California Emerging Technology Fund
Overview for Council on Competitiveness
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Closing the Digital Divide is an Imperative for Global Competitiveness

Closing the Digital Divide is an imperative for global competiveness in this Digital Age. Broadband is essential 21st Century infrastructure for economic vitality; and access to the Internet is a 21st Century Civil Right. Communities with robust broadband—a generic term for high-speed Internet infrastructure including both wireline and wireless networks—have a distinct advantage in attracting capital investment to support innovation and generate jobs. Individuals with digital literacy skills are better able to find employment and increase income.

Imagine if you were not able to communicate instantaneously with others using your smart phone, tablet, or computer. That is the reality for more than 80 million unconnected and underconnected U.S. residents living in remote rural communities, tribal lands, and low-income neighborhoods, or who have a disability. People stuck on the wrong side of the Digital Divide are being left behind at an accelerating pace—unable to apply for a job, access public services, or obtain public safety information during an emergency and are increasingly disenfranchised from participation in the democracy. If this weren't serious enough, the COVID-19 pandemic magnified the Digital Divide and laid bare widespread inequities—actually becoming a "Digital Cliff" as more families tumble off into deeper poverty and greater isolation. Shelter-in-place orders forcing the majority of people to try to be online simultaneously—telework, distance learning, telehealth—have exposed the inadequacies of home Internet service and spotlighted the need for much higher delivered speeds and more synchronous networks.

Closing the Digital Divide requires strategies and investments to address the challenges of both "supply" and "demand"—referred to as "deployment" and "adoption"—to increase the use of technologies enabled by ubiquitous high-speed Internet infrastructure and optimize return on investment. Deployment is necessary but not sufficient: people actually have to be able to use technology to add value to the economy. Successful initiatives to close the Digital Divide recognize the inextricable relationships between deployment and adoption to embrace complementary strategies.

Internet Service Providers (ISPs) have invested billions of dollars in building and upgrading their networks to provide increasingly better broadband networks that can deliver higher speeds and better technologies. This nation embraces capitalism to serve the consumer interest and should continue to do so with a commitment to transparent completion and a level playing field to operate in the public interest. Admittedly this approach is a delicate balance. However, it also is clear that there must be a transition from a "command-and-control" regulatory scheme to a "performance-based" framework to unlock innovation and spur competition. Time delays alone in the current regulatory arenas waste so much money that could be captured and redirected to investments in deployment and adoption.

Performance-based regulations coupled with procurement policies and permit streamlining for deploying broadband are one way to monetize inefficiencies in the current regulatory system to increase GDP. The public sector should adopt a practice of "approving and permitting" at the "speed of construction" to jumpstart economic recovery from the severe economic trauma of the pandemic and catch up to other nations with regard to the quality and availability of broadband to augment economic advantage.

While regulatory reform and procurement policies to advance Digital Inclusion ("Net Equality") can go a long way to closing the Digital Divide, ISPs cannot be expected to deploy Internet infrastructure where a profit is not possible. The marketplace is not operating to reach the most remote rural communities, including Tribal Lands, or to upgrade networks in the poorest urban neighborhoods. Achieving ubiquitous high-speed Internet access throughout the nation will require taxpayer and ratepayer subsidies to build adequate infrastructure to reach all unconnected and underconnected areas. To ensure future-proof Internet infrastructure, subsidies must invest in fiber middle-mile construction for backhaul to network backbones and should require open access to encourage competition. Based on recent analysis of Internet infrastructure needs to reach all households with adequate speeds to support simultaneous use in California (which quantified a need for $6.25B and is conservatively 10% of any national projection but also taking into account great variations of terrain in other states), the need for nationwide investment in broadband infrastructure is on the order of $75B. Thinking about investments in both deployment and adoption warrants thinking about a national initiative on the order of $100B. This size of investment requires leadership and funding from the federal government. Of course, federal funding can and should leverage other public-sector state and local matching funds in partnership with the private sector. However, even this size of a public commitment easily returns dividends through enhanced economic productivity and growth in GDP. The time is right to call for a $100B Digital Inclusion Initiative.

Research* identifies 3 primary barriers to adoption for low-income unconnected households: (1) Cost (Service and Device); (2) Relevance (Savings and Opportunities); (3) Digital Literacy (Skills and Knowledge). The combined cost of home Internet service and a device to connect to the Internet is the biggest barrier to unconnected households getting online. ISPs need to improve and sustain their lower-cost discounted Internet service offers for low-income households. The Federal Communications Commission (FCC) must re-instate a workable Internet Lifeline program to provide nationwide affordable home Internet service subscriptions. Most existing affordable offers have been negotiated as a public benefit resulting from corporate consolidations. The previously-promulgated FCC Internet LifeLine program has been put on "life support" by the current Commission and is dormant. The FCC should work with ISPs to blend their affordable offers with appropriate subsidies from the Universal Service Fund (USF) to incent partnerships to provide robust Internet service for low-income digitally-disadvantaged households. (*John Horrigan and CETF)

However, surveys also reveal that most low-income households eligible for affordable offers (70%) are not aware of discounted subscriptions because the ISPs do not advertise and some make it very difficult to get through their procedures to sign up for service. Further, half of the people aware of the affordable offers say they don't trust the ISPs. Therefore, effective adoption programs need to be delivered through "trusted messengers" and "honest brokers" who can explain in-language and in-culture the value proposition for being online to save time and money and to deliver digital literacy training to ensure proficiency in using technology.

Non-profit community-based organizations (CBOs) and public agencies are vital as trusted messengers to be involved in driving adoptions, which is most effectively accomplished through sincere public-private partnerships with the ISPs.

The promulgation of public-private partnerships as a public policy foundation for closing the Digital Divide and promoting Digital Inclusion is a cost-effective approach because sincere collaboration harnesses the discipline and innovation of the private sector with the expertise and cultural competency of those working on in the public interest as "trusted messengers" to reach disadvantaged populations. A public-private partnership is characterized by partners reaching agreement on goals, jointly developing an action plan to achieve explicit outcomes, and working together continuously in good faith to implement the plan with mutual accountability for results.

Finally, it must be acknowledged and understood that the Digital Divide is simply another manifestation of the Economic Divide. The most digitally-disadvantaged residents also are the most economically-disadvantaged living in concentrated persistent poverty rooted in institutionalized racism. Thus, closing the Digital Divide must address the inter-related factors and forces—constituting a "wall of poverty"—that make it very difficult for low-income residents to escape oppressive economic conditions to succeed in school or get a good job. This reality screams for systemic change that is within our grasp if policymakers and regulators are willing to overcome bureaucratic inertia and break through government silos.

Action Framework to Close the Digital Divide to Spur Economic Recovery and Prosperity

Closing the Digital Divide with public policies and strategies to achieve ubiquitous broadband deployment and to accelerate broadband adoption is an imperative for economic prosperity, quality of life, and family self-sufficiency. Fortunately, it is a goal that can be achieved with inspired vision, focused leadership, measurable goals, alignment of existing resources, and enlightened investment of a "critical mass" of public funding to encourage partnerships—federal-state, public-private, and provider-community. The next Administration must launch a national Digital Inclusion Initiative. There is ample research and empirical evidence about what it takes to get the job done. Several studies and reports have set forth recommendations that need to be revisited. Common themes point to the following 5 Major Components of an integrated Action Framework to close the Digital Divide and achieve Digital Equity.

- Set national goals and performance metrics with a timetable for broadband deployment, including capacity and speed, and for adoption, including affordability and digital literacy.

- Authorize a federal investment on the order of $100B for both broadband deployment and adoption and incorporate Digital Inclusion into all federal programs and services.

- Reform the regulatory environment to embrace performance-based regulations that promote public-private partnerships to incent and reward private-sector investment.

- Leverage federal investments by matching state and local funding and initiatives.

- Establish a robust Internet Lifeline Program to augment improved IPS affordable offers.

Recent Resource Reports that Inform and Support the Action Framework 5 Major Components

The next Administration must launch a national Digital Inclusion Initiative without delay or "reinventing wheels" that defer the hard work of convening stakeholders—both private and public sectors—to mobilize resources for immediate action. Essential public-sector stakeholders include states, state regulatory commissions, and federal government departments. Key private-sector stakeholders include Internet Service Providers (ISPs), philanthropic foundations, non-profit public-interest organizations, community-based organizations, and social justice and consumer advocates. Extensive expertise exists within the U.S. Department of Commerce National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC). NTIA and FCC also have the capacity to convene all other stakeholders to reach consensus on action and regularly report to the President and Congress. Further, several states have adopted broadband plans and many non-profit organizations have relevant experience to build upon which should be the foundation for implementing a national Digital Inclusion Initiative.

The following studies and reports are particularly timely and relevant in setting forth recommendations that need to be revisited and incorporated into a Digital Inclusion Initiative.

Benton Institute for Broadband & Society

- ***Broadband for America's Future: A Vision for the 2020s***
  October 2019

- ***Broadband for America NOW***
  October 2020

The Pew Charitable Trusts

- ***How States are Expanding Broadband Access***
  February 2020

U.S. Chamber of Commerce

- ***Unlocking the Digital Potential of Rural America***
  March 2019

The following summarizes the high-level findings and recommendations of these reports.

Benton Institute for Broadband & Society

Broadband for America's Future: A Vision for the 2020s
October 2019

Broadband Is the New Railroad

- High-Performance Broadband Is a National Priority
- The Goal: High-Performance Broadband For All
- Growing the American Economy
- Strengthening Communities
- Empowering Workers
  - Implications of Income Inequality
  - Necessity of Digital Skills in the Job Market
- Policy Recommendations

  Policy Recommendations to Promote Broadband Deployment
  A. Map Broadband Oases and Deserts
  B. Deploy High-Performance Broadband
  C. Reach Unserved Areas (and Reject Claims of "Overbuilding")
  D. Deploy High-Performance Broadband on Tribal Lands
  E. Employ Reverse Auctions to Stretch Federal Dollars
  F. Establish Eligibility for Reverse-Auction Participation
  G. Establish Requirements for Funded Deployment
  H. Increase the Effectiveness of Federal Efforts
  I. Support State Strategies Targeted for Specific State Circumstances and Needs

  Policy Recommendations to Promote Broadband Competition
  A. Promote Broadband Competition at the Local Level
  B. Enact Stronger Federal Policies to Spur Broadband Competition
  C. Execute Additional Pro-Competition Recommendations in the Repor

  Policy Recommendations to Promote Broadband Adoption
  A. Create an Affordability Agenda
  B. Support Digital Skills
  C. Incorporate Digital Skills Training in Regional Economic-Growth Strategies

  Policy Recommendations to Promote the Missions of Community Anchor Institutions
  A. Governments should establish connectivity goals fit for the rising demands of the next decade, including periodically re-examining the current goals set by the FCC for federally funded connectivity to schools and libraries and establishing connectivity goals for other community anchor institutions.
  B. Governments should support and promote competition to drive better broadband at lower prices for community anchor institutions.
  C. The administration of broadband programs supporting community anchor institutions must be transparent, rely on competitive outcomes, and provide reasoned (and thus reviewable) analysis for administrative decisions.

D. Federal and state programs should empower community members—particularly K-12 students—to access community anchor institution broadband and crucial applications ubiquitously.
E. Governmental support for High-Performance Broadband deployment to community anchor institutions should leverage those networks to spur competition and greater connectivity for nearby residents.
F. Spectrum policy should allow community anchor institutions to be full or even favored participants in shared and tiered access.
G. State and local governments should facilitate comprehensive broadband strategies, including encouraging the creation and growth of state research and education networks and bringing institutions together to learn from one another.

<u>Broadband Connectivity Best Practices</u>

- Expanding Broadband Networks
- Expanding Digital Inclusion and Digital Skills
- Improving Affordability
- Empowering Community Anchor Institutions and Civic Engagement
- Learning From States

Broadband for America NOW
October 2020

This report is an update of the 2019 publication to focus on what has been learned through the COVID-19 pandemic shelter-in-place orders for the "building blocks of better broadband policy" with following introductory and concluding statements:

> *Crises bend the arc of history, and our current health, economic, and social-justice challenges will as well. In times of crisis, taking the long view is important. Again and again in American history, national emergencies and threats have been the fulcrum for improvement in our communications infrastructure. Technology is a tool; it is neither by itself utopia nor dystopia. But it is a tool that can be used to improve society.*
>
> *We know now what we need to know: High-Performance Broadband connections are an essential pathway to full participation and equal opportunity in our society, our economy, and our democracy. The time to fulfill that promise—and to realize that prophesy—is now*

The report includes prophetic quotes from leaders with diverse backgrounds, such as:

> *"Access to the Internet is the civil rights issue of the 21st century."*
> Congressmember John Lewis, SiriusXM Radio, The Morning Briefing, August 24, 2012
>
> *"Broadband Internet is an Imperative, Not a Luxury,"*
> Former Florida Governor Jeb Bush, Slate, October 2, 2020

The report states that there are almost three times as many people without broadband in urban/metro places than in rural places, and lack of broadband adoption is greater among Black, Hispanic, and lower-income households. FCC Commissioner Geoffrey Starks, joined by civil rights leaders, explained, "Our historic failure to close the digital divide has had a devastating effect on communities of color in both rural and urban America." The pandemic has awakened everyone to the critical truths that we have known but failed to fully act upon. The report focuses on 4 topics:

- Digital Equity**:** Making affordable High-Performance Broadband available to low-income, unserved, and underserved populations—accompanied by training in digital skills that empowers users to make the most of their connections—will contribute to a more equitable society.

- Deployment: In a world in which the talents of all people matter, broadband infrastructure investment is a necessary economic strategy. There is no reason to saddle any rural and urban area with second-rate broadband.

- Competition**:** Americans should not have to pay more (in dollars, in sacrificed quality, or in delayed innovation) merely because public policy has failed to promote competition effectively.

- Community Anchor Institutions**:** Using broadband to fulfill their missions, these institutions should be able to reach users wherever they are—from dining room tables to spare bedrooms to parking lots—and serve as launching pads for communitywide access.

The following Key Recommendations are delineated:

Digital Equity
1. Make Broadband Much More Affordable
2. Delivering Digital Skills to Empower Participation and Recover Jobs

Deployment
1. Pursue a Unified Broadband Infrastructure Agenda
2. Deploy Scalable Broadband Networks
3. Support Tribal, State, and Local Efforts

Competition
1. Encourage New, Competitive Entrants and Local Experiments in Private-Public Collaboration
2. Gather Pricing Data and Other Information Necessary to Promote and Access Competition
3. Expand Competition for Residents of Multi-Tenant Environments

Anchor Institutions
1. Ensure That Everyone Can Access Community Anchor Institution Bandwidth
2. Ensure That Anchor Institutions Have the Bandwidth Needed to Meet Increased Demand at Competitive Rates
3. Use Community Anchor Institutions as a Launching Pad for Community-Based Broadband Access and Competition

The Pew Charitable Trusts

How States are Expanding Broadband Access
February 2020

Broadband is increasingly intertwined with the daily functions of modern life. It is transforming agriculture, supporting economic development initiatives, and is a critical piece of efforts to improve health care and modernize transportation. But the Federal Communications Commission (FCC) estimates that 21 million[1] Americans still lack broadband access. Other sources place this number as high as 162 million.[2] Communities without reliable high-speed internet service cite a growing gap between the resources and opportunities available to their residents and those in communities that have a robust network.[3] Recognizing the importance of broadband and responding to such frustrations, states are seeking to close this gap. Most have established programs to expand broadband to communities that lack it or are underserved.

The Pew Charitable Trusts examined state broadband programs nationwide and found that they have many similarities but also differences that reflect the political environment, the state's resource levels, the geography of the areas that remain unserved by broadband, and the entities that provide service. While it is clear that there is no one-size-fits-all approach for state expansion efforts, some measures that many states have taken are proving effective. This report identifies and explores these promising practices through examples in nine states: California, Colorado, Maine, Minnesota, North Carolina, Tennessee, Virginia, West Virginia, and Wisconsin. Pew identified the practices through conversations with more than 300 broadband stakeholders, including representatives of state broadband programs, internet service providers (ISPs), local governments, and broadband coalitions.

These promising practices are:

Stakeholder outreach and engagement. All states with broadband programs are working to engage stakeholders at both the state and local levels. At the state level, this includes broadband task forces and councils, as well as partnerships among state agencies. At the local level, it includes support for broadband committees and education of local stakeholders.

Policy framework. Many states have created a policy framework for broadband deployment by setting well-defined goals and a clear policy direction in legislation and tasking agencies or setting up separate offices to lead statewide broadband programs. They are identifying and addressing barriers to facilitate broadband deployment in unserved and underserved areas. And they are connecting broadband to other policy priorities, including economic development, transportation, health care, and agriculture, to build partnerships and leverage more funding for expansion efforts.

Planning and capacity building. Half of states have plans that define goals and objectives that provide a baseline against which to measure progress. Some also support local and regional planning efforts that help educate community members and build the local capacity necessary for successful broadband infrastructure projects. Local and regional planning efforts can help communities identify their needs and goals, start conversations with providers, evaluate options, and move toward implementing infrastructure projects.

Funding and operations. Some states are providing funding to support broadband deployment in unserved and underserved areas through grant programs that fund a portion of the cost of deployment in these communities. They are also ensuring accountability by requiring that grantees demonstrate they are providing the service they were funded to deliver while also providing the state with the data needed to evaluate the program and progress toward defined goals.

Program evaluation and evolution. States that are supporting planning efforts and funding infrastructure projects are evaluating the performance of these efforts and incorporating lessons learned. States continue to update program goals and activities as their programs mature, addressing broadband adoption and working to help communities make full use of their broadband infrastructure.

- Stakeholder Outreach and Engagement
  - Working with a broad range of entities.
  - Collaborating with state-level partners.
  - Engaging local stakeholders,
- Policy Framework
  - Defining a clear policy direction
  - Addressing identified policy barriers
  - Connecting broadband to other policy priorities
- Planning and Capacity Building
  - Adopting state broadband plans.
  - Supporting local and regional planning efforts.
- Funding and Operations
  - Provide state funding to support broadband deployment in unserved and underserved areas.
  - Address accountability for investments.
- Program Evaluation and Evolution
  - Evaluating program performance.
  - Updating program goals and activities.

U.S. Chamber of Commerce

Unlocking the Digital Potential of Rural America
March 2019

Access to digital tools for rural America would have added $74.4B per year for the last 3 years ($84.5B annually going forward) plus $41.3B per year added value for the last 3 years and would have 316,605 jobs. By increasing the quality of connectivity, calibrating the skills required by businesses with how we prepare the American workforce, and maximizing exposure to digital literacy programs for small business owners, small businesses in rural America could realize benefits far greater than they have in the past. Based on the survey conducted for this study, rural small businesses could add over $84 billion in sales per year in the next three years and could create another 360,000 jobs in rural areas, where 17.5 million adult residents are either unemployed or no longer actively looking for employment. Unlocking the digital potential in rural America is important for American small businesses and critical to future U.S. economic growth.

Increase digital connectivity in rural areas**.** Internet and mobile phone connectivity are crucial to selling online. The connection and speed at which a consumer and vendor transact matters. While over 92% of Americans have access to high-speed internet, about 27% of rural residents still do not have access to the FCC broadband standard. The private and public sectors should continue to identify opportunities to expand connectivity, including through deploying infrastructure and expanding wireless spectrum in order to add coverage and capacity in rural areas.

Increase the talent pipeline of candidates trained in digital skills (cloud, digital marketing). Without a skilled workforce, small businesses cannot thrive. There is a shortage of skilled IT professionals in rural areas to assist small businesses. The private and public sectors should continue to identify opportunities to partner to ensure the skills businesses need in their workforce match the local curricula preparing the American workforce for the 21st century.

Increase adoption of digital training and digital tools by rural small businesses so they can scale their operations**.** This study highlights two points: the positive benefits for rural small businesses effectively utilizing digital tools to sell online and the potential for businesses currently underutilizing those digital tools to grow. Showcasing existing programs offered by the Small Business Administration and affiliated Small Business Development Centers across the country is a cost-effective way for rural small business owners to increase their digital literacy. Further, as digital tools evolve, increased opportunities for private sector companies to train small business owners on new products will help them start, scale, and compete in a global economy.

Benton Institute 2019 Report Endnotes for Economic Return on Internet Investment

U.S. Digital economy has grown at an average rate of 9.9% over the past 2 decades, more than 4 times that of the total economy (2.3%). [35]

The full benefit of broadband is likely to be even larger than its impact on the GDP,[38] given its potential to transform how companies operate and how business is conducted.

Since 1998, investment in internet-connected computers, communications equipment, and software in the digital sector has more than doubled (from $173B to $325B), but it has only risen 19% in the physical sector over the same period.[40] By one economic analysis, extending technologies into physical sectors could boot economic growth by 11% over the next decade or more, adding $2.7 trillion to annual U.S. economic output in 2031, and increasing wages and salary payments t workers by $8 trillion.[41]

35. Bureau of Economic Analysis, "Measuring the Digital Economy: An Update Incorporating Data from the 2018 Comprehensive Update of the Industry Economic Accounts," April 2019, 6, https://www.bea.gov/system/files/2019-04/digital-economy-reportupdate-april-2019_1.pdf.

36. Christine Zhen-Wei Qiang, Carlo M. Rossotto, and Kaoru Kimura, "Economic Impacts of Broadband," Chapter 3, in Extending Reach and Increasing Impact: 2009 Information and Communications for Development Report, (Washington, DC: The World Bank, 2009), 37-38.

37. See, e.g., Richard Adler, "Toward a Better Understanding of Internet Economics," The Internet Association and the Richard Paul Richman Center for Business, Law, and Public Policy – Columbia Law & Business Schools, https://internetassociation. org/wp-content/uploads/2018/06/IA-Toward-A-Better-Understanding-Of-Internet-Economics-2018-1.pdf; James Manyika and Charles Roxburgh, "The Great Transformer: The Impact of the Internet on Economic Growth and Prosperity," McKinsey Global Institute, October 2011, 1-4.
38. Various researchers believe that the true impact of digital network applications is not (or perhaps cannot be) properly measured, with more traditional methods increasingly missing a growing range of their contributions. See, e.g., Roberto Gallardo, Brian Whitacre, and Alison Grant, "Broadband's Impact: A Brief Literature Review," Purdue University Center for Regional Development, Publication 001, January 2018, 10. For example, GDP does not measure the economic value of online goods and services that are available for free, the changes in quality and variety as a result of having more options, or many other efficiencies 116 Endnotes brought about by internet services. The measurement problem becomes even more pronounced as the use of broadband networks and other digital technologies become more integrated into the business processes of so many different industries. Richard Adler, "Toward A Better Understanding Of Internet Economics," Internet Association, 4-13, https://internetassociation. org/wp-content/uploads/2018/06/IA-Toward-A-Better-Understanding-Of-Internet-Economics-2018-1.pdf.

Additional Resource on Economic ROI: U.C. Riverside Paper (Lloyd Levine 2018)

At the macroeconomic level, research shows positive economic multipliers associated with government investment in infrastructure. Qiang et al. (2009), in a study for the World Bank, found that an increase in broadband access of 10 percentage points was correlated with a 1.3 percentage point increase in economic growth in high-income economies. As of 2006, the shift from dial-up internet access to broadband internet access contributed $8.3 - $10.6 billion of incremental U.S. gross domestic product (Greenstein and McDevitt, 2011).

CETF Estimate of More Than 80M Unconnected and Underconnected U.S. Residents

U.S. population is 328.2M. Pew Charitable Trusts survey shows 10% unconnected and 17% underconnected (smartphone only), which when applied to the total population would be 27% of 328.2M or about 88M are digitally-disadvantaged. In the interest of being conservative, CETF rounded down to the estimate of "more than 80M" U.S. residents.

The CETF estimable for the total number of digitally-disadvantaged U.S. residents aligns with the Common Sense Media estimate of one-third of all U.S. students (15-16M) being "shut out" from online instruction because they lack access to the devices and connectivity required for distance learning. About one-fourth of all U.S. low-income households have children in school (in California, which has a younger and poorer population than the national average, the figure is one-third). Thus, nationwide, three-fourths of all low-income households don't have children in school but also are digitally-disadvantaged. Further, the Common Sense Media estimate does not include parents. Thus, 80M estimate of total number of digitally-disadvantaged U.S. residents is consistent with the Common Sense Media estimate of the number of students.

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