, the DCP financial plan, and CENIC's general accountability to the State of California.

The PSC will be comprised of members from several education organizations, including:

- CENIC Board of Directors
- Association of Independent California Colleges and Universities
- California State University System
- California Community College System

- University of California System
- Association of California School Administrators
- California County Superintendents Educational Services Association
- California Department of Education
- California Federation of Teachers
- California School Board Association
- California Teachers Association
- Computing Using Educators, Incorporated
- California State Secretary of Education
- Small School Districts Association

Figure 5 depicts the organization of project oversight for the DCP.

## **6.4 Project Budget**

The DCP is divided into four phases. The first three phases involve planning, implementing and start-up operations of the network. As depicted in Table 1, it is estimated that \$31,600,000 will be needed annually to maintain, operate, and service the K-12 portion of the expanded K-20 statewide network backbone infrastructure in Phase 4.

The expenditure of these funds is projected for the following five categories: equipment, circuits, network support, administrative support, and contingency.

### **6.4.1 Equipment**

It is estimated that \$7,400,000 will be needed annually for equipment acquisition and maintenance on an ongoing basis.

A four-year life cycle is planned for infrastructure equipment replacement. The initial cost of the equipment and installation is projected at \$27,700,000 spread over Phases 2 and 3.

**6.4.2. Circuits, Backbones, and ISPs**

In Phase 4 the ongoing costs for circuits, backbone and ISP services are estimated at \$19,059,000 annually. This amount includes transport between the 25 hubs and 200 Access Nodes.

**6.4.3 Network Support Services**

The 4CNet Network Operations Center and the Field Services Support are estimated to cost \$2,400,000 annually.

**6.4.4 Management and Administrative Support**

The ongoing management and administrative support is projected to be \$1,320,000 per year.

**6.4.5 Contingency**

Annually, \$500,000 will be needed for contingencies.

**6.4.6 Project Management**

During the first 24 months there is a need for project management.

	Phase 1 (6 months)	Phase 2 (6 months)	Phase 3 & 4 (12 months)	Ongoing Annual
<i>Equipment and Installation</i>		\$21,012,000	\$11,429,500	\$7,417,000
<i>Circuits</i>		\$5,847,000	\$15,129,000	\$19,059,000
<i>Network Support Services</i>		\$890,500	\$2,405,000	\$2,405,000
<i>Project Management</i>	\$1,370,000	\$1,650,000	\$2,160,000	\$1,320,000
<i>Contingency</i>		\$870,000	\$500,000	\$500,000
<b>TOTAL COST</b>	<b>\$1,370,000</b>	<b>\$30,269,500</b>	<b>\$31,623,500</b>	<b>\$30,701,000</b>

Table 1. Total Digital California Project Budget



## **Section 7 CENIC Associates**

### **7.1 CENIC Charter Associates**

#### **7.1.1 California Institute of Technology**

*California Institute of Technology  
Jet Propulsion Laboratory*

#### **7.1.2 Stanford University**

*Stanford University  
Stanford Medical Center  
Stanford Linear Accelerator Center*

#### **7.1.3 California State University System**

*California State Polytechnic University,  
Pomona  
California Maritime Academy  
California Polytechnic State University,  
San Luis Obispo*

*CSU Bakersfield*

*CSU Northridge*

*CSU Channel Islands*

*CSU Chico*

*CSU Sacramento*

*CSU Dominguez Hills*

*CSU San Bernardino*

*CSU Fresno*

*CSU Fullerton*

*CSU Hayward*

*CSU Long Beach*

*CSU San Marcos*

*CSU Los Angeles*

*CSU Stanislaus*

*CSU Monterey Bay*

*Humboldt State University*

*San Diego State University*

*San Francisco State University*

*San Jose State University*

*Sonoma State University*

#### **7.1.4 University of California System**

*UC Berkeley*

*UC Davis*

*UC Irvine*

*UC Los Angeles*

*UC Merced*

*UC Riverside*

*UC San Diego*

*UC San Francisco*

*UC Santa Barbara*

*UC Santa Cruz*

#### **7.1.5 University of Southern California**

*University Park Campus*

*Health Sciences Campus*

*Information Sciences Institute*

### **7.2 CENIC Founding Partner Associates**

*Cisco Systems*

*IBM Research*

*Pacific Bell*

*Sun Microsystems*

### **7.3 CENIC Affiliate Associates**

*AVT*

*General Atomics*

*Raytheon*

### **7.4 CENIC Network Associates**

*NevadaNet*

### **7.5 CENIC Network Peerings**

*Internet 2 (Abilene)*

*ESNet*

*CUDI*

## Section 8 Glossary

***4CNet:***

The telecommunication network serving the CSU system and the California Community Colleges

***Abilene:***

The advanced-services network being built by the Internet2 consortium

***CalREN-2:***

The advanced-services network serving research and education institutions in California

***CENIC:***

The Corporation for Education Network Initiatives in California (CENIC) is a non-profit corporation founded by the five major California universities: California Institute of Technology, California State University, Stanford University, University of California, and the University of Southern California. The mission of CENIC is to facilitate and coordinate the development, deployment, and operation of a set of robust advanced communications services for education and research organizations in California based on the newest Internet technology.

***CSU:***

The California State University system

***DCP:***

The Digital California Project is a multi-million dollar initiative funded by the State of California that makes available high-performance network capability to every county and school district for use by K-12 teachers and students.

***Internet2:***

A partnership of over 170 universities, government agencies, and corporations dedicated to building a “next generation” Internet nationwide

***K-12:***

California’s elementary, middle, and high school systems

***K-20:***

All of California’s educational institutions

***LATA:***

“Local access and transport area”; a geographic area where a phone company can offer service

***UC:***

The University of California system

***UCOP:***

The University of California Office of the President