

BROADBAND ACTION PLAN
2020

CALIFORNIA BROADBAND FOR ALL



The Honorable Gavin Newsom
Governor, State of California

Re: **the State of California's Broadband Action Plan**

Dear Governor Newsom:

Broadband is essential to modern life. The Covid-19 pandemic has only reinforced our reliance on broadband—and the importance of closing the digital divide. With school, work, and health care increasingly—or completely—available online as a public health imperative, Californians' ability to access and use broadband became the difference between being able to fully engage in life, and being cut off.

In light of these challenges, in response to executive order N-73-20 calling for a California State Broadband Action Plan, the California Broadband Council developed the "Broadband for All" Action Plan with the understanding that broadband access, adoption, and training are essential components of digital equity. The Council solicited extensive engagement and input from state and local agencies, state legislative leaders, tribal nations, broadband industry leaders, nonprofits, and members of the public.

This Plan focuses on achieving three long-term goals: All Californians have high-performance broadband available at home, schools, libraries, and businesses; All Californians have access to affordable broadband and the devices necessary to access the internet; and All Californians can access training and support to enable digital inclusion. To achieve these goals the California Broadband Council plans to leverage the state's full range of tools, including policy, programs, funding, partnerships, and collaborations with federal, local, and tribal governments.

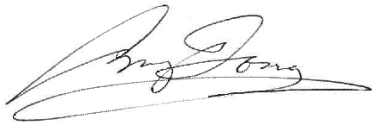
We recognize that enabling every Californian to access and adopt broadband will require time. Like the rest of the country, we face complex and deep-rooted challenges to delivering Broadband for All. We also recognize achieving Broadband for All will require partnerships with and support from the broadband industry and federal, local, and tribal governments. The California Broadband Council is committed to working with all partners to implement these actions, monitor progress, and update the action plan annually informed by what we accomplish, learn, and new opportunities.

We want to give special recognition to the California Broadband Council designees whose dedication and contributions to the Broadband for All Action Plan were invaluable.

We appreciate the opportunity to establish the state's Broadband for All Action Plan and proudly look forward to partnering across agencies and organizations at every level of government—and with industry—to take action that will ensure all Californians have equal access to affordable, high-performance broadband and the devices and skills needed to use it.

Sincerely,

The California Broadband Council

A handwritten signature in black ink, appearing to read "Amy Tong".

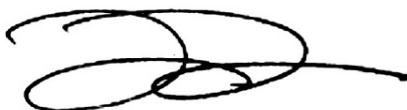
Amy Tong, Chair, State CIO and Director of California Department of Technology

A handwritten signature in blue ink, appearing to read "Ben Hueso".

Senator Ben Hueso, Vice-Chair, Member of the California State Senate
Sarah Smith, Designee, Consultant for the Senate Energy, Utilities and Communications Committee

A handwritten signature in black ink, appearing to read "Mike Gipson".

Assemblyman Mike Gipson, Member, California State Assembly
Dr. Angelo Williamson, Designee, Chief of Staff

A handwritten signature in black ink, appearing to read "Tony Thurmond".

Tony Thurmond, Member, Superintendent of Public Instruction

Jerry Winkler, Designee, Education Program Consultant for the California Department of Education



Marybel Batjer, Member, President of California Public Utilities Commission
Martha Guzman-Aceves, Designee, Commissioner



Mark Ghilarducci, Member, Director of the Governor's Office of Emergency Services

Mitch Medigovich, Designee, Deputy Director

Pat Mallon, Designee, Assistant Director Public Safety Communications



Daniel Kim, Member, Director of the Department of General Services

Brent Jamison, Designee, Deputy Director for the Interagency Support Division

David S. Kim

David Kim, Member, Secretary of the California State Transportation Agency

Lori Pepper, Designee, Deputy Secretary for Innovative Mobility Solutions



Greg Lucas, Member, Director of the California State Library

Anne Neville-Bonilla, Designee, Director of the California Research Bureau



Karen Ross, Member, Secretary of the California Department of Food and
Agriculture
Arturo Barajas, Designee, Deputy Secretary



Christina Snider, Member, Governor's Tribal Advisor



Sunne Wright-McPeak, Member, President of the California Emerging
Technology Fund

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Dedication

This Broadband for All Action Plan is dedicated to the memory of the late Honorable Gwen Moore. She was the fourth African American woman elected to the California Legislature in 1978. Assemblywoman Moore led transformative changes to California's telecommunication policies during her 16-year career in the legislature, 12 of which were as Chair of the Utilities and Commerce Committee. Assemblywoman Moore not only crafted the state's Universal Service Act, bringing affordable telephone access to all Californians—she also imagined a California in which residents could all benefit from access to the internet, even proposing a statewide ISDN network in 1993. In a state that has led the world's technology innovations, the California Broadband Council remains grateful to a leader who believed and left a legacy of work to ensure all Californians should have equal and equitable access to these innovations and opportunities.

Executive Summary

Broadband is essential to modern life. It is an engine of economic possibility, educational opportunity, civic engagement, and access to health care. People and communities that lack broadband and the means to use it are falling behind.

Residents in less populated areas have much less access to broadband services. But lack of broadband is not just a matter of geography or density; income, education, disability status, age, race, and ethnicity all correlate with lower broadband adoption. In other words, the poor, the less-educated, the differently abled, seniors, and people of color also feel the costs of the digital divide.

The COVID-19 pandemic has reinforced our reliance on broadband—and the importance of closing the divide. With school, work, and health care increasingly—or completely—available online as a public health imperative, Californians' ability to access and use broadband became the difference between being able to fully engage in life, and being cut off.

In light of these challenges, this California State Broadband Action Plan—prepared in response to Governor Gavin Newsom's executive order¹—reflects the state's belief that broadband is essential to economic and workforce development, public safety, education, and an engaged public.

The California Broadband Council developed this “Broadband for All” plan in fall 2020 understanding that digital equity warrants broadband access, adoption, and training.

The Council solicited extensive engagement and input from state and local agencies, state legislative leaders, tribal nations, broadband industry leaders, nonprofits, and members of the public. Besides our own research on national best practices, we reviewed 70 written comments and listened to ideas and concerns raised by many of the 150 organizations and more than 600 attendees that participated in listening sessions, online events, and meetings.²

This Plan focuses on achieving three long-term goals:

¹ California Executive Order N-73-20, <https://www.gov.ca.gov/wp-content/uploads/2020/08/8.14.20-EO-N-73-20.pdf>.

² All written public comments, transcripts and recordings of the listening sessions and the California Broadband Council meetings are available on the Council's website (<https://broadbandcouncil.ca.gov/action-plan/>).

Goal 1: All Californians have high-performance broadband available at home, schools, libraries, and businesses.

Goal 2: All Californians have access to affordable broadband and necessary devices.

Goal 3: All Californians can access training and support to enable digital inclusion.

To achieve these goals, the Council plans to leverage the state's full range of tools, including policy, programs, funding, partnerships, and collaborations with federal, municipal, and tribal governments. This Plan lays out key actions including:

- Modernize broadband speed and performance standards
- Simplify processes and leverage existing assets and construction
- Set reliability standards
- Increase access to affordable broadband services and devices
- Promote affordable broadband services and devices
- Encourage broadband competition
- Strengthen partnerships and coordinate initiatives
- Improve broadband data and mapping transparency and usability
- Develop technical assistance and support
- Bolster partnerships

We know this will take time. Like the rest of the country, we face complex and deep-rooted challenges to delivering Broadband for All.

We are making plans in an ever-changing landscape. For example, the potential impacts of federal programs like the Federal Communications Commission's Rural Digital Opportunity Fund remain unknown. The actions we propose here are first steps. We will revise these actions at least annually to reflect new achievements and opportunities.

We cannot do this alone. We need partnerships with and support from the broadband industry and federal, local, and tribal governments to achieve

Broadband for All. We expect to partner across agencies and organizations at every level of government and industry.

This is a moment for collaboration. The COVID-19 pandemic and devastating wildfire season have tested our state, our communities, and our loved ones. Californians have struggled to work, learn, and care for each other from home. In response, California's government, business, philanthropic, and nonprofit communities have come together to help blunt the worst effects of the digital divide.

- The [Governor's Task Force on Business and Jobs Recovery](#) and the [Superintendent of Public Instruction's Digital Divide Task Force](#) helped secure donations of over 64,000 internet-accessible devices and 100,000 hot spots for students.³
- The Governor's task force also reached out to internet service providers such as Cox, Charter, and Comcast, which extended low-cost plans to low-income children and families to assist with distance learning. Several other internet service providers expanded their affordable offers and enacted more beneficial policies on service termination, fees, and data caps.

These examples of collaboration and philanthropy helped California address the worst of the short-term effects of the pandemic, make meaningful headway on devices, and illustrate the importance of the work ahead.

We are proud to partner across our state to ensure all Californians have equal access to affordable, high-performance broadband and the devices and skills needed to use it.

³ "State Superintendent Tony Thurmond and Digital Divide Task Force Identify Resources, Partnerships Available to Support Successful Distance Learning in the Fall," California Department of Education, News Release, July 23, 2020, <https://www.cde.ca.gov/nr/ne/yr20/yr20rel61.asp>.

Why Broadband for All?

Broadband can transform lives—and lack of access or adoption of broadband can limit Californians' economic, educational, and health care opportunities.

- **Imagine two seniors with medical needs**, struggling to find reliable transportation to get to and from weekly medical appointments—and unable to take advantage of telehealth visits because they do not have access to broadband (and might not know how to use it even if they did).
- **Imagine a family of five working and learning from home**. Imagine the kids trying to understand geometry while the video of their teacher pauses and freezes. Imagine adults taking turns sitting in the car to take work video calls—unable to connect because the family does not have enough bandwidth to keep from knocking each other offline.
- **Imagine a college student working a full-time, minimum-wage job by day and attending online classes at night**, and then coming home after a nine-hour day and spending the next five hours trying to stream courses and submit homework through a smartphone.
- **Imagine a farmer in the heart of the Central Valley who cannot effectively compete in global markets** because of the lack of broadband access necessary to utilize internet-enabled machinery that other farms use to optimize soil fertility and yield more crops.

Since the beginning of the internet era, California's policymakers have envisioned a California in which all residents can communicate using robust and affordable services, and where they are empowered to leverage these technologies for economic and social benefits.⁴ Even as far back as 1993, the state considered at what point internet access would become so essential that broadband should be made affordable to everyone.⁵

⁴ See, for example, AB 1289 (Stats. 1993 Ch. 1143), which made it the policy of the state “to promote economic growth, job creation, and the substantial social benefits that will result from the rapid implementation of advanced information and communications technologies by adequate long-term investment in the necessary infrastructure.” And SB 1563 (Stats. 2002, Ch. 674) which made it the policy of California “To assist in bridging the ‘digital divide’ by encouraging expanded access to a state-of-the-art technologies for rural, inner-city, low-income, and disabled Californians.”

⁵ California Public Utilities Commission. “Enhancing California's Competitive Strength: A Strategy for Telecommunications Infrastructure (A Report to the Governor).” November 1993, 48.

The Council's pursuit of Broadband for All is rooted in a belief that broadband internet access is a critical service, not a luxury:

- Broadband access enables individuals to work, study, communicate, apply for government services, operate home-based businesses, receive emergency information, and access health care.
- Broadband powers the state's most critical systems, from its electrical grid to its water supply systems, its public safety and emergency response networks. Broadband underpins modern life.
- Broadband has helped ensure California's ability to compete on the world stage for years. Broadband enables communities to build thriving economies by attracting talent and businesses. It powers California's advancement and success in industries from higher education to manufacturing and agriculture, and in the service economy.

Like residents of every other state, however, Californians have uneven access to and adoption of broadband.

These challenges existed when Governor Newsom announced in November 2019 that he would bring stakeholders together to develop a Broadband for All plan.⁶ Four months later, the COVID-19 pandemic upended many aspects of Californians' lives—and broadband, already essential to so many activities, became the only point of entry to many critical life needs. Nearly 7 million California K-12 students saw their schools close and started learning from home,⁷ employees who were able to telework began working remotely, and Medicare patients began seeing their doctors through telehealth visits at much greater rates.

Even as in-person activities resume, digital tools and services will continue to become integral to modern life. Those without broadband will fall further behind. They will miss out on professional opportunities and quality-of-life improvements. This is especially troubling for historically underserved communities already behind their connected peers.

⁶ "In Fresno at the California Economic Summit, Governor Newsom Highlights New Investments in Higher Education, Actions to Strengthen California's Workforce & His Administration's Focus on Regional Growth Strategies," Office of Governor Gavin Newsom, News Release, November 8, 2019, <https://www.gov.ca.gov/2019/11/08/in-fresno-at-the-california-economic-summit-governor-newsom-highlights-new-investments-in-higher-education-actions-to-strengthen-californias-workforce-his-administrations-focus-on-regional/>.

⁷ Council staff calculation: <https://www.cde.ca.gov/ds/sd/cb/ceffingertipfacts.asp>.

Broadband for All also represents new opportunities; a way not just to keep up, but a means to get ahead. The COVID-19 pandemic compelled many employers, employees, and entrepreneurs to pivot quickly to working from alternative places. That same type of innovation could be harnessed to encourage new regional economic development efforts after the pandemic—building on the Governor’s Regions Rise Together initiative.⁸

⁸ “Regions Rise Together,” State of California, <https://www.arcgis.com/apps/Cascade/index.html?appid=d056b93e3116413cbd1ad25cc4245221>.

The Current State of Broadband in California

Delivering broadband to a state as large and diverse as California is complicated. Regions and communities vary by levels of competition, historic investment, and the need for subsidies to incentivize infrastructure deployment and broadband adoption.

While broadband infrastructure and increasing adoption have helped power California's fiscal health and well-being for decades, uneven access to this essential service remains.⁹ According to the most recent figures, 23 percent of California housing units—home to 8.4 million residents—do not have broadband subscriptions.¹⁰

At the end of 2018, broadband services that advertised download speeds of 100 Mbps or greater were available to nearly 95 percent of California households. This achievement reflects widespread cable and fiber deployment in dense urban areas.

Nevertheless, many homes in urban areas remain unserved or do not have access to the same broadband infrastructure (especially fiber) that is available to wealthier neighbors, illustrating a historical pattern of uneven investment.¹¹ In addition, in rural California less than half of households (46.5 percent) can adopt broadband at this speed. Even in urban areas some communities lack availability.

⁹ In this report we refer to broadband “availability” when the infrastructure is available such that a household could access it. We refer to broadband “adoption” when a household subscribes to an available service. We refer to the “digital divide” to describe either lack of availability or lack of adoption (the latter of which might be caused by issues related to lack of affordability, devices, or digital skills).

¹⁰ Council staff calculation. California's population was approximately 39.5M in 2019, assuming average household size of 3.05, and 22 percent of households did not subscribe to broadband at home through a computing device. See 2019 California Emerging Technology Fund survey for figures on non-smartphone broadband subscriptions: <https://www.cetfund.org/action-and-results/statewide-surveys/2019-statewide-surveys/>

¹¹ See the below resources on lack of access (particularly to fiber) in urban communities: “Who gets access to Fast Broadband? Evidence from Los Angeles County 2014-2017,” Hernan Galperin et. al, October 2019, <https://arnicusc.org/publications/who-gets-access-to-fast-broadband-evidence-from-los-angeles-county-2014-17/>

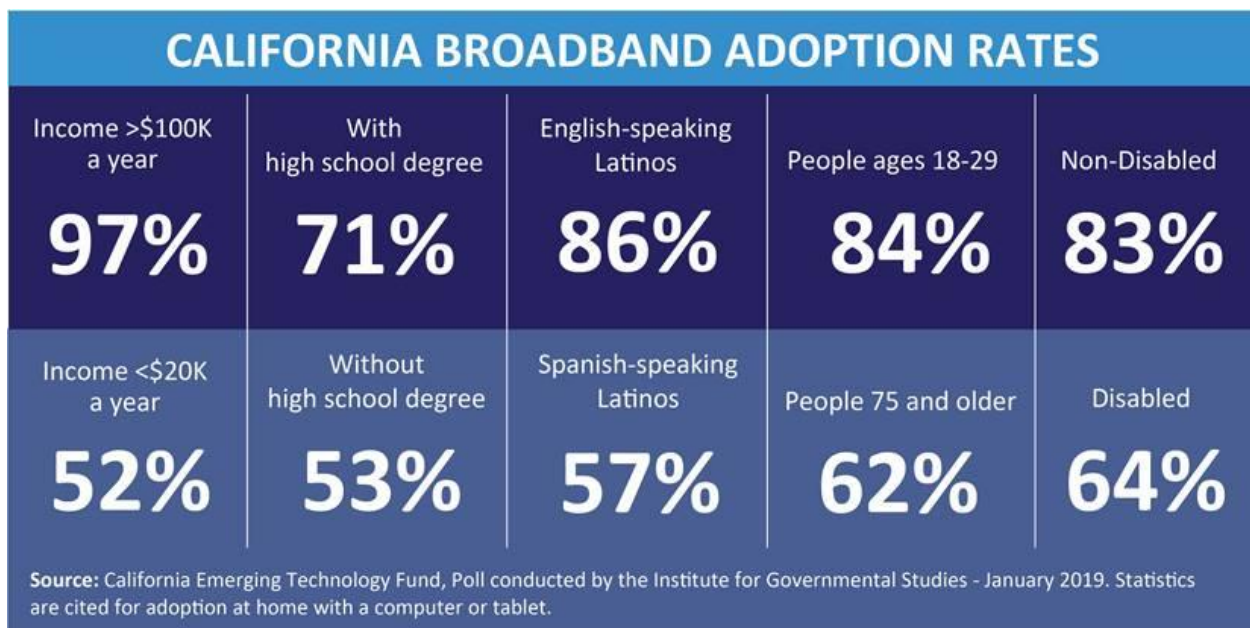
“On the Wrong Side of the Digital Divide,” Greenlining Institute, June 2020, <https://greenlining.org/publications/online-resources/2020/on-the-wrong-side-of-the-digital-divide/>

“AT&T's Digital Redlining: Leaving Communities Behind for Profit,” National Digital Inclusion Alliance and Communication Workers of America, October 2020, https://www.digitalinclusion.org/wp-content/uploads/dlm_uploads/2020/10/ATTs-Digital-Redlining-Leaving-Communities-Behind-for-Profit.pdf

Approximately 674,000 households in the state lack high-capacity broadband, with about 305,000 located in urban areas and 369,000 located in rural areas.¹²

The geographical challenge is immense. Consider that urban California covers nearly 8,200 square miles and contains almost 95 percent of the state's population. Rural California is home to 5 percent of the population spread across 147,000 square miles—an area larger than the combined land areas of Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, Rhode Island, South Carolina, Vermont, and West Virginia.¹³

But California's challenge is not only geography. Many Californians struggle to access broadband even when it is physically available.¹⁴ Income, education, disability status, age, race, and ethnicity all correlate with lower broadband adoption, as the following data illustrates.¹⁵



¹² "California Advanced Services Fund: 2019 Annual Report," April 2020, p. 11, <https://www.cpuc.ca.gov/General.aspx?id=9226>.

¹³ Council staff calculation. "United States Summary: 2010," U.S. Census, <https://www.census.gov/prod/cen2010/cph-2-1.pdf>.

¹⁴ "Statewide Survey 2019," California Emerging Technology Fund, <https://www.cetfund.org/action-and-results/statewide-surveys/2019-statewide-surveys/>.

¹⁵ The California Public Utilities Commission concluded income was the most significant factor contributing to low adoption rates: "Broadband Adoption Gap Analysis," CPUC, June 2019, https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Communications/Reports_and_Presentations/CDVideoBB/BAGapAnalysis.pdf.

Challenges to Achieving Broadband for All

State, local, and tribal governments, the private sector, nonprofits, and philanthropies have all made investments to address these challenges over the past 20 years. While California has made significant progress toward digital equity, the evolving complexity and scope of the challenges means much work remains.

The Council identified five core roadblocks preventing Californians from accessing or adopting broadband: availability (speed and reliability), affordability, access to devices, digital skills, and data.

Challenge 1: Availability (speed and reliability)

Californians' need for high-performance broadband continues to increase

In 1996, the Federal Communications Commission (FCC) defined broadband internet as a 200 kbps speed service—fast enough to send and receive email. Bandwidth needs clearly have increased since then, but speed benchmarks lag behind those needs.

The FCC last updated its definition of broadband to a minimum of 25 Mbps download and 3 Mbps upload (25/3 Mbps) in 2015.¹⁶ That benchmark was intended to be sufficient for people engaging in “light use” (email, browsing, basic video, VoIP, internet radio) or moderate use (basic functions plus one high-demand application such as videoconferencing, online gaming, or streaming HD video) for up to three devices at a time.¹⁷

California's current standard is slower than the FCC's definition. California defines broadband service in its core broadband subsidy program, the California Advanced Services Fund (CASF), as 6/1 Mbps or higher, and subsidizes build out at 10/1 Mbps or higher. This makes California one of 32 states that defines service below the FCC's benchmark.¹⁸ California also does not include latency standards, which are critical for applications like video and emerging Internet of Things and Smart Cities applications.

¹⁶ “2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment,” Federal Communications Commission, February 4, 2015, <https://docs.fcc.gov/public/attachments/FCC-15-10A1.pdf>.

¹⁷ “Household Broadband Guide,” Federal Communications Commission, February 5, 2020, <https://www.fcc.gov/consumers/guides/household-broadband-guide>.

¹⁸ “State Broadband Policy Explorer,” Pew, July 31, 2019, <https://www.pewtrusts.org/en/research-and-analysis/data-visualizations/2019/state-broadband-policy-explorer>.

There is little chance that Californians will need less broadband in the future. Americans already are outgrowing today's federal 25/3 Mbps standard. For example, the Federal Communications Commission's 2018 "Measuring Broadband America" report found that among participating home internet service providers, the median download speed experienced by users was approximately 72 Mbps, nearly triple the current federal standard.

In addition, the FCC found that from 2016 to 2017, between 2 and 50 percent of DSL subscribers, 4 and 100 percent of cable subscribers, and 14 and 80 percent of fiber subscribers moved to higher-speed tiers—either because the subscriber changed their broadband plan, or because the subscriber's service provider upgraded their plan.¹⁹

The number of internet-connected devices continues to grow. In 2019 there were approximately 10 billion Internet of Things devices connected worldwide. Industry forecasts suggest this will triple to 30.9 billion by 2025, with growth driven by personal and home devices.²⁰

Rural, tribal and some urban communities lack high-performance broadband, network resiliency, and redundancy

A large portion of California's population now has access to some broadband. At the end of 2018, 96.3 percent of Californian households had residential access to broadband at speeds of 25/3 or greater, and nearly 95 percent had access to download speeds of 100 Mbps or greater.²¹ The areas of the state in which these speeds are not available are disproportionately rural. Less than 47 percent of rural households have broadband access at 100 Mbps and just over two-thirds have access at 25/3.²²

Having low-quality or no broadband creates not only missed economic or quality-of-life opportunities but also threatens people's lives and homes. As the Governor's Wildfires and Climate Change Strike Force report noted in 2019, "the lack of broadband in rural communities and access to cell services makes it difficult to communicate clear emergency evacuation orders to residents or to

¹⁹ "Eighth Measuring Broadband America Fixed Broadband Report," Federal Communications Commission, December 14, 2018, <https://www.fcc.gov/reports-research/reports/measuring-broadband-america/measuring-fixed-broadband-eighth-report>.

²⁰ "State of the IoT 2020: 12 billion IoT connections, surpassing non-IoT for the first time," IoT Analytics, November 19, 2020, <https://iot-analytics.com/state-of-the-iot-2020-12-billion-iot-connections-surpassing-non-iot-for-the-first-time/>.

²¹ "California Advanced Services Fund: 2019 Annual Report," p. 11.

²² "California Advanced Services Fund: 2019 Annual Report," p. 11.

locate residents when they are in trouble.”²³ Progressively worse fire seasons have shone a spotlight on the limited capacity of the current infrastructure absent substantively more investment in redundancy and infrastructure hardening. Given the changing climate, there is a risk that broadband services may fail because of public safety power shutoffs or damage done to fragile infrastructure.

Tribal lands, which are largely rural, remain consistently underserved by broadband. While FCC data reports that over 98 percent of non-tribal areas in California have access to a fixed broadband provider, nearly a quarter of tribal lands lack access to such service.²⁴ Too many tribal lands in California are unserved.²⁵ Rural tribal communities often have less robust services available than their urban counterparts. According to the FCC’s Native Nations Task Force November 2019 Report, challenges include “statutory obstacles, regulatory and economic barriers, geographic and economic barriers, mapping challenges, Tribal consultation and engagement issues, accessibility, and adoption and demand issues.”²⁶ The result is a pattern of underinvestment and an exacerbation of existing inequalities.

The economics of infrastructure deployment help explain recurrent underinvestment in rural and tribal communities. Programs like CASF are designed to address this issue. There is a higher cost to build network infrastructure in less densely populated rural areas.²⁷ One possible result is that the private sector will choose not to offer services in low-density areas, especially without a subsidy.²⁸ If a provider does offer service, it will be under no obligation to continue providing internet access, even if it is the only provider in a community. Competition among

²³ “Wildfires and Climate Change: California’s Energy Future,” A Report from Governor Newsom’s Strike Force, April 12, 2020; p 12.

²⁴ “Fixed Broadband Deployment: California,” Federal Communications Commission, https://broadbandmap.fcc.gov/#/area-summary?version=dec2019&type=state&geoid=06&tech=acfow&speed=25_3&vlat=37.41896076143145&vlon=-119.30660699999999&vzoom=3.9361444836050796

²⁵ Analysis showing the reservation and trust lands (excluding tribal communities not on these lands) that 15 of California’s federally recognized tribes have no broadband and 30 have less than 25 Mbps download. See Order Instituting Rulemaking into the Review of the California High Cost Fund-A Program (Rulemaking 11-11-007), Opening Comments of the Public Advocates Office on the Assigned Commissioner’s Fifth Amended Scoping Memo and Ruling (Feb. 29, 2020) at page 10, <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M336/K533/336533984.PDF>. See

²⁶ Native Nations Task Communications Task Force, Improving and increasing Broadband Deployment on Tribal Lands, Nov 5, 2019.

²⁷ “Rural Broadband Economics: A Review of Rural Subsidies,” CostQuest Associates, 2018, page 10, <https://www.ustelecom.org/wp-content/uploads/2018/11/Rural-Broadband-Economics-A-Review-of-Rural-Subsidies-final-paper-1.pdf>.

²⁸ “Rural Broadband Economics: A Review of Rural Subsidies,” page 13.

providers is also more difficult in these communities because they offer thinner profit margins and require large capital investments.

As a result, prospective internet service providers in these areas of California require concerted help to overcome the challenges of building new infrastructure. Public intervention, particularly in the form of capital subsidies like those offered through the CASF program and various federal programs, is often necessary to incentivize providers to deliver equivalent service to poor and rural communities.

We must make it easier to serve unserved and underserved communities. This will require collaboration and consideration of alternative models and strategies to lower barriers to entry, such as making public infrastructure available for lease, barring anti-competitive agreements in multiple dwelling units like apartments, and streamlining permitting processes. For example, the Council heard from providers about the challenges associated with permitting and building across jurisdictions. This is an area that warrants continued focus and innovation,²⁹ especially in unserved and underserved communities.

Delivering Gigabit Service to unserved and underserved Californians will require at least \$6.8 billion in new private, federal, and state investments.³⁰

Broadband infrastructure is a long-term capital investment. The state must continue to invest public resources in infrastructure that will serve Californians for decades to come.

Several last-mile technologies can deliver these speeds to Californians. Fiber is always a critical component for last-mile and advanced wireless services, whether to the home, community or somewhere between.³¹ It is a critical backhaul for next-generation wireless technologies, such as 5G.³² A home's

²⁹ See, for example: "Public Infrastructure/Private Service: A Shared-Risk Partnership Model for 21st Century Broadband Infrastructure," published by the Benton Institute for Broadband and Society, 2020, <https://www.benton.org/publications/public-infrastructureprivate-service>.

³⁰ See California Broadband Cost Model, <https://www.cpuc.ca.gov/communications/costmodel/>.

³¹ "The Case for Fiber to the Home, Today: Why Fiber is a Superior Medium for 21st Century Broadband," Electronic Frontier Foundation, 2019, page 22, <https://www.eff.org/document/case-fiber-home-today-why-fiber-superior-medium-21st-century-broadband>.

³² "5G Deployment: FCC Needs Comprehensive Strategic Planning to Guide Its Efforts," U.S. Government Accountability Office, June 2020, page 19, <https://www.gao.gov/assets/710/707530.pdf>.

proximity to fiber improves service quality dramatically.³³ The economics of building fiber do not make sense in parts of the state. These places will require alternative solutions.³⁴ Providing fiber connectivity across California will take a long time, and require considerable investment from the state and the federal government.

The California Public Utilities Commission (CPUC) contracted with experts to estimate the network investment required to build fiber networks that can provide broadband and voice services to California homes and businesses. The model includes the cost of middle-mile for use by multiple service providers. The model estimates the cost to build a network to serve currently unserved locations specified in three different tiers: 25 Mbps download and 3 Mbps upload, 100 Mbps download and 10 Mbps upload, and 100 Mbps download with no upload considered. It includes investment in “extremely high-cost” areas supported by monthly FCC subsidies. The estimates are for a passive fiber optical network delivering broadband and voice service to residences and businesses.

Because the areas of the state unserved today are often difficult to reach, it is possible that build-out may present more challenges—and need more resources—than the cost model estimates. Regardless, the model provides an informative baseline from which the state can plan targeted investments. Comparing the estimated costs for middle-mile and last-mile for three speed tiers illuminates details about how the model considers each part of the network, as described below.

Middle-mile provides a critical transport platform that multiple service providers can use between last-mile nodes. Middle-mile is distinct from wireless backhaul, which is usually built for a single provider. Although middle-mile fiber is already present in many locations, often it is not available for use by all service providers due to price, bandwidth, or owner policies. The estimated cost to build a statewide, middle-mile, dark fiber network along highways from scratch is \$2.2 billion. (Operators’ electronics would be priced separately.)

For the last-mile or access network, the model estimated three tiers of service that include middle-mile costs. Each estimate is standalone, meaning that each speed tier provides for a complete network in unserved areas at that speed tier.

³³ “Issue Brief: California’s Digital Divide,” Little Hoover Commission, December 2020, page 4, <https://lhc.ca.gov/sites/lhc.ca.gov/files/Reports/253/IssueBrief1.pdf>.

³⁴ For example, each year California schools and libraries solicit bids from providers for broadband access. In some cases, rural schools and libraries receive no bid for fiber or they receive a single bid, usually for fixed wireless.

Unserved areas are the places where a network that provides this speed does not currently exist. Unlike the middle mile estimate, the last mile model network considers using infrastructure of existing service providers. The model factors in existing facilities costs such as pole attachments, conduit/duct, and manholes. The cost model does not currently reflect the costs of a new entrant into a market, which are likely to differ from incumbents. The CPUC could consider changes to the model to reflect a full range of deployment scenarios.

For last-mile network speeds of 25 Mbps download and 3 Mbps upload, the estimated cost for the California network build, including middle-mile, is \$5.6 billion. For last-mile network speeds of 100 Mbps download and 10 Mbps upload, the estimated cost for the California network build, including middle-mile, is \$6.8 billion. For last-mile network speeds of 100 Mbps download without estimating an upload speed, the estimated cost for the California network build, including middle-mile, is \$6.7 billion. The difference between these two model estimates is the cost of network electronics.

The CPUC's cost modeling tool will help the state target subsidized funding and deployment—and, with enhancements, can provide the state with better tools to measure progress.

Challenge 2: Affordability

Price matters. When we consider what broadband costs a Californian, we have to account for all of the components in its price tag. The service cost is just one component; there are also taxes, surcharges, rental charges for modems and routers, and the cost of devices used for getting online—such as laptops and tablets. There are also additional unexpected costs of contractual penalties if a family falls behind and has to catch up, cancel, or switch plans. Each of these is a mandatory cost—and barrier—to getting online.

Compared to many other countries, broadband in the United States is expensive. Across the Organization for Economic Co-operation and Development (OECD) countries, only Mexico has higher broadband prices than the United States.³⁵ For a family with a tight budget, it is easy to see how paying for food, electricity, rent, and other necessities would take precedence over purchasing internet services.

That is one reason cellular phone subscriptions are the core communications service purchased by many Californians. However, smartphones provide only

³⁵ “Broadband Portal,” OECD, <http://www.oecd.org/sti/broadband/broadband-statistics/>. See fixed broadband basket, high user.

limited broadband access, and have a limited ability to share service with others—a spouse, children, or an elderly parent—in the household.

Over half of Californians without broadband at home cannot afford market prices or do not own a computer.³⁶ Many lower-income households believe they could afford \$10 to \$15 per month for broadband.³⁷

Unfortunately, many existing affordable broadband programs cost more per month, have limited eligibility, and limited awareness. Providers limit eligibility for their affordable programs to people living right above the poverty line. This restriction makes them more limited in scope than the federal Lifeline subsidy program, in which most broadband providers do not take part. Affordable broadband programs also do not offer broadband at high speeds. Most affordable programs provide only at least 15/2 Mbps. In a pre-pandemic survey, over 70 percent of California non-adopters did not know these programs existed.³⁸ The state's LifeLine program does not offer broadband by itself.³⁹ And there are no broadband programs to support families at risk of losing their service, like the Low Income Home Energy Assistance program.

Competition, which can drive down prices in an open, lightly regulated market, is more difficult to find for a service with such high capital costs. In its 2018 report on the state of competition among retail communications services in California, the PUC found that regional fixed broadband markets are highly concentrated, and that competition is weaker at higher speed thresholds.⁴⁰

The lack of competition is particularly striking at higher speeds. For example, FCC data on 100/10 Mbps access shows that 4 percent of households have no access, 28 percent only had one provider, 45 percent have two choices, and only 23 percent were able to choose between three or more providers.⁴¹

In general, wealthier communities are two to three times more likely to have more than two choices than communities with households that have-lower-than-

³⁶ "Statewide Survey 2019," California Emerging Technology Fund.

³⁷ Jonathan Sallet, "Broadband for America's Future: A Vision for the 2020s," Benton Institute for Broadband & Society, October 2019, pages 65–66, <https://www.benton.org/publications/broadband-policy2020s>.

³⁸ "Statewide Survey 2019," California Emerging Technology Fund.

³⁹ California LifeLine, <https://www.californialifeline.com/en>.

⁴⁰ "Retail Communications Services in California," California Public Utilities Commission, December 2018,

https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Communications/Reports_and_Presentations/CD_Mgmt/re/CompetitionReportFinal%20Jan2019.pdf.

⁴¹ "Fixed Broadband Deployment," Federal Communications Commission, December 2019 map data, <https://broadbandmap.fcc.gov/#/>.

average income.⁴² This results in greater inequities in poorer communities. Consumers benefit when companies compete for customers, and research shows that broadband competition reduces prices, and improves service.⁴³

Challenge 3: Devices

As we focus on creating digital equity, we must look at not only what is available and affordable, but also how Californians access the internet.

In 2019, only 82 percent of California households had a desktop or laptop at home.⁴⁴ For those not yet connected to the internet, a device can be a barrier. For example, 51 percent of non-adopters stated that broadband was too expensive or they did not have a computer at home.⁴⁵ Several hundred dollars is a significant investment for a lower-income household. If that household lacks good credit, the true cost can be much higher.

Households that access the internet through a smartphone only are unable to fully participate in modern digital life. In 2019, 78 percent of California households with home internet had a home desktop, laptop, or tablet computer, but 10 percent of those households only accessed broadband through their smartphone.⁴⁶ Smartphone-only users are often limited to consumer applications, finding it challenging to use such basic tools as word processors and spreadsheets. In addition, Smartphone-only users must contend with plans that have usage limits, resulting in a kind of “workaround ecosystem” using free Wi-Fi hotspots—exactly the kind of workaround the 2020 pandemic has disabled.⁴⁷

⁴² Jonathan Sallet, “Broadband for America's Future: A Vision for the 2020s,” Benton Institute for Broadband & Society, October 2019, https://www.benton.org/sites/default/files/BBA_full_F5_10.30.pdf.

⁴³ Jonathan Sallet, “Broadband for America's Future: A Vision for the 2020s.”

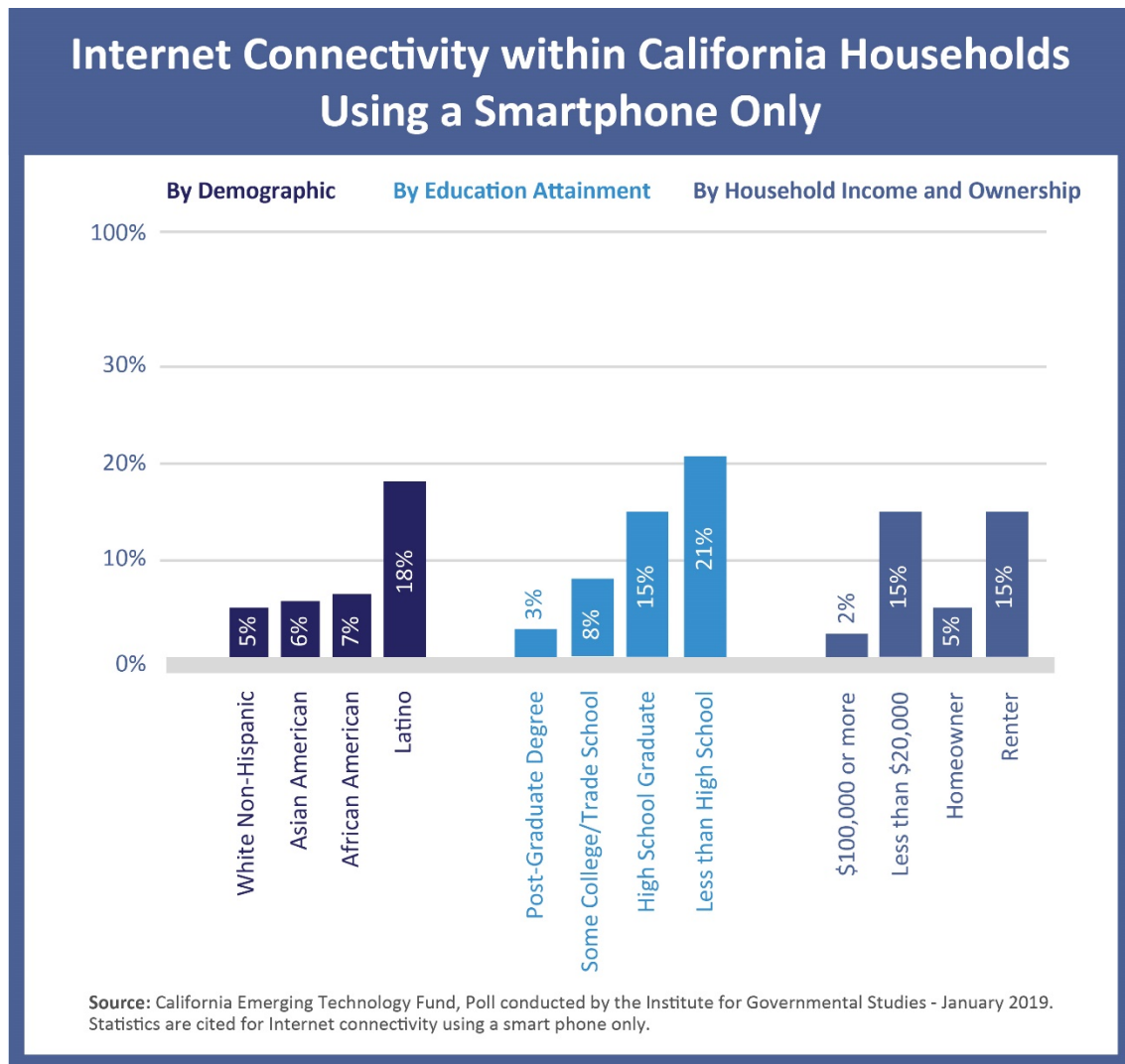
⁴⁴ “Types of Computer and Internet Subscriptions,” U.S. Census Bureau, American Community Survey 2019 (Table S2801), <https://data.census.gov/cedsci/table?q=computer%20ownership&g=0400000US06&tid=ACST1Y2019.S2801&hidePreview=true>. An additional 0.6 percent have a tablet, but no other computing device.

⁴⁵ “Internet Connectivity and the ‘Digital Divide’ in California - 2019,” California Emerging Technology Fund, page 12.

⁴⁶ “Internet Connectivity and the ‘Digital Divide’ in California - 2019,” California Emerging Technology Fund, page 5.

⁴⁷ Monica Anderson and John B. Horrigan, “Smartphones help those without broadband get online, but don’t necessarily bridge the digital divide,” Pew, October 3, 2016, <https://www.pewresearch.org/fact-tank/2016/10/03/smartphones-help-those-without-broadband-get-online-but-dont-necessarily-bridge-the-digital-divide/>.

Vulnerable populations are often the most likely to be smartphone dependent, as the following data illustrates.



Often our most vulnerable populations can only access the internet on a smartphone.⁴⁸ Mobile service is an important tool, but it cannot bridge the digital divide. People who can access the internet through smartphones only cannot enjoy the full benefits of high-speed broadband.

Not everyone will have access to a desktop or laptop at home. Computer labs at libraries and nonprofits, and programs in which students can bring laptops home from schools will continue to be critical. Discount or refurbishing programs may help some afford devices. Others may continue to struggle to afford devices for a variety of reasons ranging from housing insecurity to concerns about privacy. In these cases, libraries and nonprofits fill a gap by providing computer and internet

⁴⁸ "Internet Connectivity and the 'Digital Divide' in California - 2019," California Emerging Technology Fund. See "underconnected" users.

access to all. Across the nearly 1,200 library branches in California, community members used public computers 24 million times in fiscal year 2018–2019.⁴⁹ While this does not substitute for home adoption, it is an important backstop for the most vulnerable Californians.

Challenge 4: Digital skills

Broadband adoption requires more than a device to access affordable, available broadband. It also requires digital skills. The skills to get online are essential for ensuring Broadband for All.

Digital literacy is a spectrum, from basic computing and internet search skills to computer science. And, like other forms of literacy, the need for digital literacy changes over time. A young child needs different digital skills than someone searching for a job, seeing a doctor for a telehealth visit, or engaging in civic life. So, we need to build digital skills to address different needs at different phases in life.

For new broadband adopters, creating equity starts with ensuring access to introductory skills. For example, a study of users of Comcast's program for low-income subscribers, Internet Essentials, found that significantly more of these households felt they would need help setting up a new device (69 percent) compared to the control group (50 percent).⁵⁰

For households where broadband is available, but not adopted, research demonstrates that a low price is not the only barrier.⁵¹ These households worry they may not be able to use the internet. A large share of new adopters feel uncomfortable in even setting up a device. Therefore, local digital learning programs run by cities, community colleges, libraries, schools, and nonprofit organizations play a critical role in creating a digitally inclusive California, and require ongoing support.

It is important to note that in the same Comcast Internet Essentials study, the users who engaged in basic training were more likely to “use the internet for learning,

⁴⁹ 2018–2019 California State Library Annual Survey. Results available at <https://www.countingopinions.com/pireports/report.php?7ee907072fa6bbb008b6b06b39cad413&live>.

⁵⁰ John Horrigan, PhD, “Reaching the Unconnected: Benefits for kids and schoolwork drive broadband subscriptions, but digital skills training opens doors to household internet use for jobs and learning,” Technology Policy Institute, August 2019, p. 23, https://techpolicyinstitute.org/wp-content/uploads/2019/08/Horrigan_Reaching-the-Unconnected.pdf.

⁵¹ Horrigan, “Reaching the Unconnected,” pages 3 – 4.

job searching, and improving job skills.”⁵² This lends further credence to the notion that digital skills training is important because it impacts the way people use the internet.

Digital literacy often focuses on reaching late adopters who risk falling further behind. This is important as the lack of digital literacy compounds existing disadvantages and excludes them from opportunities. For example, a lack of digital literacy excludes potential students from opportunities to build skills online.

Challenge 5: Data

Try solving a problem when you do not know exactly who has it, or where it occurs, or how much it will cost to fix it. We face this situation today in trying to solve California’s digital divide. Data about costs, gaps, speeds, and access to broadband in California is disparate and subjective.

Key data problems are granularity and accuracy.⁵³ Data about broadband availability exists at the census block level. Blocks in urban areas might be an actual city block, but in rural areas they might span miles. In remote areas, blocks may encompass several hundred square miles.⁵⁴ Additionally, concerns over the accuracy of California and FCC availability data remain. Inaccurate data can make communities eligible or ineligible for state and federal funds.

Another part of the problem is that we do not have critical data to understand the quality of availability and adoption. For example, for the affordable broadband programs what is the take-up rate? How quickly do customers cycle off? How many people that apply are turned away? What are the prices for the same kind of service in different parts of the state?

Finally, actual service data remains elusive. Broadband subscription data is critical for understanding where people actually have internet service, as opposed to where providers advertise service. Subscription data by address provides granularity to map broadband affordability and adoption accurately.

High-quality data is not an end to itself. But without accurate, transparent, and updated data, we cannot develop good policies to solve real problems. Other critical sectors provide models for gathering better data. As one example, the U.S.

⁵² Horrigan, “Reaching the Unconnected,” page 26.

⁵³ Ryan Johnston, “FCC’s annual broadband report criticized for ‘inconsistent’ methodology,” StateScoop, May 30, 2019, <https://statescoop.com/fccs-annual-broadband-report-criticized-for-inconsistent-methodology/>.

⁵⁴ “Glossary: Blocks (Census Blocks),” U.S. Census Bureau, <https://www.census.gov/programs-surveys/geography/about/glossary.html>.

Energy Information Administration (EIA) collects the location of energy infrastructure throughout the country from industry, and makes it public. EIA also collects cost and pricing data from industry and consumers, and publishes data at the state level. These robust data sets provide policymakers the tools needed to respond to supply and pricing challenges, particularly for low-income consumers.

From Obstacles to Opportunity: California's Broadband Goals

For all Californians to have access to affordable broadband and the means to use it, we must meet three goals:

Goal 1: All Californians have high-performance broadband available at home, schools, libraries, and businesses.

Broadband is not available or resilient in all corners of the state. Rural communities, tribal lands, and some urban areas face particular challenges. Californians also need fast enough internet to live and thrive in modern society. Learning, getting government services, working, and receiving health care increasingly assume broadband access. All Californians should have high-performance broadband available where they live. This includes low-income neighborhoods. The homeless or those without broadband at home should have access to broadband in their communities. Schools, libraries, and community-based organizations will continue to provide critical community access.

Goal 2: All Californians have access to affordable broadband and necessary devices.

Broadband service is still unaffordable for too many Californians today. The total cost of access is challenging. The costs stack up: a computer, a mouse, a router, a subscription. These costs can put broadband out of reach, particularly for lower-income families or those with little credit. All Californians should have affordable broadband service and devices available, regardless of geography or household income.

Goal 3: All Californians can access training and support to enable digital inclusion.

Broadband adoption requires more than availability and affordability of service and devices. People need digital literacy to want broadband services, and to enjoy the many (and ever-increasing) digital opportunities. Californians must have access to digital skills training for job opportunities to thrive in a digital world.

Action Plan

Delivering tangible and measurable results will require innovation and action across many sectors and levels of government. This action must be grounded in strong partnerships among federal, state, tribal, and local governments, and with the private sector, nonprofits, and philanthropy.

Key opportunities for progress are reflected in the Action Plan items below. The Council and its partners will begin working on these items in 2021, recognizing that some may require legislative action. The Council will evaluate priorities and results over the next year in order to update the plan in 2022.

Actions to ensure all Californians have high-performance broadband available at home, schools, libraries, and businesses

The state must pull all levers to make high-performance broadband available to all Californians. These levers include modernizing state broadband definitions, optimizing the state's financial toolkit, simplifying deployment, leveraging existing assets, and setting reliability standards for critical infrastructure. Universal access to high-performance broadband will take time, and it is critical that the state build a strong foundation to ensure meaningful and efficient investment.

Modernize broadband speed and performance standards

1. Recommend, and adopt shared standards among all state grant-funding and related broadband programs:
 - a. Define “broadband” with dual definitions: (1) a baseline definition to match the FCC standard of 25/3 Mbps and (2) a goal of 100/20 Mbps that reflects the Governor's Executive Order of a minimum of 100 Mbps download, and growing demand for higher upload speeds. These dual definitions bring the state in alignment with current federal standards⁵⁵ and adopt a forward-looking speed as bandwidth needs continue to grow. Federal funding benchmarks will be updated accordingly in the coming years.
 - b. Mitigate the problems with federal data. California should evaluate broadband at the serviceable location level to bring greater accuracy and granularity.

At the same time, state programs should evaluate definitions of “unserved” and “underserved” with each state funding opportunity to ensure that awardees are best positioned to leverage state funding to pursue competitive federal funding opportunities. Projects eligible for funding should deliver at least 25/3 Mbps to align with national and

⁵⁵ Federal Communications Commission, “FCC Launches \$20 Billion Rural Digital Opportunity Fund To Expand Rural Broadband Deployment,” <https://docs.fcc.gov/public/attachments/FCC-20-5A1.pdf>. See above baseline performance tier.

international standards, and 100/20 Mbps ideally to align with the Governor's Executive Order.

Review broadband funding speed targets for infrastructure subsidies or grants annually in light of national and international trends to ensure California remains competitive. Also review standards in light of federal funding requirements and scoring criteria to ensure that California applicants are able to leverage state funding to unlock federal grant and other funding opportunities.

- c. Develop criteria for state funding around demonstrated local and tribal government involvement that align with criteria for federal broadband funding, specifically the Department of Agriculture's ReConnect and Community Connect programs. Requiring robust demonstrated support will help to make state-funded projects even more competitive to receive funding from federal programs that require significant community support.
- d. Prioritize funding open access, middle-mile infrastructure, including connections to anchor institutions.

Key Parties: California Public Utilities Commission, California Department of Education, California State Library, California Department of Housing and Community Development and any other agency that makes broadband-eligible infrastructure grants.

- 2. Identify alternative financing opportunities with government and philanthropic partners to maximize funding for new infrastructure. The state should work with local governments to explore opportunities for public financing, including but not limited to bond instruments. The state should also engage with active philanthropy organizations to identify areas of shared interest and potential sources of funding to support new broadband deployments in unserved and underserved areas.

Key Parties: Governor's Office of Business and Economic Development, and California Public Utilities Commission

- 3. Modernize California's universal service programs to support the deployment and ongoing maintenance of broadband networks.

Key Parties: California Public Utilities Commission

Additional areas worth consideration:

- Increase financial resources allocated to expanding broadband availability statewide.
- Establish obligations for existing Internet Service Providers to serve all customers.

Simplify processes and leverage existing assets and construction

4. Implement a Dig Smart policy to install conduit as part of any appropriate and feasible state-funded transportation project in strategic corridors, as an incentive for service build-outs to un- and under-connected communities. Dig Smart policies present an opportunity to lower the capital cost of infrastructure deployment and minimize disruptions caused by ongoing or duplicitous construction, both incentivizing and expediting new investment.

Key Parties: California State Transportation Agency

5. Continue improving state encroachment permitting processes and rights-of-way management to accelerate broadband deployment projects that will serve un- and under-connected communities.

Key Parties: California State Transportation Agency

6. Explore various actions to enhance permitting processes at all levels of government through meaningful partnerships. Convene semi-annual meetings with broadband providers and local governments to enhance permitting processes that support the construction of broadband infrastructure and the needs of local governments. In addition, the office should launch a formal partnership with federal agencies to support prioritization of permits for broadband construction through federal land and when permit holders are experiencing delays.

Key Parties: California Department of Technology

7. Identify state property for possible use for broadband infrastructure, based on specific criteria identified by the CPUC, Caltrans and other relevant agencies, to accelerate broadband deployment.

Key Parties: California Public Utilities Commission, Department of General Services, California State Transportation Agency, California Department of Technology

8. Regularly coordinate and convene with jurisdictions implementing next-generation 9-1-1 to expand broadband infrastructure to enhance public

safety and disaster preparedness, response, recovery, and mitigation capabilities.

Key Parties: California Office of Emergency Services

Set reliability standards

9. Establish standards for middle mile and backhaul resilience and reliability. Recent experiences responding to wildfires throughout the state can be leveraged to identify shortcomings in network resilience and reliability. Analysis of demonstrated gaps can be used to set standards and a timeline for bringing networks throughout the state in line with such goals.

Key Parties: California Public Utilities Commission in consultation with the Governor's Office of Emergency Services

10. Establish clear standards of consumer protection and provisioning of equitable service by providers. Evaluate the surcharge collections and overall bill impacts, including other, non-public charges, to minimize total customer bill impacts. Examine whether broadband service in underserved and unserved communities is consistent with current licensing requirements.

Key Parties: California Public Utilities Commission

Additional areas worth consideration:

- Explore framework to ensure broadband resilience and reliability standards are met.

Actions to ensure all Californians have access to affordable broadband and necessary devices

The Council recognizes that broadband affordability remains an obstacle for many Californians. Partnerships with anchor institutions such as libraries, schools, and community organizations, as well as with philanthropies and private industry, will continue to be critical in ensuring access to internet-enabled devices and ultimately encouraging broadband adoption. The Council believes we can make significant progress in helping Californians enroll in existing affordable internet programs.

Increase access to affordable broadband services and devices

11. Within the scope of the California Public Utilities Commission's current proceeding, "Order Instituting Rulemaking to Establish a Framework and

Processes for Assessing the Affordability of Utility Service,” develop a framework to define essential broadband service affordability standards, evaluate those standards relative to other essential service costs, and develop a range of metrics to provide a comprehensive assessment of households’ ability to afford essential broadband service.

Key Parties: California Public Utilities Commission

12. Improve the California LifeLine Program by including stand-alone broadband service, and work in partnership with internet service providers to encourage participation in the program.

Key Parties: California Public Utilities Commission

13. Leverage existing California Department of Housing and Community Development programs, such as the Infill Infrastructure Grant Program and the Affordable Housing and Sustainable Communities Program, to provide free broadband service for tenants in newly built housing. Funding programs could incorporate opportunities for awardees to provide 100/20 Mbps broadband service for free of charge to all tenants in publicly subsidized units.

Key Parties: Department of Housing and Community Development

14. Promote existing state contractual vehicles with internet service providers and equipment vendors to support cost savings and efficient purchasing of broadband services and equipment by local public entities, such as school and library districts. Leveraging existing contracts is a resource-efficient strategy to help other public entities acquire affordable broadband services, especially in bulk.

Key Parties: Department of General Services, California Department of Technology, California Department of Education and California State Library

15. Analyze the needs of people ages 60 and older for access to affordable, reliable, high-speed broadband, and identify programmatic and partnership opportunities to meet these needs.

Key Parties: California Department of Aging, California Department of Technology, California Public Utilities Commission

Additional areas worth consideration:

- Ensure all affordable broadband offers meet minimum state standards for broadband

Promote affordable broadband services and devices

16. Partner with internet service providers to promote, track, and publicly report the progress of adoption of affordable internet services and devices throughout the state.
- a. Request providers to develop multi-language marketing materials for distribution to under-adopting communities and support dissemination by leveraging existing public programs and campaigns, such as: CalFresh, Department of Motor Vehicles (DMV), CalWorks, Covered California, public libraries, public housing, and the National School Lunch Program (NSLP), investor-owned utility CARES and Energy Savings Assistance (ESA) programs.
 - b. Develop tools for low-income individuals and service organizations to identify and subscribe to affordable broadband plans easily.
 - c. Continue promoting affordable broadband and device offers to:
 - i. Recipients of the National School Lunch program
 - ii. Public library patrons

Key Parties: California Department of Technology, California Public Utilities Commission, California Emerging Technology Fund and California State Library with support from all departments listed above, providers, manufacturers, and local government

Encourage broadband competition

17. Provide guidance to local governments and partner with tribal governments to develop broadband strategies and explore options for increasing competition in their communities. Specifically, provide guidelines for communities to inventory local infrastructure assets, publish template lease agreements, and make assets available on an open-access basis.

Key Parties: California Public Utilities Commission

Additional areas worth consideration:

- Identify if there are new incentives to encourage competitive leasing of privately-owned infrastructure to encourage competition.
- Explore methods of promoting competition within multi-dwelling units – for example, through statewide adoption of San Francisco's Article 52 – to

enable tenants in apartment buildings to choose among multiple internet service providers.

Actions to ensure all Californians can access training and support to enable digital inclusion

Digital skills and literacy training are essential for digital inclusion. Nearly a quarter of Californians who do not subscribe to broadband today say that they are uncomfortable using a computer or going online.⁵⁶ The California Broadband Council thinks the state can make headway by better aligning skills training with infrastructure build-outs. The state can identify existing grant funds that can support digital skills training and can continue to support the organizations leading the way today—local governments, libraries, nonprofits, schools, and other stakeholders.

Strengthen partnerships and coordinate initiatives

18. Develop and manage a multi-layer network of digital-inclusion stakeholders to discuss ongoing needs, share resources, and coordinate initiatives.

First, leverage California Broadband Council meetings and the GO-Biz broadband funding identification initiative to strengthen partnerships among anchor organizations such as schools, libraries, workforce development boards, and county social service departments.

Second, convene local government broadband coordinators and managers quarterly to identify barriers to local programming, new actions undertaken, and tools developed at the local level. Also, regularly convene private and nonprofit sector companies in an effort to understand and predict current and future demand for broadband.

Third, convene broadband adoption practitioners, including libraries, nonprofit organizations, and others semi-annually to share best practices and ongoing community needs to innovate and create new digital literacy tools, and develop curriculum and training programs to meet the needs of the workforce, community, and students.

Key Parties: Office of Broadband and Digital Literacy, Governor's Office of Business and Economic Development, California Public Utilities Commission, Department of General Services, state agencies that work with the local

⁵⁶ "Internet Connectivity and the 'Digital Divide' in California - 2019," California Emerging Technology Fund, table 6.

agencies listed above, California Emerging Technology Fund, private and nonprofit sector broadband providers, and local partners.

Additional areas worth consideration:

- Build out digital skills training programs that include core digital literacy as well as more advanced technical training that is linked specific jobs and career pathways.

Actions to support all goals

Achieving the goals presented in this action plan requires cross-cutting action in three key areas: data transparency, technical assistance, and partnerships.

First, improve and share accurate, granular data to help stakeholders develop targeted solutions to improve broadband availability and adoption.

Second, expand technical assistance for local and tribal governments and their key partners to better leverage funding availability.

Finally, bolster partnerships among local, state, and federal governments, as well as with industry providers to ensure all resources are leveraged to the fullest extent possible.

Improve broadband data and mapping transparency and usability

19. Collect more granular and accurate broadband data and leverage this information to build out the public California Interactive Broadband Map.

Collecting and mapping broadband availability data at the home address level will provide internet service providers and local and tribal governments the tools needed to pursue state and federal funding opportunities competitively. It will also enable them to advocate proactively for their eligibility to participate in such programs, by being able to demonstrate a lack of broadband access.

Improve the California Interactive Broadband Map by incorporating: existing public broadband assets, geographic boundaries, roads, anchor institutions, public rights-of-way, and fairgrounds.

Key Parties: California Public Utilities Commission in partnership with other departments/agencies including the California Department of Food and Agriculture and the Governor's Office of Emergency Services.

20. Leverage the California Public Utilities Commission's cost model to inform broadband planning and investments, project broadband availability based on existing resources, and inform statewide discussions of additional resources required to achieve our broadband goals.

Key Parties: California Public Utilities Commission in partnership with the Governor's Office of Business and Economic Development and the California Department of Technology

21. Establish a Broadband For All portal to enable easy access to broadband information and tools and serve as a central repository, including:

- a. A page for the public to submit data to validate or dispute broadband mapping data related to broadband speeds and availability.
- b. Resources and toolkits specific to broadband planning and implementation.
- c. Digital inclusion plans, initiatives, and best practices developed by local governments, nonprofits, anchor institutions, and community partners. When possible, entities should include resources that can be replicated or built upon by other entities.
- d. Digital skills training tools, such as curricula, fact sheets, promotion collateral, and more.
- e. Information on affordable internet offers and devices, including cost, eligibility, customer service contact information, and instructions on how to sign up.
- f. State and federal broadband funding opportunities using the grants.ca.gov site, including program status, eligibility requirements, and ability to be leveraged as match for other programs.

Key Parties: California Department of Technology

Develop technical assistance and support

22. Identify additional opportunities to provide technical assistance to local governments, Tribes, nonprofits, and their partners to best leverage local, state, federal, and private funding opportunities. This may include supporting the creation of special districts or cooperatives to deploy networks, and providing support in navigating the technical, regulatory, and financial hurdles to deployment.

Key Parties: California Public Utilities Commission, California Department of Technology

Additional areas worth consideration:

- Building out a technical assistance program that could include feasibility studies for potential infrastructure build-outs.
- Explore mechanisms for private entities to share asset availability with local governments on a project-by-project basis to enable efficient investment.

Bolster partnerships

23. Form a planning group of all state agencies that oversee any potential infrastructure or broadband adoption funding to meet quarterly to ensure alignment in funding goals and implementation, and to identify existing and new programs that can support Broadband for All. The planning group will:

- a. Allow various agencies to coordinate funding priorities to ensure maximum impact of state funds, maximization of new and existing federal funding opportunities,⁵⁷ and that various programs complement one another in meeting the state's broadband goals.
- b. Explore setting shared standards among state grant programs to prioritize joint infrastructure and adoption projects.
- c. Explore opportunities to use programs under their jurisdiction to accelerate broadband deployment and to leverage utility infrastructure to increase access to existing fiber and cost-effectively deploy new fiber.
- d. Identify and facilitate new broadband projects that support precision agriculture and food systems in rural communities.
- e. Identify ways to increase free or low-cost broadband connectivity at all publicly subsidized housing communities for residential units.
- f. Include updates from the California Department of Education as it continues leading statewide efforts to ensure that students have computing devices and connectivity necessary for distance learning and online instruction.

⁵⁷ Existing funding opportunities include broadband-specific programs, but also those programs for which broadband access and adoption are an eligible use of funds (e.g., CARES Act, TANF, SNAP, U.S. Department of Labor funds)

- g. Identify additional opportunities for cross-department partnerships that bring new funding sources together, such as the current initiative by the Labor and Workforce Development Agency and the California State Library that supports access to online training and digital literacy.
- h. Support issuing guidance on how state agencies and local partners can support digital inclusion via existing federal programs, as has already been happening across departments.⁵⁸
- i. Support access to broadband in fast-growing, inland parts of the state, as well as facilitate the growth of second offices for established CA companies, new startups, and telework opportunities to reduce vehicle miles traveled consistent with the state's climate commitments.

Key Parties: Governor's Office Business and Economic Development, California Public Utilities Commission, California Department of Food and Agriculture, California Department of Education, California State Library, California Department of Housing and Community Development, California Department of Water Resources, California Labor and Workforce Development Agency, California Department of Social Services, California Department of Aging, Governor's Office of Planning and Research, and any other agency with broadband infrastructure and adoption eligible programs.

24. Request that the executive branch entities and constitutional agencies incorporate broadband into their strategic plans, and provide broadband priorities to the California Broadband Council annually to ensure effective interagency collaboration.

Key Parties: All executive branch state entities (agencies, departments, commissions, etc.), and if they agree, constitutional agencies.

⁵⁸ See, for example, recent guidance from the California Department of Social Services to County Welfare Departments, which includes adoption and training options for program recipients: https://cdss.ca.gov/Portals/9/Additional-Resources/Letters-and-Notices/ACINs/2020/I-76_20.pdf?ver=2020-11-05-094747-987.

What's Next

This Broadband Action Plan will be a live, iterative document. The California Broadband Council will update the Plan on an annual or more frequent basis through 2025 as directed by Governor Newsom's broadband executive order N-73-20.⁵⁹

The California Broadband Council—in partnership with key state, local, and Tribal government agencies, internet service providers, nonprofits, and other broadband stakeholders—will continue to collaborate and identify critical action items.

Lead agencies or organizations will regularly report on their ongoing progress and provide assessments of each assigned action to the California Broadband Council—and the Council will convene quarterly meetings to discuss and determine next steps.

The Council appreciates the public input it has received during the preparation of this Plan. Public comments on the Broadband Action Plan may be submitted via email ([CABroadbandCouncil@state.ca.gov](mailto: CABroadbandCouncil@state.ca.gov)) or during public comment periods at the California Broadband Council meetings.

⁵⁹ California Executive Order N-73-20, <https://www.gov.ca.gov/wp-content/uploads/2020/08/8.14.20-EO-N-73-20.pdf>.

Acknowledgements

This report would not be possible without the time and energy invested by the members of the California Broadband Council and their staffs, designees, and other experts around the state. In particular, the Council wishes to thank Stephanie Tom, Deputy Director for Broadband and Digital Literacy at the California Department of Technology, and Justin Cohan-Shapiro, Chief Strategist at the California Department of Technology, who led the development of this Plan.

The Council is also grateful to the following staff, stakeholders, and experts for their feedback, research, and input: the analysts at CTC Technology & Energy, Sara Hudson, Technical Writer, and the California Regional Broadband Consortia. Also special recognition goes to Anne Neville-Bonilla, Director of the California Research Bureau, and Stuart Drown, Deputy Secretary, California Government Operations Agency, whose significant contributions to the writing and editing of this report were invaluable.

A committed team coordinated the Council's efforts on this Plan. At the California Department of Technology, Adelina Zendejas, Deputy Director of Special Projects; Jules Stein, Manager for Broadband and Digital Literacy and Legislation; Sachin Brahme, Information Technology Manager, Bob Andosca, Acting Deputy Director of Communication; Katherine Milton, Communications Manager; and Michelle Wagner, Graphic Designer all provided invaluable support to the Council's meetings and operations for this report.

A special note of appreciation to California Forward, Elizabeth Doohar, Broadband Facilities Coordinator at the Department of Transportation, and Christina Snider, the Governor's Tribal Advisor for their support leading the listening sessions with the community, local government, and Tribes to ensure diverse and inclusive feedback was obtained and incorporated into the Plan.

The collective support of the Council, staff, stakeholders, and experts, yielded unprecedented feedback and engagement from over 650 individuals through the following channels:

- 8 Council meetings with an average of 70 attendees.
- 6 listening sessions with an average of 60 participants.
- 2 tribal consultants with a total of 15 participants.
- 8 public working sessions with an average of 20 participants.
- 12 individual one-on-one meetings with California Broadband Council staff.

- 77 submitted written public comments.

The Council thanks all of these contributors for the skill, energy, and dedication they brought to creating this Plan.

Appendix A: Summary of 12-Month Action Plan

GOAL #1: Actions to ensure all Californians have high-performance broadband available at home, schools, libraries, and businesses

Modernize broadband speed and performance standards

1. Recommend, and adopt shared standards among all state grant-funding and related broadband programs:

- a) Define “broadband” with dual definitions: (1) a baseline definition to match the FCC standard of 25/3 Mbps and (2) a goal of 100/20 Mbps that reflects the Governor’s Executive Order of a minimum of 100 Mbps download, and growing demand for higher upload speeds. These dual definitions both bring the state in alignment with current federal standards and adopt a forward-looking speed as bandwidth needs continue to grow. Federal funding benchmarks will be updated accordingly in the coming years.
- b) Mitigate the problems with federal data. California should evaluate broadband at the serviceable location level to bring greater accuracy and granularity.

At the same time, state programs should evaluate definitions of “unserved” and “underserved” with each state funding opportunity to ensure that awardees are best positioned to leverage state funding to pursue competitive federal funding opportunities. Projects eligible for funding should deliver at least 25/3 Mbps to align with national and international standards, and 100/20 Mbps ideally to align with the Governor’s Executive Order.

Review broadband funding speed targets for infrastructure subsidies or grants annually in light of national and international trends to ensure California remains competitive. Also review standards in light of federal funding requirements and scoring criteria to ensure that California

Key Parties:

- California Public Utilities Commission,
- California Department of Education,
- California State Library,
- California Department of Housing and Community Development, and
- Any other agency that makes broadband-eligible infrastructure grants.

<p>applicants are able to leverage state funding to unlock federal grant and other funding opportunities.</p> <p>c) Develop criteria for state funding around demonstrated local and tribal government involvement that align with such criteria for federal broadband funding, specifically the Department of Agriculture’s ReConnect and Community Connect programs. Requiring robust demonstrated support will help to make state-funded projects even more competitive to receive funding from federal programs that require significant community support.</p> <p>d) Prioritize funding open access, middle-mile infrastructure, including connections to anchor institutions.</p>	
<p>2. Identify alternative financing opportunities with government and philanthropic partners to maximize funding for new infrastructure. The state should work with local governments to explore opportunities for public financing, including but not limited to bond instruments. The state should also engage with active philanthropy organizations to identify areas of shared interest and potential sources of funding to support new broadband deployments in unserved and underserved areas.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • Governor’s Office of Business and Economic Development, and • California Public Utilities Commission
<p>3. Modernize California’s universal service programs to support the deployment and ongoing maintenance of broadband networks effectively.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • California Public Utilities Commission
<p>Additional areas worth consideration:</p> <ul style="list-style-type: none"> • Increase financial resources allocated to expanding broadband availability statewide. • Establish obligations for existing Internet Service Providers to serve all customers. 	<p>TBD</p>

Simplify processes and leverage existing assets and construction

<p>4. Implement a Dig Smart policy to install conduit as part of any appropriate and feasible state-funded transportation project in strategic corridors, as an incentive for service build-outs to un- and under-</p>	<p>Key Parties:</p>
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<p>connected communities. Dig Smart policies present an opportunity to lower the capital cost of infrastructure deployment and minimize disruptions caused by ongoing or duplicitous construction, both incentivizing and expediting new investment.</p>	<ul style="list-style-type: none"> • California State Transportation Agency
<p>5. Continue improving state encroachment permitting processes and rights-of-way management to accelerate broadband deployment projects that will serve un- and under-connected communities.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • California State Transportation Agency
<p>6. Explore various actions to enhance permitting processes at all levels of government through meaningful partnerships. Convene semi-annual meetings with broadband providers and local governments to enhance permitting processes that support the construction of broadband infrastructure and the needs of local governments. In addition, the office should launch a formal partnership with federal agencies to support prioritization of permits for broadband construction through federal land and when permit holders are experiencing delays.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • California Department of Technology
<p>7. Identify state property for possible use for broadband infrastructure, based on specific criteria identified by the CPUC, Caltrans and other relevant agencies, to accelerate broadband deployment.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • California Public Utilities Commission, • Department of General Services, • California State Transportation Agency, • California Department of Technology
<p>8. Regularly coordinate and convene with jurisdictions implementing next-generation 911 to expand broadband infrastructure to enhance public safety and disaster preparedness, response, recovery, and mitigation capabilities.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • California Office of Emergency Services

Set reliability standards	
9. Establish standards for middle-mile and backhaul resilience and reliability. Recent experiences responding to wildfires throughout the state can be leveraged to identify shortcomings in network resilience and reliability. Analysis of demonstrated gaps can be used to set standards and a timeline for bringing networks throughout the state in line with such goals.	Key Parties: <ul style="list-style-type: none"> • California Public Utilities Commission in consultation with the • Governor's Office of Emergency Services
10. Establish clear standards of consumer protection and provisioning of equitable service by providers. Evaluate the surcharge collection and overall bill impacts, including other non-public charges to minimize total customer bill impacts. Examine whether broadband service in underserved and unserved communities is consistent with current licensing requirements.	Key Parties: <ul style="list-style-type: none"> • California Public Utilities Commission
Additional areas worth consideration: <ul style="list-style-type: none"> • Explore framework to ensure broadband resilience and reliability standards are met. 	TBD

GOAL #2: Actions to ensure all Californians have access to affordable broadband and necessary devices

Increase access to affordable broadband services and devices	
11. Within the scope of the California Public Utilities Commission's current proceeding, "Order Instituting Rulemaking to Establish a Framework and Processes for Assessing the Affordability of Utility Service," develop a framework to define essential broadband service affordability standards, evaluate those standards relative to other essential service costs, and develop a range of metrics to provide a comprehensive assessment of households' ability to afford essential broadband service.	Key Parties: <ul style="list-style-type: none"> • California Public Utilities Commission
12. Improve the California LifeLine Program by including stand-alone broadband service, and work in partnership with internet service providers to encourage participation in the program.	Key Parties: <ul style="list-style-type: none"> • California Public Utilities Commission

<p>13. Leverage existing California Department of Housing and Community Development programs, such as the Infill Infrastructure Grant Program and the Affordable Housing and Sustainable Communities Program, to provide free broadband service for tenants in newly built housing. Funding programs could incorporate opportunities for awardees to provide 100/20 Mbps broadband service free of charge to all tenants in publicly subsidized units.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • Department of Housing and Community Development
<p>14. Promote existing state contractual vehicles with internet service providers and equipment vendors to support cost savings and efficient purchasing of broadband services and equipment by local public entities such as school and library districts. Leveraging existing contracts is a resource-efficient strategy to help other public entities acquire affordable broadband services, especially in bulk.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • Department of General Services, • California Department of Technology, • California Department of Education • California State Library
<p>15. Analyze the needs of people ages 60 and older for access to affordable, reliable, high-speed broadband, and identify programmatic and partnership opportunities to meet these needs.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • California Department of Aging, • California Department of Technology, • California Public Utilities Commission
<p>Additional areas worth consideration:</p> <ul style="list-style-type: none"> • Ensure all affordable broadband offers meet minimum state standards for broadband 	<p>TBD</p>

Promote affordable broadband services and devices	
<p>16. Partner with internet service providers to promote, track and publicly report the progress of adoption of affordable internet services and devices throughout the state.</p> <p>a) Request providers to develop multi-language marketing materials for distribution to under-adopting communities and support dissemination by leveraging existing public programs and campaigns, such as: CalFresh, Department of Motor Vehicles (DMV), CalWorks, Covered California, public libraries, public housing, and the National School Lunch Program (NSLP), investor-owned utility CARES and Energy Savings Assistance (ESA) programs.</p> <p>b) Develop tools for low-income individuals and service organizations to identify and subscribe to affordable broadband plans easily.</p> <p>c) Continue promoting affordable broadband and device offers to:</p> <ul style="list-style-type: none"> i. Recipients of the National School Lunch program ii. Public library patrons 	<p>Key Parties:</p> <ul style="list-style-type: none"> • California Department of Technology, • California Public Utilities Commission, • California Emerging Technology Fund and • California State Library, with support from all departments listed above, providers, manufacturers, and local government

Encourage broadband competition	
<p>17. Provide guidance to local governments and partner with Tribal governments to develop broadband strategies and explore options for increasing competition in their communities. Specifically, provide guidelines for communities to inventory local infrastructure assets, publish template lease agreements, and make assets available on an open-access basis.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • California Public Utilities Commission
<p>Additional areas worth consideration:</p> <ul style="list-style-type: none"> • Identify if there are new incentives to encourage competitive leasing of privately-owned infrastructure to encourage competition. • Explore methods of promoting competition within multi-dwelling units – for example, through statewide adoption of San Francisco’s Article 52 – to enable 	<p>TBD</p>

tenants in apartment buildings to choose between multiple internet service providers.	
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GOAL #3: Actions to ensure all Californians can access training and support to enable digital inclusion

<p>Strengthen partnerships and coordinate initiatives</p>	
<p>18. Develop and manage a multi-layer network of digital inclusion stakeholders to discuss ongoing needs, share resources, and coordinate initiatives. First, leverage California Broadband Council meetings and the GO-Biz broadband funding identification initiative to strengthen partnerships among anchor organizations such as schools, libraries, workforce development boards, and county social service departments. Second, convene local government broadband coordinators and managers quarterly to identify barriers to local programming, new actions undertaken, and tools developed at the local level. Also, regularly convene private and nonprofit sector companies in an effort to understand and predict current and future demand for broadband. Third, convene broadband adoption practitioners, including libraries, nonprofit organizations, and others semi-annually to share best practices and ongoing community needs in regard to, innovate and create new digital literacy tools, and develop curriculum and training programs to meet the needs of the workforce, community, and students.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • Office of Broadband and Digital Literacy, • Governor's Office of Business and Economic Development, • California Public Utilities Commission , • Department of General Services, • State agencies that work with the local agencies listed above, • California Emerging Technology Fund, • Private and nonprofit sector broadband providers, and • Local partners.
<p>Additional areas worth consideration:</p> <ul style="list-style-type: none"> • Build out digital skills training programs that include core digital literacy, as well as more advanced technical training linked to specific jobs and career pathways. 	<p>TBD</p>

Improve broadband data and mapping transparency and usability	
<p>19. Collect more granular and more accurate broadband data and leverage this information to build out the public California Interactive Broadband Map. Collecting and mapping broadband availability data at the home address level will provide internet service providers and local and tribal governments the tools needed to pursue state and federal funding opportunities competitively. It will also enable them to advocate proactively for their eligibility to participate in such programs by being able to demonstrate a lack of broadband access. This will incorporate the following data in the California Interactive Broadband Map: Existing public broadband assets, geographic boundaries, roads, anchor institutions, public rights-of-way, and fairgrounds.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • California Public Utilities Commission in partnership with other departments/agencies including the • California Department of Food and Agriculture and the • Governor's Office of Emergency Services.
<p>20. Leverage the California Public Utilities Commission's cost model to inform broadband planning and investments, project broadband availability based on existing resources, and inform statewide discussions of additional resources required to achieve our broadband goals.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • California Public Utilities Commission in partnership with the • Governor's Office of Business and Economic Development and the • California Department of Technology
<p>21. Establish a Broadband for All portal to enable easy access to broadband information and tools and serve as a central repository, including:</p> <ol style="list-style-type: none"> a) A page for the public to submit data to validate or dispute broadband mapping data related to broadband speeds and availability. b) Resources and toolkits specific to broadband planning and implementation. c) Digital inclusion plans, initiatives, and best practices developed by local governments, nonprofits, anchor institutions, and community 	<p>Key Parties:</p> <ul style="list-style-type: none"> • California Department of Technology

<p>partners. When possible, entities should include resources that can be replicated or built upon by other entities.</p> <p>d) Digital skills training tools, such as curricula, fact sheets, promotion collateral, and more.</p> <p>e) Information on affordable internet offers and devices, including cost, eligibility, customer service contact information, and instructions on how to sign up.</p> <p>f) State and federal broadband funding opportunities using the grants.ca.gov site, including program status, eligibility requirements, and ability to be leveraged as match for other programs.</p>	
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Develop technical assistance and support	
<p>22. Identify additional opportunities to provide technical assistance to local governments, Tribes, nonprofits and their partners to best leverage local, state, federal, and private funding opportunities. This may include supporting the creation of special districts or cooperatives to deploy networks, and providing support in navigating the technical, regulatory, and financial hurdles to deployment.</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • California Public Utilities Commission, • California Department of Technology
<p>Additional areas worth consideration:</p> <ul style="list-style-type: none"> • Building out a technical assistance program that could include feasibility studies for potential infrastructure build-outs. • Explore mechanisms for private entities to share asset availability with local governments on a project-by-project basis to enable efficient investment. 	<p>TBD</p>

Bolster partnerships	
<p>23. Form a planning group of all state agencies that oversee any potential infrastructure or broadband adoption funding to meet quarterly to ensure alignment in funding goals and implementation, and further identify existing and new programs that can support Broadband for All. The planning group will:</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • Governor's Office Business and Economic Development, • California Public Utilities Commission,

<p>a) Allow various agencies to coordinate funding priorities to ensure maximum impact of state funds, maximization of new and existing federal funding opportunities, and that various programs complement one another in meeting the state's broadband goals.</p> <p>b) Explore setting shared standards among state grant programs to prioritize joint infrastructure and adoption projects.</p> <p>c) Explore opportunities to use programs under their jurisdiction to accelerate broadband deployment and to leverage utility infrastructure to increase access to existing fiber and cost-effectively deploy new fiber.</p> <p>d) Identify and facilitate new broadband projects that support precision agriculture and food systems in rural communities.</p> <p>e) Identify ways to increase free or low-cost broadband connectivity for residential units at all publicly subsidized housing communities.</p> <p>f) Include updates from the California Department of Education as it leads statewide efforts to ensure that students have the computing devices and connectivity necessary for distance learning and online instruction.</p> <p>g) Identify additional opportunities for cross-department partnerships that bring new funding sources together, such as the current initiative by the Labor and Workforce Development Agency and the California State Library that supports access to online training and digital literacy.</p> <p>h) Support issuing guidance on how state agencies and local partners can support digital inclusion via existing federal programs, such as has already happened across departments.</p> <p>i) Support access to broadband in fast-growing inland parts of the state, as well as facilitate the growth of second offices for established CA companies, new startups, and telework opportunities to reduce vehicle miles traveled consistent with the state's climate commitments.</p>	<ul style="list-style-type: none"> • California Department of Food and Agriculture, • California Department of Education, • California State Library, • California Department of Housing and Community Development, • California Department of Water Resources, • California Labor and Workforce Development Agency, • California Department of Social Services, • California Department of Aging, • Governor's Office of Planning and Research, and • Any other agency with broadband infrastructure and adoption eligible programs.
<p>24. Request that executive branch entities and constitutional agencies incorporate broadband into their strategic plans, and provide broadband priorities</p>	<p>Key Parties:</p> <ul style="list-style-type: none"> • All executive branch state entities

to the California Broadband Council annually to ensure effective interagency collaboration.	(agencies, departments, commissions, etc.), and if they agree, constitutional agencies.
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Appendix B: CPUC Cost Model

Excerpt from the California Broadband Cost Model CBCM Report (December 2020). Available at <https://www.cpuc.ca.gov/communications/costmodel/>.

Authored By:
 CostQuest Associates
 1430 E. McMillan St.
 Cincinnati, OH 45206
 U. S.

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EXECUTIVE SUMMARY

INTRODUCTION

Chico State University, on behalf of California Public Utilities Commission (CPUC), engaged CostQuest Associates, Inc. (CQA) to provide a statewide cost model for broadband and voice services using methods consistent with the adopted FCC Connect America Cost Model (CACM) as modified by the approach requested by the CPUC. The CACM is used under multiple FCC funding mechanisms, including the Rural Digital Opportunity Fund (RDOF) program¹. It must be noted here however that the California State Broadband Cost Model (CBCM) is not the CACM. The CBCM has as its purpose the estimation of investment to build broadband network infrastructure to given locations on a one-time capital cost basis.

The cost elements comprising CBCM are based on network design and engineering methods, to model, as closely as possible, estimated network deployment costs of a fiber to the premises network capable of meeting current and future consumer bandwidth demand requirements. The model's inputs are flexible, so that information about cost factors specific to areas of California may be adjusted going forward, at the option of the CPUC.

The purpose of the CBCM is to provide the CPUC and state Policy Makers with cost estimates for broadband across the state. To that end, and to support the various needs the CPUC seeks to address, the CBCM is provided as an iterative process. This model provides Middle Mile and Access Network investment with aggregate build out costs for Fiber to the Premises (FTTP) for the access networks and service tiers as described in the Scope section of this report. FTTP networks are capable of providing services with bandwidth up to 1000 Mbps. Investment is categorized above and below a threshold. The threshold value is intended to help identify areas which may be too costly for economically viable FTTP.

Future iterations of the model may be expanded to include additional network tech types, tiers of service, and geographies. We note, for example, a majority of California housing units are served with broadband services provided by cable companies. At the request of CPUC staff, the model may be adjusted to evaluate areas served by cable companies.

SUMMARY FINDINGS

The cost models provide estimates for a Fiber to the Premises (FTTP) network. The Fiber to the Premises network is constructed for all unserved locations. Unserved locations *over* an investment threshold are served with the same network as those *under* the threshold.

¹ The FCC RDOF Program information is available at: <https://www.fcc.gov/auction/904>. RDOF mapped locations in California are available via CPUC mapping at: <https://www.broadbandmap.ca.gov/federal/funding/>. The CPUC's support mechanisms for in-state RDOF bidders and federal program updates are available at: <https://www.cpuc.ca.gov/broadband/federal/funding/>.

The estimated investments to provide voice and broadband² were calculated for areas not served by the following speed standards:

1. 25 Mbps download / 3 Mbps upload
2. 100 Mbps download / no specified upload
3. 100 Mbps download / 10Mbps upload

Results are presented in Tables 1-4, below. The access network values allocate 100% of the middle mile structure to the voice and broadband network. Associated state maps for each speed standard table can be found in a separate document; see appendix D for detail.

Table 1: Estimated Investments - Statewide Comparative Summary, by Speed Tier³

Tier 1 (25/3) Total Network Investment	Category	Structure Count (Demand Locations)	Passed Access Investment	Service Turnup Based Investment	Total Investment
	Unserviced Network Subtotal	513,700	\$3,034,255,049	\$350,898,450	\$3,385,153,499
	Statewide Middle Mile Network Subtotal	na	na	na	\$2,167,280,701
See: Table 2	Total Investment	na	na	na	\$5,552,434,200
Tier 2 (100 Down) Total Network Investment	Category	Structure Count (Demand Locations)	Passed Access Investment	Service Turnup Based Investment	Total Investment
	Unserviced Network Subtotal	760,053	\$4,058,476,496	\$507,437,479	\$4,565,913,975
	Statewide Middle Mile Network Subtotal	na	na	na	\$2,167,280,701
See: Table 3	Total Investment	na	na	na	\$6,733,194,676
Tier 3 (100/10) Total Network Investment	Category	Structure Count (Demand Locations)	Passed Access Investment	Service Turnup Based Investment	Total Investment
	Unserviced Network Subtotal	779,065	\$4,114,007,951	\$518,715,826	\$4,632,723,777
	Statewide Middle Mile Network Subtotal	na	na	na	\$2,167,280,701
See: Table 4	Total Investment	na	na	na	\$6,800,004,478

² The Service Turnup investment (ONT and Drop) is not sensitive to the service speed deployed, up to 1 Gb of best-efforts service. The access network investment, while fairly static, is sensitive to the delivered speeds mainly with respect to splitter ratios and core electronics. Those sensitivities will be driven by bandwidth consumption assumptions for the end user, services consumed, and the number of supported end users connected to the network in an area.

³ The Statewide Middle Mile Network Subtotal is based on a full state greenfield analysis.




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