CENIC

COMMUNITY REPORT

JULY 2019–2021

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

Table of Contents

01

PLANNING FOR THE FUTURE

REFLECTING ON 25 YEARS

STRATEGIC PLAN FOR 2019–2023

From the President & CEO: Reflecting on 25 Years

In 1997, visionary leaders within California's research and education institutions came together to form CENIC, a nonprofit organization that would provide a world-class broadband network: the California Research and Education Network (CalREN). Now in our 25th year of operation, CENIC has expanded beyond the network imagined by the founders, yet continues to provide cost-effective, high-bandwidth 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, Caltech, the Naval Postgraduate School, University of Southern California, California's public K-12 schools, and public libraries, along with affiliated education, government, medical research, and cultural institutions throughout the state. CENIC now operates one of the world's most complex and diverse networks.

**LOUIS FOX**
CEO & PRESIDENT

Over the past quarter of a century, CENIC has worked to build, secure, and expand the impact of its broadband networks; to encourage and showcase innovative uses of its networks; to improve broadband access and equity across California, and to strengthen our organization.

In this report, you will read about our new initiative to extend middle-mile broadband infrastructure across California, major upgrades and enhancements to the network backbone, work to connect the last hardest-to-reach K-12 schools, outreach to extend connectivity to unserved and underserved areas during the COVID-19 pandemic; and a new service in cybersecurity. You will also learn how we are addressing new challenges and taking advantage of new opportunities in our five-year strategic plan for 2019-2023. Finally, this report highlights how staff work flexibly and nimbly to meet the needs of our members.

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 25 years of common work.

Louis Fox
President & CEO, CENIC
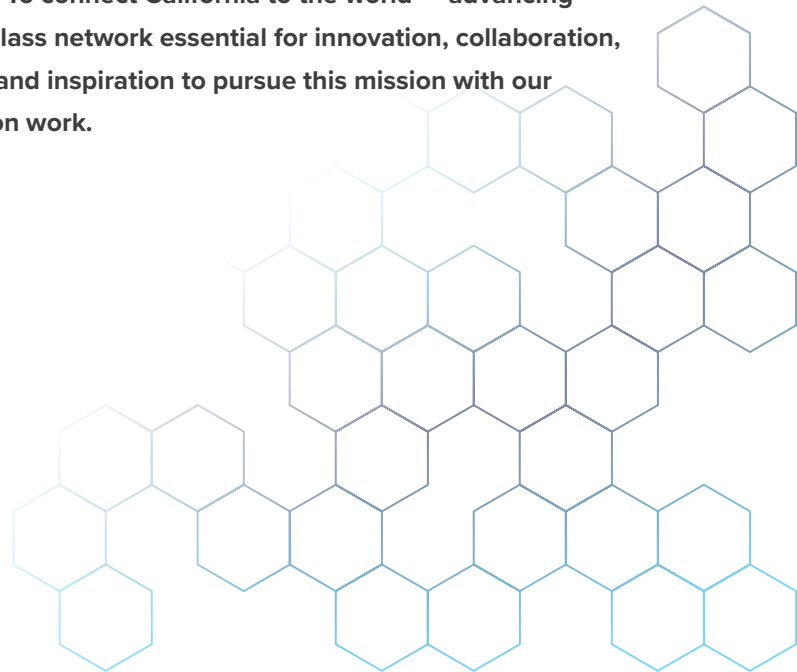
Strategic Plan 2019–2023

Part One: Investing in the Evolution of CalREN

To continue its history of responsiveness and relevance to the diverse communities it serves, and to perpetuate its leadership and successes, CENIC must be able to (1) meet the exponential growth in traffic; (2) reach more un- and underserved sites among its charter associates and their partners, while continuously upgrading existing sites; (3) sustain network performance, reliability, and resiliency; and, (4) remain cost-effective, as it has for 20+ years.

With input from the capacity planning process from each segment, and discussions with the board and technical advisory committees, CENIC prepared a multi-year, phased development and implementation plan. The plan for the future of CalREN includes the following elements: (1) the network must be cost-effective and manage/flatten the cost curve; (2) the network must be reliable and resilient; (3) the network must meet the capability and capacity needs of all CENIC segments; and (4) it must be "facilities efficient," deploying cost-saving new technologies that decrease both capital and operating expenses, often in partnership with other networks.

Goals include:

COMPLETED

- Work with, learn from, and develop prospective partnering strategies — with key partners at research and education networks, commercial organizations, and cloud entities — to share costs, facilities, and development.

IN PROGRESS

- Execute CENIC's five-year network roadmap. This involves network modernization, new service offerings, standardization, increasing network speed, improving visibility, and a standardized design at all hub sites.

- Explore resource development through new customer segments in government health care and education.

- Explore cost savings through automation technologies, circuit consolidation, and other improved efficiencies.

- Deploy network transparency and measurement tools on CalREN networks and among all CENIC institutions.

Part Two: Improving Access & Equity Across California

CENIC seeks to continue enhancing connectivity among our already connected members, and continue the work of connecting those institutions who are either un or under served. The latter are often in communities that have little or no access to broadband capacity – in their community anchor institutions, businesses, government offices, or homes. In order to serve our members, we must find common cause with our partners in the public, private, and governmental sectors. We have a history of engagement with these partners and we must deepen our ties to them, explore new strategies and resources for our common work and, together, achieve the goal of a "Connected California."

Particularly in light of the COVID-19 pandemic, we continue to work with private and public sector partners to help shape public policy and responses to inequities in residential access and affordability, given that our 20 million CENIC users have been profoundly impacted by the pandemic and the increasing need to access education, research, health care, and employment at home.

Goals include:

COMPLETED

- Enhance forecasting and deploying new circuits and/or new fiber connections for CENIC Charter Associate institutions.

- Continue to provide high-performance connectivity between 20+ campus Science DMZs that form the backbone of the NSF-funded Pacific Research Platform, now in its sixth year.

IN PROGRESS

- Partner with urban and rural broadband working groups and private sector partners committed to innovations in urban and rural connectivity.

- Assist the California Emerging Technology Fund (CETF) in achieving its goal of 98% broadband access in California, with CENIC's focus on its community anchor institutions.

- Increase the emphasis on "digital divide" mitigation in both rural and urban areas, focusing on home connectivity in the wake of the COVID-19 pandemic with our public and private sector partners, including working with policymakers at the state and federal levels to ensure that new funding for broadband connectivity is spent in ways that benefit anchor institutions and their constituents.

CENIC
California Research and Education Network (CalREN)
January 2021
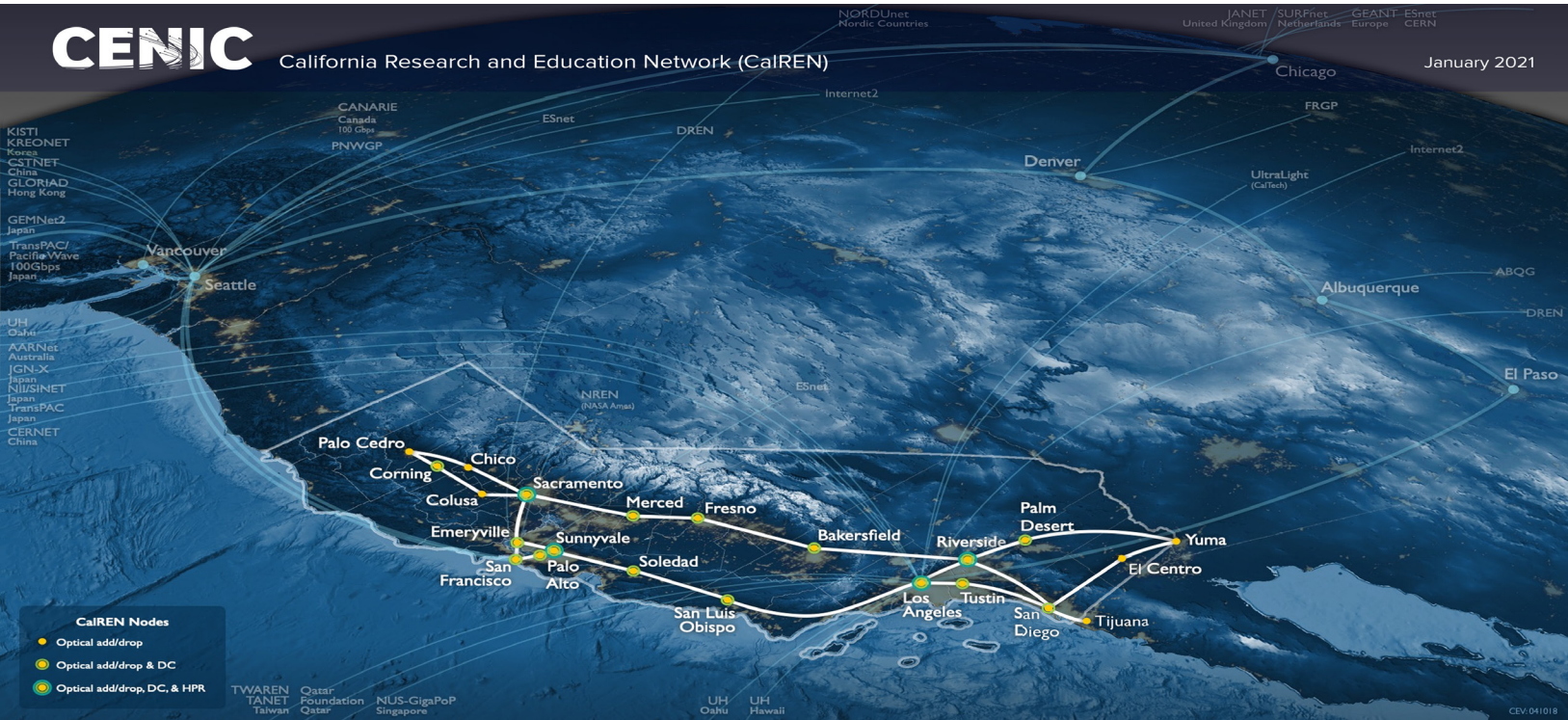
Part Three: A Secure CENIC and a Resilient CalREN

We aspire to a secure CENIC and a resilient CalREN. We seek a CENIC enterprise in which all CENIC computing and networking and intellectual property assets are identified, activity involving those assets is visible, and industry best practices for security mitigations are applied to those assets.

Simultaneously, we seek a CalREN that supports the research and education missions of CENIC's constituents, while being resilient to attacks against the network and other failures. We also seek a CalREN that provides CENIC's constituents with the appropriate visibility and security controls to help them enhance the security of their own enterprise, without interfering with the research and educational missions of their respective sites.

Goals include:

COMPLETED

- Implement updated enterprise security standards, including strong authentication practices and highly segmented and insulated local area networks.

- Increase security personnel capacity.

- Advance the ability to aid CENIC's constituents with technical security mitigations.

IN PROGRESS

- Update CENIC's disaster recovery plan and conduct annual disaster preparedness and recovery drills.
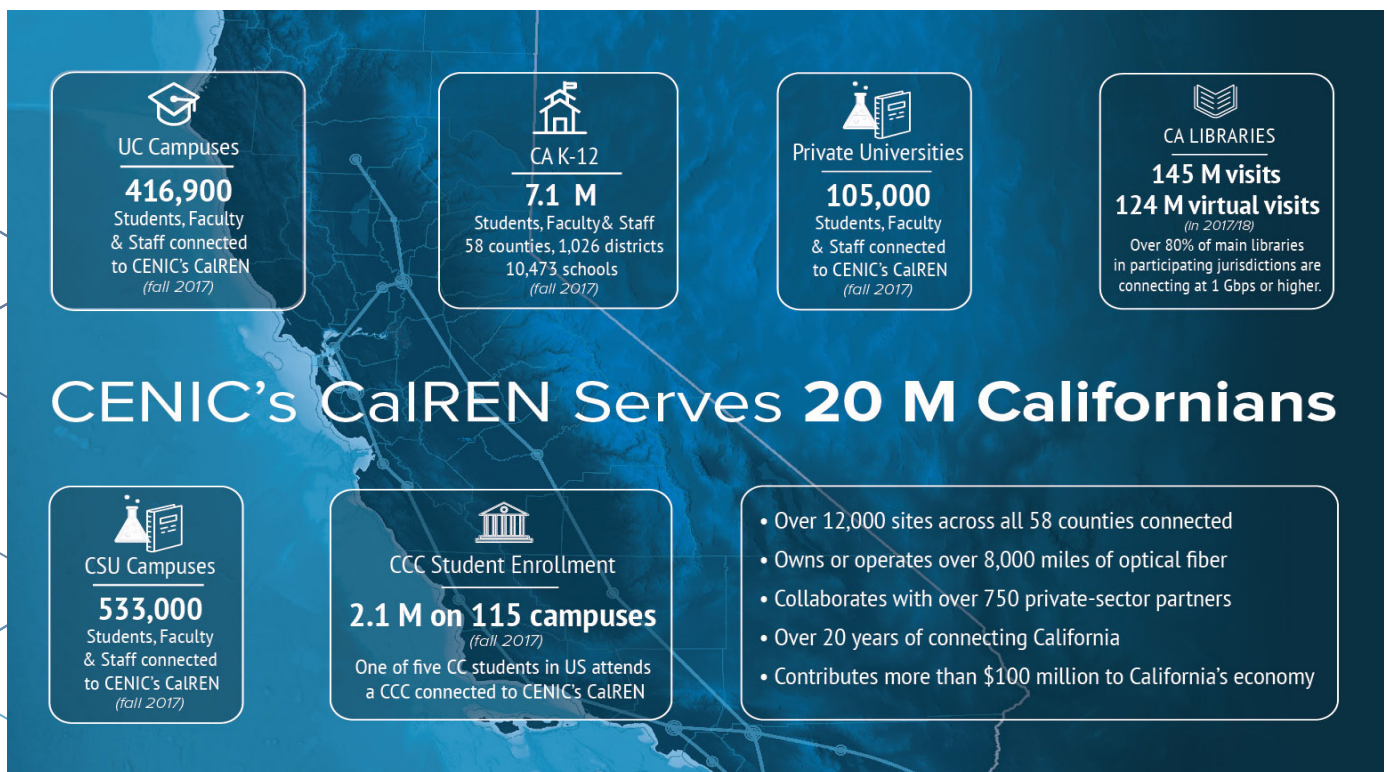
02

GOVERNANCE & FINANCIALS

About CENIC

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

In 1997, visionary leaders in California's research and education institutions came together to form CENIC, a nonprofit organization operating the world-class California Research and Education Network (CalREN) essential for innovation, collaboration, and economic growth statewide.

Today, CENIC continues to provide cost-effective, reliable, 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 ecosystem 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.

UC Campuses
416,900
Students, Faculty
& Staff connected
to CENIC's CalREN
(fall 2017)

CA K-12
7.1 M
Students, Faculty & Staff
58 counties, 1,026 districts
10,473 schools
(fall 2017)

Private Universities
105,000
Students, Faculty
& Staff connected
to CENIC's CalREN
(fall 2017)

CA LIBRARIES
145 M visits
124 M virtual visits
(In 2017/18)
Over 80% of main libraries
in participating jurisdictions are
connecting at 1 Gbps or higher.

CENIC's CalREN Serves 20 M Californians

CSU Campuses
533,000
Students, Faculty
& Staff connected
to CENIC's CalREN
(fall 2017)

CCC Student Enrollment
2.1 M on 115 campuses
(fall 2017)
One of five CC students in US attends
a CCC connected to CENIC's CalREN

- Over 12,000 sites across all 58 counties connected
- Owns or operates over 8,000 miles of optical fiber
- Collaborates with over 750 private-sector partners
- Over 20 years of connecting California
- Contributes more than $100 million to California's economy

Board of Directors

CENIC is governed by its member institutions by means of the board of directors. Director seats are held by representatives of the Charter Associates — the segments of the California research and education community for and by which CENIC was created, as well as significant segments that joined later. The following Board listing is current as of May 2022. Many members served partial or whole three-year terms during the period July 2019 to June 2021.

CALIFORNIA COMMUNITY COLLEGES
Deborah Ludford, District Director, IT Services (retired), North Orange CCC District
Valerie Lundy-Wagner, Vice Chancellor of Digital Innovations and Infrastructure, CCC Chancellor's Office
Bill Moseley, Dean of Academic Technology, Bakersfield College

CALIFORNIA INSTITUTE OF TECHNOLOGY
Jin Chang, Chief Information Officer, California Institute of Technology

CALIFORNIA K–12 SYSTEM
Terry Loftus, Assistant Superintendent & CTO, San Diego County Office of Education
Michelle Murphy, Superintendent, Rim of the World Unified School District
Jerry Winkler, Director, Education Data Management Division, California Department of Education

CALIFORNIA PUBLIC LIBRARIES
Josh Chisom, Manager, Broadband Opportunities Program, California State California State Library
Michael Liang, Chief Information Officer, San Francisco Public Library
Nancy Schram, Library Director, Ventura County Library

CALIFORNIA STATE UNIVERSITY
Kendra Ard, Senior Director, Infrastructure, Support & Communications Services, CSU Chancellor's Office
Michael Berman, Chief Information Officer, CSU Chancellor's Office
Samuel Sudhakar, Vice President for Information Technology Services & CIO, CSU San Bernardino

NAVAL POSTGRADUATE SCHOOL
Vacant

STANFORD UNIVERSITY
Sylvie Cosgrove, Executive Director, Communication Services & IT Facilities, Stanford University

UNIVERSITY OF CALIFORNIA
Ann Kovalchick, Associate Vice Chancellor and CIO, UC Merced
Ramesh Rao, Director of Qualcomm Institute & Professor, UC San Diego
Van Williams, CIO and Vice President for Information Technology Services , UC Office of the President

UNIVERSITY OF SOUTHERN CALIFORNIA
Douglas Shook, Vice Provost & CIO University of Southern California

OUTSIDE DIRECTORS
Ron Johnson, Vice President & CIO Emeritus, & Professor, University of Washington
Marla Meehl, Network Engineering and Telecommunications Section Head & Front Range GigaPoP (FRGP) Manager, University Corporation for Atmospheric Research (UCAR)
Larry Smarr, Founding Director of Calit2 & Professor, California Institute for Telecommunications & Information Technology, UC San Diego

EX-OFFICIO
Louis Fox, President & CEO, CENIC
Bill Paik, Treasurer & CFO, CENIC

Technical Advisory Councils

The Technical Advisory Councils (TACs) serve to provide technical review and recommendations on infrastructure issues relating to the California Research & Education Network (CalREN) as requested by the CENIC board of directors. TACs are made up of interested members of the CalREN community who work closely on hardware, software, interoperability issues, performance management, and network research priorities.

- CalREN TAC: Advises on the development of CENIC's High-Performance Research (HPR) and Digital California (DC) networks. CENIC's HPR network provides leading-edge services for large-application users at CENIC Associate sites through national and international research and educational networks such as Internet2, ESNet, and AARnet. CENIC's DC network provides high-quality network services for faculty, staff, students, researchers, patrons, and patients in member institutions through the commercial Internet.

- CalREN-SEC TAC: Advises on network security systems, tools, and techniques as part of CalREN and related infrastructure, as well as data privacy issues related to CalREN and common to CENIC Associates.

Individuals eligible to participate in TACs are employed by CENIC Associates as defined in the CENIC Bylaws by its board of directors and listed on the CENIC website.

TAC members should actively participate in the discussion list, meeting, and subcommittees as needed. For more information about getting involved with TACs, contact Brian Court at CENIC.

Community Members

Charter Associates

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

- University of California
- California State University
- California Community Colleges
- California Institute of Technology
- University of Southern California
- Stanford University
- California K–12 Schools
- California Public Libraries
- 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.

- Carnegie-Mellon University West
- Community Hospital of the Monterey Peninsula
- Monterey Bay Aquarium Research Institute
- NASA Ames Research Center
- Salinas Valley Memorial Healthcare System

Sponsored Associates

These are cultural, scientific, or artistic institutions or organizations with a close tie to a Charter Associate that serves as a sponsor. Sponsored Associates have direct access to an abbreviated portfolio of CENIC's networks and services.

- California Academy of Sciences
- Exploratorium
- Jackson Labs
- SFJAZZ Center
- United States Geological Survey (USGS), Menlo Park Campus

Auxiliary Associates

Auxiliary Associates are smaller institutions and organizations that engage with the CENIC community and have direct access to an abbreviated portfolio of networks and services.

- Chapman University
- City of Hope National Medical Center
- Chan Zuckerberg Biohub
- J. Paul Getty Trust
- Los Angeles Philarmonic
- Pepperdine University
- University of San Diego

Affiliates

These educational and research institutions and organizations make use of CalREN indirectly through a Charter Associate that serves as an Affiliate's connection to the network.

- ArtCenter College of Design
- Broad Art Foundation
- Charles Drew University
- Claremont College
- Colburn School
- Dell'Arte School of Physical Theatre
- East Bay Community Law Centers
- International Computer Science Institute
- Loyola Marymount University
- National Oceanic & Atmospheric Administration
- Occidental College
- Pac-12 Enterprises
- The Scripps Research Institute
- Venter Institute

CENIC Financial Statement 2019-2021

	FY2019-20	FY2020-21
Total Assets	$89,088,355	$84,912,543
Total Liabilities	12,757,747	11,935,510
Net Assets	$76,330,608	$72,977,033

Total Liabilities

Net Assets

03

NETWORK STORIES FROM OUR BLOG

BUILDING AND SECURING A WORLD-CLASS NETWORK

EXPANDING THE NETWORK

DYNAMIC AND INNOVATIVE USES OF THE NETWORK

EQUITY & ACCESS INITIATIVES POWERED BY THE NETWORK

Building & Securing a World-Class Network

CENIC Builds 400G Superchannel

CENIC has built a 400-Gbps optical circuit between Los Angeles and Riverside, one of the first-ever 400G superchannels to be deployed by a US regional research and education network. Construction included upgrading nodes in Los Angeles, Tustin, Oceanside, San Diego, Escondido, Sun City, and Riverside to 400G capabilities.

This important networking milestone ensures CENIC can easily meet today's networking demands while remaining future-proof and flexible to meet the needs of tomorrow. This new capacity supports increasing demands for 100G services among our community, as well as projects such as the Pacific Research Platform (PRP), a big data "freeway system" with support from the National Science Foundation, and FABRIC, an NSF-funded testbed for scientists to explore how to build the Internet of the future.

Network capacity will not limit the work or ambitions of CENIC members, from research scientists working with big data sets to educators using technology to transform the classroom.

CENIC Offering Mitigation Solutions for DDoS Attacks

CENIC is now offering its members protection from Distributed Denial of Service (DDoS) attacks, which have the potential to prevent people from accessing online resources, and in the worst cases, to take institutions offline completely. A DDoS attack is a cyberattack in which the perpetrator overwhelms the target or its surrounding infrastructure with a flood of Internet traffic.

DDoS attacks are increasing in size, frequency, and duration. In 2020, the total number of observed attacks doubled, attack duration increased by 24%, and Amazon Web Services recorded the largest attack ever at a peak traffic volume of 2.3 Terabits per second.

CENIC is able to offer DDoS Mitigation Services (DMS) through its membership with Internet2. Radware offers an on-demand, cloud-based DMS at attractive rates to Internet2 members. CENIC is able to use and offer this service to CENIC associates, leveraging CENIC's high capacity, direct connections with Internet2 in Los Angeles and Sunnyvale.
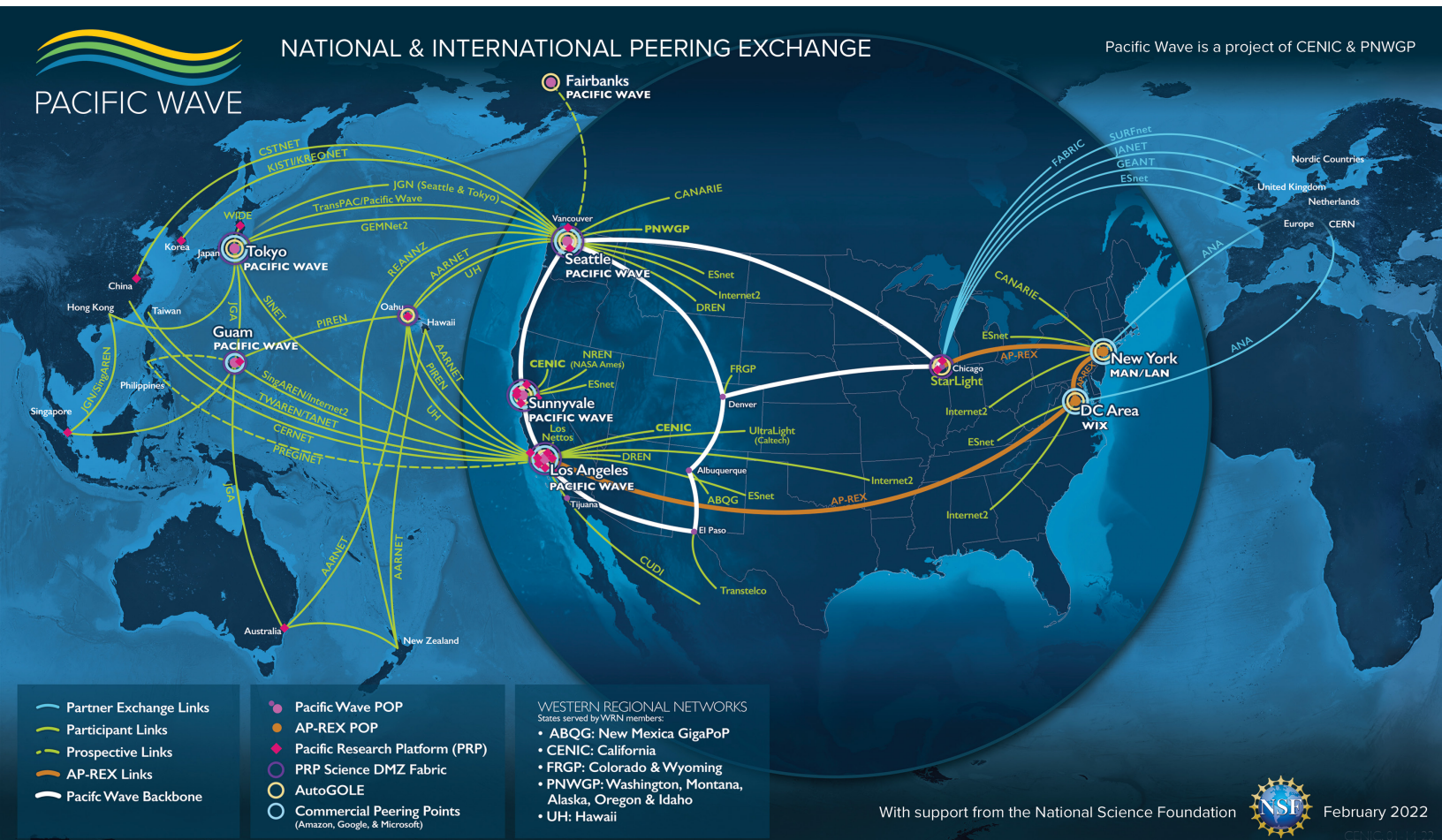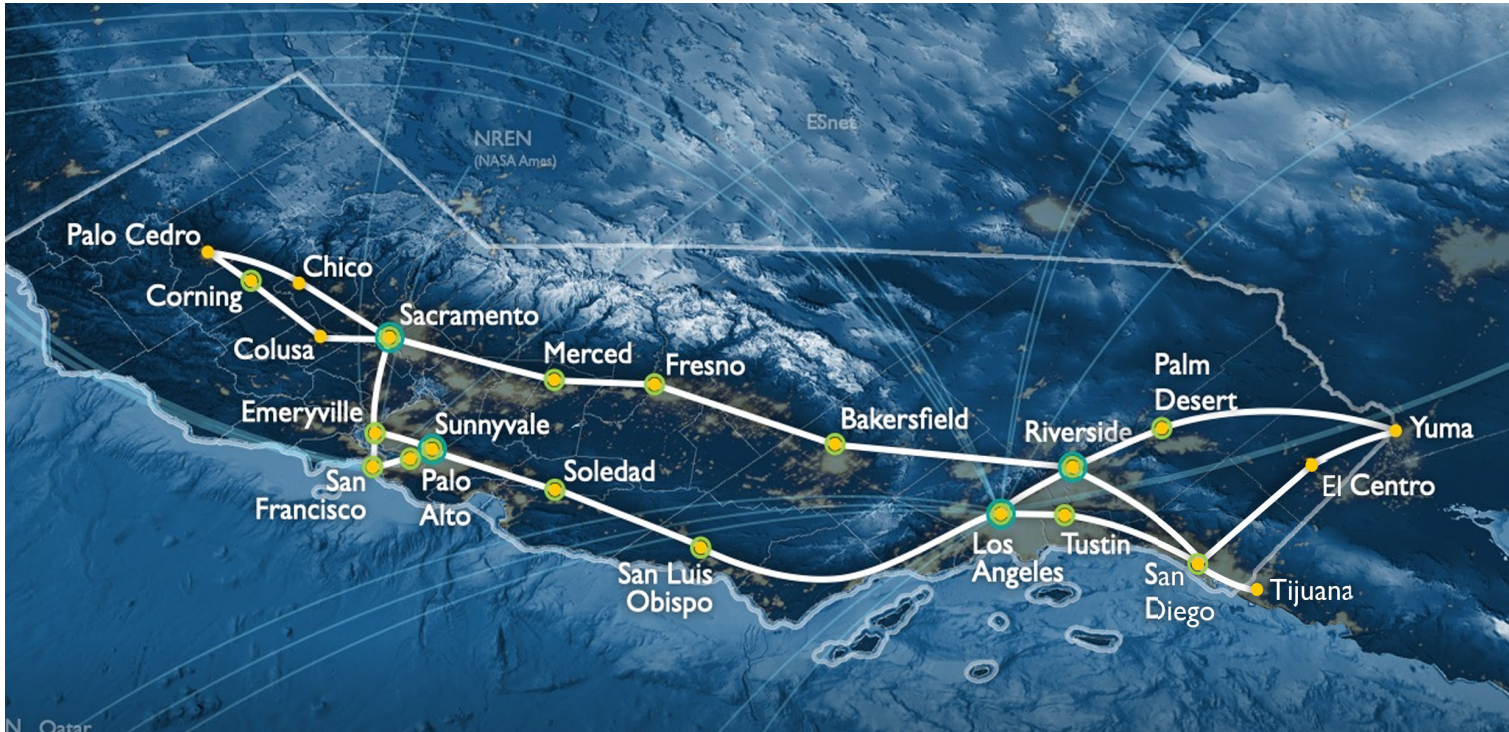
Expanding the Network

NSF Awards CENIC an International Networking Grant for Operation of Pacific Wave

The National Science Foundation has awarded CENIC a $4 million, five-year grant for continued operation and enhancement of Pacific Wave International Exchange. A joint project of CENIC and the Pacific Northwest Gigapop, Pacific Wave interconnects international Asia-Pacific research and education networks, key US Western regional research and education networks, leading national-scale research networks, and major commercial research cloud services.

Pacific Wave enables large-scale scientific workflows to accelerate discovery in all areas of science and engineering, including high-energy physics, earth sciences, astronomy and astrophysics, biology and biomedical engineering, as well as scalable visualization, virtual reality, machine learning, and artificial intelligence.

This NSF International Research Network Connections grant will allow expansion of Pacific Wave through increases in capacity, supporting demands for 400 Gbps-plus data rates, and the addition of new access points. An advanced measurement, monitoring, and analytic framework will also be deployed, supported by University of California, San Diego's Interactive Global Research Observatory Knowledge Base cluster.

PACIFIC WAVE

NATIONAL & INTERNATIONAL PEERING EXCHANGE

Pacific Wave is a project of CENIC & PNWGP

Legend:
- Partner Exchange Links
- Participant Links
- Prospective Links
- AP-REX Links
- Pacifc Wave Backbone
- Pacific Wave POP
- AP-REX POP
- Pacific Research Platform (PRP)
- PRP Science DMZ Fabric
- AutoGOLE
- Commercial Peering Points (Amazon, Google, & Microsoft)

WESTERN REGIONAL NETWORKS
States served by WRN members:
- ABQG: New Mexica GigaPoP
- CENIC: California
- FRGP: Colorado & Wyoming
- PNWGP: Washington, Montana, Alaska, Oregon & Idaho
- UH: Hawaii

With support from the National Science Foundation   February 2022

CENIC Announces New and Diverse Fiber Route From Sacramento to Northern California

CENIC has built a new and diverse fiber path between Sacramento and northern California, adding to its inland route. The new path creates a diverse 260-mile regional loop from Sacramento and back, traveling through Colusa, Corning, Palo Cedro, and Chico. The path has 3.2 Terabits per second of capacity and includes new nodes in Chico and Palo Cedro.

This new and diverse path demonstrates CENIC's commitment to provide reliable, high-capacity, low-latency connectivity to members in northern California. Adding network diversity ensures that there are alternative paths available for network traffic in the event of a disaster or technical failure. This new route also increases capacity at Corning to 100G and opens up aggregation sites for local networks to connect to CalREN.

CENIC's members now have a more robust and efficient network on which to conduct data-intensive research, support teaching and learning, provide cutting-edge medical care, and enhance community engagement.

CENIC Extends 400G Capabilities to Coastal and Inland Paths

CENIC is now able to provide high-capacity services, from 100G to 400G and beyond on its entire optical network. CENIC upgraded its optical line system along the coastal path between Los Angeles and Sunnyvale, including nodes in Santa Barbara, San Luis Obispo, and Soledad; and along the inland path between Los Angeles and Riverside, which includes nodes in Oakland, Sacramento, Fergus, Fresno, and Bakersfield.

To develop the new 400G routes, CENIC staff upgraded the backbone network from fixed-grid technology to flex-grid spectrum Reconfigurable Optical Add-Drop Multiplexers (ROADMs). Flex-grid enables next-generation transponders that can deliver high-capacity services at a lower price per bit.

New high-capacity services will help address urgent needs for advanced cyberinfrastructure. Scientific research done by CENIC members increasingly requires massive big-data workflows, which include collecting, transferring, processing, and storing huge data sets as they collaborate with colleagues across California, the nation, and the world.

The 400G upgrade to CENIC's coastal path represented a milestone in infrastructure sharing between CENIC and Internet2 as both networks are moving to higher-bandwidth technologies and seeking to reduce both cost and environmental impact.

A significant factor in the success of CENIC's upgrade was the use of Internet2's separate network along the same path for backup capacity. CENIC and Internet2 have had an agreement for almost a decade to share an "express" optical system between Los Angeles and Sunnyvale that utilizes CENIC's fiber and Internet2's equipment and operations on a similar coastal path. During its upgrade, CENIC used its capacity on that shared path to maintain backbone integrity. This was a great win for CENIC's members as the network upgrade had less impact on their daily routines. This creative approach is a great example of how research and education networks can leverage each other's infrastructure for large projects and reduce costs.

Ongoing Upgrades Support the Evolution of CalREN

In accordance with our strategic plan, CENIC staff are completing network upgrades that will ensure network reliability, deploy cost-saving technologies, decrease our environmental footprint, and enable high-capacity services.

In addition to the 400G upgrades and the new route in northern California, projects include consolidation of the hardware on the Digital California (DC) and High-Performance Research (HPR) networks and automation of network processes.

CENIC members can now use one circuit for both CENIC's DC and HPR networks. Consolidation of hardware for the two networks provides cost savings on equipment, maintenance, and facilities, as well as better support for new hardware and software features such as Resource Public Key Infrastructure for improved routing security.

CENIC staff are also optimizing workflows and moving towards network automation. For outage announcements, ScienceLogic, a new network monitoring system, provides faster alerts, an improved view of the status of network devices, and support for next-generation network initiatives.

Global Research and Education Networks Collaborate to Connect the Asia Pacific Oceania Region

Eleven global leading-edge research and education networks in North America, East Asia, Southeast Asia, and Oceania have agreed to collaborate to improve high-speed network services in the Asia Pacific Oceania region. The Asia Pacific Oceania network (APOnet) collaboration involves Pacific Wave, a joint project of CENIC and Pacific Northwest Gigapop, as well as the following networks:

- Australia's Academic and Research Network (AARNet),
- Arterial Research and Educational Network in Asia-Pacific (ARENA-PAC),
- Internet2,
- Korea Research Environment Open NETwork (KREONET),

- Japan Gigabit Network (JGN),
- Science Information Network (SINET),
- Research and Education Advanced Network New Zealand (REANNZ),
- Singapore Advanced Research and Education Network (SingAREN),
- TransPAC, and University of Hawaii (UH).

These networks support important multidisciplinary discoveries made by teams of experts spread around the world, collaborating and sharing data and scientific instruments across national boundaries. To support these multinational collaborations, all 11 networks will contribute resources that together can be managed to create a high-speed trans-oceanic network services delivery system that is more resilient, flexible, and consistent than any individual network on its own.

To learn more visit **APONET.GLOBAL**
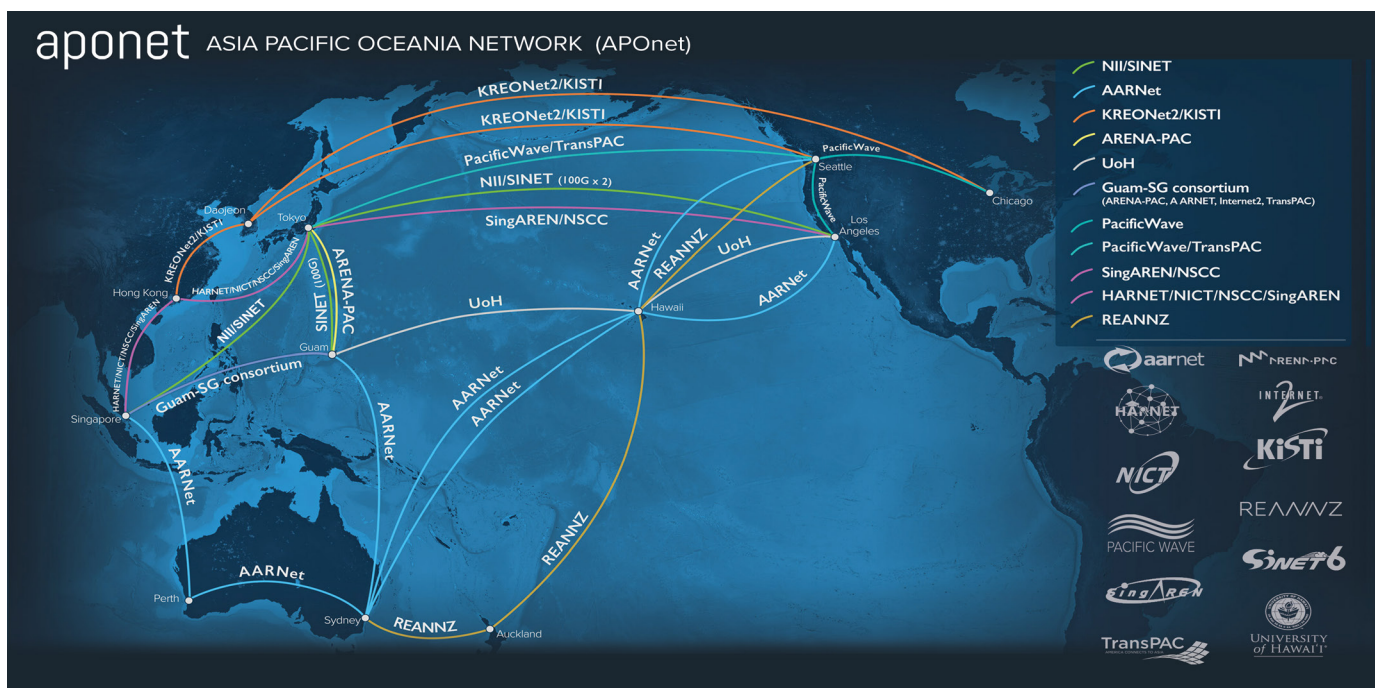
Dynamic and Innovative Uses of the Network

Virtual Excavations: Pacific Research Platform Enables Remote Collaboration on Underwater Archeological Dig in Israel

Amid the COVID-19 pandemic, many archeological digs were put on hold, as collaborating researchers from international universities could not travel to conduct fieldwork as a team. In California, the Pacific Research Platform not only enabled researchers at the University of California San Diego and their partners at the University of Haifa (UH) in Israel to go ahead with their expedition but also drastically accelerated data analysis times.

UH researchers conducted the fieldwork while UCSD researchers analyzed the findings virtually. UH researchers scuba dived at the underwater excavation of a late Stone Age Neolithic village located off northern Israel's Carmel Coast, collecting artifacts and live-streaming video of their movements. UCSD researchers received raw data from the divers daily and used the PRP to recreate the site virtually, print artifacts in 3D, and examine the information within mere hours. Due to the 10-hour time difference, one team was able to work while the other team slept.
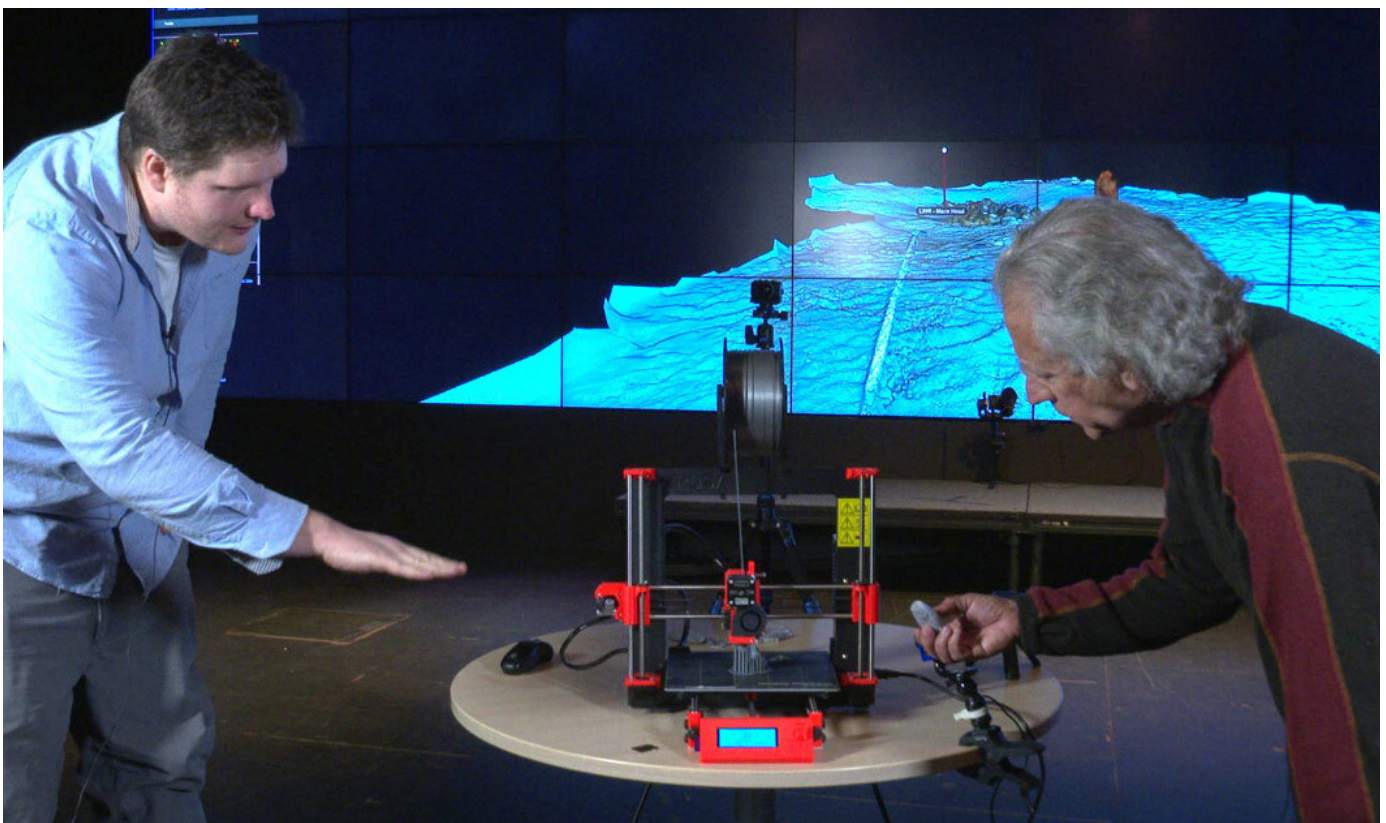
The Chan Zuckerberg Biohub Joins CENIC's Broadband Network

The Chan Zuckerberg Biohub (CZ Biohub) has joined CENIC. The CZ Biohub brings together physicians, scientists, and engineers from Stanford University, UC San Francisco, and UC Berkeley. Medical researchers at the CZ Biohub are seamlessly integrating biology, engineering, mathematics, physics, and computer science to solve the world's biggest medical problems and to collaborate with scientists around the world.

The CZ Biohub joined CENIC at 10 Gigabits per second, with the ability to upgrade to 100 Gbps, enabling the center's researchers and their partners to better access, share, and analyze massive datasets, employ remote scientific instruments and computational resources, and take part in multi-institution collaborations.

"Open science is better science. Collaboration and sharing accelerate discovery and will help us answer some of science's biggest questions -- and the work relies on an underlying, powerful network," said Rosio Alvarez, PhD, vice president, data security and IT, CZ Biohub.

California Cultural Institutions Increase Online Initiatives During COVID-19 Pandemic
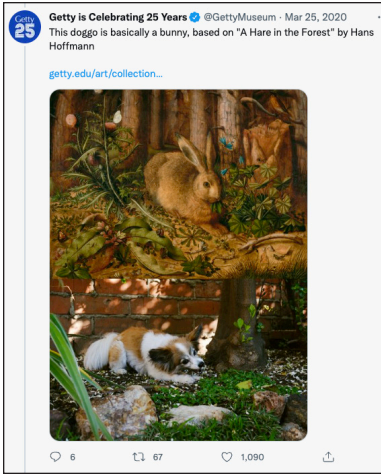
CENIC's member cultural institutions launched innovative digital initiatives to reach people at home during the COVID-19 pandemic, providing valuable resources for the research and education community and beyond.

High-speed broadband, and connections to research and education communities, can bring people and far-flung resources together in new ways, and leaders like the Exploratorium, SFJAZZ, and the Getty demonstrated some of the possibilities. These organizations kept their communities engaged with online offerings including hands-on science, art, and music projects that support the latest curriculum standards, COVID-related educational materials, teacher workshops, 3D virtual museum tours, live virtual music concerts, gaming activities, social media challenges, and more.

Despite being closed during stay-at-home orders, CENIC's member cultural institutions still transferred 414 Terabits on the California Research and Education Network (CalREN) in a week, which was 94% of the previous year's usage during the same time.

CENIC and Alameda Peer to Connect Students to Saildrone and Berkeley Lab

Thanks to a settlement-free interconnection (SFI) agreement between CENIC and the City of Alameda, students in Alameda and Contra Costa counties are able to work with first-of-its-kind data captured from autonomous ocean vehicles studying everything from marine wildlife to climate models.

Saildrone, which manufactures unmanned surface vehicles at Alameda Point, has developed partnerships with scientists at the nearby US Department of Energy's Lawrence Berkeley National Laboratory for access to next-generation supercomputers. That's where CENIC comes in. CENIC's peering through the SFI agreement with the City of Alameda enables sharing of Saildrone's data not only with Berkeley Lab, but also with students at K-12 schools, community colleges, and universities on CENIC's network.

The two-year SFI agreement between CENIC and Alameda is a model for other local governments that may wish to connect technology and research and development companies in their region with a state's research and education institutions.

Equity & Access Initiatives Powered by the Network

Indigenous Tribes in Southern California Are Now Participants in Pacific Wave

Twenty Native American tribes in Southern California are now directly connected to the state-of-the-art International Internet Exchange, Pacific Wave, and its peering, high-performance scientific networks and ever-expanding global connectivity. This new connection enables tribal libraries, scientific research facilities, and cultural preservation institutions to collaborate with partners across the state, the nation, and the world.

Tribal Digital Village, a tribal consortium-owned Internet service provider in San Diego County, has connected to Pacific Wave's infrastructure on the West Coast. Pacific Northwest GigaPop and CENIC established the connection with TDVnet with help from Google and AT&T.

The entire research and education community benefits from this partnership as it brings tribal institutions onto the same networks as their peers. We at CENIC believe this partnership between Pacific Wave, private sector partners, and tribal communities has the potential to be replicated and extended initially in California, Washington, and Montana and, eventually, throughout the West.

The Minds We Need: Federal Broadband Investment Should Include Research and Education Infrastructure

As the federal government considers a major investment in broadband, members of the research and education community, including CENIC, Internet2, The Quilt, and EDUCAUSE, came together to support and publish The Minds We Need. This report calls for investments in people, collaboration tools, and infrastructure to ensure the talent and potential of all students within every community through nearly 4,000 academic institutions.

Together, our community members propose that the US invest nearly $5 billion to connect every college and university, including every community college, historically black college and university, minority-serving institution, tribal college and university, and college and university-related research facility, to advanced, research-quality infrastructure, tools, and services.

A national broadband strategy that includes a comprehensive, coordinated, and aggressive investment in R&E infrastructure offers great leverage to increase America's competitiveness, which is presently at risk. It is exactly the kind of strategic investment imagined in the COVID-19 pandemic relief bills as well as the national broadband bills being considered by Congress. The full report can be read here at **mindsweneed.org**

State Selects CENIC California MMBI as Third-Party Administrator for Broadband Middle-Mile Network

The California Department of Technology has retained CENIC California Middle-Mile Broadband Initiative, LLC as the California middle-mile broadband network third-party administrator (TPA).

"California is bridging the digital divide by facilitating equitable, affordable access to high-speed internet service throughout the state," said Amy Tong, Director, California Department of Technology. "CENIC California MMBI has the experience and reach to deliver an open-access middle-mile broadband network throughout California."

Governor Newsom and the state legislature partnered on a historic $6 billion multi-year investment that will give more Californians access to broadband coverage. The legislation provides $3.25 billion over the next three years to build an open-access, middle-mile network made of high-capacity optical fiber that carries large amounts of data at high speeds over long distances between local networks and the global internet.

As the TPA, CENIC California MMBI is the partner responsible for developing the fiber network, creating rural exchange points, and collaborating with the California Public Utilities Commission and CalTrans.

"We are honored to be a part of the most ambitious state digital equity effort in the history of the public internet," said Louis Fox, President of CENIC California MMBI. "The COVID-19 pandemic underscored how access to broadband is now a social determinant of health, education, work, and economic security. Our goal, in partnership with the state, is to ensure that every community — rural, urban, tribal — has access to broadband technologies and to do this work with alacrity."

To learn more about GoldenStateNet and the progress being made, please visit **GOLDENSTATENET.ORG**

Read all these stories and more at cenic.org/blog.

04

CENIC ANNUAL CONFERENCE

CONNECTING SPEAKERS, PARTICIPANTS, AND COMMUNITIES

INNOVATIONS IN NETWORKING AWARDS

THE RIGHT
CONNECTION
#2022

Connecting Speakers, Participants, & Communities

CENIC's annual three-day conference convenes more than 400 leaders from research, education, and technology communities to share successes that have come from leveraging CENIC's California Research and Education Network (CalREN). The conference typically has more than 45 sessions with plenty of opportunities for participants to network, ask questions, and get inspired.

In workshop sessions, conference participants learn about and discuss innovative uses of the CENIC network to support diverse California research and education projects; state-of-the-art and future network technologies; wireless technologies that extend CENIC's network reach; cybersecurity and cyberinfrastructure; transformations in K-12 education and public libraries; broadband public policy; and new global collaborations supported by an interconnected research and education world.

"The conference brings together a remarkable and diverse group of leaders from California research, education, technology industry, and policy and government sectors, along with peers from around the US and representatives from nearly 20 countries to learn from one another on topics as varied as emerging network technologies and applications to issues of access, equity, and affordability of high-speed broadband," said CENIC President and CEO Louis Fox. "The seeds from new collaborations, new ideas, and new projects are planted during these three days of rich dialogue."

Due to the COVID-19 pandemic, the 2020 conference was cancelled but planning is underway for the **2022 conference to be held in Monterey, CA September 26-28, 2022.**

CENIC's 25th Anniversary Celebration

In March of 2022 we held an online 25th Anniversary Celebration, marking the first quarter of a century of the CENIC network. The webinar included a video and speakers from the CENIC community that shared highlights of CalREN's expansion, innovation, and broadband access as steps toward a future of quality education, research, healthcare, and prosperity for all Californians.

CENIC
CONNECTING CALIFORNIA 1997-2022
25

All past conference sessions and other CENIC highlights are available on the YouTube channel for "CENICNews." Visit www.cenic.org/events/september-2022 for events and conference details.

CENIC Innovations in Networking Awards

CENIC's Innovations in Networking Awards are presented annually at the conference and serve to highlight exemplary people, projects, and organizations that leverage ultra high-bandwidth networking, particularly efforts that have the potential to transform how instruction and research are conducted or that further the deployment of broadband in underserved areas.

2021 Awardees

Research Applications: University of California San Diego and the University of Haifa for Remote Collaboration Throughout the COVID-19 Pandemic and Work to Reshape Archeological Studies

Project members at UC San Diego:

- Thomas Levy
- Areli Alvarez
- Raquel Benguiat
- Hector Bracho
- Margie Burton
- Katrina Cantu
- Eleni Carwin
- Loren Clark
- Tom DeFanti
- Parke Funderburk
- Alexandra Hangsterfer
- John Hildebrand
- Brittany Hook
- Reuben Huerta
- Andrew Johnson
- Inga Kiderra
- Nancy Lee
- Kendall Mahony
- Alex Matthews
- Scott McAvoy
- Christian McDonald
- Richard Norris
- Ashleigh Palinkas
- Joel Polizzi
- Xochitl Rojas-Rocha
- Steve Savage
- Gilad Shtienberg
- Sophia Sylvestri
- Anthony Tamberino
- Rich Walsh

This team included researchers and staff from UC San Diego's Scripps Institution of Oceanography, Qualcomm Institute, and Department of Anthropology, Division of Social Sciences.

Project members at University of Haifa:

- Assaf Yasur-Landau
- Taufik Agbaria
- Mosheko Bachar
- Laura Cohen
- Meir Edrey
- David Friezem
- Jonathan Gotlieb
- Ruth Shahack Gross
- Sara Lantos
- Michael Lazar
- Sara Macke
- Omry Nachum
- Roey Nickelsberg
- Eran Nisenbaum
- Arie Pesso
- Alyssa Pietraszek
- Aviva Pollack
- Ehud Arkin Shalev
- Dorit Sivan
- Tanya Sokolsky
- Amir Yurman
- Rami Zadok
- Bracha Zimmerman

This team included researchers, staff, and students from the University of Haifa Leon Recanati Institute for Maritime Studies, the Department of Maritime Civilizations, and the Leon Cherney School of Marine Sciences.

R&E Network Partner: The Quilt for Leadership and Collaboration Throughout the Covid-19 Pandemic

- Jennifer Leasure
- Jennifer Griffin
- Tracey Norris

05

TECHNICAL OPERATIONS
& IMPROVEMENTS

EXPERT TEAMS KEEP DATA FLOWING

CONTINUOUS IMPROVEMENTS TO LAYERS 1–3

CENIC'S NETWORK OPERATIONS CENTER
RESOLVES NETWORK ISSUES

CIRCUIT ADDITIONS & UPGRADES

Expert Teams Keep Data Flowing

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

- **The Operations team** runs the Network Operations Center and keeps the technical environment operating seamlessly for thousands of organizations throughout the state.

- **The Core Engineering team** is instrumental in connecting millions of Californians with reliable and forward-thinking solutions, from basic broadband to advanced services for experimental networks.

- **The Network Design and Consultation team** designs, configures, deploys, and maintains all layers of our network infrastructure in consultation with our member constituents to meet their requirements.

- **The Project Management Office** ensures that new connections and connectivity upgrades are completed as efficiently as possible by coordinating tasks internally and externally throughout numerous project stages.

- **The Internet Services team** oversees our traffic peering and exchange relationships with key internet service providers, content providers, and cloud service companies.

- **The Information Security team** leads strategy on enterprise and network security and privacy issues as traffic demands and capacity increase over time.

- **The Systems Engineering team** ensures that our internal systems are operating effectively and securely to help CENIC maintain a focus on customer demands.

These groups collaborate with one another and throughout the organization to ensure seamless connectivity.
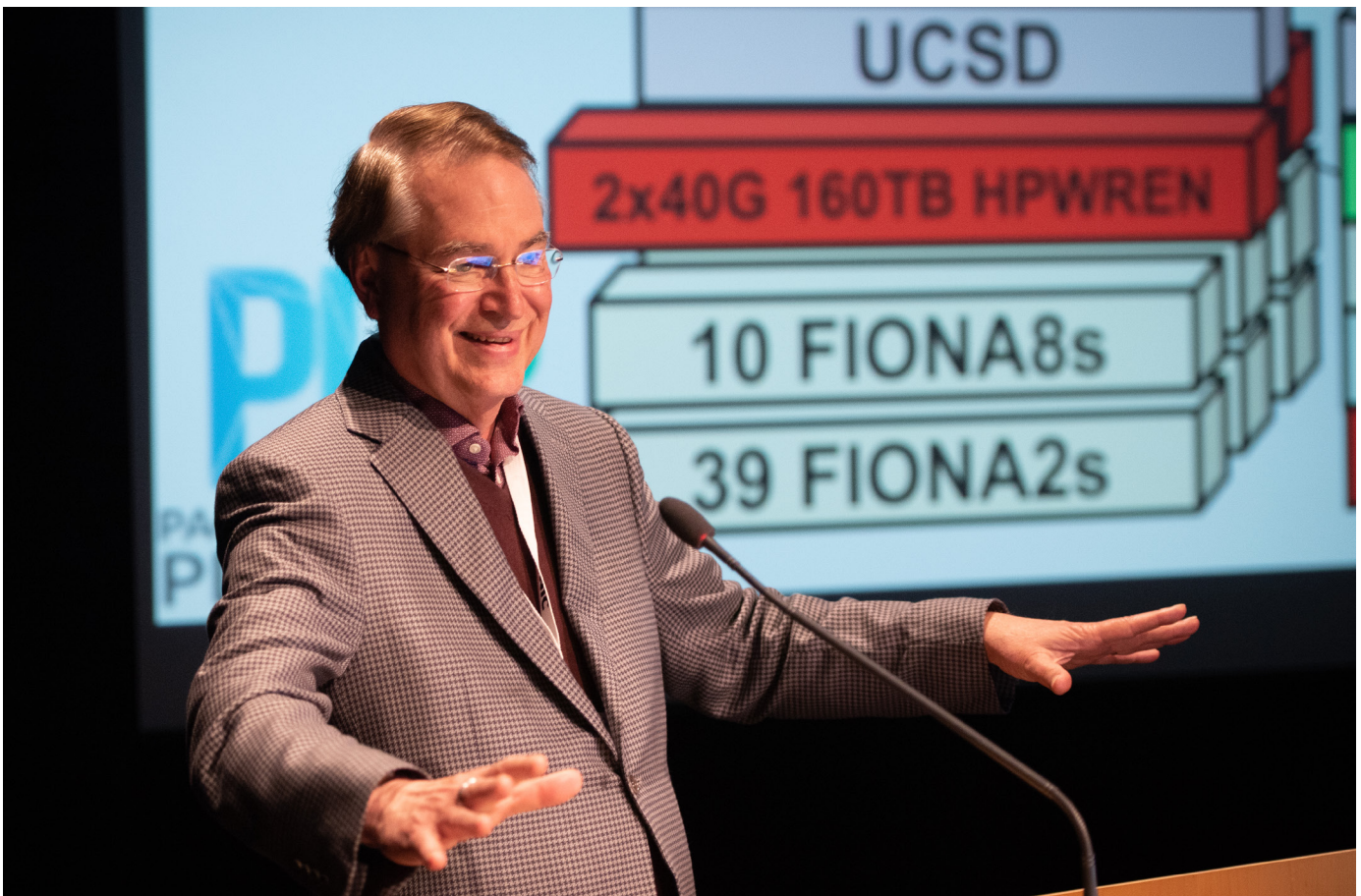
Continuous Improvements to Layers 1–3

CENIC's California Research and Education Network (CalREN) is a multi-tiered, advanced network-services fabric serving the majority of research and education institutions in the state. The CalREN backbone includes roughly 8,000 miles of CENIC-owned and managed fiber, last-mile fiber, and hundreds of optical components.

CENIC engineers perform regular upgrades at the three network layers outlined below. As of July 2021, recent network upgrades include:

LAYER 1: OPTICAL BACKBONE

- Upgraded the coastal path between Los Angeles and Sunnyvale to flexible grid technology in support of planned 400G+ backbone upgrades.

- Added colorless, directionless, contentionless (CDC) capabilities to the coastal path to extend software provisioning to the optical layer.

- Completed new fiber path in northern California between Corning and Sacramento. New fiber path adds diversity for Corning and includes two new optical nodes in Chico and Palo Cedro.

- Extended flexible grid and CDC capabilities to the inland route traversing Oakland, Sacramento, Fergus, Fresno, Bakersfield, and Riverside (expected completion FY23).

- Deployed SmartOptics metro optical solution to provide additional peering capacity up to 500 Gbps and distances up to 40 km.

LAYER 2 (DC/HPR CUSTOMER ACCESS, COMMODITY PEERING TRANSPORT, AND PACIFIC WAVE EXCHANGE)

- Upgraded the Pacific Wave backbone between Los Angeles and Sunnyvale to 1x300G, leveraging CENIC's flexible grid capabilities over the coastal path.

- Upgrade the Pacific Wave backbone capacity between Los Angeles, Sunnyvale, and Seattle to 400G (expected completion FY23).

- Upgrade the Western Regional Network (WRN) backbone between Los Angeles, El Paso, Albuquerque, Denver, Chicago, and Seattle to 100G+ (expected completion FY23).

- Added availability of MPLS-based Layer 2 solution, ELAN, and ELINE, to provide a more robust and seamless Layer 2 connection.

- Migrated current Layer 2 circuits to MPLS-based Layer 2 solutions.

LAYER 3: ROUTED NETWORKS (DC AND HPR BACKBONES)

- Deployed Segment Routing MPLS across the backbone to support flexible MPLS services.

- Consolidated DC and HPR platforms to provide additional flexibility in associate connectivity and location.

- Consolidate DC and HPR backbone links to 4x100G to enable more efficient use of available backbone bandwidth (expected completion FY22).

- Upgrade backbone aggregation routers at major hubsites to support 400Gbps connection (expected completion FY22).

- Upgrade 400G-capable backbone aggregation router at Triangle Court and San Diego (expected completion FY22).

- Upgrade higher density 100G-capable DC backbone aggregation router at Fresno, Fergus, Sacramento, San Francisco, and San Luis Obispo (expected completion FY22).

- Implemented and deployed enhanced network architectures and features (Route Reflector, Next-Hop Self, BGP PIC, TI-LFA) for quicker restoration of services (expected completion FY22).

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.

NOC staff from left: Stanley Han, Alaa Shaheen, Eugene Ho, Mark Lozada (back), Phat Tran, Ola Gamal, Viet Do (back), Jose Gonzalez (back), Gary Sun, Travis Sevigny, and Ozzie Reyes. Not pictured: Thomas Araneta, Bryan Barnett, James Bellon, Kenny Calalang, Josh Dickman, George Dolidze, Ron Esteban, Michael Gong, Dan Hegarty, Lawrenze Morales, Steve Shibley, and Mark Swank.

CENIC FY 2019- 2021 Total NOC handled tickets for Issues Resolution and Alarms

■ New Tickets (x10)　■ Maintenances　■ Outages
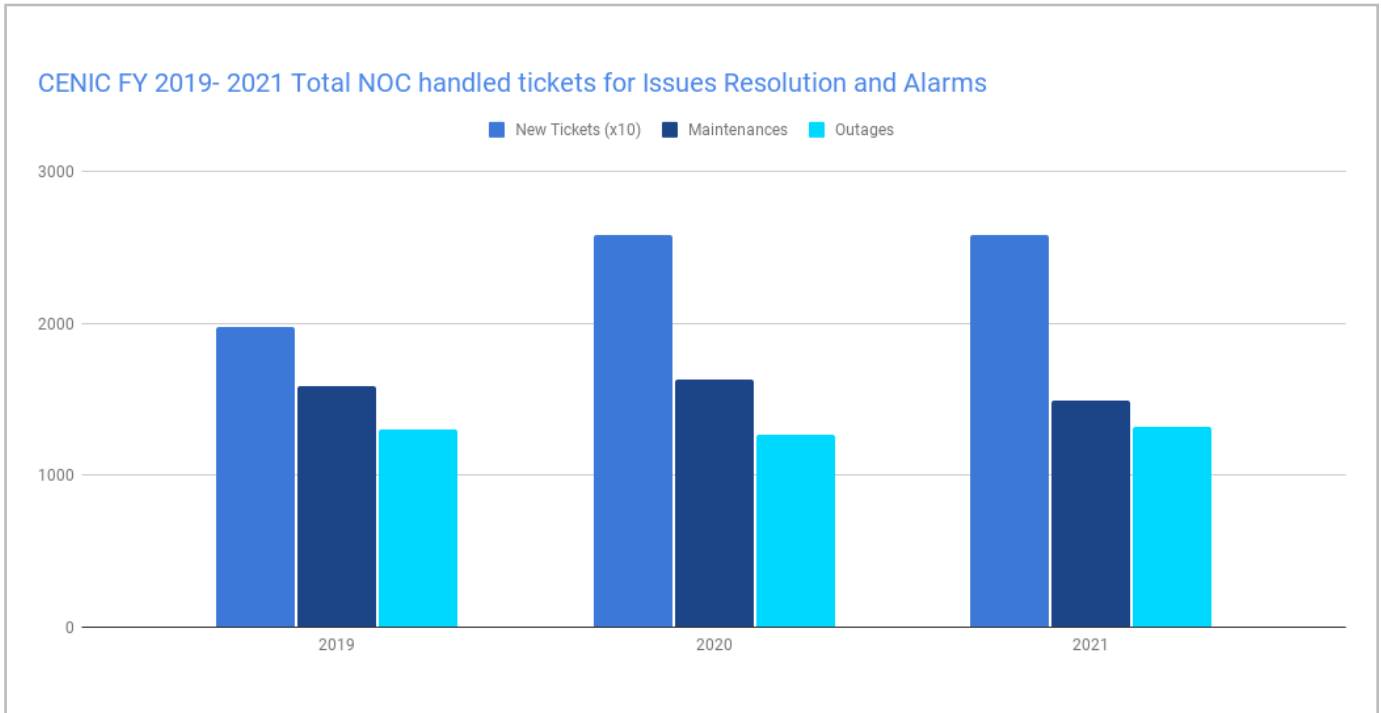
The NOC uses a ticketing system to track issues that need resolution. Many issues can be resolved on the same day, while some are more complex and take longer. In 2021, the NOC:

- Resolved 17,836 tickets

- Assessed 31,998 alarms

NOC engineers also coordinate and communicate third-party maintenance and repair activities, perform equipment updates, replacements, and upgrades, decommision retired equipment, and handle tasks in support of circuit installations, service upgrades, and backbone upgrades. In 2021, the NOC:

- Performed 1,493 maintenance procedures

- Completed 240 operational readiness tickets, related to new devices and 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 and Core Engineering.

Circuit Additions & Upgrades

CENIC is a member-driven organization focused on delivering a high level of service. We shape our network to meet the multi-faceted and dynamic needs of our research and education communities. 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, robust bandwidth is available to all organizations on the network. Network capacity is greater 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 from July of 2019 through December 2021, status last updated May 10, 2022.

University of California System

UC SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
UC DAVIS	10 GBPS	1/4/19	UPGRADE
UCANR EL DORADO	100 MBPS	8/6/2019	NEW
UCANR GLENN COUNTY	100 MBPS	6/7/2019	NEW
UCANR PLACER	100 MBPS	2/17/2020	NEW
UCANR RIVERSIDE MORENO	100 MBPS	11/6/2019	NEW
UCANR SHASTA FSNEP	100 MBPS	8/6/2019	NEW
UCLA FILM AND TELEVISION ARCHIVE	10 GBPS	4/27/21	NEW
UCOP BROADWAY	10 GBPS	5/6/2020	NEW
UCOP FRANKLIN	10 GBPS	2/5/2020	NEW

California State University System

CSU SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
CAL POLY POMONA	100 GBPS	4/18/19	UPGRADE
CMS SANTA CLARA DATA CENTER	10 GBPS	10/21/20	UPGRADE
CMS SANTA CLARA DATA CENTER	10 GBPS	9/30/20	UPGRADE
CSU CHANCELLORS OFFICE - LONG BEACH	10 GBPS	11/15/19	UPGRADE
CSU CHANNEL ISLANDS	10 GBPS	11/7/19	UPGRADE
CSU CHANNEL ISLANDS	10 GBPS	11/11/19	UPGRADE
CSU CHICO	10 GBPS	10/24/19	UPGRADE
CSU DOMINGUEZ HILLS	10 GBPS	2/11/20	UPGRADE
CSU DOMINGUEZ HILLS	10 GBPS	10/30/19	UPGRADE
CSU EAST BAY CONCORD	1 GBPS	5/30/19	UPGRADE
CSU FULLERTON IRVINE	1 GBPS	11/25/19	UPGRADE
CSU LOS ANGELES	1 GBPS	10/21/19	UPGRADE
CSU MONTEREY BAY	10 GBPS	10/15/19	UPGRADE
CSU MOSS LANDING MARINE LABS	1 GBPS	10/17/19	UPGRADE
CSU SAN MARCOS	10 GBPS	9/10/19	UPGRADE
CSU SONOMA	10 GBPS	10/2/19	UPGRADE
CSU SONOMA	10 GBPS	9/18/19	UPGRADE
DELL'ARTE INTERNATIONAL SCHOOL OF PHYSICAL THEATRE	1 GBPS	8/27/2021	NEW
HUMBOLDT MARINE LAB	1 GBPS	10/23/19	NEW
HUMBOLDT STATE AQUATIC CENTER	1 GBPS	6/7/21	NEW
SAN FRANCISCO STATE	10 GBPS	8/20/19	UPGRADE

Other Universities, Scientific, and Cultural Institutions

SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
CHAN ZUCKERBURG BIOHUB	10 GBPS	IN PROGRESS	NEW
CHAPMAN UNIVERSITY	10 GBPS	4/13/19	UPGRADE
CITY OF HOPE	10 GBPS	8/28/19	NEW
CITY OF HOPE	10 GBPS	8/29/19	NEW
GETTY INSTITUTE	10 GBPS	3/3/2020	NEW
GETTY INSTITUTE	10 GBPS	2/13/19	NEW
JACKSON LAB	1 GBPS	12/02/19	NEW
PEPPERDINE WEST LA	1 GBPS	09/10/20	NEW
PEPPERDINE WEST LA	1 GBPS	09/10/20	NEW
SF JAZZ	10 GBPS	11/13/19	UPGRADE
STANFORD UNIVERSITY	100 GBPS	2/9/19	UPGRADE
STANFORD UNIVERSITY - HOPKINS MARINE STATION	1 GBPS	11/16/20	TECHNOLOGY REFRESH
TRIBAL DIGITAL VILLAGE	10 GBPS	6/26/2019	NEW
UNIVERSITY OF SAN DIEGO	10 GBPS	8/6/19	UPGRADE
USC WRIGLEY MARINE SCIENCE CENTER	1 GBPS	2/15/19	NEW
USGS MENLO PARK	1 GBPS	3/16/2019	NEW

California Community College System

CCC SITE NAME	BANDWIDTH	DATE	UPGRADE
ALLAN HANCOCK COLLEGE	10 GBPS	4/5/19	UPGRADE
ALLAN HANCOCK COLLEGE	10 GBPS	11/17/2020	UPGRADE
ANTELOPE VALLEY CC PALMDALE CENTER	10 GBPS	2/14/2020	NEW
ANTELOPE VALLEY CCD	10 GBPS	IN PROGRESS	NEW
ANTELOPE VALLEY CCD	10 GBPS	2/17/2020	UPGRADE
BUTTE GLENN CCD	10 GBPS	08/28/20	NEW
BUTTE GLENN CCD	10 GBPS	07/10/20	UPGRADE
CALIFORNIA COMMUNITY COLLEGES, CHANCELLOR'S OFFICE	1 GBPS	03/29/19	NEW
CCCCO DATACENTER	1 GBPS	03/29/19	NEW
CHABOT CC	10 GBPS	10/6/2020	UPGRADE
CHABOT CC	10 GBPS	10/6/2020	UPGRADE
CHAFFEY CCD - CHINO CENTER	1 GBPS	3/21/2019	NEW

CCC SITE NAME	BANDWIDTH	DATE	UPGRADE
CITY COLLEGE OF SAN FRANCISCO	10 GBPS	8/13/2019	UPGRADE
COAST CCDO	10 GBPS	11/18/2019	UPGRADE
COAST CCDO	10 GBPS	11/18/2019	UPGRADE
COLLEGE OF ALAMEDA	10 GBPS	6/11/2019	UPGRADE
COLLEGE OF ALAMEDA	10 GBPS	6/14/2019	UPGRADE
COLLEGE OF MARIN	1 GBPS	IN PROGRESS	NEW
COLLEGE OF MARIN - KENTFIELD CAMPUS	10 GBPS	IN PROGRESS	UPGRADE
COLLEGE OF THE REDWOODS	1 GBPS	02/02/2021	NEW
COLLEGE OF THE REDWOODS	1 GBPS	2/26/21	NEW
COLLEGE OF THE SEQUOIAS - VISALIA CAMPUS	10 GBPS	12/17/2020	UPGRADE
COLLEGE OF THE SEQUOIAS - VISALIA CAMPUS	10 GBPS	7/1/2019	UPGRADE
COLLEGE OF THE SISKIYOUS	10 GBPS	IN PROGRESS	NEW
COLLEGE OF THE SISKIYOUS	10 GBPS	IN PROGRESS	NEW
COLLEGE OF THE SISKIYOUS	1 GBPS	10/4/2021	NEW
COLLEGE OF THE SISKIYOUS	1 GBPS	10/4/2021	NEW
CONTRA COSTA CCDO	1 GBPS	IN PROGRESS	NEW
CUYAMACA COLLEGE	10 GBPS	8/13/2019	UPGRADE
DIABLO VALLEY SAN RAMON VALLEY	1 GBPS	8/24/21	NEW
FOLSOM LAKE COLLEGE	10 GBPS	7/23/19	UPGRADE
FOOTHILL CC	1 GBPS	6/11/19	NEW
FOX FIELD	1 GBPS	08/31/2020	NEW
GAVILAN CC	10 GBPS	1/10/19	UPGRADE
GAVILAN CC	10 GBPS	1/10/19	UPGRADE
HARTNELL CC	10 GBPS	IN PROGRESS	UPGRADE
HARTNELL CC	10 GBPS	IN PROGRESS	UPGRADE
IMPERIAL VALLEY COLLEGE	10 GBPS	IN PROGRESS	UPGRADE
LA CCD	10 GBPS	IN PROGRESS	UPGRADE
LA HARBOR COLLEGE	10 GBPS	07/21/2021	UPGRADE
LA HARBOR COLLEGE	10 GBPS	07/19/2021	UPGRADE
LA MISSION CC	10 GBPS	3/27/19	UPGRADE
LA MISSION CC EAST CAMPUS	10 GBPS	02/24/21	NEW
LA VALLEY COLLEGE	1 GBPS	05/05/21	NEW
LAS POSITAS CC	10 GBPS	10/6/20	UPGRADE
LOS MEDANOS BRENTWOOD CENTER	1 GBPS	4/8/2020	NEW
LOS MEDANOS BRENTWOOD CENTER	1 GBPS	04/08/20	NEW
MENDOCINO COMMUNITY COLLEGE	10 GBPS	10/4/21	UPGRADE

CCC SITE NAME	BANDWIDTH	DATE	UPGRADE
MENDOCINO COMMUNITY COLLEGE	10 GBPS	12/1/2021	UPGRADE
MERCED COLLEGE	10 GBPS	3/29/19	UPGRADE
MERCED COLLEGE	10 GBPS	3/27/19	UPGRADE
MIRAMAR COLLEGE	10 GBPS	3/6/20	UPGRADE
MONTEREY PENINSULA CC	10 GBPS	11/12/19	NEW
MONTEREY PENINSULA CC - EDUCATION CENTER AT MARINA	10 GBPS	7/10/19	UPGRADE
MONTEREY PENINSULA CC - PUBLIC SAFETY TRAINING CENTER IN SEASIDE	1 GBPS	10/23/19	NEW
MONTEREY PENINSULA CC - PUBLIC SAFETY TRAINING CENTER IN SEASIDE	1 GBPS	10/23/19	NEW
MONTEREY PENINSULA COLLEGE	10 GBPS	11/12/19	UPGRADE
MSJC MENIFEE VALLEY CAMPUS	10 GBPS	4/30/19	UPGRADE
MSJC MENIFEE VALLEY CAMPUS	10 GBPS	9/20/2019	NEW
MSJC SAN GORGONIO PASS CAMPUS	1 GBPS	1/15/20	NEW
MSJC SAN GORGONIO PASS CAMPUS	1 GBPS	1/23/20	NEW
MSJC TEMECULA VALLEY CAMPUS	10 GBPS	4/30/19	NEW
MT. SAN ANTONIO COLLEGE	10 GBPS	06/11/2021	UPGRADE
MT. SAN ANTONIO COLLEGE	10 GBPS	06/11/2021	UPGRADE
MT. SAN JACINTO COLLEGE, SJ CAMPUS	10 GBPS	IN PROGRESS	UPGRADE
NAPA VALLEY CC	1 GBPS	09/23/2021	NEW
NAPA VALLEY CC	1 GBPS	6/18/21	NEW
PALO VERDE COLLEGE	10 GBPS	12/01/2020	UPGRADE
PALOMAR COLLEGE	1 GBPS	7/3/2019	NEW
PALOMAR COLLEGE	10 GBPS	9/10/19	UPGRADE
PASADENA CITY COLLEGE - COLORADO CAMPUS	10 GBPS	10/15/19	NEW
PORTERVILLE COLLEGE	10 GBPS	12/11/2020	UPGRADE
PORTERVILLE COLLEGE	10 GBPS	12/11/2020	UPGRADE
PUGET SOUND NAVAL SHIPYARD DETACHMENT NAS NORTH ISLAND	1 GBPS	8/10/20	NEW
RIO HONDO CC - EL MONTE EDUCATION CENTER	1 GBPS	3/15/2019	NEW
RIO HONDO CC - SANTA FE SPRINGS REGIONAL TRAINING CENTER	1 GBPS	4/16/20	NEW
RIO HONDO CC - SANTA FE SPRINGS REGIONAL TRAINING CENTER	1 GBPS	3/15/2019	NEW
RIO HONDO CC - SOUTH WHITTIER EDUCATION CENTER	1 GBPS	3/15/2019	NEW
RIO HONDO COLLEGE	1 GBPS	3/15/2019	NEW
RIO HONDO COLLEGE	10 GBPS	10/23/19	UPGRADE
RIO HONDO COLLEGE	1 GBPS	3/15/2019	NEW

CCC SITE NAME	BANDWIDTH	DATE	UPGRADE
SAN BERNARDINO COMMUNITY COLLEGE DISTRICT	1 GBPS	9/9/19	NEW
SAN DIEGO CCD	10 GBPS	12/30/19	NEW
SAN JOAQUIN DELTA CC MOUNTAIN HOUSE CAMPUS	1 GBPS	07/23/20	NEW
SAN JOSE EVERGREEN CCD DISTRICT OFFICE	1 GBPS	11/16/2021	NEW
SAN JOSE EVERGREEN CCD DISTRICT OFFICE	1 GBPS	11/9/2021	NEW
SAN JOSE EVERGREEN CCD DISTRICT OFFICE	1 GBPS	10/5/2021	NEW
SAN JOSE EVERGREEN VALLEY CC	1 GBPS	7/23/2021	NEW
SANTA BARBARA CITY COLLEGE	1 GBPS	11/17/20	NEW
SANTA BARBARA CITY COLLEGE	1 GBPS	IN PROGRESS	NEW
SANTA BARBARA CITY COLLEGE	10 GBPS	3/26/20	UPGRADE
SANTA MONICA CC - CENTER FOR MEDIA AND DESIGN	10 GBPS	8/19/2019	NEW
SANTA ROSA JUNIOR COLLEGE	10 GBPS	10/28/2021	NEW
SANTA ROSA JUNIOR COLLEGE - PUBLIC SAFETY TRAINING CENTER	1 GBPS	8/16/19	NEW
SANTA ROSA JUNIOR COLLEGE - PUBLIC SAFETY TRAINING CENTER	1 GBPS	10/28/2021	NEW
SHASTA CC - TRINITY CAMPUS	1 GBPS	1/10/19	NEW
SHASTA CC - TRINITY CAMPUS	1 GBPS	1/10/19	NEW
SHASTA COLLEGE	10 GBPS	9/13/19	UPGRADE
SIERRA CCD - ROSEVILLE CENTER	1 GBPS	8/9/19	NEW
SIERRA CCD - TAHOE-TRUCKEE CAMPUS	1 GBPS	3/19/2019	NEW
SIERRA COLLEGE - ROCKLIN CAMPUS	10 GBPS	1/31/19	NEW
SOUTHWESTERN CCD HEC - CROWN COVE AQUATIC CENTER	1 GBPS	11/17/21	NEW
SOUTHWESTERN CCD HEC - NATIONAL CITY	1 GBPS	12/8/21	NEW
SOUTHWESTERN CCD HEC - NATIONAL CITY	1 GBPS	11/20/19	NEW
SOUTHWESTERN CCD HEC - SAN YSIDRO	1 GBPS	2/5/2020	NEW
SOUTHWESTERN COLLEGE	1 GBPS	6/15/20	NEW
TAFT COLLEGE	10 GBPS	11/4/20	UPGRADE
VICTOR VALLEY CC - SCLA SCHOOL OF AVIATION TECHNOLOGY	1 GBPS	12/17/21	NEW
VICTOR VALLEY CC - SCLA SCHOOL OF AVIATION TECHNOLOGY	1 GBPS	IN PROGRESS	NEW
VICTOR VALLEY CC - SCLA SCHOOL OF AVIATION TECHNOLOGY	1 GBPS	12/05/2019	NEW
VICTOR VALLEY CC - SCLA SCHOOL OF AVIATION TECHNOLOGY	1 GBPS	12/05/2019	NEW
VICTOR VALLEY COLLEGE	10 GBPS	2/19/20	UPGRADE
VICTOR VALLEY COLLEGE	10 GBPS	3/4/2020	UPGRADE
WATSONVILLE CENTER	1 GBPS	IN PROGRESS	

CCC SITE NAME	BANDWIDTH	DATE	UPGRADE
WOODLAND COMMUNITY COLLEGE - LAKE COUNTY CAMPUS	1 GBPS	6/11/19	NEW
YUBA COLLEGE	10 GBPS	5/8/19	UPGRADE
YUBA COLLEGE - BEALE AFB OUTREACH CENTER	1 GBPS	1/9/2019	NEW

California K-12 System

K–12 SITE NAME	BANDWIDTH	DATE	UPGRADE
ALAMEDA COE	100 GBPS	7/1/2021	UPGRADE
ALPINE COE	1 GBPS	3/11/2020	UPGRADE
ALPINE COE	1 GBPS	2/28/2020	NEW
CA DEPARTMENT OF EDUCATION	10 GBPS	9/30/2019	TECHNOLOGY REFRESH
CHAFFEY JOINT UHSD	100 GBPS	3/14/2019	UPGRADE
CHOWCHILLA USD	10 GBPS	9/11/2019	UPGRADE
CHOWCHILLA USD	10 GBPS	9/9/2019	UPGRADE
CONTRA COSTA COE	100 GBPS	5/5/2019	UPGRADE
GLENN COE	10 GBPS	10/10/2019	RING TOPOLOGY
HUMBOLDT COE	10 GBPS	7/2/2019	TECHNOLOGY REFRESH
LAKE COE	10 GBPS	8/28/2019	TECHNOLOGY REFRESH
LOS ANGELES COE	100 GBPS	3/10/2020	UPGRADE
LOS ANGELES COE	DARK FIBER	3/10/2020	UPGRADE
LOS ANGELES USD VAN NUYS	DARK FIBER	2/25/2019	UPGRADE
MADERA COE ISC	10 GBPS	4/22/2020	RING TOPOLOGY
MARIN COE	10 GBPS	10/7/2019	NEW
MENDOCINO COE	10 GBPS	9/25/2019	TECHNOLOGY REFRESH
MENDOCINO COE	10 GBPS	9/10/2019	TECHNOLOGY REFRESH
MONTEREY COE	10 GBPS	1/25/2019	NEW
NAPA COE	10 GBPS	11/19/2019	TECHNOLOGY REFRESH
NORTHERN HUMBOLDT UHSDO	10 GBPS	6/18/2019	UPGRADE
RIVERSIDE COE	10 GBPS	6/23/2021	NEW
RIVERSIDE COE	10 GBPS	6/23/2021	RING TOPOLOGY
RIVERSIDE COE	10 GBPS	6/23/2021	RING TOPOLOGY
SAN BENITO COE	10 GBPS	4/10/2019	UPGRADE
SAN BERNARDINO CSS	10 GBPS	6/21/2019	NEW
SAN BERNARDINO CSS	10 GBPS	4/21/2019	RING TOPOLOGY
SAN DIEGO COE	DARK FIBER	4/20/2020	UPGRADE

K—12 SITE NAME	BANDWIDTH	DATE	UPGRADE
SAN DIEGO COE	100 GBPS	4/20/2020	UPGRADE
SAN FRANCISCO COE	10 GBPS	11/25/2019	TECHNOLOGY REFRESH
SAN FRANCISCO COE	10 GBPS	11/25/2019	TECHNOLOGY REFRESH
SAN JOAQUIN COE	100 GBPS	2/3/2019	UPGRADE
SAN LUIS OBISPO COE	10 GBPS	4/8/2020	TECHNOLOGY REFRESH
SAN MATEO COE	10 GBPS	1/3/2019	RING TOPOLOGY
SANTA BARBARA COE	10 GBPS	9/30/2019	UPGRADE
SANTA CLARA COE	100 GBPS	1/4/2019	UPGRADE
SHASTA COE	10 GBPS	11/13/2019	TECHNOLOGY REFRESH
SOLANO COE	10 GBPS	9/10/2019	TECHNOLOGY REFRESH
SONOMA COE	10 GBPS	2/5/2019	TECHNOLOGY REFRESH
SONOMA COE	10 GBPS	10/27/2020	NEW
STANISLAUS COE #2	10 GBPS	4/24/2019	UPGRADE
STANISLAUS COE #2	10 GBPS	8/11/2021	NEW
SUTTER COE #1	10 GBPS	1/23/2020	RING TOPOLOGY
TEHAMA COE	10 GBPS	2/17/2019	UPGRADE
TEHAMA COE	10 GBPS	2/22/2019	NEW
TRINITY COE	10 GBPS	11/18/2020	UPGRADE
TRINITY COE	10 GBPS	6/19/2019	UPGRADE
TULELAKE BASIN JOINT USD	500 MBPS	8/1/2019	UPGRADE
VENTURA COE #2	10 GBPS	11/10/2019	NEW
VICTOR VALLEY CC	10 GBPS	2/19/2020	NEW
WHITTIER USD	10 GBPS	10/27/2020	TECHNOLOGY REFRESH
YOLO COE	10 GBPS	12/12/2019	TECHNOLOGY REFRESH
YOLO COE	10 GBPS	10/1/2019	TECHNOLOGY REFRESH

California Public Libraries

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
ALAMEDA COUNTY LIBRARY - FREMONT	10 GBPS	6/1/20	UPGRADE
ALAMEDA COUNTY LIBRARY - FREMONT	10 GBPS	6/1/20	UPGRADE
ALTADENA LIBRARY DISTRICT - ALTADENA LIBRARY DISTRICT	10 GBPS	12/15/2020	UPGRADE
ALTADENA LIBRARY DISTRICT - BOB LUCAS MEMORIAL LIBRARY AND LITERACY CENTER	10 GBPS	1/5/2021	UPGRADE
BANNING LIBRARY	1 GBPS	4/28/2021	NEW
BERKELEY PUBLIC LIBRARY - CENTRAL BRANCH BERKELEY	10 GBPS	3/20/2020	UPGRADE

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
BERKELEY PUBLIC LIBRARY - CLAREMONT BRANCH	10 GBPS	3/20/2020	UPGRADE
BERKELEY PUBLIC LIBRARY - NORTH BRANCH	10 GBPS	3/20/2020	UPGRADE
BERKELEY PUBLIC LIBRARY - TAREA HALL PITTMAN SOUTH BRANCH	10 GBPS	3/20/2020	UPGRADE
BERKELEY PUBLIC LIBRARY - WEST BRANCH	10 GBPS	3/20/2020	UPGRADE
BLACK GOLD COOPERATIVE SYSTEM - GOLETA VALLEY	1 GBPS	3/15/2021	NEW
BLACK GOLD COOPERATIVE SYSTEM - SANTA BARBARA - BUELLTON	100 MBPS	6/14/2019	NEW
BLACK GOLD COOPERATIVE SYSTEM - SANTA BARBARA - MONTECITO	100 MBPS	2/20/2019	NEW
BUTTE COUNTY LIBRARY - OROVILLE BRANCH	1 GBPS	IN PROGRESS	NEW
BUTTE COUNTY LIBRARY - CHICO BRANCH	1 GBPS	IN PROGRESS	NEW
BUTTE COUNTY LIBRARY - DEPARTMENT OF EMPLOYMENT AND SOCIAL SERVICES SATELLITE LOCATION	1 GBPS	IN PROGRESS	NEW
BUTTE COUNTY LIBRARY - DURHAM BRANCH	1 GBPS	IN PROGRESS	NEW
BUTTE COUNTY LIBRARY - PARADISE BRANCH	1 GBPS	IN PROGRESS	NEW
CALIFORNIA STATE LIBRARY	1 GBPS	2/28/19	NEW
CALIFORNIA STATE LIBRARY - CAPITOL BRANCH	1 GBPS	2/28/19	NEW
CALIFORNIA STATE LIBRARY - SUTRO	1 GBPS	3/31/19	NEW
CAMARILLO PUBLIC LIBRARY	1 GBPS	7/10/2020	NEW
CITY OF COMMERCE PUBLIC LIBRARY - GREENWOOD	1 GBPS	1/10/2019	NEW
COALINGA HURON UNIFIED SCHOOL DISTRICT LIBRARY - HURON BRANCH	100 MBPS	7/22/2021	UPGRADE
CONTRA COSTA LIBRARY - ANTIOCH	1 GBPS	5/20/2021	NEW
CONTRA COSTA LIBRARY - BAY POINT	1 GBPS	5/28/2021	NEW
CONTRA COSTA LIBRARY - BRENTWOOD	1 GBPS	6/16/2021	NEW
CONTRA COSTA LIBRARY - CLAYTON	1 GBPS	5/11/2021	NEW
CONTRA COSTA LIBRARY - CONCORD	1 GBPS	7/1/2021	NEW
CONTRA COSTA LIBRARY - CROCKETT	1 GBPS	5/26/2021	NEW
CONTRA COSTA LIBRARY - DANVILLE	1 GBPS	6/8/2021	NEW
CONTRA COSTA LIBRARY - DOUGHERTY STATION	1 GBPS	6/3/2021	NEW
CONTRA COSTA LIBRARY - EL CERRITO	1 GBPS	6/16/2021	NEW
CONTRA COSTA LIBRARY - EL SOBRANTE	1 GBPS	8/11/2021	NEW
CONTRA COSTA LIBRARY - HERCULES	1 GBPS	5/20/2021	NEW
CONTRA COSTA LIBRARY - KENSINGTON	1 GBPS	7/14/2021	NEW
CONTRA COSTA LIBRARY - LAFAYETTE	1 GBPS	6/24/2021	NEW
CONTRA COSTA LIBRARY - LIBRARY ADMINISTRATION	10 GBPS	5/6/21	NEW
CONTRA COSTA LIBRARY - MARTINEZ	1 GBPS	6/16/2021	NEW

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
CONTRA COSTA LIBRARY - MORAGA	1 GBPS	6/11/2021	NEW
CONTRA COSTA LIBRARY - OAKLEY	1 GBPS	6/10/2021	NEW
CONTRA COSTA LIBRARY - ORINDA	1 GBPS	6/4/2021	NEW
CONTRA COSTA LIBRARY - PINOLE	1 GBPS	6/8/2021	NEW
CONTRA COSTA LIBRARY - PITTSBURG	1 GBPS	5/28/2021	NEW
CONTRA COSTA LIBRARY - PLEASANT HILL	1 GBPS	IN PROGRESS	NEW
CONTRA COSTA LIBRARY - PREWETT LIBRARY	1 GBPS	6/1/2021	NEW
CONTRA COSTA LIBRARY - RODEO	1 GBPS	5/26/2021	NEW
CONTRA COSTA LIBRARY - SAN PABLO	1 GBPS	7/7/2021	NEW
CONTRA COSTA LIBRARY - SAN RAMON	1 GBPS	9/20/2021	NEW
CONTRA COSTA LIBRARY - WALNUT CREEK	1 GBPS	6/29/2021	NEW
CONTRA COSTA LIBRARY - YGNACIO VALLEY	1 GBPS	7/26/2021	NEW
CORONA PUBLIC LIBRARY - CORONA PUBLIC LIBRARY	1 GBPS	9/24/2020	NEW
CORONADO PUBLIC LIBRARY - CORONADO PUBLIC LIBRARY	10 GBPS	1/4/2021	UPGRADE
DOWNEY CITY LIBRARY - DOWNEY CITY LIBRARY	10 GBPS	1/6/2021	UPGRADE
FOLSOM PUBLIC LIBRARY	1 GBPS	10/23/2020	NEW
FRESNO COUNTY PUBLIC LIBRARY - AUBERRY BRANCH	100 MBPS	IN PROGRESS	NEW
FRESNO COUNTY PUBLIC LIBRARY - BEAR MOUNTAIN BRANCH	100 MBPS	IN PROGRESS	NEW
FRESNO COUNTY PUBLIC LIBRARY - BETTY RODRIGUEZ	1 GBPS	3/24/2021	NEW
FRESNO COUNTY PUBLIC LIBRARY - BIG CREEK BRANCH	100 MBPS	IN PROGRESS	NEW
FRESNO COUNTY PUBLIC LIBRARY - CARUTHERS BRANCH	100 MBPS	7/23/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - CLOVIS BRANCH	1 GBPS	3/26/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - EASTON BRANCH	100 MBPS	8/4/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - FIG GARDEN BRANCH	1 GBPS	4/5/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - FIREBAUGH BRANCH	1 GBPS	8/17/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - FOWLER	100 MBPS	9/15/2020	NEW
FRESNO COUNTY PUBLIC LIBRARY - FRESNO HQ	10 GBPS	12/12/2020	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - GILLIS BRANCH	100 MBPS	10/21/2019	NEW
FRESNO COUNTY PUBLIC LIBRARY - KERMAN BRANCH	1 GBPS	IN PROGRESS	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - KINGSBURG BRANCH	100 MBPS	8/11/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - LATON BRANCH	100 MBPS	7/23/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - MENDOTA BRANCH	100 MBPS	8/5/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - MOSQUEDA CENTER BRANCH	100 MBPS	8/5/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - ORANGE COVE BRANCH	100 MBPS	8/9/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - PARLIER BRANCH	100 MBPS	9/20/2021	UPGRADE

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - PIEDRA BRANCH	100 MBPS	IN PROGRESS	NEW
FRESNO COUNTY PUBLIC LIBRARY - PINEDALE BRANCH	100 MBPS	IN PROGRESS	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - RIVERDALE	100 MBPS	10/19/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - SAN JOAQUIN BRANCH	1 GBPS	3/19/2019	NEW
FRESNO COUNTY PUBLIC LIBRARY - SANGER BRANCH	100 MBPS	8/31/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - SELMA BRANCH	100 MBPS	8/26/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - SHAVER LAKE BRANCH	100 MBPS	IN PROGRESS	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - SUNNYSIDE BRANCH	1 GBPS	3/25/2021	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - TALKING BOOK BRANCH	100 MBPS	IN PROGRESS	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - TEAGUE BRANCH	100 MBPS	9/3/2021	NEW
FRESNO COUNTY PUBLIC LIBRARY - WEST FRESNO BRANCH	100 MBPS	IN PROGRESS	UPGRADE
FRESNO COUNTY PUBLIC LIBRARY - WOODWARD PARK BRANCH	1 GBPS	3/26/2021	UPGRADE
FULLERTON PUBLIC LIBRARY - FULLERTON PUBLIC LIBRARY	10 GBPS	8/25/2021	UPGRADE
GLENDALE LIBRARY, ARTS & CULTURE - GLENDALE LIBRARY, ARTS & CULTURE	10 GBPS	10/12/2020	UPGRADE
HAYWARD PUBLIC LIBRARY - WEEKES	1 GBPS	9/28/2021	NEW
HUMBOLDT COUNTY - HOOPA LIBRARY	100 MBPS	IN PROGRESS	NEW
HUMBOLDT COUNTY - WILLOW CREEK	100 MBPS	IN PROGRESS	NEW
HUMBOLDT COUNTY LIBRARY - GARBERVILLE	500 MBPS	8/25/2021	NEW
KERN COUNTY LIBRARY - ARVIN BRANCH	100 MBPS	10/16/2021	UPGRADE
KERN COUNTY LIBRARY - BAKER STREET BRANCH	100 MBPS	10/12/2021	UPGRADE
KERN COUNTY LIBRARY - BEALE MEMORIAL HQ	10 GBPS	11/18/2020	UPGRADE
KERN COUNTY LIBRARY - CALIFORNIA CITY BRANCH	10 MBPS	8/28/2020	NEW
KERN COUNTY LIBRARY - DELANO BRANCH	100 MBPS	10/28/2021	UPGRADE
KERN COUNTY LIBRARY - FRAZIER PARK BRANCH	100 MBPS	10/27/2021	UPGRADE
KERN COUNTY LIBRARY - HOLLOWAY-GONZALES BRANCH	100 MBPS	11/30/2021	UPGRADE
KERN COUNTY LIBRARY - KERN RIVER VALLEY	100 MBPS	2/13/2020	NEW
KERN COUNTY LIBRARY - LAMONT BRANCH	100 MBPS	IN PROGRESS	UPGRADE
KERN COUNTY LIBRARY - MCFARLAND BRANCH	100 MBPS	IN PROGRESS	UPGRADE
KERN COUNTY LIBRARY - MOJAVE	1 GBPS	12/4/2019	NEW
KERN COUNTY LIBRARY - NORTHEAST BRANCH	100 MBPS	IN PROGRESS	UPGRADE
KERN COUNTY LIBRARY - RATHBUN BRANCH	100 MBPS	10/27/2021	UPGRADE
KERN COUNTY LIBRARY - RIDGECREST BRANCH	10 MBPS	1/1/2019	NEW
KERN COUNTY LIBRARY - SOUTHWEST BRANCH	100 MBPS	10/11/2019	UPGRADE
KERN COUNTY LIBRARY - TAFT	1 GBPS	10/11/2019	NEW
KERN COUNTY LIBRARY - TEHACHAPI BRANCH	100 MBPS	IN PROGRESS	UPGRADE

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
KERN COUNTY LIBRARY - WANDA KIRK BRANCH	100 MBPS	10/11/2019	UPGRADE
KERN COUNTY LIBRARY - WASCO BRANCH	100 MBPS	IN PROGRESS	UPGRADE
KERN COUNTY LIBRARY - WILSON BRANCH	100 MBPS	IN PROGRESS	UPGRADE
KINGS COUNTY LIBRARY - ARMONA BRANCH	100 MBPS	IN PROGRESS	UPGRADE
KINGS COUNTY LIBRARY - AVENAL BRANCH	100 MBPS	4/30/2021	UPGRADE
KINGS COUNTY LIBRARY - KETTLEMAN CITY BRANCH	1 GBPS	12/22/2021	UPGRADE
KINGS COUNTY LIBRARY - LEMOORE BRANCH	1 GBPS	IN PROGRESS	UPGRADE
KINGS COUNTY LIBRARY - STRATFORD BRANCH	100 MBPS	8/3/2021	UPGRADE
LONG BEACH PUBLIC LIBRARY - BRET HARTE	1 GBPS	7/9/2019	NEW
LONG BEACH PUBLIC LIBRARY - MAIN	10 GBPS	7/8/2019	UPGRADE
LOS ANGELES COUNTY - A C BILBREW	1 GBPS	5/29/2019	NEW
LOS ANGELES COUNTY - ACTON	1 GBPS	2/13/2020	NEW
LOS ANGELES COUNTY - AGOURA HILLS	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - ALONDRA BRANCH	1 GBPS	5/23/2019	NEW
LOS ANGELES COUNTY - ANGELO M IACOBONI	1 GBPS	1/18/2019	NEW
LOS ANGELES COUNTY - ANTHONY QUINN	1 GBPS	3/13/2019	NEW
LOS ANGELES COUNTY - ARTESIA	1 GBPS	5/19/2020	NEW
LOS ANGELES COUNTY - AVALON	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - BALDWIN PARK	1 GBPS	8/3/2020	NEW
LOS ANGELES COUNTY - BELL	1 GBPS	5/23/2019	NEW
LOS ANGELES COUNTY - BELL GARDENS	1 GBPS	12/20/2018	NEW
LOS ANGELES COUNTY - CARSON LIBRARY AND WEST REGION	1 GBPS	10/21/2020	NEW
LOS ANGELES COUNTY - CASTAIC	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - CHARTER OAK	1 GBPS	1/29/2021	NEW
LOS ANGELES COUNTY - CITY TERRACE	1 GBPS	6/28/2019	NEW
LOS ANGELES COUNTY - CLAREMONT	1 GBPS	10/14/2020	NEW
LOS ANGELES COUNTY - CLIFTON M BRAKENSIEK	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - COMPTON	1 GBPS	5/31/2019	NEW
LOS ANGELES COUNTY - CUDAHY	1 GBPS	4/16/2019	NEW
LOS ANGELES COUNTY - CULVER CITY JULIAN DIXON	1 GBPS	5/23/2019	NEW
LOS ANGELES COUNTY - DATA CENTER	100 GBPS	1/10/2019	NEW
LOS ANGELES COUNTY - DIAMOND BAR LIBRARY	1 GBPS	6/6/2019	NEW
LOS ANGELES COUNTY - DR. MARTIN LUTHER KING (VICTORIA PARK)	1 GBPS	5/31/2019	NEW
LOS ANGELES COUNTY - DUARTE	1 GBPS	1/15/2019	NEW
LOS ANGELES COUNTY - EAST LOS ANGELES	1 GBPS	5/8/2019	NEW

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
LOS ANGELES COUNTY - EAST RANCHO DOMINGUEZ	1 GBPS	7/16/2019	NEW
LOS ANGELES COUNTY - EL CAMINO REAL	1 GBPS	1/14/2020	NEW
LOS ANGELES COUNTY - EL MONTE	1 GBPS	7/22/2020	NEW
LOS ANGELES COUNTY - FLORENCE	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - GARDENA MAYME DEAR	1 GBPS	12/19/2019	NEW
LOS ANGELES COUNTY - GEORGE NYE JR	1 GBPS	7/16/2019	NEW
LOS ANGELES COUNTY - GRAHAM	1 GBPS	5/29/2019	NEW
LOS ANGELES COUNTY - HACIENDA HEIGHTS	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - HAWAIIAN GARDENS	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - HAWTHORNE	1 GBPS	5/27/2019	NEW
LOS ANGELES COUNTY - HEADQUATERS COUNTY OF LA PUBLIC LIBRARY (LHQ)	1 GBPS	3/12/2019	NEW
LOS ANGELES COUNTY - HERMOSA BEACH	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - HOLLYDALE	1 GBPS	8/21/2019	NEW
LOS ANGELES COUNTY - HUNTINGTON PARK PUBLIC	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - LA CAÑADA FLINTRIDGE	1 GBPS	2/4/2020	NEW
LOS ANGELES COUNTY - LA CRESCENTA	1 GBPS	5/23/2019	NEW
LOS ANGELES COUNTY - LA MIRADA	1 GBPS	3/22/2019	NEW
LOS ANGELES COUNTY - LA PUENTE	1 GBPS	10/22/2019	NEW
LOS ANGELES COUNTY - LA VERNE	1 GBPS	9/23/2019	NEW
LOS ANGELES COUNTY - LAKE LOS ANGELES	1 GBPS	9/9/2019	NEW
LOS ANGELES COUNTY - LANCASTER	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - LAWNDALE	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - LELAND R WEAVER	1 GBPS	1/2/2021	NEW
LOS ANGELES COUNTY - LENNOX	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - LITTLEROCK	1 GBPS	10/27/2020	NEW
LOS ANGELES COUNTY - LIVE OAK	1 GBPS	8/19/2020	NEW
LOS ANGELES COUNTY - LLOYD TABER-MARINA DEL REY	1 GBPS	3/15/2019	NEW
LOS ANGELES COUNTY - LOMITA	1 GBPS	11/5/2020	NEW
LOS ANGELES COUNTY - LOS NIETOS	1 GBPS	8/19/2021	NEW
LOS ANGELES COUNTY - LYNWOOD	1 GBPS	6/11/2019	NEW
LOS ANGELES COUNTY - MALIBU	1 GBPS	5/23/2019	NEW
LOS ANGELES COUNTY - MANHATTAN BEACH	1 GBPS	6/6/2019	NEW
LOS ANGELES COUNTY - MASAO W SATOW	1 GBPS	4/18/2019	NEW
LOS ANGELES COUNTY - MAYWOOD CESAR CHAVEZ	1 GBPS	3/19/2019	NEW
LOS ANGELES COUNTY - MONTEBELLO REGIONAL LIBRARY AND CENTRAL REGION	1 GBPS	3/20/2019	NEW

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
LOS ANGELES COUNTY - NORTH REGIONAL OFFICE	1 GBPS	4/18/2019	NEW
LOS ANGELES COUNTY - NORWALK REGIONAL LIBRARY AND SOUTH REGION	1 GBPS	4/18/2019	NEW
LOS ANGELES COUNTY - NORWOOD	1 GBPS	8/23/2019	NEW
LOS ANGELES COUNTY - PARAMOUNT	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - PICO RIVERA	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - QUARTZ HILL	1 GBPS	1/17/2019	NEW
LOS ANGELES COUNTY - RIVERA	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - ROSEMEAD	1 GBPS	1/3/2020	NEW
LOS ANGELES COUNTY - ROWLAND HEIGHTS	1 GBPS	6/7/2019	NEW
LOS ANGELES COUNTY - SAN DIMAS	1 GBPS	10/23/2020	NEW
LOS ANGELES COUNTY - SAN FERNANDO	1 GBPS	5/10/2019	NEW
LOS ANGELES COUNTY - SAN GABRIEL	1 GBPS	12/13/2019	NEW
LOS ANGELES COUNTY - SORENSEN	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - SOUTH EL MONTE	1 GBPS	6/15/2020	NEW
LOS ANGELES COUNTY - SOUTH WHITTIER	1 GBPS	9/27/2019	NEW
LOS ANGELES COUNTY - STEVENSON RANCH	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - SUNKIST	1 GBPS	3/ 1/2020	NEW
LOS ANGELES COUNTY - TEMPLE CITY	1 GBPS	3/ 1/2021	NEW
LOS ANGELES COUNTY - TOPANGA	1 GBPS	3/ 1/2022	NEW
LOS ANGELES COUNTY - VIEW PARK BEBE MOORE CAMBELL	1 GBPS	4/18/2019	NEW
LOS ANGELES COUNTY - WALNUT BRANCH	1 GBPS	3/20/2019	NEW
LOS ANGELES COUNTY - WEST COVINA REGIONAL LIBRARY AND EAST REGION	1 GBPS	12/10/2019	NEW
LOS ANGELES COUNTY - WEST HOLLYWOOD	1 GBPS	5/26/2020	NEW
LOS ANGELES COUNTY - WESTLAKE VILLAGE	1 GBPS	1/21/2020	NEW
LOS ANGELES COUNTY - WILLOWBROOK	1 GBPS	12/28/2019	NEW
LOS ANGELES COUNTY - WISEBURN	1 GBPS	3/ 1/2019	NEW
LOS ANGELES COUNTY - WOODCREST	1 GBPS	7/18/2019	NEW
LOS ANGELES PUBLIC LIBRARY - ALMA REAVES WOODS – WATTS	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - ANGELES MESA	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - ARROYO SECO REGIONAL BRANCH	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - ASCOT	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - ATWATER VILLAGE	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - BALDWIN HILLS	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - BENJAMIN FRANKLIN	1 GBPS	6/30/2021	NEW

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
LOS ANGELES PUBLIC LIBRARY - CAHUENGA	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - CANOGA PARK	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - CENTRAL LIBRARY	80 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - CHATSWORTH	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - CHINATOWN	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - CYPRESS PARK	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - DONALD BRUCE KAUFMAN – BRENTWOOD	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - EAGLE ROCK	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - ECHO PARK	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - EDENDALE	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - EL SERENO	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - ENCINO – TARZANA	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - EXPOSITION PARK – REGIONAL BRANCH	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - FAIRFAX	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - FELIPE DE NEVE	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - GRANADA HILLS	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - HARBOR GATEWAY – HARBOR CITY	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - HOLLYWOOD REGIONAL BRANCH	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - HYDE PARK - MIRIAM MATTHEWS	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - JEFFERSON	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - JOHN C. FREMONT	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - JOHN MUIR	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - JUNIPERO SERRA	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - LAKE VIEW TERRACE	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - LINCOLN HEIGHTS	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - LITTLE TOKYO	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - LOS FELIZ	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - MALABAR	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - MAR VISTA	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - MARK TWAIN	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - MEMORIAL	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - MID-VALLEY REGIONAL BRANCH	10 GBPS	12/6/2021	NEW

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
LOS ANGELES PUBLIC LIBRARY - MID-VALLEY REGIONAL BRANCH	10 GBPS	IN PROGRESS	NEW
LOS ANGELES PUBLIC LIBRARY - NORTH HOLLYWOOD REGIONAL BRANCH	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - NORTHRIDGE	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - PACOIMA	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - PALISADES	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - PALMS – RANCHO PARK	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - PANORAMA CITY	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - PICO UNION	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - PIO PICO – KOREATOWN	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - PLATT	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - PLAYA VISTA	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - PORTER RANCH	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - ROBERT LOUIS STEVENSON	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - ROBERTSON	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - SAN PEDRO REGIONAL BRANCH	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - SHERMAN OAKS	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - SILVER LAKE	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - STUDIO CITY	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - SUN VALLEY	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - SUNLAND – TUJUNGA	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - SYLMAR	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - VALLEY PLAZA	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - VAN NUYS	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - VENICE – ABBOT KINNEY MEMORIAL	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - VERMONT SQUARE	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - VERNON	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - WASHINGTON IRVING	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - WEST LOS ANGELES REGIONAL BRANCH	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - WEST VALLEY REGIONAL BRANCH	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - WESTCHESTER - LOYOLA VILLAGE	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - WESTWOOD	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - WILL & ARIEL DURANT	1 GBPS	6/30/2021	NEW

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
LOS ANGELES PUBLIC LIBRARY - WILMINGTON	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - WILSHIRE	1 GBPS	6/30/2021	NEW
LOS ANGELES PUBLIC LIBRARY - WOODLAND HILLS	1 GBPS	6/30/2021	NEW
MADERA COUNTY LIBRARY - CHOWCHILLA BRANCH	100 MBPS	8/4/2021	UPGRADE
MADERA COUNTY LIBRARY - NORTH FORK BRANCH	50 MBPS	5/2/2019	UPGRADE
MARIN COUNTY FREE LIBRARY - MARIN COUNTY FREE LIBRARY/MARINET OFFICE	5 GBPS	7/1/2021	UPGRADE
MARIPOSA COUNTY LIBRARY - EL PORTAL BRANCH	100 MBPS	IN PROGRESS	NEW
MARIPOSA COUNTY LIBRARY - MARIPOSA HQ	1 GBPS	IN PROGRESS	UPGRADE
MARIPOSA COUNTY LIBRARY - RED CLOUD BRANCH	100 MBPS	IN PROGRESS	NEW
MARIPOSA COUNTY LIBRARY - WAWONA BRANCH	100 MBPS	IN PROGRESS	NEW
MENDOCINO COUNTY LIBRARY - COAST COMMUNITY LIBRARY	1 GBPS	8/25/2021	NEW
MENDOCINO COUNTY LIBRARY - FT. BRAGG	1 GBPS	8/25/21	NEW
MENDOCINO COUNTY LIBRARY - LAYTONVILLE LIBRARY	1 GBPS	12/15/2021	NEW
MERCED COUNTY LIBRARY - DELHI BRANCH	1 GBPS	IN PROGRESS	UPGRADE
MERCED COUNTY LIBRARY - GUSTINE BRANCH	100 MBPS	7/23/2021	UPGRADE
MERCED COUNTY LIBRARY - HILMAR BRANCH	100 MBPS	7/29/2021	UPGRADE
MERCED COUNTY LIBRARY - LOS BANOS BRANCH	1 GBPS	8/19/2021	UPGRADE
MERCED COUNTY LIBRARY - SNELLING BRANCH	1 GBPS	IN PROGRESS	NEW
MERCED COUNTY LIBRARY - WINTON BRANCH	1 GBPS	8/18/2019	UPGRADE
MORENO VALLEY PUBLIC LIBRARY - IRIS PLAZA BRANCH	1 GBPS	9/8/2021	NEW
MORENO VALLEY PUBLIC LIBRARY - MAIN BRANCH	1 GBPS	10/18/2021	NEW
MORENO VALLEY PUBLIC LIBRARY - MALL BRANCH	1 GBPS	10/18/2021	NEW
NEVADA COUNTY LIBRARY - SAN JUAN RIDGE	500 MBPS	5/19/2020	NEW
OAKLAND PUBLIC LIBRARY - AFRICAN AMERICAN MUSEUM	250 MBPS	11/11/2019	UPGRADE
OAKLAND PUBLIC LIBRARY - ASIAN BRANCH	500 MBPS	1/3/19	NEW
OAKLAND PUBLIC LIBRARY - BROOKFIELD	250 MBPS	11/8/2019	UPGRADE
OAKLAND PUBLIC LIBRARY - EASTMONT	500 MBPS	1/3/19	NEW
OAKLAND PUBLIC LIBRARY - ELMHURST	250 MBPS	11/8/2019	UPGRADE
OAKLAND PUBLIC LIBRARY - GOLDEN GATE	250 MBPS	11/12/2019	UPGRADE
OAKLAND PUBLIC LIBRARY - LAKEVIEW	250 MBPS	11/12/2019	UPGRADE
OAKLAND PUBLIC LIBRARY - MARTIN LUTHER KING JR.	250 MBPS	11/12/2019	UPGRADE
OAKLAND PUBLIC LIBRARY - MELROSE	250 MBPS	11/13/2019	UPGRADE
OAKLAND PUBLIC LIBRARY - MONTCLAIR	250 MBPS	11/13/2019	UPGRADE
OAKLAND PUBLIC LIBRARY - OAKLAND PUBLIC LIBRARY	10 GBPS		UPGRADE
OAKLAND PUBLIC LIBRARY - PIEDMONT	250 MBPS	11/13/2019	UPGRADE

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
OAKLAND PUBLIC LIBRARY - TEMESCAL	250 MBPS	11/14/2019	UPGRADE
OAKLAND PUBLIC LIBRARY - WEST OAKLAND	250 MBPS	11/14/2019	UPGRADE
ORLAND FREE LIBRARY	1 GBPS	3/7/2019	NEW
PENINSULA LIBRARY SYSTEM - CSM - HEADEND	10 GBPS	3/15/21	NEW
POMONA PUBLIC LIBRARY - POMONA PUBLIC LIBRARY	1 GBPS	IN PROGRESS	NEW
RANCHO MIRAGE PUBLIC LIBRARY - RANCHO MIRAGE PUBLIC LIBRARY	10 GBPS	2/10/2020	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - ANZA LIBRARY	1 GBPS	10/26/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - CABAZON LIBRARY	1 GBPS	10/8/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - CALIMESA LIBRARY	1 GBPS	11/22/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - CANYON LAKE LIBRARY	1 GBPS	11/30/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - CATHEDRAL CITY LIBRARY	1 GBPS	IN PROGRESS	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - COACHELLA LIBRARY	1 GBPS	IN PROGRESS	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - DESERT HOT SPRINGS LIBRARY 2	1 GBPS	9/3/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - EASTVALE LIBRARY	1 GBPS	IN PROGRESS	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - EL CERRITO LIBRARY	1 GBPS	IN PROGRESS	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - FRENCH VALLEY	1 GBPS	11/12/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - GLEN AVON LIBRARY	1 GBPS	IN PROGRESS	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - GRACE MELLMAN COMMUNITY LIBRARY	1 GBPS	11/24/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - HIGHGROVE LIBRARY	1 GBPS	11/22/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - HOME GARDENS LIBRARY	1 GBPS	11/30/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - IDYLLWILD LIBRARY	1 GBPS	11/23/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - INDIO LIBRARY	1 GBPS	11/19/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - LA QUINTA LIBRARY	1 GBPS	IN PROGRESS	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - LAKE ELSINORE LIBRARY	1 GBPS	12/2/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - LAKE TAMARISK	1 GBPS	IN PROGRESS	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - LAKESIDE LIBRARY	1 GBPS	11/29/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - LIBRARY MANAGEMENT OFFICES	100 GBPS	IN PROGRESS	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - LIBRARY MANAGEMENT OFFICES	40 GBPS	IN PROGRESS	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - MEAD VALLEY LIBRARY	1 GBPS	12/17/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - MECCA LIBRARY	1 GBPS	IN PROGRESS	NEW

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
RIVERSIDE COUNTY LIBRARY SYSTEM - MENIFEE	1 GBPS	9/22/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - MURRIETA PUBLIC LIBRARY	1 GBPS	10/26/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - NORCO LIBRARY	1 GBPS	IN PROGRESS	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - NUVIEW LIBRARY	1 GBPS	12/1/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - PALM DESERT LIBRARY	1 GBPS	12/8/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - PERRIS LIBRARY	1 GBPS	12/1/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - SAN JACINTO LIBRARY	1 GBPS	12/2/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - SUN CITY LIBRARY	1 GBPS	IN PROGRESS	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - TEMECULA PUBLIC LIBRARY	1 GBPS	11/18/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - THOUSAND PALMS - ART SAMSON LIBRARY	1 GBPS	9/17/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - VALLE VISTA LIBRARY	1 GBPS	11/29/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - WILDOMAR LIBRARY	1 GBPS	12/8/21	NEW
RIVERSIDE COUNTY LIBRARY SYSTEM - WOODCREST LIBRARY	1 GBPS	12/7/21	NEW
ROSEVILLE PUBLIC LIBRARY - DATA CENTER	1 GBPS	7/31/2019	NEW
SACRAMENTO PUBLIC LIBRARY - CENTRAL	10 GBPS	IN PROGRESS	UPGRADE
SACRAMENTO PUBLIC LIBRARY - COURTLAND	500 MBPS	1/14/2020	NEW
SACRAMENTO PUBLIC LIBRARY - ELK GROVE	10 GBPS	10/8/2019	NEW
SACRAMENTO PUBLIC LIBRARY - FRANKLIN	1 GBPS	12/10/2019	NEW
SACRAMENTO PUBLIC LIBRARY - ISLETON	1 GBPS	12/10/2019	NEW
SACRAMENTO PUBLIC LIBRARY - VALLEY HIGH, NORTH LAGUNA	1 GBPS	12/10/2019	NEW
SACRAMENTO PUBLIC LIBRARY - WALNUT GROVE	1 GBPS	12/10/2019	NEW
SAN BENITO COUNTY FREE LIBRARY - SAN BENITO COUNTY FREE LIBRARY	10 GBPS	9/10/2020	UPGRADE
SAN DIEGO COUNTY - 4S RANCH BRANCH	1 GBPS	2/8/2019	NEW
SAN DIEGO COUNTY - ALPINE	1 GBPS	2/12/2019	NEW
SAN DIEGO COUNTY - BONITA-SUNNYSIDE	1 GBPS	3/12/2019	NEW
SAN DIEGO COUNTY - BORREGO SPRINGS	1 GBPS	6/17/2019	NEW
SAN DIEGO COUNTY - CAMPO-MORENA VILLAGE	1 GBPS	3/12/2019	NEW
SAN DIEGO COUNTY - CARDIFF-BY-THE-SEA	1 GBPS	2/14/2019	NEW
SAN DIEGO COUNTY - CASA DE ORO	1 GBPS	2/28/2019	NEW
SAN DIEGO COUNTY - CREST	1 GBPS	5/15/2019	NEW
SAN DIEGO COUNTY - DEL MAR	1 GBPS	2/13/2019	NEW
SAN DIEGO COUNTY - DESCANSO	1 GBPS	2/21/2019	NEW

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
SAN DIEGO COUNTY - EL CAJON	10 GBPS	3/27/2019	NEW
SAN DIEGO COUNTY - EL CAJON	1 GBPS	2/7/2019	NEW
SAN DIEGO COUNTY - ENCINITAS	1 GBPS	2/18/2019	NEW
SAN DIEGO COUNTY - FALLBROOK	1 GBPS	2/15/2019	NEW
SAN DIEGO COUNTY - FLETCHER HILLS	1 GBPS	3/8/2019	NEW
SAN DIEGO COUNTY - IMPERIAL BEACH	1 GBPS	2/8/2019	NEW
SAN DIEGO COUNTY - JACUMBA	1 GBPS	3/6/2019	NEW
SAN DIEGO COUNTY - JULIAN	1 GBPS	2/19/2019	NEW
SAN DIEGO COUNTY - LA MESA	1 GBPS	3/14/2019	NEW
SAN DIEGO COUNTY - LAKESIDE	1 GBPS	2/27/2019	NEW
SAN DIEGO COUNTY - LEMON GROVE	1 GBPS	3/12/2019	NEW
SAN DIEGO COUNTY - LINCOLN ACRES	1 GBPS	6/24/2019	NEW
SAN DIEGO COUNTY - PINE VALLEY	1 GBPS	3/21/2019	NEW
SAN DIEGO COUNTY - PORTRERO	1 GBPS	9/13/2019	NEW
SAN DIEGO COUNTY - POWAY	1 GBPS	2/20/2019	NEW
SAN DIEGO COUNTY - RAMONA	1 GBPS	2/21/2019	NEW
SAN DIEGO COUNTY - RANCHO SAN DIEGO	1 GBPS	2/27/2019	NEW
SAN DIEGO COUNTY - RANCHO SANTA FE	1 GBPS	5/14/2019	NEW
SAN DIEGO COUNTY - SAN MARCOS	1 GBPS	2/21/2019	NEW
SAN DIEGO COUNTY - SANTEE	1 GBPS	3/4/2019	NEW
SAN DIEGO COUNTY - SOLANA BEACH	1 GBPS	2/21/2019	NEW
SAN DIEGO COUNTY - SPRING VALLEY	1 GBPS	3/7/2019	NEW
SAN DIEGO COUNTY - VALLEY CENTER	1 GBPS	2/22/2019	NEW
SAN DIEGO COUNTY - VISTA	10 GBPS	2/28/2019	NEW
SAN DIEGO COUNTY LIBRARY - ADMINISTRATIVE OFFICES	1 GBPS	2/4/2021	NEW
SAN DIEGO PUBLIC LIBRARY - ALLIED GARDENS/ BENJAMIN BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - BALBOA BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - CARMEL MOUNTAIN RANCH BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - CARMEL VALLEY BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - CITY HEIGHTS/ WEINGART BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - CLAIREMONT BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - COLLEGE- ROLANDO BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
SAN DIEGO PUBLIC LIBRARY - KENSINGTON-NORMAL HEIGHTS BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - LA JOLLA/ RIFORD BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - LINDA VISTA BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - LOGAN HEIGHTS BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - MIRA MESA BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - MISSION HILLS BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - MISSION VALLEY BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - MOUNTAIN VIEW/ BECKWOURTH BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - NORTH CLAIREMONT BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - NORTH PARK BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - NORTH UNIVERSITY COMMUNITY BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - OAK PARK BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - OCEAN BEACH BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - OTAY MESA-NESTOR BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - PACIFIC BEACH/ TAYLOR BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - PARADISE HILLS BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - POINT LOMA/ HERVEY BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - RANCHO BERNARDO BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - RANCHO PEÑASQUITOS BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - SAN CARLOS BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - SAN DIEGO PUBLIC CENTRAL LIBRARY	10 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - SAN DIEGO PUBLIC CENTRAL LIBRARY	10 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - SAN YSIDRO BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - SCRIPPS MIRAMAR RANCH BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - SERRA MESA-KEARNY MESA BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
SAN DIEGO PUBLIC LIBRARY - SKYLINE HILLS BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - TIERRASANTA BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - UNIVERSITY COMMUNITY BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - UNIVERSITY HEIGHTS BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN DIEGO PUBLIC LIBRARY - VALENCIA PARK/MALCOLM X BRANCH LIBRARY	1 GBPS	IN PROGRESS	NEW
SAN JOSE PUBLIC LIBRARY - MT. PLEASANT NEIGHBORHOOD LIBRARY	1 GBPS	IN PROGRESS	NEW
SANTA CLARA COUNTY LIBRARY - SANTA CLARA COUNTY LIBRARY DISTRICT	10 GBPS	7/1/2020	UPGRADE
SANTA CLARA COUNTY LIBRARY - SANTA CLARA COUNTY LIBRARY DISTRICT	10 GBPS	6/23/2020	DIVERSITY
SANTA MARIA PUBLIC LIBRARY - CUYAMA	100 MBPS	10/1/2021	NEW
SANTA MARIA PUBLIC LIBRARY - LOS ALAMOS	100 MBPS	IN PROGRESS	NEW
SIGNAL HILL PUBLIC LIBRARY - SIGNAL HILL PUBLIC LIBRARY	1 GBPS	1/29/2020	NEW
SISKIYOU COUNTY FREE LIBRARY - DUNSMUIR	100 MBPS	5/10/2019	NEW
SISKIYOU COUNTY FREE LIBRARY - MCCLOUD	100 MBPS	IN PROGRESS	NEW
SOLANO COUNTY LIBRARY - DIXON	1 GBPS	9/8/2020	NEW
SOLANO COUNTY LIBRARY - FAIRFIELD CIVIC CENTER LIBRARY	10 GBPS	7/1/2020	UPGRADE
SOLANO COUNTY LIBRARY - FAIRFIELD CIVIC CENTER LIBRARY	10 GBPS	10/30/2020	UPGRADE
SOLANO COUNTY LIBRARY - RIO VISTA	1 GBPS	3/16/21	UPGRADE
SOLANO COUNTY LIBRARY - TECH CENTER	1 GBPS	8/31/2020	NEW
SONOMA COUNTY LIBRARY - ADMINISTRATIVE SERVICES CENTER	1 GBPS	12/18/2019	NEW
SONOMA COUNTY LIBRARY - ADULT LITERACY PROGRAM	1 GBPS	IN PROGRESS	UPGRADE
SONOMA COUNTY LIBRARY - CLOVERDALE	1 GBPS	IN PROGRESS	UPGRADE
SONOMA COUNTY LIBRARY - GUERNEVILLE	1 GBPS	IN PROGRESS	UPGRADE
SONOMA COUNTY LIBRARY - HEALDSBURG	1 GBPS	IN PROGRESS	UPGRADE
SONOMA COUNTY LIBRARY - NORTHWEST SANTA ROSA	1 GBPS	IN PROGRESS	UPGRADE
SONOMA COUNTY LIBRARY - PETALUMA	1 GBPS	6/7/2021	UPGRADE
SONOMA COUNTY LIBRARY - RINCON VALLEY	1 GBPS	6/7/2021	UPGRADE
SONOMA COUNTY LIBRARY - ROHNERT PARK COTATI	1 GBPS	6/7/2021	UPGRADE
SONOMA COUNTY LIBRARY - SEBASTAPOL	1 GBPS	IN PROGRESS	UPGRADE
SONOMA COUNTY LIBRARY - SONOMA VALLEY	1 GBPS	6/7/2021	UPGRADE
SONOMA COUNTY LIBRARY - WINDSOR	1 GBPS	IN PROGRESS	UPGRADE

LIBRARY SITE NAME	BANDWIDTH	DATE	NEW OR UPGRADE
STOCKTON-SAN JOAQUIN COUNTY - ARNOLD RUE	1 GBPS	5/15/2020	NEW
STOCKTON-SAN JOAQUIN COUNTY - STRIBLEY	1 GBPS	12/30/2019	NEW
STOCKTON-SAN JOAQUIN COUNTY PUBLIC LIBRARY - VAN BUSKIRK CENTER	1 GBPS	10/27/2020	NEW
TRINITY COUNTY LIBRARY - MAIN LIBRARY, WEAVERVILLE	1 GBPS	IN PROGRESS	NEW
TULARE COUNTY LIBRARY - DINUBA BRANCH	100 MBPS	10/24/2019	NEW
TULARE COUNTY LIBRARY - EARLIMART	100 MBPS	9/23/2021	UPGRADE
TULARE COUNTY LIBRARY - IVANHOE BRANCH	100 MBPS	9/20/2021	UPGRADE
TULARE COUNTY LIBRARY - OROSI/CUTLER BRANCH	100 MBPS	9/23/2021	UPGRADE
TULARE COUNTY LIBRARY - SPRINGVILLE BRANCH	100 MBPS	9/13/2021	UPGRADE
TULARE COUNTY LIBRARY - THREE RIVERS BRANCH	100 MBPS	9/13/2021	UPGRADE
TULARE COUNTY LIBRARY - TIPTON BRANCH	100 MBPS	9/13/2021	UPGRADE
TULARE COUNTY LIBRARY - WOODLAKE BRANCH	100 MBPS	9/20/2021	UPGRADE
VENTURA COUNTY LIBRARY - MUSEUM OF VENTURA COUNTY RESEARCH LIBRARY	1 GBPS	5/26/2020	NEW
WATSONVILLE PUBLIC LIBRARY - MAIN	1 GBPS	4/27/2020	NEW
YOLO COUNTY LIBRARY - ADMINISTRATIVE HQ YOLO	10 GBPS	9/28/2020	UPGRADE
YOLO COUNTY LIBRARY - ADMINISTRATIVE HQ YOLO	1 GBPS	9/28/2020	NEW

Notes:

SOUTHERN CALIFORNIA:

16700 Valley View, Ste 400

La Mirada, CA 90638

NORTHERN CALIFORNIA:

1919 5th Street

Berkeley, CA 94710

PHONE: 714.220.3400
WWW.CENIC.ORG

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