

# CENIC

## COMMUNITY REPORT

SUMMER 2017



[www.cenic.org](http://www.cenic.org)



CENIC connects California to the world—advancing education and research statewide by providing a world-class network essential for innovation, collaboration, and economic growth.

# Letter from President & CEO

Dear Colleagues,

In 1996, visionary leaders within California's research and education institutions came together to form CENIC, a non-profit organization providing the world-class broadband network CalREN (the California Research and Education Network), essential for innovation, collaboration, and economic growth statewide. Now, in our 20th year of operation, CENIC continues to provide cost-effective, high-bandwidth networking capacity and connectivity to support research and education conducted by our members: the University of California System, the California State University System, California Community Colleges, Stanford, Caltech, the Naval Postgraduate School, USC, and California's public K-12 schools and libraries, along with affiliated education, government, medical research, and cultural institutions throughout the state.



**LOUIS FOX**  
CEO & PRESIDENT

The pace of change continues to accelerate, and it's critical that California's research and education communities have the advanced networking they need to meet their most pressing needs and respond to opportunities we cannot yet imagine. CENIC remains committed to working with its members to tailor this high-capacity network to their needs.

Over the last several years we have worked to secure and expand the network, to encourage and showcase innovative uses of it, and to strengthen our organization. In this report you will read about major upgrades within specific segments, enhancements to the network backbone, and a new initiative in cybersecurity. You will learn that new communities have been added to the network, including California public libraries, city governments, and hundreds of the hardest-to-reach K-12 schools. You will also learn about some of the hundreds of innovative uses of the network, from collaborative research on the Pacific Research Platform to the ways in which cultural institutions collaborate with K-12 schools and libraries.

Finally, the report highlights the ways in which we have worked to strengthen our organization in support of our members by creating a project management office, developing a connection tracker that displays the status of hundreds of annual upgrades, and operating a state of the art Network Operations Center.

As our work evolves, CENIC's mission remains unchanged: To connect California to the world—advancing education and research statewide by providing the world-class network essential for innovation, collaboration, and economic growth. For all of us at CENIC, it's an honor and inspiration to pursue this mission with our associates. We look forward to the next twenty years of common work.



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# About CENIC

In 1996, visionary leaders within California's research and education institutions came together to form CENIC, a nonprofit organization providing the world-class broadband network CalREN (the California Research and Education Network) — a network essential for innovation, collaboration, and economic growth statewide. CENIC was initially formed by the University of California system, the California State University system, Stanford University, the California Institute of Technology, and the University of Southern California, organizations which recognized the need to combine resources and build one purpose-built network that could serve all of their needs.



Today, CENIC continues to provide cost-effective, high-bandwidth networking capacity and connectivity to support research and education conducted by our members: the University of California System, the California State University System, California Community Colleges, Stanford University, the California Institute of Technology, the University of Southern California, the Naval Postgraduate School, and California's public K–12 schools and libraries, along with affiliated educational, governmental, medical research, and cultural institutions throughout the state. CENIC serves shared long-term public goals of technological innovation, democratic vitality, and opportunity for the next generation.

CENIC connects the state's research and education institutions to peers around the world, with an estimated 20 million Californians using CENIC's services each year. CENIC is part of a global ecology of research and education, government, and commercial networks, and manages a vast portfolio of integrated networks on behalf of its members and partners, delivering quality, efficiency, and value for all.

# Board of Directors

CENIC is governed by its members. The CENIC Board of Directors is comprised of representatives from CENIC's Charter Associates, who meet six times per year to guide the organization and make decisions about its future direction.

## CALIFORNIA INSTITUTE OF TECHNOLOGY

**Jin Chang** Chief Information Officer

## STANFORD UNIVERSITY

**Mark Miyasaki** Executive Director, Communication Services, Information Technology

## CALIFORNIA COMMUNITY COLLEGES

**Tim Calhoon** Director, CCC Technology Center

**Deborah Ludford** District Director, IT Services, North Orange CCC District

**Van Ton-Quinlivan** Vice Chancellor, CCC Chancellor's Office

## CALIFORNIA STATE UNIVERSITY

**Patrick Perry** Chief Information Officer, CSU Chancellor's Office

**Mildred García** President, California State University, Fullerton

**Michael Berman** Vice President for Technology & Communication & CIO, CSU Channel Islands

## CALIFORNIA K-12 SYSTEM

**Jerry Winkler** Director, Education Data Management Division, California Department of Education

**Terry Walker** Superintendent, Irvine Unified School District

**Todd Finnell** Superintendent, Imperial County Office of Education

## UNIVERSITY OF CALIFORNIA

**Tom Andriola** Vice President & CIO, UC Office of the President

**Michael Pazzani** Vice Chancellor, Research & Economic Development, UC Riverside

**Larry Conrad** Associate Vice Chancellor and CIO, University of California, Berkeley

## UNIVERSITY OF SOUTHERN CALIFORNIA

**David Galassi** Assistant CIO, University of Southern California

## CALIFORNIA STATE LIBRARIES

**Anne W. Neville** Director, California Research Bureau

**Natalie Cole** Library Programs Consultant, Library Development Services Bureau

**Patty Wong** City Librarian, Santa Monica Public Library

## NAVAL POSTGRADUATE SCHOOL

**Joseph LoPiccolo** CIO and Director, Information Technology and Communication Services

## OUTSIDE DIRECTORS

**Greg Bell** CEO, Broala

**Christine Haska** Vice President, Information Resources & CIO, Naval Postgraduate School (retired)

**Ron Johnson** Vice President & CIO Emeritus, Professor, University of Washington

**Larry Smarr** Director, Calit2 & Professor, California Institute for Telecommunications and Information Technology, UCSD

## CENIC

**Louis Fox** President and CEO (Ex-Officio)

## EX-OFFICIO

**Ju Kim** Sr. Manager, Network Operations, UCLA

**Paula McKinnon** Interim Director, Califa

# OUR COMMUNITY

CENIC's network resources provide cost-effective, high-bandwidth networking to support the missions of our members, responding to the needs of their faculties, staff, students, researchers, patrons, and patients, and facilitating excellence in scientific, educational, governmental, and private sector collaboration and innovation. CENIC members include:

**CHARTER ASSOCIATES**

**ASSOCIATES**

**SPONSORED & AUXILIARY ASSOCIATES**

**AFFILIATES**

## Charter Associates

These founding and governing research and education members comprise the Board of Directors, setting policy and guiding the organization. Charter Associates have full access to CENIC's portfolio of networks and services.

University of California system

California K–12 schools

California Community Colleges

California State University system

California Public Libraries

Stanford University

The California Institute of Technology

University of Southern California

Naval Postgraduate School



## Associates

These independent research, educational, medical, and technology institutions and organizations engage with and connect directly to the broader CENIC community. Associates have direct access to CENIC's portfolio of networks and services.

California Telehealth Network

Carnegie-Mellon University West

Chapman University

Community Hospital of the Monterey Peninsula

Monterey Bay Aquarium Research Institute

NASA Ames Research Center

Naval Postgraduate School

Pepperdine University

Salinas Valley Memorial Healthcare System

University of Pennsylvania Wharton West

University of San Diego

University of San Francisco

## Sponsored Associates

These cultural, scientific, and artistic institutions have close ties to a Charter Associate which serves as a sponsor. Sponsored associates have direct access to an abbreviated portfolio of CENIC's networks and services.

Exploratorium

SFJAZZ

California Academy of Sciences

## Auxiliary Associates

These smaller institutions and organizations engage with the CENIC community, and have direct access to an abbreviated portfolio of networks and services.

City of Hope

## Affiliates

These educational and research institutions and organizations make use of CalREN indirectly, through a Charter Associate that is willing to serve as an affiliate's connection to the CalREN Network.

Art Center College & Design

Broad Art Foundation

Charles Drew University

Claremont College

Colburn School

East Bay Community Law Center

International Computer Science Institute

Loyola Marymount

National Marine Fisheries Service

Occidental College

Pac-12 Enterprises

The Scripps Research Institute

Venter Institute

# NETWORK COLLABORATORS

In order to achieve its mission, CENIC collaborates with a host of other broadband networks, governmental entities, nonprofit organizations, and private sector businesses around the state, country, and world. CENIC actively pursues peering relationships with other network providers, including both commercial networks and research and education networks. Use of CalREN's peering services provides high-speed access to many data-intensive sites, such as Amazon, Google, and Microsoft.

## **GOVERNMENT & NONPROFIT ORGANIZATIONS**

## **BROADBAND NETWORKS**

## **COMMERCIAL PROVIDERS AND EQUIPMENT PROVIDERS**

## **OTHER PRIVATE SECTOR COLLABORATORS**

# Government & Non-profit Organizations

Federal, state, regional, and national government organizations and departments, along with non-profit organizations, are essential partners in ensuring that Californians can access leading-edge broadband networks and network resources.

California Broadband Council

California Broadband Consortia:

Broadband Consortium of the Pacific Coast

California's One Million New Internet Users Coalition (Los Angeles County)

Central Coast Broadband Consortium

Central Sierra Connect Consortium

Connected Capital Area Broadband Consortium

East Bay Broadband Consortium (Alameda, Contra Costa, Solano Counties)

Eastern Sierra Connect Consortium (Inyo, Eastern Kern, Mono Counties)

Gold Country Broadband Consortium

Inland Empire Regional Broadband Consortium

Los Angeles County Regional Broadband Consortium

North Bay North Coast Consortium

Northeastern California Connect Consortium

Redwood Coast Connect Consortium

San Diego Imperial Regional Broadband Consortium (Imperial, San Diego Counties)

San Joaquin Valley Regional Broadband Consortium

Upstate California Connect Consortium

California Public Utilities Commission

California State Department of Finance

California State Legislature

California Emerging Technology Fund

City of Los Angeles

City and County of San Francisco

Federal Communications Commission

Energy Sciences Network

Monterey County

The United States Department of Energy

The United States Department of Defense

US Ignite

# Broadband Networks

CENIC is part of an ecology of networks — research and education networks, governmental networks, and commercial networks — and manages a vast portfolio of integrated networks on behalf of its members and partners.

## STATE NETWORKS

Bay Area Rapid Transit  
California Department of Technology  
California Telehealth Network  
City of Los Angeles  
City of Los Angeles Department of Water & Power  
City and County of San Francisco  
County of Monterey IT Department  
Digital 395  
Los Nettos  
Sunesys  
Vast Networks

## WESTERN REGIONAL NETWORKS

Albuquerque GigaPop  
Front Range Gigapop  
Pacific Northwest Gigapop  
University of Hawaii

## NATIONAL NETWORKS

Akamai  
Amazon  
Apple  
CenturyTel  
Charter  
Cisco  
Comcast  
CoreSite  
Cox Communications

Digital Realty  
DREN III  
Dropbox  
Equinix  
ESnet  
Facebook  
Frontier  
Google  
Hurricane Electric  
IBM Softlayer  
Internet Software Consortium  
Internet2  
Level3 Communications  
Limelight Networks  
Microsoft Corporation  
NASA Research & Education Network (NREN)  
Netflix  
OpenDNS  
Packet Clearing House  
Shaw Communications  
Sony  
StarLight  
TelX  
The Quilt  
TimeWarner Cable  
TransPAC  
TW Telecom  
Twitch  
University of Hawaii  
Verizon Digital Media  
XO Communications  
Yahoo  
Zayo

## INTERNATIONAL NETWORKS

AARNet (Australia)  
AmLight (United States)  
APAN (Asia Pacific)  
CANARIE (Canada)  
CERNET (China)  
CineGrid (Global)  
CSTNet (China)  
CUDI (Mexico)  
GÉANT (Europe)  
GEMnet (Japan, NTT)  
JGN-X (Japan)  
KISTI/KREONET  
SIINET/NII (Japan, National Institute of Informatics)  
NORDUnet (Nordics)  
NUS-Gigapop (Singapore)  
Qatar Foundation (Qatar)  
REANNZ (New Zealand)  
Softbank Telecom (Japan)  
TEIN (Eurasia)  
TWAREN (Taiwan)  
UbuntuNet (Africa)  
UltraLight (Global)  
WIDE (Japan)

## Commercial Service and Equipment Providers

CENIC contracts with a number of leading private companies to provide circuits and equipment needed to connect member institutions to CalREN. Below is a list of companies with whom CENIC conducted business between July 1, 2014 and January 2016.

101Netlink	Imperial Valley
AMS.NET	Telecommunications Authority
AT&T	Karuk Tribe
Broadband Associates Intl	Level 3
Brocade	LV.net
California Internet	MOX, LLC
Cal-Ore	Network Services Solutions, LLC (NSS)
CenturyLink (Qwest)	N orthcoast Communication
Charles Taylor Comm	Plumas Sierra Telecommunications (PST)
Charter Business	Root Automation
Cisco	SeaKay, Inc
Comcast	Suddenlink
Cox Business Services	Sunesys
CyberNet	SunGard Availability Services
Equinix	Time Warner Cable Business Class
Frontier Communications	Vast Networks (CVIN)
Global Capacity	Wave Broadband
Hunter Communications	Wilcon Group

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# CENIC COUNCILS & COMMITTEES

**TECHNICAL ADVISORY COUNCILS**

**COMMITTEES OF THE BOARD OF DIRECTORS**

# Technical Advisory Councils

The Technical Advisory Councils (TACs) are comprised of interested members of the CENIC community who participate in the planning and design of CENIC networks and technologies. TACs provide advice on technology, including recommendations on hardware, software, interoperability issues, performance management, and network research priorities.

## **CalREN-HPR Technical Advisory Council**

This council advises on the development of CENIC's High-Performance Research (HPR) network, which provides leading-edge services for large-application users at CENIC associate sites through national and international research and educational networks such as Internet2, ESNNet, and AARnet.

## **CalREN-DC Technical Advisory Council**

This council advises on CENIC's Digital California (DC) network, which provides high-quality network services for faculty, staff, students, researchers, patrons, and patients in member institutions through the commercial Internet.

# Committees of the Board of Directors

## EXECUTIVE COMMITTEE

Bill Clebsch, Stanford University (Chair)  
 Patrick Perry, CSU Chancellor's Office (Vice Chair)  
 Deborah Ludford, North Orange County Community College District (Treasurer)  
 Tom Andriola, UC Office of the President (Secretary)  
 Terry Walker, Irvine Unified School District  
 Louis Fox, CENIC (Ex-Officio)  
 Bill Paik, CENIC (Ex-Officio)  
 Sherilyn Evans, CENIC (Ex-Officio)  
 John Dundas, CENIC (Ex-Officio)  
 Dave Reese, CENIC (Ex-Officio)  
 Ju Kim, UCLA (Ex-Officio)  
 Paula McKinnon, Califa (Ex-Officio)

## AUDIT COMMITTEE

Christine Haska, Naval Postgraduate School, Retired (Chair)  
 Deborah Ludford, North Orange County Community College District  
 Michael Berman, CSU Channel Islands  
 Terry Walker, Irvine Unified School District  
 Louis Fox, CENIC (Ex-Officio)  
 Bill Paik, CENIC (Ex-Officio)

## FINANCE COMMITTEE

Jo Lo Piccolo, Naval Postgraduate School  
 Deborah Ludford, North Orange County Community College District (Chair)  
 Patrick Perry, CSU Chancellor's Office  
 Luis Wong, Imperial County Office of Education  
 Sam Steinhardt, Stanford University  
 Louis Fox, CENIC (Ex-Officio)  
 Bill Paik, CENIC (Ex-Officio)

## XD/HPR COMMITTEE

Christine Haska, Naval Postgraduate School (Retired)  
 Jim Davis, UCLA  
 Tom DeFanti, UC San Diego  
 John Haskins, UC Santa Cruz  
 Greg Hidley, UC San Diego  
 Russ Hobby, UC Davis  
 Ron Johnson, University of Washington  
 Erik McCroskey, UC Berkeley  
 Paul Murray, Stanford University  
 John Silvester, USC  
 Larry Smarr, UC San Diego  
 Louis Fox, CENIC  
 Dave Reese, CENIC  
 Brian Court, CENIC

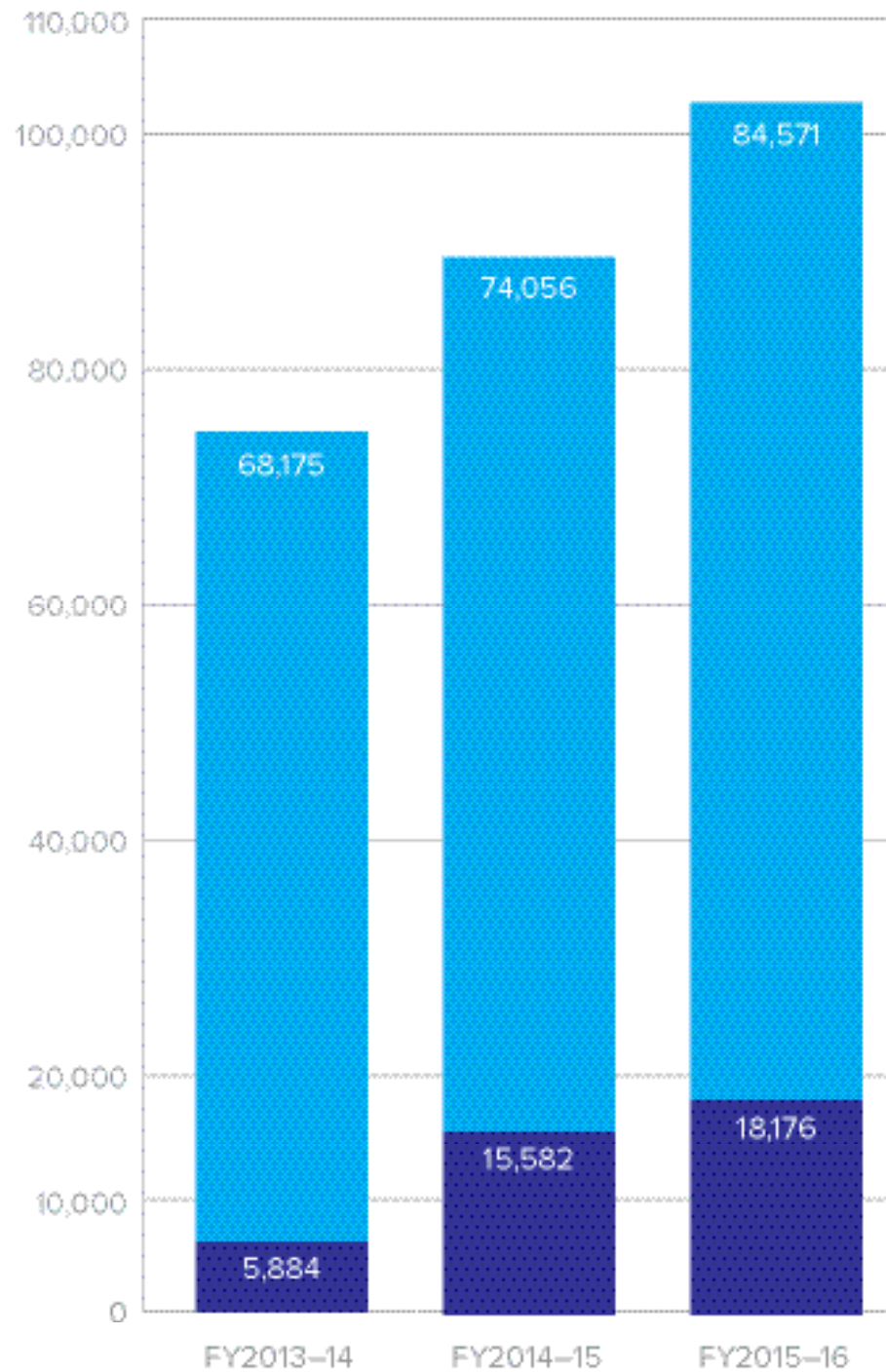
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# FINANCIAL INFORMATION

# CENIC Financial Statement 2013–2016

	FY2013–14	FY2014–15	FY2015–16
Liabilities	5,884	15,582	18,176
Net Assets	68,175	74,056	84,571
<b>Total Liabilities &amp; Net Assets</b>	<b>74,059</b>	<b>89,638</b>	<b>102,747</b>

■ Net Assets  
■ Liabilities  
*in thousands*



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# BUILDING A WORLD-CLASS NETWORK

**CIRCUIT UPGRADES COMPLETED**

**CALIFORNIA LIBRARIES ADDED TO CALREN**

**NEW AND IN PROGRESS LIBRARIES**

**HIGH-SPEED RAIL AND CENIC JOIN FORCES TO CREATE  
CALIFORNIA BROADBAND COMMUNITIES**

**REDUNDANCY RESTORATION AND BANDWIDTH  
UPGRADES FOR CALIFORNIA COMMUNITY COLLEGES**

**SETTING A NEW STANDARD FOR CONNECTIVITY:  
CENIC MEMBERS UPGRADE TO 100 Gbps**

**STRENGTHENING CENIC'S BACKBONE**

**CENIC'S NETWORK SECURITY INITIATIVE**

**INTERNATIONAL RESEARCH & EDUCATION  
NETWORKS PARTNER WITH CENIC**

## Circuit Upgrades Completed

CENIC is a member-driven organization focused on delivering a high level of service to members. We shape our network to meet the needs of our research and education communities, needs which are multi-faceted and dynamic. The CalREN network is reliably and carefully monitored by a 24x7x365 Network Operations Center (NOC). Because NOC engineers continuously monitor shared network capacity to ensure that available bandwidth is always higher than demand, a high level of bandwidth is available to all organizations on the network. The network is more robust than what is typically expected from a commercial network, and engineers consult with members to solve performance issues as they arise. CENIC members are continually assessing their networking needs and planning for connectivity upgrades to provide constituents the highest level of service.

*The following upgrades have taken place or are in progress since July 1, 2014.*

## University of California

UC SITE NAME	BANDWIDTH	DATE	UPGRADE	SECONDARY UPGRADE
UC BERKELEY	100 Gbps	7/18/2016	BANDWIDTH UPGRADE	
UC IRVINE	10 Gbps	12/3/2015	RING TOPOLOGY	
UC IRVINE	10 Gbps	12/3/2015	BANDWIDTH UPGRADE	RING TOPOLOGY
UC IRVINE	10 Gbps	1/31/2015	BANDWIDTH UPGRADE	RING TOPOLOGY
UC IRVINE	100 Gbps	7/6/2016	BANDWIDTH UPGRADE	
UC MERCED	10 Gbps	11/29/2014	BANDWIDTH UPGRADE	
UC MERCED	10 Gbps	7/6/2016	BANDWIDTH UPGRADE	
UC RIVERSIDE	10 Gbps	9/19/2016	BANDWIDTH UPGRADE	
UC RIVERSIDE	100 Gbps	6/6/2015	BANDWIDTH UPGRADE	
UC RIVERSIDE	10 Gbps	9/17/2016	BANDWIDTH UPGRADE	
UC RIVERSIDE	10 Gbps	8/14/2015	BANDWIDTH UPGRADE	
UC SAN FRANCISCO	100 Gbps	11/21/2016	BANDWIDTH UPGRADE	
UC SAN FRANCISCO	10 Gbps	5/19/2015	DIVERSITY	
UC SANTA BARBARA	100 Gbps	9/24/2015	BANDWIDTH UPGRADE	
UC SANTA BARBARA	10 Gbps	12/8/2015	DIVERSITY	
UC SANTA CRUZ	10 Gbps	8/17/2015	BANDWIDTH UPGRADE	
UC SANTA CRUZ	100 Gbps	8/23/2014	BANDWIDTH UPGRADE	
UC LOS ANGELES	20 Gbps	7/7/2015	BANDWIDTH UPGRADE	

## University of California Health System

UC HEALTH SYSTEM SITE NAME	BANDWIDTH	DATE	UPGRADE
UCLA HEALTH SYSTEM	10 Gbps	5/2/2016	DIVERSITY
UCLA HEALTH SYSTEM	10 Gbps	5/8/2016	DIVERSITY
UCLA HEALTH SYSTEM	10 Gbps	5/21/2016	RING TOPOLOGY

## California State Universities

CSU SITE NAME	BANDWIDTH	DATE	UPGRADE
CSU STANISLAUS - STOCKTON CENTER	1 Gbps	8/6/14	BANDWIDTH UPGRADE
CSU SAN BERNARDINO - PALM DESERT	10 Gbps	8/10/14	DIVERSITY
CSU SAN BERNARDINO	10 Gbps	9/10/14	BANDWIDTH UPGRADE
CSU FULLERTON (IRVINE CAMPUS)	1 Gbps	9/17/14	DIVERSITY
CSU STANISLAUS	10 Gbps	9/24/14	BANDWIDTH UPGRADE
CSU LOS ANGELES	10 Gbps	9/28/14	BANDWIDTH UPGRADE
CSU SAN MARCOS	10 Gbps	9/29/14	BANDWIDTH UPGRADE
CSU CHICO	10 Gbps	9/30/14	BANDWIDTH UPGRADE
CSU SAN BERNARDINO	10 Gbps	10/11/14	BANDWIDTH UPGRADE
CSU EAST BAY CONCORD	1 Gbps	10/15/14	BANDWIDTH UPGRADE
CSU EAST BAY CONCORD	1 Gbps	11/4/14	DIVERSITY
CSU SONOMA	10 Gbps	12/17/14	BANDWIDTH UPGRADE
CSU LONG BEACH	10 Gbps	2/4/15	BANDWIDTH UPGRADE
CSU SAN MARCOS	10 Gbps	2/9/15	BANDWIDTH UPGRADE
CSU SONOMA	10 Gbps	4/23/15	BANDWIDTH UPGRADE
CSU CHANCELLORS OFFICE - LONG BEACH	1 Gbps	5/1/15	BANDWIDTH UPGRADE
CSU CHANNEL ISLANDS	10 Gbps	7/4/15	BANDWIDTH UPGRADE
CSU LOS ANGELES	10 Gbps	11/30/15	BANDWIDTH UPGRADE
SAN DIEGO STATE UNIVERSITY	100 Gbps	12/2/15	BANDWIDTH UPGRADE
CSU DOMINGUEZ HILLS	10 Gbps	3/8/16	BANDWIDTH UPGRADE
CSU STANISLAUS	10 Gbps	3/30/16	BANDWIDTH UPGRADE
CSU DOMINGUEZ HILLS	10 Gbps	4/4/16	BANDWIDTH UPGRADE
CSU MARITIME ACADEMY	10 Gbps	5/13/16	BANDWIDTH UPGRADE
CSU MARITIME ACADEMY	10 Gbps	5/20/16	BANDWIDTH UPGRADE
CSU STANISLAUS - STOCKTON CENTER	1 Gbps	5/24/16	DIVERSITY
CSU MOSS LANDING MARINE LABS	1 Gbps	8/6/16	DIVERSITY
CSU CHANNEL ISLANDS	10 Gbps	9/2/16	DIVERSITY
HUMAN RESOURCES - INFORMATION SUPPORT & ANALYSIS UNIT	100 Mbps	10/31/16	BANDWIDTH UPGRADE
CSU ADVOCACY & STATE RELATIONS	100 Mbps	11/30/16	BANDWIDTH UPGRADE

## Private Universities and Scientific and Cultural Institutions

SITE NAME	BANDWIDTH	DATE	UPGRADE
STANFORD UNIVERSITY	100 Gbps	3/19/15	BANDWIDTH UPGRADE
SAN DIEGO SUPERCOMPUTER CENTER	40 Gbps	3/25/15	BANDWIDTH UPGRADE
LAWRENCE BERKELEY NATIONAL LABORATORY	10 Gbps	10/16/15	BANDWIDTH UPGRADE
STANFORD UNIVERSITY (LIVERMORE)	1 Gbps	1/25/16	BANDWIDTH UPGRADE
EXPLORATORIUM	1 Gbps	1/25/16	BANDWIDTH UPGRADE
PEPPERDINE UNIVERSITY	1 Gbps	6/8/16	DIVERSITY
STANFORD UNIVERSITY	10 Gbps	9/26/16	DIVERSITY
UNIVERSITY OF SOUTHERN CALIFORNIA	100 Gbps	12/14/16	BANDWIDTH UPGRADE
NAVAL POST GRADUATE SCHOOL	100 Gbps	1/12/17	BANDWIDTH UPGRADE

## California Community Colleges

CCC SITE NAME	BANDWIDTH	DATE	UPGRADE
MIRA COSTA COMMUNITY COLLEGE- SAN ELIJO CENTER	1 Gbps	7/13/14	BANDWIDTH UPGRADE
LASSEN COMMUNITY COLLEGE	1 Gbps	8/30/14	BANDWIDTH UPGRADE
SIERRA COLLEGE	1 Gbps	8/30/14	DIVERSITY
WEST HILLS LEMOORE COMMUNITY COLLEGE	1 Gbps	10/13/14	BANDWIDTH UPGRADE
LOS ANGEELS VALLEY COLLEGE	1 Gbps	10/18/14	BANDWIDTH UPGRADE
LOS ANGEELS VALLEY COLLEGE	1 Gbps	10/18/14	BANDWIDTH UPGRADE
WEST HILLS LEMOORE COMMUNITY COLLEGE	1 Gbps	10/31/14	DIVERSITY
MENDOCINO COMMUNITY COLLEGE	1 Gbps	12/12/14	DIVERSITY
LONG BEACH CITY COLLEGE	1 Gbps	3/23/15	RING TOPOLOGY
LONG BEACH CITY COLLEGE - PACIFIC COAST CAMPUS	1 Gbps	3/30/15	BANDWIDTH UPGRADE
BARSTOW COMMUNITY COLLEGE DISTRICT	1 Gbps	4/11/15	BANDWIDTH UPGRADE
GAVILAN COMMUNITY COLLEGE DISTRICT	1 Gbps	4/13/15	BANDWIDTH UPGRADE
LOS RIOS COMMUNITY COLLEGE DISTRICT (FOLSOM LAKE COLLEGE)	10 Gbps	5/11/15	BANDWIDTH UPGRADE
OHLONE COMMUNITY COLLEGE	1 Gbps	5/20/15	BANDWIDTH UPGRADE
TAFT COMMUNITY COLLEGE	1 Gbps	5/21/15	BANDWIDTH UPGRADE
PALO VERDE COMMUNITY COLLEGE	155 Mbps	6/19/15	BANDWIDTH UPGRADE
COLUMBIA COMMUNITY COLLEGE	1 Gbps	7/8/15	DIVERSITY
LOS ANGELES TRADE-TECHNICAL COLLEGE	1 Gbps	8/6/15	DIVERSITY

CCC SITE NAME	BANDWIDTH	DATE	UPGRADE
PASADENA AREA COMMUNITY COLLEGE	10 Gbps	8/15/15	BANDWIDTH UPGRADE
BARSTOW COMMUNITY COLLEGE DISTRICT	1 Gbps	8/17/15	DIVERSITY
BUTTE GLENN COMMUNITY COLLEGE DISTRICT	1 Gbps	8/18/15	BANDWIDTH UPGRADE
LOS ANGELES SOUTHWEST COLLEGE	1 Gbps	9/2/15	BANDWIDTH UPGRADE
SAN BERNARDINO COMMUNITY COLLEGE	1 Gbps	9/4/15	BANDWIDTH UPGRADE
SAN DIEGO COMMUNITY COLLEGE DISTRICT	10 Gbps	10/12/15	BANDWIDTH UPGRADE
SAN DIEGO COMMUNITY COLLEGE DISTRICT	10 Gbps	10/12/15	BANDWIDTH UPGRADE
SAN JOAQUIN DELTA COMMUNITY COLLEGE	10 Gbps	11/2/15	BANDWIDTH UPGRADE
SAN JOAQUIN DELTA COMMUNITY COLLEGE	10 Gbps	11/6/15	BANDWIDTH UPGRADE
EAST LOST ANGELES COLLEGE	1 Gbps	11/10/15	BANDWIDTH UPGRADE
LOS RIOS COMMUNITY COLLEGE DISTRICT	10 Gbps	1/21/16	BANDWIDTH UPGRADE
GLENDAL COMMUNITY COLLEGE - GARFIELD CENTER	1 Gbps	2/3/16	BANDWIDTH UPGRADE
WEST VALLEY MISSION COMMUNITY COLLEGE	1 Gbps	2/3/16	BANDWIDTH UPGRADE
LAKE TAHOE COMMUNITY COLLEGE	1 Gbps	2/8/16	BANDWIDTH UPGRADE
MISSION COLLEGE	1 Gbps	2/21/16	BANDWIDTH UPGRADE
STATE CENTER COMMUNITY COLLEGE DISTRICT OFFICE	10 Gbps	2/28/16	BANDWIDTH UPGRADE
WOODLAND COMMUNITY COLLEGE	1 Gbps	2/29/16	BANDWIDTH UPGRADE
GLENDAL COMMUNITY COLLEGE	1 Gbps	3/1/16	RING TOPOLOGY
COLLEGE OF THE REDWOODS	1 Gbps	3/2/16	DIVERSITY
VENTURA COUNTY COMMUNITY COLLEGE DISTRICT	1 Gbps	3/3/16	BANDWIDTH UPGRADE
COMPTON COMMUNITY COLLEGE	1 Gbps	3/14/16	BANDWIDTH UPGRADE
CABRILLO COMMUNITY COLLEGE	1 Gbps	5/4/16	BANDWIDTH UPGRADE
EL CAMINO COMMUNITY COLLEGE	1 Gbps	5/26/16	BANDWIDTH UPGRADE
COLLEGE OF THE SEQUOIAS	10 Gbps	5/30/16	BANDWIDTH UPGRADE
YUBA COMMUNITY COLLEGE DISTRICT- CLEAR LAKE CAMPUS	1 Gbps	6/7/16	BANDWIDTH UPGRADE
PALO VERDE COMMUNITY COLLEGE	100 Mbps	6/13/16	BANDWIDTH UPGRADE
PALOMAR COMMUNITY COLLEGE	10 Gbps	6/13/16	BANDWIDTH UPGRADE
YUBA COMMUNITY COLLEGE DISTRICT	1 Gbps	6/29/16	BANDWIDTH UPGRADE
YUBA COMMUNITY COLLEGE DISTRICT	1 Gbps	7/1/16	DIVERSITY
KERN COMMUNITY COLLEGE DISTRICT	10 Gbps	7/9/16	BANDWIDTH UPGRADE
BRENTWOOD CENTER COMMUNITY COLLEGE	1 Gbps	7/11/16	BANDWIDTH UPGRADE
COLUMBIA COMMUNITY COLLEGE	1 Gbps	7/11/16	BANDWIDTH UPGRADE
CITY COLLEGE OF SAN FRANCISCO	10 Gbps	7/18/16	BANDWIDTH UPGRADE
MENDOCINO COMMUNITY COLLEGE	1 Gbps	7/29/16	BANDWIDTH UPGRADE

CCC SITE NAME	BANDWIDTH	DATE	UPGRADE
COLLEGE OF THE SISKIYOU	1 Gbps	8/1/16	DIVERSITY
YOSEMITE COMMUNITY COLLEGE DISTRICT	1 Gbps	8/8/16	BANDWIDTH UPGRADE
YOSEMITE COMMUNITY COLLEGE DISTRICT	1 Gbps	8/10/16	DIVERSITY
LOS ANGELES CITY COLLEGE	1 Gbps	8/21/16	BANDWIDTH UPGRADE
SANTA ROSA JUNIOR COLLEGE	10 Gbps	8/23/16	BANDWIDTH UPGRADE
LOS ANGELES COMMUNITY COLLEGE DISTRICT	1 Gbps	8/28/16	BANDWIDTH UPGRADE
CONTRA COSTA COMMUNITY COLLEGE DISTRICT OFFICE	1 Gbps	9/1/16	DIVERSITY
LOS ANGELES PIERCE COLLEGE	1 Gbps	9/8/16	BANDWIDTH UPGRADE
SKYLINE COMMUNITY COLLEGE	1 Gbps	9/12/16	BANDWIDTH UPGRADE
CONTRA COSTA COMMUNITY COLLEGE	1 Gbps	9/23/16	DIVERSITY
SAN MATEO COMMUNITY COLLEGE DISTRICT	1 Gbps	9/29/16	BANDWIDTH UPGRADE
LOS ANGELES HARBOR COLLEGE	1 Gbps	10/18/16	BANDWIDTH UPGRADE
LANEY COLLEGE	1 Gbps	10/23/16	BANDWIDTH UPGRADE
SOLANO COMMUNITY COLLEGE	1 Gbps	10/24/16	BANDWIDTH UPGRADE
SAN RAMON VALLEY COMMUNITY COLLEGE	1 Gbps	11/18/16	BANDWIDTH UPGRADE
COAST COMMUNITY COLLEGE DISTRICT OFFICE	10 Gbps	11/28/16	BANDWIDTH UPGRADE
WAKE CENTER COMMUNITY COLLEGE	1 Gbps	11/28/16	RING TOPOLOGY
BERKELEY COMMUNITY COLLEGE	1 Gbps	12/1/16	BANDWIDTH UPGRADE
MERRITT COMMUNITY COLLEGE	1 Gbps	1/13/17	BANDWIDTH UPGRADE

## California K–12

K–12 SITE NAME	BANDWIDTH	DATE	UPGRADE
CONTRA COSTA COUNTY OFFICE OF EDUCATION	10 Gbps	7/1/14	BANDWIDTH UPGRADE
SONOMA COUNTY OFFICE OF EDUCATION	10 Gbps	7/1/14	BANDWIDTH UPGRADE
LOS ANGELES UNIFIED SCHOOL DISTRICT	30 Gbps	7/14/14	BANDWIDTH UPGRADE
KINGS COUNTY OFFICE OF EDUCATION	10 Gbps	8/1/14	BANDWIDTH UPGRADE
KINGS COUNTY OFFICE OF EDUCATION	10 Gbps	8/7/14	BANDWIDTH UPGRADE
STANISLAUS COUNTY OFFICE OF EDUCATION	10 Gbps	8/25/14	BANDWIDTH UPGRADE
TULARE COUNTY OFFICE OF EDUCATION	10 Gbps	9/1/14	UPGRADE
TULARE COUNTY OFFICE OF EDUCATION	10 Gbps	9/17/14	BANDWIDTH UPGRADE
KERN COUNTY OFFICE OF EDUCATION	10 Gbps	9/26/14	DIVERSITY
KERN COUNTY OFFICE OF EDUCATION	10 Gbps	11/1/14	BANDWIDTH UPGRADE
LOYALTON HIGH SCHOOL-SIERRA COUNTY OFFICE OF EDUCATION	1 Gbps	11/24/14	RING TOPOLOGY
NEVADA JOINT UNIFIED HIGH SCHOOL DISTRICT	1 Gbps	12/9/14	BANDWIDTH UPGRADE

K-12 SITE NAME	BANDWIDTH	DATE	UPGRADE
SIERRA COUNTY OFFICE OF EDUCATION-WEST	1 Gbps	12/9/14	BANDWIDTH UPGRADE
MERCED COUNTY OFFICE OF EDUCATION	10 Gbps	12/12/14	BANDWIDTH UPGRADE
SACRAMENTO COUNTY OFFICE OF EDUCATION	10 Gbps	2/6/15	BANDWIDTH UPGRADE
SOLANO COUNTY OFFICE OF EDUCATION	10 Gbps	2/6/15	BANDWIDTH UPGRADE
SOLANO COUNTY OFFICE OF EDUCATION	10 Gbps	2/12/15	BANDWIDTH UPGRADE
TRUCKEE HIGH SCHOOL	1 Gbps	2/13/15	RING TOPOLOGY
BUTTE COUNTY OFFICE OF EDUCATION	10 Gbps	2/27/15	BANDWIDTH UPGRADE
SAN JOAQUIN COUNTY OFFICE OF EDUCATION	10 Gbps	3/14/15	RING TOPOLOGY
ORANGE COUNTY DEPARTMENT OF EDUCATION	10 Gbps	4/1/15	DIVERSITY
SANTA BARBARA COUNTY OFFICE OF EDUCATION	1 Gbps	4/21/15	BANDWIDTH UPGRADE
ALPINE COUNTY OFFICE OF EDUCATION	100 Mbps	5/1/15	BANDWIDTH UPGRADE
TUOLUMNE COUNTY OFFICE OF EDUCATION	10 Gbps	5/6/15	BANDWIDTH UPGRADE
RIVERSIDE COUNTY OFFICE OF EDUCATION-INDIO	10 Gbps	5/12/15	BANDWIDTH UPGRADE
LOS ANGELES COUNTY OFFICE OF EDUCATION	10 Gbps	5/18/15	BANDWIDTH UPGRADE
IMPERIAL COUNTY OFFICE OF EDUCATION	10 Gbps	5/19/15	BANDWIDTH UPGRADE
YUBA COUNTY OFFICE OF EDUCATION	10 Gbps	5/29/15	BANDWIDTH UPGRADE
YUBA COUNTY OFFICE OF EDUCATION	10 Gbps	5/29/15	BANDWIDTH UPGRADE
YUBA COUNTY OFFICE OF EDUCATION	10 Gbps	5/30/15	DIVERSITY
MADERA COUNTY OFFICE OF EDUCATION	10 Gbps	6/8/15	DIVERSITY
CALAVERAS COUNTY OFFICE OF EDUCATION	10 Gbps	6/18/15	BANDWIDTH UPGRADE
FRESNO COUNTY OFFICE OF EDUCATION	10 Gbps	6/22/15	BANDWIDTH UPGRADE
EL DORADO COUNTY OFFICE OF EDUCATION	10 Gbps	6/24/15	DIVERSITY
COLUSA COUNTY OFFICE OF EDUCATION	10 Gbps	7/9/15	BANDWIDTH UPGRADE
MADERA COUNTY OFFICE OF EDUCATION	10 Gbps	7/10/15	BANDWIDTH UPGRADE
SUTTER COUNTY SCHOOLS	10 Gbps	7/16/15	BANDWIDTH UPGRADE
SUTTER COUNTY SCHOOLS	10 Gbps	7/20/15	DIVERSITY
GARDEN GROVE UNIFIED SCHOOL DISTRICT	40 Gbps	7/24/15	BANDWIDTH UPGRADE
FRESNO COUNTY OFFICE OF EDUCATION	10 Gbps	8/1/15	BANDWIDTH UPGRADE
FRESNO COUNTY OFFICE OF EDUCATION	10 Gbps	8/3/15	BANDWIDTH UPGRADE
AMADOR COUNTY OFFICE OF EDUCATION	10 Gbps	8/4/15	BANDWIDTH UPGRADE
SANTA CRUZ COUNTY OFFICE OF EDUCATION	10 Gbps	8/31/15	BANDWIDTH UPGRADE
BUTTE COUNTY OFFICE OF EDUCATION	10 Gbps	9/4/15	RING TOPOLOGY
SHASTA COUNTY OFFICE OF EDUCATION	10 Gbps	9/4/15	BANDWIDTH UPGRADE
SHASTA COUNTY OFFICE OF EDUCATION	10 Gbps	9/4/15	RING TOPOLOGY
FETP MONROVIA-UNIFIED SCHOOL DISTRICT	10 Gbps	9/23/15	BANDWIDTH UPGRADE
SANTA CLARA COUNTY OFFICE OF EDUCATION	10 Gbps	9/23/15	BANDWIDTH UPGRADE

K-12 SITE NAME	BANDWIDTH	DATE	UPGRADE
SANTA CRUZ COUNTY OFFICE OF EDUCATION	10 Gbps	9/23/15	BANDWIDTH UPGRADE
SANTA BARBARA COUNTY OFFICE OF EDUCATION	1 Gbps	10/21/15	RING TOPOLOGY
SANTA MARIA JOINT UNION HIGH SCHOOL DISTRICT	1 Gbps	10/21/15	RING TOPOLOGY
SISKIYOU COUNTY OFFICE OF EDUCATION	1 Gbps	10/21/15	BANDWIDTH UPGRADE
TULELAKE BASIN JOINT UNIFIED SCHOOL DISTRICT	1 Gbps	10/21/15	BANDWIDTH UPGRADE
MODOC COUNTY OFFICE OF EDUCATION	100 Mbps	10/26/15	BANDWIDTH UPGRADE
TULELAKE BASIN JOINT UNIFIED SCHOOL DISTRICT	100 Mbps	10/26/15	BANDWIDTH UPGRADE
SAN JOAQUIN COUNTY OFFICE OF EDUCATION	10 Gbps	10/28/15	RING TOPOLOGY
NEVADA JOINT UNIFIED HIGH SCHOOL DISTRICT	10 Gbps	11/3/15	BANDWIDTH UPGRADE
KERN HIGH SCHOOL DISTRICT	10 Gbps	11/11/15	BANDWIDTH UPGRADE
NAPA VALLEY UNIFIED SCHOOL DISTRICT	10 Gbps	12/7/15	BANDWIDTH UPGRADE
SAN LUIS OBISPO COUNTY OFFICE OF EDUCATION	10 Gbps	12/18/15	BANDWIDTH UPGRADE
NAPA COUNTY OFFICE OF EDUCATION	10 Gbps	12/21/15	BANDWIDTH UPGRADE
NAPA VALLEY UNIFIED SCHOOL DISTRICT	10 Gbps	12/21/15	BANDWIDTH UPGRADE
NORTHERN HUMBOLDT UNION HIGH SCHOOL DISTRICT OFFICE	1 Gbps	12/30/15	RING TOPOLOGY
PLACER COUNTY OFFICE OF EDUCATION	10 Gbps	2/13/16	BANDWIDTH UPGRADE
NEVADA JOINT UNIFIED HIGH SCHOOL DISTRICT	10 Gbps	3/11/16	RING TOPOLOGY
BEAR RIVER HIGH SCHOOL (NEVADA JOINT UNIFIED SCHOOL DISTRICT)	10 Gbps	3/11/16	RING TOPOLOGY
SANTA CLARA COUNTY OFFICE OF EDUCATION	10 Gbps	3/15/16	DIVERSITY
ORANGE COUNTY DEPARTMENT OF EDUCATION	100 Gbps	3/19/16	BANDWIDTH UPGRADE
AMADOR COUNTY OFFICE OF EDUCATION	10 Gbps	3/21/16	BANDWIDTH UPGRADE
MENDOCINO COUNTY OFFICE OF EDUCATION-RIVER CENTER	10 Gbps	4/9/16	BANDWIDTH UPGRADE
PLACER COUNTY OFFICE OF EDUCATION	10 Gbps	4/22/16	DIVERSITY
TUOLUMNE COUNTY OFFICE OF EDUCATION	10 Gbps	5/21/16	DIVERSITY
SUTTER COUNTY SCHOOLS	10 Gbps	5/24/16	UPGRADE
COLUSA COUNTY OFFICE OF EDUCATION	10 Gbps	6/12/16	DIVERSITY
YOLO COUNTY OFFICE OF EDUCATION	10 Gbps	6/18/16	RING TOPOLOGY
YOLO COUNTY OFFICE OF EDUCATION	10 Gbps	6/20/16	RING TOPOLOGY
EL DORADO COUNTY OFFICE OF EDUCATION	10 Gbps	6/24/16	BANDWIDTH UPGRADE
SANTA MARIA JOINT UNION HIGH SCHOOL DISTRICT	10 Gbps	6/29/16	BANDWIDTH UPGRADE
CA DEPARTMENT OF EDUCATION	10 Gbps	7/13/16	BANDWIDTH UPGRADE
KERN COUNTY OFFICE OF EDUCATION	10 Gbps	7/14/16	BANDWIDTH UPGRADE
SAN DIEGO COUNTY OFFICE OF EDUCATION	40 Gbps	7/14/16	BANDWIDTH UPGRADE

K-12 SITE NAME	BANDWIDTH	DATE	UPGRADE
SAN LUIS OBISPO COUNTY OFFICE OF EDUCATION	10 Gbps	7/14/16	BANDWIDTH UPGRADE
CA DEPARTMENT OF EDUCATION	10 Gbps	7/20/16	BANDWIDTH UPGRADE
CHAFFEY JOINT UNIFIED HIGH SCHOOL DISTRICT	10 Gbps	7/25/16	DIVERSITY
MONTEBELLO UNIFIED SCHOOL DISTRICT	10 Gbps	7/29/16	BANDWIDTH UPGRADE
ALAMEDA COUNTY OFFICE OF EDUCATION	10 Gbps	8/1/16	RING TOPOLOGY
RIVERSIDE COUNTY OFFICE OF EDUCATION	100 Gbps	8/1/16	BANDWIDTH UPGRADE
MARIN COUNTY OFFICE OF EDUCATION	10 Gbps	8/21/16	RING TOPOLOGY
BURBANK UNIFIED SCHOOL DISTRICT	10 Gbps	9/1/16	BANDWIDTH UPGRADE
BISHOP UNIFIED SCHOOL DISTRICT-INYO COUNTY	10 Gbps	9/6/16	BANDWIDTH UPGRADE
MONO COUNTY OFFICE OF EDUCATION	10 Gbps	9/6/16	BANDWIDTH UPGRADE
NAPA COUNTY OFFICE OF EDUCATION	10 Gbps	10/11/16	BANDWIDTH UPGRADE
MONO COUNTY OFFICE OF EDUCATION	10 Gbps	10/12/16	BANDWIDTH UPGRADE
BEAR RIVER HIGH SCHOOL (NEVADA JOINT UNIFIED SCHOOL DISTRICT)	10 Gbps	10/19/16	RING TOPOLOGY
STANISLAUS COUNTY OFFICE OF EDUCATION	10 Gbps	10/19/16	RING TOPOLOGY
LAKE COUNTY OFFICE OF EDUCATION	10 Gbps	10/31/16	BANDWIDTH UPGRADE
MENDOCINO COUNTY OFFICE OF EDUCATION-RIVER CENTER	10 Gbps	10/31/16	BANDWIDTH UPGRADE
SACRAMENTO COUNTY OFFICE OF EDUCATION	40 Gbps	11/2/16	BANDWIDTH UPGRADE
LAKE COUNTY OFFICE OF EDUCATION	10 Gbps	11/3/16	BANDWIDTH UPGRADE
DEL NORTE COUNTY OFFICE OF EDUCATION	1 Gbps	1/12/17	RING TOPOLOGY
SISKIYOU COUNTY OFFICE OF EDUCATION	1 Gbps	1/12/17	RING TOPOLOGY
HUMBOLDT COUNTY OFFICE OF EDUCATION	10 Gbps	1/19/17	

## In-Progress Site Upgrades

K-12 SITE NAME	BANDWIDTH	UPGRADE TYPE	SECONDARY
ALAMEDA COUNTY OFFICE OF EDUCATION	100 Gbps	BANDWIDTH UPGRADE	
CHAFFEY JOINT UNIFIED SCHOOL DISTRICT	TBD	BANDWIDTH UPGRADE	
CONTRA COSTA COUNTY OFFICE OF EDUCATION	10 Gbps	BANDWIDTH UPGRADE	
CONTRA COSTA COUNTY OFFICE OF EDUCATION	10 Gbps	BANDWIDTH UPGRADE	
CONTRA COSTA COUNTY OFFICE OF EDUCATION	100 Gbps	BANDWIDTH UPGRADE	
FRESNO COUNTY OFFICE OF EDUCATION	100 Gbps	BANDWIDTH UPGRADE	
KERN COUNTY OFFICE OF EDUCATION	10 Gbps	BANDWIDTH UPGRADE	
LOS ANGELES COUNTY OFFICE OF EDUCATION	100 Gbps	BANDWIDTH UPGRADE	
LOS ANGELES UNIFIED SCHOOL DISTRICT-BEAUDRY	TBD	BANDWIDTH UPGRADE	DIVERSITY

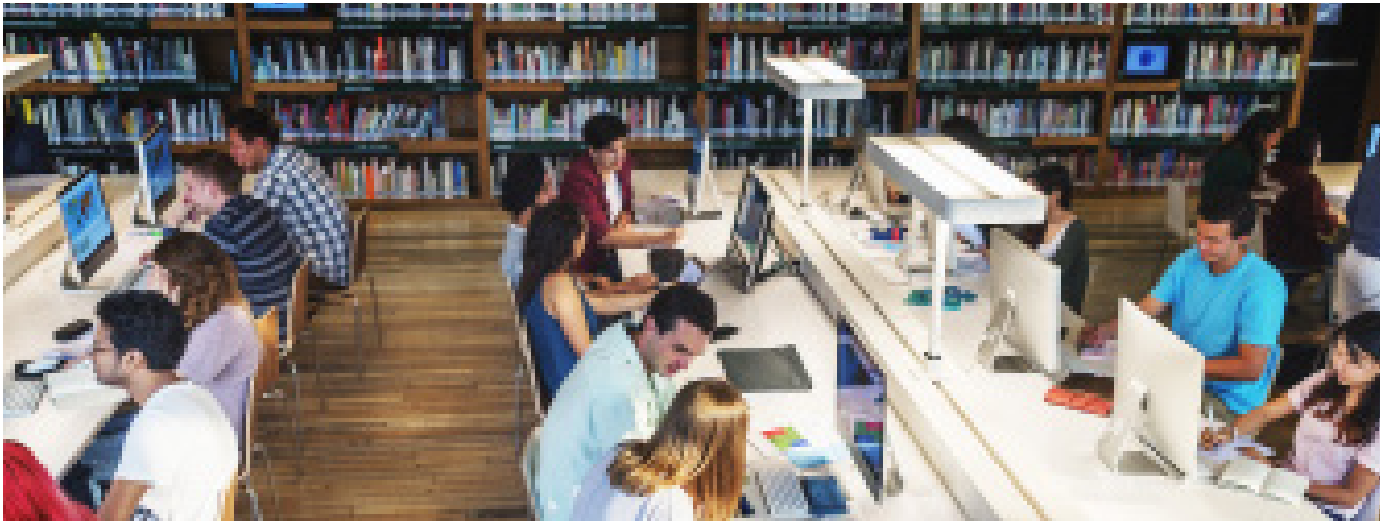
<b>K-12 SITE NAME</b>	<b>BANDWIDTH</b>	<b>UPGRADE TYPE</b>	<b>SECONDARY</b>
LOS ANGELES UNIFIED SCHOOL DISTRICT- VAN NUYS	TBD	BANDWIDTH UPGRADE	DIVERSITY
MODOC COUNTY OFFICE OF EDUCATION	1 Gbps	DIVERSITY	
NORTHERN HUMBOLDT UNIFIED HIGH SCHOOL DISTRICT OFFICE	10 Gbps	BANDWIDTH UPGRADE	
NORTHERN HUMBOLDT UNIFIED HIGH SCHOOL DISTRICT OFFICE	10 Gbps	BANDWIDTH UPGRADE	
ORANGE COUNTY DEPARTMENT OF EDUCATION	TBD	BANDWIDTH UPGRADE	
SAN BENITO COUNTY OFFICE OF EDUCATION	10 Gbps	BANDWIDTH UPGRADE	
SAN BENITO COUNTY OFFICE OF EDUCATION	10 Gbps	BANDWIDTH UPGRADE	
SAN BERNARDINO COUNTY SUPERINTENDENT OF SCHOOLS	TBD	BANDWIDTH UPGRADE	RING TOPOLOGY
SANTA CLARA COUNTY OFFICE OF EDUCATION	100 Gbps	BANDWIDTH UPGRADE	DIVERSITY
SACRAMENTO COUNTY OFFICE OF EDUCATION	100 Gbps	BANDWIDTH UPGRADE	
STANISLAUS COUNTY OFFICE OF EDUCATION	10 Gbps	DIVERSITY	
TRINITY COUNTY OFFICE OF EDUCATION	DS3	BANDWIDTH UPGRADE	
LOS ANGELES COUNTY OFFICE OF EDUCATION	100 Gbps	BANDWIDTH UPGRADE	
LOS ANGELES COUNTY OFFICE OF EDUCATION	100 Gbps	BANDWIDTH UPGRADE	

<b>CSU SITE NAME</b>	<b>BANDWIDTH</b>	<b>UPGRADE TYPE</b>	<b>SECONDARY</b>
CALIFORNIA STATE UNIVERISTY FULLERTON	10 Gbps	DIVERSITY	

<b>CCC SITE NAME</b>	<b>BANDWIDTH</b>	<b>UPGRADE TYPE</b>	<b>SECONDARY</b>
CHABOT COMMUNITY COLLEGE	1 Gbps	DIVERSITY	
CITY COLLEGE OF SAN FRANCISCO	10 Gbps	DIVERSITY	
CRAFTON HILLS COMMUNITY COLLEGE	1 Gbps	DIVERSITY	
LAS POSITAS COMMUNITY COLLEGE	1 Gbps	DIVERSITY	
LOS MEDANOS COMMUNITY COLLEGE	1 Gbps	DIVERSITY	
LAKE TAHOE COMMUNITY COLLEGE	1 Gbps	DIVERSITY	
LOS ANGELES MISSION COLLEGE	1 Gbps	BANDWIDTH UPGRADE	DIVERSITY
PALMDALE EDUCATION CENTER	10 Gbps	BANDWIDTH UPGRADE	DIVERSITY
CITY COLLEGE OF SAN FRANCISCO	10 Gbps	RING TOPOLOGY	
PORTERVILLE COMMUNITY COLLEGE	1 Gbps	RING TOPOLOGY	
AMERICAN RIVER COMMUNITY COLLEGE	10 Gbps	RING TOPOLOGY	
AMERICAN RIVER COMMUNITY COLLEGE	10 Gbps	RING TOPOLOGY	
ANTELOPE VALLEY COMMUNITY COLLEGE	10 Gbps	RING TOPOLOGY	
ANTELOPE VALLEY COMMUNITY COLLEGE	1 Gbps	RING TOPOLOGY	
BAKERSFIELD COLLEGE	1 Gbps	RING TOPOLOGY	
BAKERSFIELD COLLEGE	1 Gbps	RING TOPOLOGY	

CCC SITE NAME	BANDWIDTH	UPGRADE TYPE	SECONDARY
SACRAMENTO CITY COLLEGE	10 Gbps	RING TOPOLOGY	
SANTA BARBARA CITY COLLEGE	1 Gbps	RING TOPOLOGY	
SANTA ROSA JUNIOR COLLEGE	10 Gbps	RING TOPOLOGY	
SANTA BARBARA CITY COLLEGE SCHOTT CENTER	1 Gbps	RING TOPOLOGY	
SLOCCD NORTH COUNTY CENTER	1 Gbps	RING TOPOLOGY	
WEST SACRAMENTO CENTER	1 Gbps	RING TOPOLOGY	
REEDLEY COLLEGE	1 Gbps	RING TOPOLOGY	
ANTELOPE VALLEY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
CANYON COUNTRY ED CENTER	10 Gbps	BANDWIDTH UPGRADE	
CERRITOS COLLEGE	1 Gbps	BANDWIDTH UPGRADE	
CERRITOS COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
CHAFFEY COMMUNITY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
CHAFFEY COMMUNITY COLLEGE-FONTANA CENTER	10 Gbps	BANDWIDTH UPGRADE	
COLLEGE OF ALAMEDA	1 Gbps	BANDWIDTH UPGRADE	
COLLEGE OF THE CANYONS	10 Gbps	BANDWIDTH UPGRADE	
COLLEGE OF THE CANYONS	10 Gbps	BANDWIDTH UPGRADE	
COLUMBIA COMMUNITY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
COLUMBIA COMMUNITY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
COMPTON CENTER	10 Gbps	BANDWIDTH UPGRADE	
DEANZA COLLEGE	1 Gbps	BANDWIDTH UPGRADE	
DEANZA COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
EL CAMINO COMMUNITY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
EL CAMINO COMMUNITY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
FOOTHILL COLLEGE	1 Gbps	BANDWIDTH UPGRADE	
GAVILAN COLLEGE	1 Gbps	BANDWIDTH UPGRADE	
LONG BEACH COMMUNITY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
LONG BEACH COMMUNITY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
LONG BEACH PACIFIC COMMUNITY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
MT SAN ANTONIO COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
NAPA VALLEY COLLEGE	1 Gbps	BANDWIDTH UPGRADE	
OXNARD COLLEGE	1 Gbps	BANDWIDTH UPGRADE	
PERALTA COLLEGE	1 Gbps	BANDWIDTH UPGRADE	
SANTA BARBARA CITY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
SANTA MONICA COMMUNITY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
SHASTA COLLEGE	1 Gbps	BANDWIDTH UPGRADE	
WEST LOS ANGELES COLLEGE	1 Gbps	BANDWIDTH UPGRADE	
YOSEMITECOMMUNITY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	

CCC SITE NAME	BANDWIDTH	UPGRADE TYPE	SECONDARY
YOSEMITE COMMUNITY COLLEGE	10 Gbps	BANDWIDTH UPGRADE	
CANADA COLLEGE	1 Gbps	BANDWIDTH UPGRADE	
SANTA ROSA JUNIOR COLLEGE PETALUMA CAMPUS	10 Gbps	BANDWIDTH UPGRADE	



## California Public Libraries Added to the CalREN Network

In 2013, the California State Legislature and Governor Edmund G. Brown Jr. tasked the California State Library with assessing the high-speed broadband needs of California's public libraries. Although broadband is essential for libraries to fulfill their missions, the needs assessment found that approximately 52% of California's public libraries had slower broadband connections than many Californians have in their homes.

In response to this assessment, Governor Brown and the State Legislature provided funds for a historic initiative to help all of California's public libraries receive high-speed broadband service via CalREN. Through the efforts of CENIC and Califa ([califa.org](http://califa.org))—contracted by the California State Library to serve as a point of coordination between CENIC and the public libraries—over 80% of eligible public library jurisdictions in California are now either connected or in the process of connecting to CalREN.

A major goal of this initiative, as determined by CENIC and the public libraries, is to set a new standard for Internet connectivity in public libraries at 1 Gbps (or 1,000 Mbps) or higher. This goal is being achieved, and California libraries will truly be gigabit libraries, with 90% of main libraries in participating jurisdictions connecting at 1 Gbps or higher.

**Read more CENIC stories from the network on our blog at [www.cenic.org/blog](http://www.cenic.org/blog)**

## California State Library Sites

California State Libraries are the newest members of CENIC and the following new circuits are in progress or have been completed since July 1, 2014..

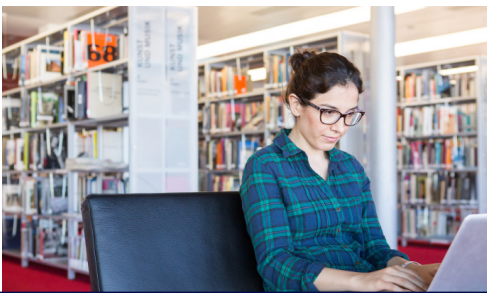
<b>LIBRARY SITE NAME</b>	<b>BANDWIDTH</b>	<b>UPGRADE TYPE</b>	<b>SECONDARY</b>
ALAMEDA COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
ALAMEDA FREE LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
ALHAMBRA PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
ALTADENA LIBRARY DISTRICT	1 Gbps	NEW CENIC CIRCUIT	
ARCADIA PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
AZUSA CITY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
BEAUMONT LIBRARY DISTRICT	1 Gbps	NEW CENIC CIRCUIT	
BELVEDERE-TIBURON LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
BENECIA PUBLIC LIBRARY	1 Gbps		
BERKELEY PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
BLACK GOLD- SLO COUNTY GOVERNMENT CENTER	10 Gbps	NEW CENIC CIRCUIT	
BUENA PARK LIBRARY DISTRICT	1 Gbps	NEW CENIC CIRCUIT	
BUTTE COUNTY LIBRARY			
BUTTE COUNTY LIBRARY-COUNTY DATA CENTER	1 Gbps	NEW CENIC CIRCUIT	
CALABASAS CITY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
CARLSBAD CITY LIBRARY-DOVE LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
CHULA VISTA PUBLIC LIBRARY- CIVIC CENTER BRANCH	1 Gbps	NEW CENIC CIRCUIT	
CITY OF COMMERCE PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
CORONA PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
CORONADO PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
COVINA PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
CROWELL PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
DOWNEY CITY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
EL SEGUNDO PUBLIC LIBRARY	10 Gbps	NEW CENIC CIRCUIT	
ESCONDIDO PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
FULLERTON PUBLIC LIBRARY-FULLERTON	1 Gbps	NEW CENIC CIRCUIT	
GLENDALE LIBRARY, ARTS & CULTURE - PERKINS DATA CENTER	10 Gbps	NEW CENIC CIRCUIT	
GLENDORA PUBLIC LIBRARY & CULTURAL CENTER	1 Gbps	NEW CENIC CIRCUIT	
HARRISON MEMORIAL LIBRARY	100 Mbps	NEW CENIC CIRCUIT	
HEMET PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	

<b>LIBRARY SITE NAME</b>	<b>BANDWIDTH</b>	<b>UPGRADE TYPE</b>	<b>SECONDARY</b>
HUMBOLDT COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
HUNTINGTON BEACH LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
INGLEWOOD PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
IRWINDALE PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
LAKE COUNTY LIBRARY/COURTHOUSE	500 Mbps	NEW CENIC CIRCUIT	
LARKSPUR PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
LINCOLN PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
LIVERMORE PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
LOMPOC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
LONG BEACH PUBLIC LIBRARY	1 GE	NEW CENIC CIRCUIT	
LOS ANGELES PUBLIC LIBRARY / CENTRAL LIBRARY	100 Gbps	NEW CENIC CIRCUIT	
LOS GATOS PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
MARIN COUNTY FREE LIBRARY	10 Gbps	NEW CENIC CIRCUIT	
MARIN COUNTY FREE LIBRARY- CIVIC CENTER BRANCH	1 Gbps	NEW CENIC CIRCUIT	
MILL VALLEY PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
MODOC COUNTY LIBRARY	50 Mbps	NEW CENIC CIRCUIT	
MONROVIA PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
MONTEREY PARK BRUGGEMEYER LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
MOORPARK CITY LIBRARY	100 Mbps	NEW CENIC CIRCUIT	
MOUNTAIN VIEW PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
NAPA COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
NATIONAL CITY PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
NEWPORT BEACH PUBLIC LIBRARY / CENTRAL	1 Gbps	NEW CENIC CIRCUIT	
OAKLAND PUBLIC LIBRARY	10 Gbps	NEW CENIC CIRCUIT	
ORANGE PUBLIC LIBRARY-CITY HALL	1 Gbps	NEW CENIC CIRCUIT	
ORLAND FREE LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
OXNARD PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
PACIFIC GROVE PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
PALM SPRINGS PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
PALMDALE CITY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
PALOS VERDES LIBRARY DISTRICT- PENINSULA CENTER LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
PASADENA PUBLIC LIBRARY	N/A	NEW CENIC CIRCUIT	
PASO ROBLES CITY LIBRARY	500 Mbps	NEW CENIC CIRCUIT	
PLACENTIA LIBRARY DISTRICT	1 Gbps	NEW CENIC CIRCUIT	
PLEASANTON PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
PORTERVILLE PUBLIC LIBRARY	100 Mbps	NEW CENIC CIRCUIT	

<b>LIBRARY SITE NAME</b>	<b>BANDWIDTH</b>	<b>UPGRADE TYPE</b>	<b>SECONDARY</b>
RANCHO CUCAMONGA PUBLIC LIBRARY -PAUL A. BIANE LIBRARY	10 Gbps	NEW CENIC CIRCUIT	
REDONDO BEACH PUBLIC LIBRARY - REDONDO BEACH CITY HALL	1 Gbps	NEW CENIC CIRCUIT	
RICHMOND PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
RIVERSIDE PUBLIC LIBRARY	10 Gbps	NEW CENIC CIRCUIT	
SACRAMENTO PUBLIC LIBRARY	10 Gbps	NEW CENIC CIRCUIT	
SALINAS PUBLIC LIBRARY -JOHN STEINBECK	1 Gbps	NEW CENIC CIRCUIT	
SAN ANSELMO PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SAN BENITO COUNTY FREE LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SAN BERNARDINO PUBLIC LIBRARY-FELDHEYM CENTRAL LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SAN DIEGO PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SAN JOAQUIN VALLEY LIBRARY SYSTEM - KERN COUNTY- BEALE MEMORIAL	100 Mbps	BANDWIDTH UPGRADE	
SAN JOAQUIN VALLEY LIBRARY SYSTEM - KINGS COUNTY-HANFORD HQ	100 Mbps	BANDWIDTH UPGRADE	
SAN JOAQUIN VALLEY LIBRARY SYSTEM - MADERA COUNTY	100 Mbps	BANDWIDTH UPGRADE	
SAN JOAQUIN VALLEY LIBRARY SYSTEM - MERCED COUNTY	100 Mbps	BANDWIDTH UPGRADE	
SAN JOAQUIN VALLEY LIBRARY SYSTEM - TULARE COUNTY	100 Mbps	BANDWIDTH UPGRADE	
SAN JOAQUIN VALLEY LIBRARY SYSTEM - TULARE PUBLIC	100 Mbps	BANDWIDTH UPGRADE	
SAN JOAQUIN VALLEY LIBRARY SYSTEM- FRESNO COUNTY PUBLIC LIBRARY	100 Mbps	BANDWIDTH UPGRADE	
SAN JOAQUIN VALLEY LIBRARY SYSTEM- COALINGA / HURON UNIFIED SCHOOL DISTRICT	1 Gbps	BANDWIDTH UPGRADE	
SAN JOAQUIN VALLEY LIBRARY SYSTEM- MARIPOSA COUNTY LIBRARY	100 Mbps	BANDWIDTH UPGRADE	
SAN JOSE PUBLIC LIBRARY-MARTIN LUTHER KING, JR.	"10 Gbps	NEW CENIC CIRCUIT	
SAN LUIS OBISPO COUNTY LIBRARY		NEW CENIC CIRCUIT	
SAN RAFAEL PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SANTA BARBARA PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SANTA CLARA COUNTY LIBRARY	10 Gbps	NEW CENIC CIRCUIT	
SANTA CRUZ PUBLIC LIBRARY / CENTRAL	10 Gbps	NEW CENIC CIRCUIT	
SANTA FE SPRINGS CITY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SANTA MARIA PUBLIC LIBRARY	500 Mbps	NEW CENIC CIRCUIT	
SANTA PAULA PUBLIC LIBRARY DISTRICT -BLANCHARD COMMUNITY LIBRARY	500 Mbps	NEW CENIC CIRCUIT	
SAUSALITO PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	

<b>LIBRARY SITE NAME</b>	<b>BANDWIDTH</b>	<b>UPGRADE TYPE</b>	<b>SECONDARY</b>
SHASTA PUBLIC LIBRARIES-REDDING LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SIERRA MADRE PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SIGNAL HILL PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SISKIYOU COUNTY FREE LIBRARY-YREKA	1 Gbps	NEW CENIC CIRCUIT	
SOLANO COUNTY LIBRARY (BENICIA PUBLIC LIBRARY)	10 Gbps	NEW CENIC CIRCUIT	
SONOMA COUNTY LIBRARY-CENTRAL LIBRARY	10 Gbps	NEW CENIC CIRCUIT	
SOUTH PASADENA PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
ST. HELENA PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
STOCKTON-SAN JOAQUIN COUNTY PUBLIC LIBRARY - CHAVEZ LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SUNNYVALE PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SUTTER COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
TEHAMA COUNTY LIBRARY RED BLUFF BRANCH	100 Mbps	NEW CENIC CIRCUIT	
THOUSAND OAKS LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
TORRANCE PUBLIC LIBRARY-KATY GEISSERT CIVIC CENTER LIBRARY (MAIN)	1 Gbps	NEW CENIC CIRCUIT	
TULARE COUNTY - VISALIA BRANCH HQ	100 Mbps	NEW CENIC CIRCUIT	
UPLAND PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
VENTURA COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
VICTORVILLE CITY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
WHITTIER PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
WILLOWS PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
YOLO COUNTY LIBRARY	10 Gbps	NEW CENIC CIRCUIT	
YORBA LINDA PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SISKIYOU COUNTY FREE LIBRARY-YREKA	1 Gbps	NEW CENIC CIRCUIT	
SOLANO COUNTY LIBRARY (BENICIA PUBLIC LIBRARY)	10 Gbps	NEW CENIC CIRCUIT	
SONOMA COUNTY LIBRARY-CENTRAL LIBRARY	10 Gbps	NEW CENIC CIRCUIT	
SOUTH PASADENA PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SOUTH SAN FRANCISCO PUBLIC LIBRARY			
ST. HELENA PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
STANISLAUS COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
STOCKTON-SAN JOAQUIN COUNTY PUBLIC LIBRARY - CHAVEZ LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
SUNNYVALE PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
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LIBRARY SITE NAME	BANDWIDTH	UPGRADE TYPE	SECONDARY
TORRANCE PUBLIC LIBRARY-KATY GEISSERT CIVIC CENTER LIBRARY (MAIN)	1 Gbps	NEW CENIC CIRCUIT	
TULARE COUNTY - VISALIA BRANCH HQ	100 Mbps	NEW CENIC CIRCUIT	
TUOLUMNE COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
UPLAND PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
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YUBA COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
VENTURA COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
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WILLOWS PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
YOLO COUNTY LIBRARY	10 Gbps	NEW CENIC CIRCUIT	
YORBA LINDA PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT	
YUBA COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT	



## Library Sites Completed Prior to this Report

LIBRARY SITE NAME	BANDWIDTH	UPGRADE
AMADOR COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT
BRAWLEY PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
BURLINGAME PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
CALAVERAS COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT
CAMARENA MEMORIAL PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
COLUSA COUNTY FREE LIBRARY	1 Gbps	NEW CENIC CIRCUIT
DALY CITY PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
EL CENTRO PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
EL DORADO COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT
IMPERIAL COUNTY FREE LIBRARY	1 Gbps	NEW CENIC CIRCUIT
IMPERIAL PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
MENLO PARK PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
MONO COUNTY FREE LIBRARY	1 Gbps	NEW CENIC CIRCUIT
MONTEREY COUNTY FREE LIBRARIES	1 Gbps	NEW CENIC CIRCUIT
MONTEREY PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
NEVADA COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT
PLACER COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT
REDWOOD CITY PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
SAN BRUNO PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
SAN FRANCISCO PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
SAN MATEO COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT
SAN MATEO PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
SOUTH SAN FRANCISCO PUBLIC LIBRARY	1 Gbps	NEW CENIC CIRCUIT
STANISLAUS COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT
TUOLUMNE COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT
YUBA COUNTY LIBRARY	1 Gbps	NEW CENIC CIRCUIT



## High-Speed Rail and CENIC Join Forces to Create California Broadband Communities

CENIC and the California High-Speed Rail Authority have signed an agreement to work toward linking fiber in the high-speed rail system corridor to CalREN, CENIC's ultra-fast statewide research and education network, as well as to other public and private sector broadband networks. The resulting network will provide needed connectivity for communities located near the high-speed rail system, starting in the Central Valley. To realize this goal, the California High-Speed Rail Authority and CENIC are working together to develop a strategic plan that will include network design, deployment, economics, operations, and management.

For more information, see the recently issued press release: [cenic.org/news/item/CaHSR-CENIC](http://cenic.org/news/item/CaHSR-CENIC).

## Redundancy Restoration and Bandwidth Upgrades for California Community Colleges

The California Community Colleges are one of CENIC's Charter Associates and, with more than 2.1 million students on 113 campuses, comprise the largest system of higher education in the United States. Community college graduates are integral to California's future. Using new funding, CENIC has been working closely with the CCC Chancellor's Office to significantly upgrade connections to CalREN. With well over 190 colleges undergoing these upgrades and more than 70 eligible off-site centers needing new or improved connections, the scope and size of this effort is considerable. Close to twenty 10 Gbps circuits are already in service, and more than twenty-five are in deployment. In addition, eligible off-site centers are being provided with Gigabit connectivity. It is important to note that their last-mile connectivity to CalREN will be a symmetrical connection—in which the upload and download speeds are the same.

# Setting a New Standard for Connectivity: CENIC Members Upgrade to 100 Gbps

More and more CENIC members are choosing to upgrade their connectivity to 100 Gbps—a level becoming the new standard for research universities, and a choice which is attracting other members to attain this level as well.

In March 2016, the Orange County Department of Education, in consultation with the K–12 High Speed Network and the California Department of Education, established the world's first 100-Gigabit per second K–12 connection. As of now there is one other completed 100-Gigabit K-12 connection and four additional 100-Gigabit K-12 connections in progress.

In October, the Los Angeles Public Library became the first 100-Gigabit library in the US. And the City of Los Angeles has signed an agreement to interconnect its network with CENIC's, allowing CENIC members access to the City's databases and providing connectivity 1,000 times faster than what had been available previously.



**The City of Los Angeles is already unmatched in digital transparency, but speed and accessibility are just as important in the 21st century. This agreement means that young people, students of all ages, some of the world's leading thinkers and educators, can now access the City's digital resources up to 1,000 times faster. When we open our data to the public, and commit ourselves to making it more easily available, we create limitless potential for innovation, discovery, and new understanding.**

Mayor Eric Garcetti



## CENIC's Network Security Initiative

The 20 million people who rely on CENIC's network to connect with each other and with the world want to know that their network is secure, safe, and reliable. As part of developing a more robust security strategy, CENIC has produced a comprehensive, risk-prioritized list of computing and networking assets, and has begun a detailed examination of security posture and risk exposure for the most critical assets. Mitigations, including monitoring and hardening, have also begun.



**Our systems have increased in complexity in such a way that no one person understands how any one system is interconnected with an unknown number of other systems. There was a time when there were a limited number of computers connected to any one network. Today every person walking onto a California campus or library arrives with a smartphone that can connect to its network with unknown apps and programs.**

John Dundas III, Vice President and CTO

In response to the concerns of its members, CENIC has launched a new initiative to ensure the reliability and security of the CalREN network. With cybersecurity threats growing, CENIC's Chief Cybersecurity Strategist is now joined by a Senior Security Engineer dedicated to operational security issues, and working to introduce new software-based, automated detection systems into the CENIC toolset. CENIC has formed an internal "virtual security team," including representatives from multiple departments, to discuss security issues and mitigations and to disseminate that knowledge to the rest of CENIC.

CENIC also continues to collaborate with and learn from others in the security arena—working, for example, with ESnet on technology, staffing, and incident response, and having discussions with the R&D community about new technologies that may be useful for CENIC and its constituents.

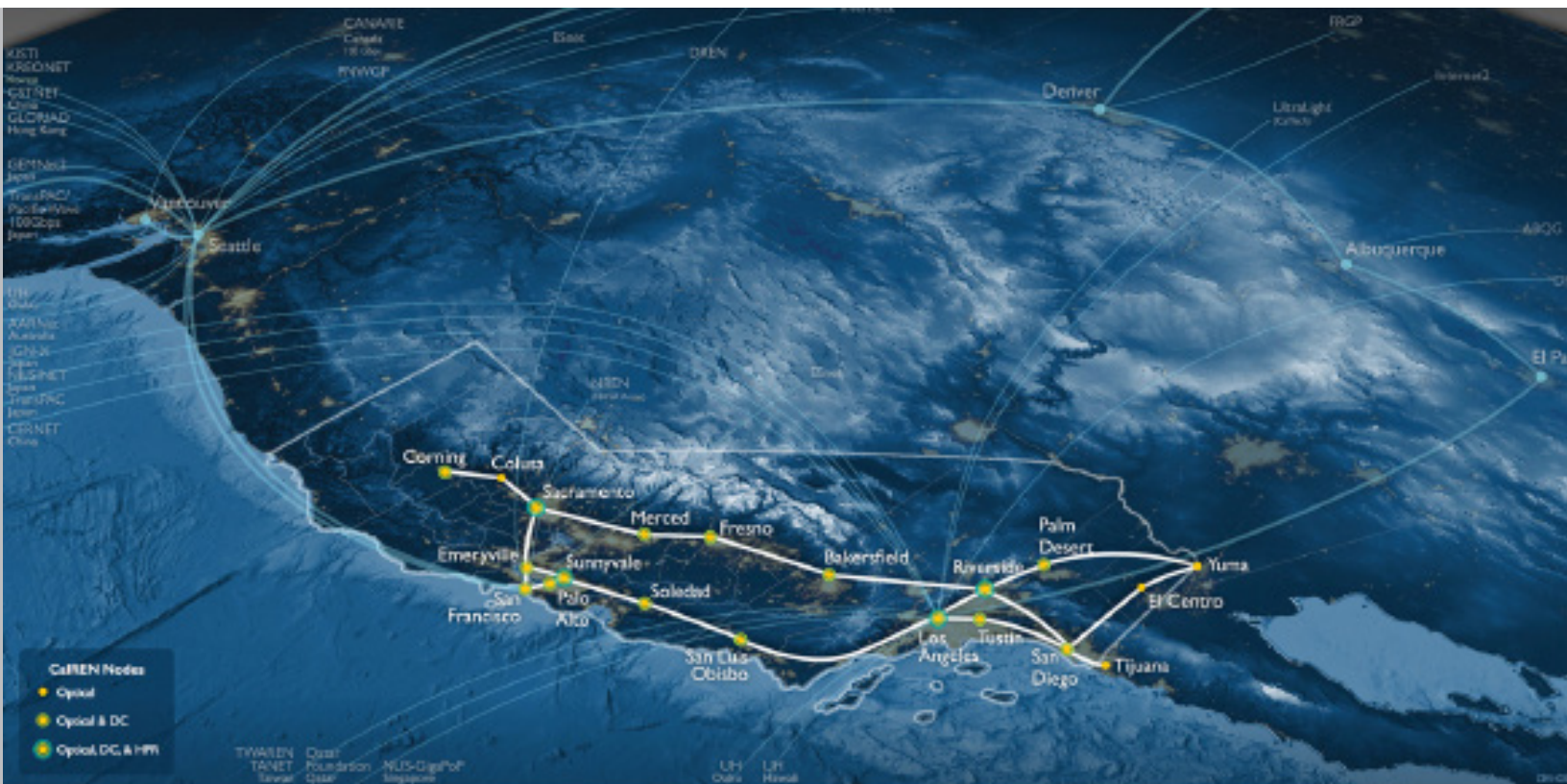
**Read an interview on CENIC's security initiative with John Dundas III, Vice President and CTO, and Sean Peisert, Chief Cybersecurity Strategist on our new blog at [www.cenic.org/blog](http://www.cenic.org/blog).**

# Strengthening CENIC's Backbone

CENIC's California Research and Education Network (CalREN) is a multitiered, advanced network-services fabric serving the majority of research and education institutions in the state. The CalREN backbone includes roughly 3,800 miles of CENIC-owned and managed fiber, last-mile fiber, and hundreds of optical components.

The backbone has three components: optical (Layer 1), Ethernet (Layer 2), and routing (Layer 3). CENIC engineers perform regular upgrades to all three layers, with recent upgrades including:

- Core backbone: upgrade from 4x10 GE to 100 GE (spring 2014)
- Los Angeles to San Diego to Riverside region: upgrade of the Layer-3 network from 4x10 GE to 100 GE (fall 2015)
- Los Angeles: upgrade of 10 GE access port capacity (fall 2015)
- Central Valley region: upgrade of the layer-3 network from 10 GE to 100 GE (spring 2016)
- Los Angeles: additional 10 GE access port capacity upgrades (summer 2016)
- Downtown Sacramento hub site: upgrade to 4x10 GE backbone bandwidth (summer 2016)
- Oakland: upgrade of 10 GE access port capacity (early fall 2016)
- Los Angeles: upgrade of 1 GE access port capacity (fall 2016)
- Sunnyvale: upgrade of 10 GE access port capacity (fall 2016)
- Oakland: additional 10 GE access port capacity upgrades (late fall 2016)



# International Research and Education Networks Partner with CENIC

CENIC has relationships with major international research and education networks. Most are peering relationships, in which traffic flows directly between the two networks without first being routed elsewhere, improving speed and reliability.

Operated in partnership with the Pacific Northwest Gigapop, Pacific Wave ([pacificwave.net](http://pacificwave.net)) continues to be one of CENIC's major international initiatives. Undertaken to help improve service for CENIC members, Pacific Wave creates improved, high-performance connectivity between CalREN and 29 Asia-Pacific countries. Every day, researchers in California use Pacific Wave to collaborate with international colleagues and collect data from remote sensors. Areas of work include climate research, astronomy, meteorology, volcanology, and cultural preservation.

Pacific Wave has been partially supported by two 5-year grants from the NSF through the International Research Network Connections (IRNC) program. In support of experimentation and expansion of 100 G capabilities, CENIC received the third 5-year grant in 2015.

CENIC and the Pacific Northwest Gigapop continue to improve Pacific Wave to better serve the community of users. Recent advancements include:

- **AutoGOLE**, which creates a dedicated pathway using the automatic provisioning of service between AutoGOLE-enabled exchanges worldwide.
- **Software-Defined Networking Exchange (SDX)**, which provides Software-Defined Networking (SDN) connection services between research and education networks, optimizing the flow of traffic ([www.nanog.org/sites/default/files/mon.general.sdx\\_gupta\\_19..pdf](http://www.nanog.org/sites/default/files/mon.general.sdx_gupta_19..pdf)).
- The first **100 G TransPacific Link** from Seattle to Tokyo (in collaboration with TransPAC) and two points of presence in Tokyo.
- **perfSONAR**, a widely-deployed test and measurement infrastructure employed by science networks and facilities around the world to monitor and ensure network performance, and used in the exchange for networks running at 10 G and 100 G.
- Pacific Wave also provides a key part of the infrastructure for the **Pacific Research Platform**, a science-driven, high-capacity, data-centric “freeway system” connecting institutions on the West Coast.

## International Peers

- AARNet (Australia)
- AmLight (Global)
- CANARIE (Canada)
- CERNET (China)
- CineGrid (Global)
- CSTNet (China)
- CUDI (Mexico)
- GÉANT (Europe)
- GEMnet2 (Japan, NTT)
- JGN-X (Japan)
- KISTI/KREONET
- NORDUnet (Nordics)
- Qatar Foundation (Qatar)
- REANNZ (New Zealand)
- SIINET/NII (Japan, National Institute of Informatics)
- TransPAC (Global)
- Transtelco (Mexico)
- TWAREN (Taiwan)
- UltraLight (Global)
- WIDE (Japan)

## Other International Network Collaborators

- APAN (Asia Pacific)
- ESNet
- Indiana University GlobalNOC (Global)
- Internet2
- NetSage (Global)
- Network Startup Resource Center (NSRC - Global)
- PIREN (Pacific Islands)
- Starlight (Global)
- TEIN (Eurasia)
- UbuntuNet (Africa)



# INTERNATIONAL PEERING EXCHANGE

PACIFIC WAVE IS A PROJECT OF CENIC & PACIFIC NORTHWEST GIGAPOP



WITH SUPPORT FROM THE NATIONAL SCIENCE FOUNDATION





# EXPANDING THE NETWORK

**COMMUNITY BY THE NUMBERS**

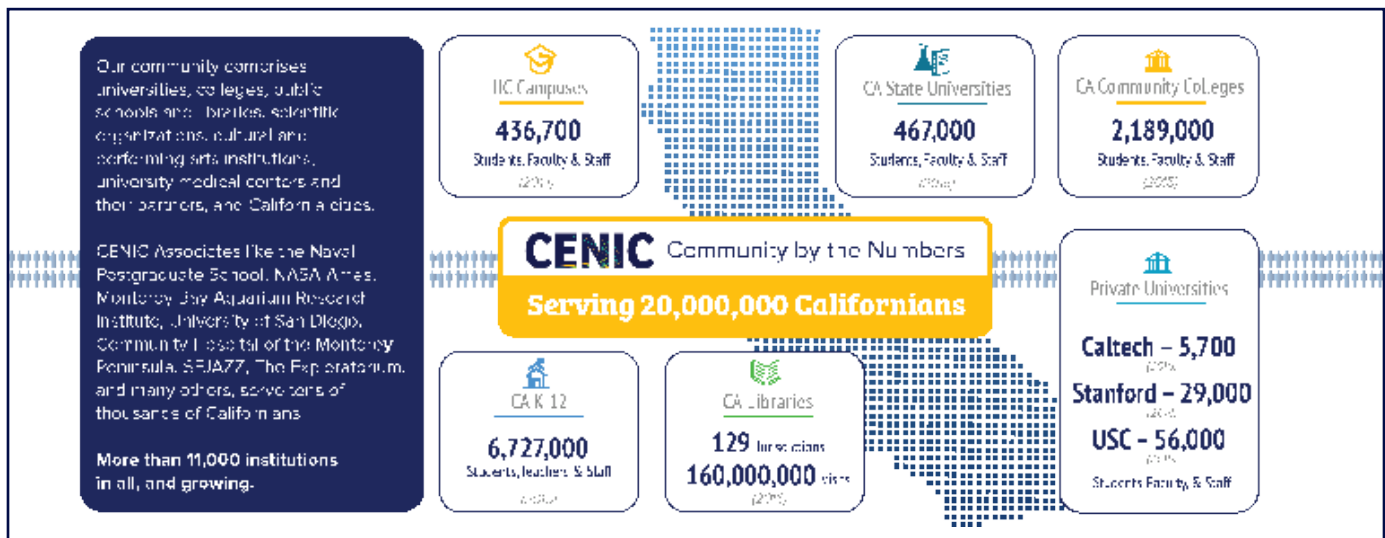
**CALIFORNIA PUBLIC LIBRARIES ADDED TO THE CaIREN NETWORK**

**UNIVERSITY OF CALIFORNIA AGRICULTURE AND NATURAL  
RESOURCES FACILITIES CONNECTED TO CaIREN**

**NAVAL POSTGRADUATE SCHOOL  
NOW A CHARTER MEMBER OF CENIC**

**THE HARDEST TO REACH K-12 SCHOOLS  
ARE NOW CONNECTED TO CaIREN**

## Community by the Numbers



## CENIC Partners with the Private Sector to Expand the Reach of High-speed Broadband

To serve its many constituents, CENIC works with hundreds of private sector organizations—many of which are located in California—to operate production and leading-edge research and education networks. As a result, CENIC contributes tens of millions of dollars every year to the California economy, creating jobs and economic development across the state. These private sector organizations share beliefs in basic values such as equity, innovation, and collaboration, and welcome the opportunity to contribute to California’s education and research sectors.

“Our goal is to equalize opportunity despite geography,” says Chris Roy, Vice President of Government and Education Solutions - West for AT&T. “That goal perfectly aligns with the goals of CENIC and its member institutions. We work toward that goal every day. Our 37,000 employees spent 900,000 hours giving back to communities last year, and education is one of our key priorities. Due in part to the efforts of CENIC and its members, we have seen a 250,000% increase in education traffic over the last several years. Education powers California, and we are proud to work with CENIC to support educators and students throughout the state.”

David Young, Vice President, Sales for the Federal Market Group at Level 3, affirms the necessity of collaboration between CENIC members and private sector companies. “We need to come together on the private side to help the public side. CENIC has a better view than any one provider, and we should work with them and with others until the goal of equal access is fulfilled.”

## University of California Agriculture and Natural Resources Facilities Connected to CaREN

The University of California Agriculture and Natural Resources Division works to ensure the health of California's food systems, environments, and communities. Until recently, the efforts of its 700 researchers—working in over 60 locations in the most rural parts of California—have been hampered by poor Internet connectivity. But key facilities are now connected to CENIC's ultra-fast 100 Gbps research and education network, allowing researchers at these facilities to collect data in real time using remote instrumentation, collaborate and share data, and extend the reach of their Cooperative Extension services.



Read more about this path-breaking initiative: [cenic.org/news/item/cenic-and-uc-anr](http://cenic.org/news/item/cenic-and-uc-anr).



**The Naval Postgraduate School uses the CENIC 100 Gbps High-Performance Research connection as part of the Pacific Research Platform. This will be increasingly important for our big data teams that must be able to share datasets on the order of terabyte size with external collaborators.**

Joe LoPiccolo, CIO and Director, Information Technology and Communications Services

## Naval Postgraduate School now a Charter Member of CENIC

The Naval Postgraduate School (NPS) is now recognized as a CENIC Charter Associate. Charter Associates comprise the CENIC Board of Directors and set policy and guide the organization, and have full access to CENIC's complete portfolio of networks and services. At NPS, four world-class schools oversee 14 academic departments, providing 85 master's and 16 doctoral degree programs, as well as certificate programs, to approximately 1,600 resident students, including over 200 international students. In addition, NPS provides online education programs to nearly 1,000 distributed-learning students worldwide. Three research institutes, multiple secure research facilities, and 30 centers of excellence add to the wealth of NPS resources. From supporting distributed-learning to enabling the work of weather researchers who need to transfer high-resolution weather forecast data sets, NPS uses its 100 Gbps connection to the network to carry out the essential work of the institution every day.

## The Hardest to Reach K–12 Schools are Now Connected to CalREN

As a result of the Broadband Infrastructure Improvement Grant project, CENIC and its partners are overcoming barriers to Internet connectivity in California's hardest-to-reach public schools. Working with the California State Legislature and the Governor's office, CENIC and K12HSN were able to highlight the need of all K–12 public schools for high-speed broadband to help educators implement the Common Core and improve teaching and learning. Initial funding was appropriated to assess need. In 2014, based on this assessment, the Governor of California and the State Legislature funded the initiative. Additional funding was approved in 2015.

Work is underway to connect 312 California schools to CalREN. These schools have been difficult to reach because of obstacles such as geography and lack of fiber infrastructure in their communities. As a result of this funding, these obstacles are being overcome, and most schools will receive a symmetrical broadband connection of 1 Gbps. More than 70% of these upgrades will employ fiber-optic based solutions, ensuring that the schools will have the fiber infrastructure necessary to increase capacity in the future. Approximately 95,000 students in some of California's lowest-income and most-remote regions will benefit from these connectivity upgrades.

Identifying and implementing connectivity solutions for underserved schools and districts has been a collective effort from a broad community, including the California Department of Education, the K–12 High Speed Network, and CENIC. These organizations work closely with advisors in Sacramento from the Department of Finance, State Board of Education, and the Governor's Office, as well as with commercial service providers, equipment providers, and third-party contractors and subcontractors charged with site readiness and integration activities.



09

# DYNAMIC AND INNOVATIVE USES OF THE NETWORK

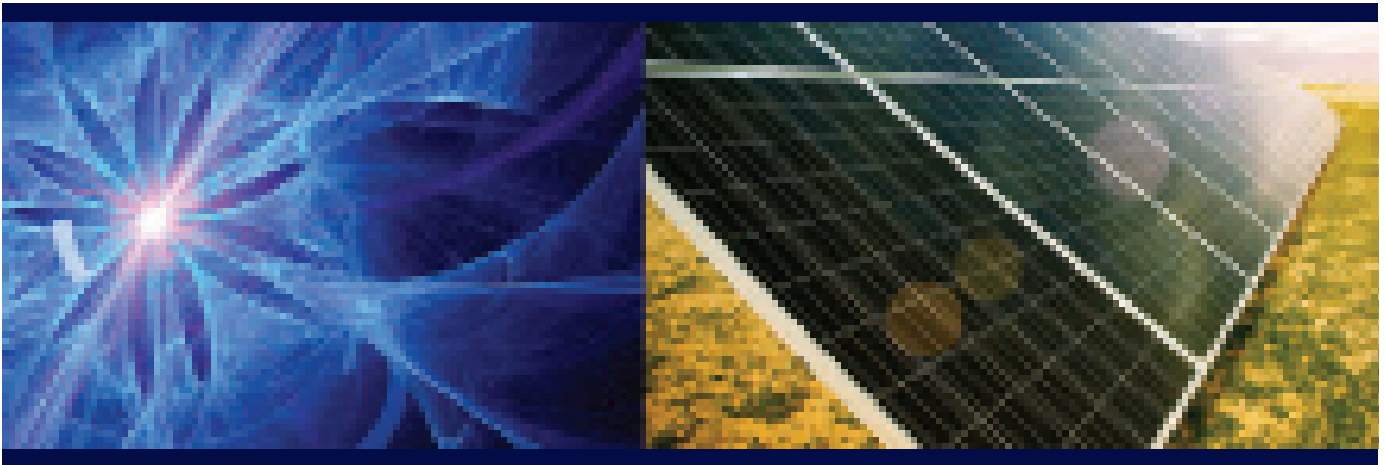
**SMART CITIES INITIATIVE**

**PACIFIC RESEARCH PLATFORM LAUNCHED**

**CULTURAL INSTITUTIONS COLLABORATE WITH  
K-12 SCHOOLS AND LIBRARIES USING CaIREN**

## Smart Cities Initiative

Communities across the country are examining the ways in which they collect, aggregate, and use data to improve the lives of their residents. Many cities are making this data publicly available. With its mission to promote the public good through support of research and education, CENIC is a natural partner in these efforts. The cities of Los Angeles, Alameda, San Francisco, and Sacramento have signed or are in the process of signing peering agreements to connect their networks to CENIC's ultra-fast 100 Gbps research and education network. By working with communities throughout California to advance the Smart Cities movement through high-capacity collection, use, and sharing of city-scale data and information technology, CENIC is helping build stronger digital connections among California's innovators, researchers, educators, students, and the public at large.



## Pacific Research Platform Launched

From biomedical sciences to particle physics, nearly all of today's research and data analysis involve remote collaboration. To work effectively and efficiently on multi-institutional projects, researchers depend heavily on high-speed access to large datasets and computing resources. Helping meet the needs of researchers in California and beyond, the National Science Foundation (NSF) awarded a five-year, \$5 million grant to fund the Pacific Research Platform (PRP, [prp.ucsd.edu](http://prp.ucsd.edu)). The PRP integrates Science DMZs ([fasterdata.es.net/science-dmz/](http://fasterdata.es.net/science-dmz/)), an architecture developed by the U.S. Department of Energy's Energy Sciences Network (ESnet), into a high-capacity regional "freeway system." This system makes it possible for large amounts of scientific data to be moved, without performance degradation, between scientists' labs and their collaborators' sites, super-computer centers, or data repositories. Led by researchers at UC San Diego and UC Berkeley, the PRP enables fast and secure data transfers between researchers at more than 20 universities, and supports a broad range of data-intensive research projects in areas such as cancer genomics, cultural preservation, galaxy evolution research, climate modeling, and the creation of virtual reality gaming systems.

## Cultural Institutions Collaborate with K–12 Schools and Libraries Using CalREN

Museums and performing arts organizations enrich communities across California. Recognizing the contribution these organizations can make to the creation and dissemination of knowledge, CENIC has begun adding them to the CalREN network. SFJAZZ and the Exploratorium were the first organizations involved, and they are using their CalREN connection to reach audiences in public schools and libraries.

SFJAZZ first used high-speed broadband to create a cyber-symposium focused on the work of pianist and jazz legend Mary Lou Williams. This symposium was a collaboration between eight educational and cultural institutions across the nation. High-speed broadband allowed participants to use music collaboration software and videoconferencing to explore and celebrate the life of this great American artist. Building on this work, in October 2015, a concert of the award-winning SFJAZZ Collective was live-streamed from SFJAZZ Center to audiences in the San Mateo County Library System, and a similar event was later live-streamed to public middle schools across California. The two-way high-speed connection over CalREN allowed remote audiences and musicians to see and hear one another and to exchange ideas in real time. Today, SFJAZZ continues to utilize CalREN to reach audiences across the state as a standard part of its educational outreach program.

In March 2016, San Francisco's Exploratorium collaborated with NASA and the National Science Foundation to produce a live broadcast of the total solar eclipse from the Federated States of Micronesia. With a team in Woleai to film and broadcast the event over the CalREN network, the Exploratorium was able to share this amazing phenomenon with educators, students, and the general public through the Internet, mobile phones, and television.

**Read more CENIC community stories on our blog at: [www.cenic.org/blog](http://www.cenic.org/blog)**



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## INSIDE CENIC

**TECHNICAL EXPERTS KEEP THE NETWORK OPERATING**

**CENIC CREATES A PROJECT MANAGEMENT OFFICE**

**CONNECTION TRACKER**

**CENIC'S NETWORK OPERATIONS CENTER  
RESOLVES NETWORK ISSUES**

**CENIC OPERATES THE NATION'S LARGEST E-RATE CONSORTIA**

## Technical Experts Keep the Network Operating

CENIC's greatest asset is its staff. Our technical experts, organized into six groups, are dedicated to CENIC's mission and members, and work tirelessly to operate and improve the network.

- The **Operations** group keeps the technical environment operating seamlessly for millions of organizations and individuals throughout the state, and runs the Network Operations Center.
- The **Network Engineering** group designs, configures, and deploys all layers of our network infrastructure, and implements agreed upon connectivity solutions with member organizations
- The **Infrastructure and Provisioning** group is responsible for relationships with telephone, cable, and dark fiber providers managing the provision of lit services and dark fiber, and also coordinates the implementation of design, deployment, and upgrade projects for various member segments.
- The **Systems and Tools** group ensures that internal systems are operating effectively and securely.
- The **Internet Services** group oversees our peering and exchange relationships with key internet service providers, content providers, and cloud service companies.
- The **Network Security** group is a cross functional team drawn from across the organization and led by an internal expert on security.

These six groups collaborate with one another and throughout the organization to ensure seamless connectivity.

## CENIC Creates a Project Management Office

To better respond to the needs of our customers, CENIC has created a project management office. Each project manager is assigned to one or more of CENIC's member segments, with back-up by the other project managers, ensuring that new connections and connectivity upgrades within that segment are completed as efficiently as possible by coordinating tasks internally and externally. At any given time, there can be hundreds of bandwidth upgrade projects in planning or implementation stages. These are complex projects with numerous steps to completion, making this kind of project oversight essential. Project managers coordinate closely with leaders from their assigned segment for the duration of each project.

## Connection Tracker

The Connection Tracker displays the status of current projects among three segments (with others to follow): K–12, libraries, and community colleges. Displaying each project in fourteen steps—from initial project overview meeting to completion—the tracker shows progress for each institution and aggregate processes within a sector. This is a new tool intended to serve both CENIC associates and our large community of stakeholders in public, private, and governmental sectors.

See the Connection Tracker in Action > <http://status.cenic.org/public>



## CENIC’s Network Operations Center Resolves Network Issues

Once an institution is connected to CalREN, CENIC’s Network Operations Center (NOC) is the first point of contact for any issue or question that arises. CENIC’s NOC monitors the network 24 hours a day, 7 days a week, 365 days a year. CENIC members who experience a problem notify the NOC and are placed in immediate contact with an experienced, highly trained network engineer who begins to troubleshoot with them. These engineers have experience sufficient to resolve most issues, and fewer than 1% of incoming tickets are escalated to a more senior engineer.

The engineers who staff the NOC also diagnose and resolve problems identified by network monitoring tools, which generate an alarm when an issue is detected on the network. This alarm system often allows engineers to detect problems before they affect users, and work to quickly resolve them.

The NOC uses a ticketing system to track issues that need resolution. Many issues can be resolved on the same day, while some are more complex and take longer. In 2016, the NOC:

- Processed 19,803 new tickets
- Resolved 17,220 tickets
- Assessed 85,410 alarms

NOC engineers also coordinate and communicate third-party maintenance and repair activities, perform equipment updates, replacements, and upgrades, decommission retired equipment, and handle tasks in support of circuit installations, service upgrades, and backbone upgrades.

In 2016, the NOC:

- Performed 1,516 maintenance procedures
- Operationalized 196 new devices
- Deployed and operationalized 289 new circuits

Engineers who work in the NOC gain broad experience and a deep understanding of CENIC. As a result, they become valuable assets to the organization and are frequently promoted elsewhere within CENIC, bringing their expertise to departments such as Internet Services, Provisioning, and Core Engineering.

## CENIC Operates the Nation's Largest E-rate Consortia

As part of its service to its members, CENIC operates the two largest E-rate consortia in the U.S., one serving libraries (public libraries and library systems) and one serving the K–12 community (public schools, school districts, and county offices of education). These consortia are currently comprised of 1,139 members. In 2016, 50 certified E-rate applications with 187 funding requests were submitted for a maximum of \$33,857,775 in e-rate discounts, representing up to a 90% savings in telecommunications costs for eligible CENIC associates. In operating its consortia, CENIC competitively bids services, awards and executes contracts, files for E-rate funding, orders and implements services, and pays invoices. Participation in these consortia saves K–12 and libraries from the burden of navigating the complex process of E-rate filing, a process so cumbersome that many schools and libraries previously could not take advantage of federal and state discounts.

The state of California leverages the E-rate program, expanding its benefits through the California Teleconnect Fund, a California public purpose program funded by a surcharge on phone bills and administered by the California Public Utilities Commission. This fund provides discounts of up to 50% to schools, libraries, community colleges, hospitals and health clinics, and community-based organizations for eligible telecommunications services. For schools and libraries participating in the E-rate program, this discount is applied on the total remaining after the E-rate discount is applied.

# ANNUAL CENIC CONFERENCE: THE RIGHT CONNECTIONS FOR THE FUTURE

**CONFERENCE COMMITTEE MEMBERS**

**INNOVATIONS IN NETWORKING AWARD WINNERS**

**2017 CENIC CONFERENCE**

## THE RIGHT CONNECTION : CENIC 2.0



20TH ANNIVERSARY CONFERENCE

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The CENIC annual conference brings together CENIC's richly diverse community, with participants from all levels of education, public and private research universities, public libraries, science and performing arts centers, private sector technology businesses, and city, county, and state government sectors. California attendees will be joined by colleagues from around the globe, all of whom are leaders and visionaries in research and education. Attendees will hear from noted experts about innovations at the intersection of network technologies and scientific research, education, the arts, and public service. They will learn about innovations in networks and infrastructure, all of which support the missions of CENIC's members. Attendees will share insights and opinions during the conference program, as well as in informal networking setting.

Areas of work critical to the future of CENIC and to the communities it serves will be explored at the conference, including:

- Fostering global scientific and cultural exchange.
- Providing a platform for research on issues that know no geographic boundaries, such as health and climate change.
- Improving teaching and learning.
- Promoting equity through cutting-edge technology, including working with partners to bring high-speed broadband to unserved and underserved communities, promoting gender equity in the technology workforce, and enabling public access to data.
- Optimizing network security while finding the balance between openness and secure networks.
- Envisioning the future of CalREN, CENIC's high-capacity network: emerging work with the California High-Speed Rail Authority, the exponential growth of 100 G connections, and the addition of critical segments such as cities, agricultural centers and medical centers.

## Conference Committee members

### 2015–2016

Doug Hartline, Chair: Director, Core Technologies, UC Santa Cruz

Mount Allen

Michael Berman

Stephanie Beverage

Will Habeck

Jarrid Keller

Valerie Polichar

George Peek

John Rolon

Rob Rothfarb

Jeremy Sims

Rita Schnepf

### 2016–2017

Jeffrey D. Weekly, Chair: Director of CyberInfrastructure & Research Computing, University of California, Merced, Office of Information Technology

Mount Allen

Stephanie Beverage

Jarrid Keller

George Peek

John Rolon

Antonio Romayor Jr.

Steve Shiotsu

Jeremy Sims

## Innovations in Networking Award Winners

Innovations in Networking awards are presented each year to highlight exemplary innovations that leverage ultra high-bandwidth networking, particularly innovations that have the potential to transform the ways in which instruction and research are conducted or that further the deployment of broadband in underserved areas.

### 2015

- **Innovations in Networking Award for Educational Applications** SFJAZZ: Mount V. Allen, Director of Operations
- **Gigabit/Broadband Applications** Assemblywoman Susan Bonilla, CA Department of Finance Director Michael Cohen, and CA State Superintendent Tom Torlakson
- **High-Performance Research Applications** ESnet 100-Gigabit SDN Testbed
- **Corporate Partner** AT&T Government/Education West: Chris Congo and Team
- **Outstanding Individual Contribution** John Haskins, UC Santa Cruz

### 2016

- **Innovations in Networking Award for Outstanding Individual Contribution** Dr. Christine M. Haska
- **Innovations in Networking Award for Educational Applications** Luis Herrera, Director, San Francisco Public Library, The Mix at SFPL
- **Innovations in Networking Award for Outstanding Technical Contributions** Rodger Hess
- **Innovations in Networking Award for Research Applications** Thomas E. Levy, The Levantine and Cyber-Archeology Lab at UC San Diego

- **Innovations in Networking Award for Broadband Applications** Matthew R. Rantanen, Tribal Digital Village Network
- **Innovations in Networking Award, Corporate Partner** Mark Ronaldson & Koby Kumasaka, CISCO - State, Local, and Education (SLED) Western Operation Team
- **Innovations in Networking Award for Experimental Applications** Pacific Research Platform Team: Larry Smarr, Camille Crittenden, Tom DeFanti, Frank Würthwein, Phil Papadopoulos, John Graham, Eli Dart, John Hess

## 2017

See videos of sessions from the 2015, 2016 and 2017 Conference on our YouTube Channel CENIC News.

# 2017 CENIC Conference

Learn more about The Right Connection | CENIC 2.0 and the 20th anniversary of CENIC's



Our presence at the 2016 CENIC conference is a milestone in the history of California Public Library Services. We have had some wonderful milestones in California Public Libraries—Carnegie brick and mortar buildings, our first library computers from the Gates Foundation and now digital integration into the best broadband infrastructure in California, CENIC's CalREN network. My major take-away from the conference was that CENIC's major digital roads are being built right into our neighborhood libraries and amazing people are already queuing up to visit us—for example, the scientists at the Exploratorium and the best jazz musicians from San Francisco.

Chris Ricker, Assistant Library Director, Monterey County Free Libraries

funding at our conference webpage: [www.cenic.org/conference](http://www.cenic.org/conference)



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