



DELTA PROTECTION

COMMISSION



Connecting the Delta: Broadband Action Plan

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for the Delta Protection Commission

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BACKGROUND AND PURPOSE

In 2014, the Delta Protection Commission (DPC) developed the Delta Community Action Planning project to increase civic vitality and preserve the values and character of historic Delta towns. Through the community action planning process, broadband infrastructure was identified as an essential utility needed to serve residents, businesses (including agricultural operations), and visitors.

Broadband access supports economic growth and connects individuals and households to business, government, health, safety, and educational resources. Proper infrastructure and education around this technology are necessary for communities to fully participate in society, democracy, and economy.

According to the Federal Communications Commission’s [2018 Broadband Deployment Report](#), 80% of the approximately 24 million Americans who still lack access to affordable high-speed Internet service reside in rural communities. Among the five legacy communities identified in the Delta community action plans (Clarksburg, Courtland, Hood, Isleton, and Walnut Grove), approximately one-third of households do not have Internet subscriptions. Additionally, 17% of households within Delta communities do not have access to a computing device (desktop, laptop, smartphone or tablet).

Table 1- Household Computers and Internet Subscription Data

	California	Delta Legacy Communities (Combined)	Clarksburg (95612)	Courtland (95615)	Hood (95639)	Isleton (95641)	Walnut Grove (95690)
Total Households		2,432	398	309	84	816	825
Households with an Internet subscription	83%	69%	80%	83%	60%	61%	67%
<i>Cellular data plan only</i>	7%	18%	24%	19%	23%	9%	23%
<i>Cable, fiber optic, DSL, fixed wireless</i>	72%	39%	39%	45%	37%	42%	35%
<i>Satellite</i>	6%	14%	24%	20%	0%	13%	8%
Households without Internet subscription	17%	31%	20%	17%	40%	39%	33%
Households with no computing device	10%	17%	12%	2%	51%	21%	18%

Source: [2013-2017 American Community Survey 5-Year Estimates](#)

The purpose of this report is to prompt specific action by providing a detailed, tangible broadband improvement plan for the five legacy communities. Additionally, it is intended to improve broadband adoption and support by informing local governments and all those affected by the lack of high-speed Internet service.

METHODOLOGY

The Delta Protection Commission engaged Valley Vision to develop this broadband report and action plan. Valley Vision manages the Connected Capital Area Broadband Consortium,

which has completed a variety of broadband assessments and developed priorities and recommendations for improving broadband in communities across the Sacramento region. Additionally, Valley Vision managed the Ag Tech Pilot project in the Sacramento region, which assessed and documented needs for broadband access in agricultural settings and tested broadband-reliant precision agriculture technologies.

Valley Vision initiated this broadband action planning project by introducing itself and the project goals to the Delta community by attending standing community meetings with the Clarksburg Citizens Advisory Council, Courtland Town Association, Hood Community Council, Isleton City Council, Walnut Grove Rotary, and Delta Citizens Municipal Advisory Council. Valley Vision then facilitated three community workshops in Clarksburg, Walnut Grove, and Isleton respectively. The workshops were open to the public, and invitations were distributed through posted flyers at community gathering spots and email invitations sent through the entities noted above as well as the Delta River Unified School District, and the Delta Protection Commission.

Each of the workshops were attended by four to nine attendees. At the workshops, Valley Vision shared information on existing capacity and resources in the region, and sought input on community priorities, perceived challenges, and suggested solutions. The following plan reflects priorities and concerns voiced in the introductory meetings, workshops, and Delta Community Action Planning project, as well as successes identified from other places.

THE STATE OF BROADBAND IN THE DELTA

Community Challenges and Concerns

As noted previously in this report (*Table 1 – Household Computer Access and Internet Subscription Data*), households in the legacy communities subscribe to the Internet at a far lower rate than is seen throughout the state (31% of households in legacy communities have no Internet subscription as opposed to 17% in California). Access, quality, reliability, and cost all factor into this circumstance. The Delta is faced with many barriers and substandard conditions of and for broadband, compared to its more urbanized neighboring geographies.

Although each Delta community has unique governance, demographics, and interests, many of the broadband challenges identified in the workshops were shared among these different communities. Delta community members voiced broadband quality and access frustrations, equity discrepancies, and educational and safety concerns. Additionally, while not exclusive to broadband, it must be noted that each community also identified challenges with mobile wireless (i.e. cell phones) and lack of signal availability.

Quality and Access Challenges

Challenges begin with limited options by which to access the Internet. Households and businesses within the legacy communities have no fiber optic options, only one (and in some cases no) digital subscriber line (DSL) provider option, limited fixed wireless options which are entirely dependent on place of residence/business, and two satellite options.

Most of the options that do exist are inadequate. By way of example, the Federal Communication Commission and United States Department of Agriculture have both targeted minimum Internet speeds of 25 megabytes per second (Mbps) download and 3 Mbps upload. These speeds allow users to search the Internet, receive and send email, upload and download pictures and large documents, stream music and movies, control household “smart” appliances and security systems, participate in video conferencing, and other functions that are becoming the norm in everyday life. Speeds lower than this can result in unreliable connections and slow transfer times. While at least one of the fixed wireless options available to some within the Delta is able to deliver at these speeds, none of the other sources (i.e. DSL or satellite) offer services that meet this target.

Broadband quality and access challenges in the Delta are exacerbated by limited provider investment and physical terrain barriers. The underinvestment from service providers can be linked to return on investment. Generally, the Internet service providers (ISPs) look for evidence that costs will be recovered, and ultimately, profit will result from their infrastructure investments. Achieving return on investment in rural communities is a tall order, which may necessitate supplemental resources.

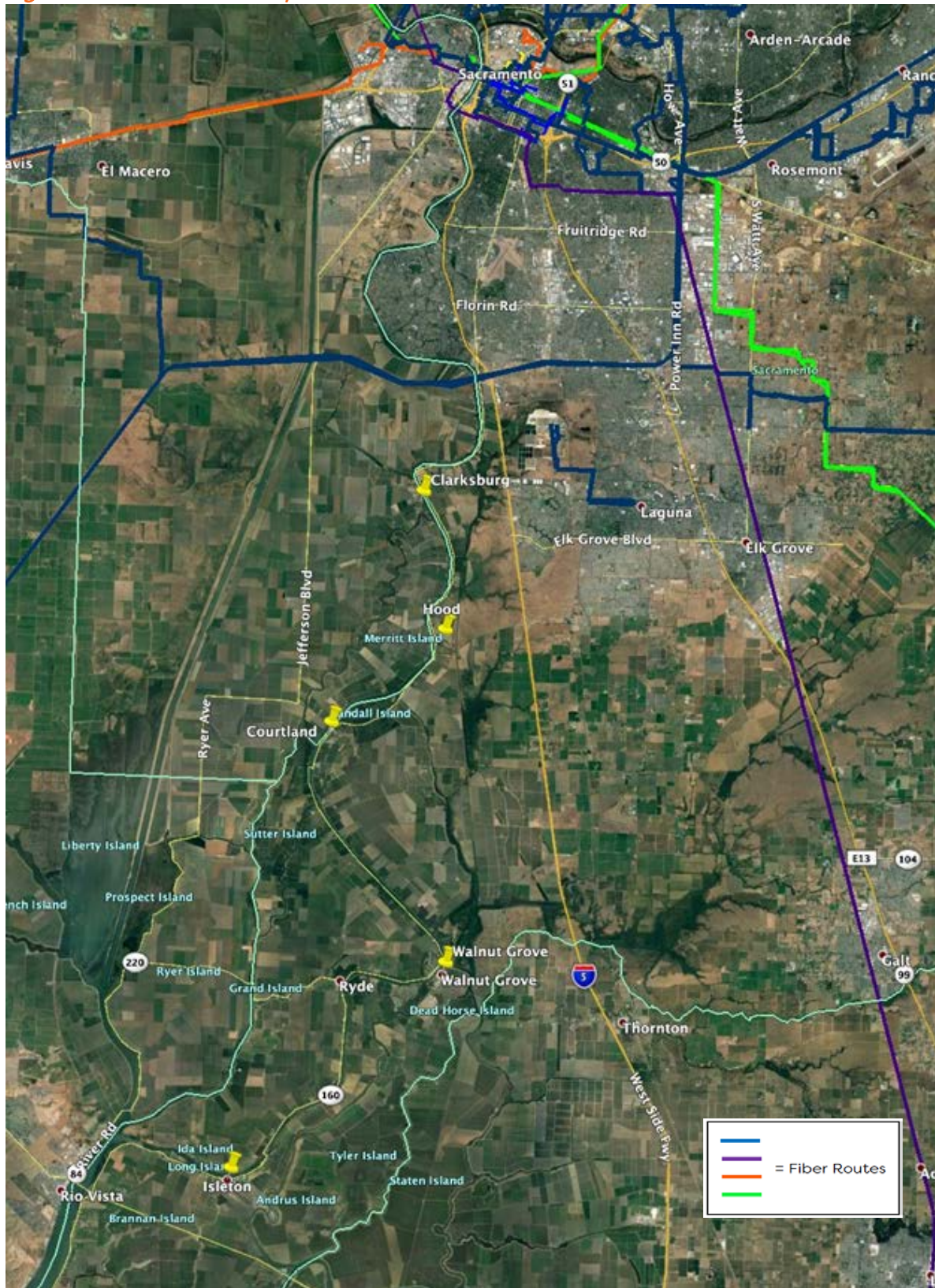
Currently, Frontier Communications is the only wireline Internet Service Provider (ISP) registered with the California Public Utilities Commission (CPUC) as serving the Delta’s legacy communities. Frontier relies on copper-wire connections, which are unable to deliver the bandwidth needed to provide high speed Internet connections to all residents, businesses, schools, and others in the Delta. Maximum advertised speeds cap at 24 Mbps, however, workshop attendees expressed that their own testing commonly reported actual download speeds of less than 3 Mbps.

Reported fiber optic routes currently bypass the Delta, limiting connectivity to this broadband source (Figure 1). Connecting to the closest fiber routes is cost prohibitive for service providers, due to the low housing and population density in the Delta. Workshop attendees in Clarksburg and Walnut Grove both noted potential opportunities to link the installation of fiber (or conduit through which fiber could later be installed) with other upcoming capital improvement projects that may create cost saving and generate interest.

While wireline options (fiber, DSL, copper) have not advanced in the recent past, more fixed wireless options have become available in some of the Delta communities, with speeds of 50 and even 100 Mbps. Fixed wireless options were discussed at each of the workshops as a potentially less cost-intensive infrastructure solution than fiber or wireline services. It was noted, however, that wireless services degrade due to physical barriers such as tree canopies, buildings, levees, and even weather events, such as fog, making non-line-of-site connections challenging. Similar problems were reported with satellite technologies, which were further challenged by the presence of monthly data-usage caps.

The challenge of quality and access was reflected in an assessment completed by Tellus Venture Associates, which has graded numerous geographies throughout California based on the number of provider options, broadband speeds, and availability of fiber. Under Tellus Ventures rating instrument, all of the Delta communities received failing grades.

Figure 1 - Fiber Routes Map



Source: Tellus Venture Associates, April 2019

Equity and Social Justice Concerns

Many Delta community members shared that they feel left behind with regards to broadband investment. This sentiment is not out of line with other's perceptions of investment in rural areas. In a comparative study conducted by Pew Research Center, majorities of Americans in rural (71%), suburban (61%) and urban (57%) communities say that, when it comes to how the federal government spends money, rural areas receive less than their fair share.

With the exception of Isleton, Delta communities are unincorporated areas without stand-alone jurisdictional authority or organizing power, leading them to rely on resident volunteers or county government to address public concerns. Individuals from the community workshops shared that broadband priorities can and have been set aside for more pressing issues due to capacity limitations of these communities and their leadership. Generating sustained interest is a challenge.

In addition to challenges in attracting and securing broadband infrastructure investments, workshop attendees also perceived that Delta residents pay a higher cost for inferior service levels compared to residents in urban core areas. Attendees want comparable cost for comparable service.

Concerns for non/non-native English speakers, senior populations and low-income households within the Delta were also identified. The [*California Emerging Technology Fund's \(CETF\) 2016 Annual Survey*](#) found that those without broadband are more likely to be Latino, foreign-born and non-English-speaking, and with a family income of less than \$50,000 in comparison to those with broadband. The same factors are greatly impacting broadband use in the Delta communities, where 34% of the residents speak a language other than English in the home; 45% of households have one or more people who are 60 years or older, and 46% of household incomes are less than \$50,000 (US Census, American Community Survey). With limited broadband access, these populations will be further isolated and fall further behind, making the Delta as a whole less competitive than other geographies.

Safety and Education Concerns

At all three community workshops, Delta residents emphasized educational and safety factors as reasons for prioritizing broadband. It was expressed that the Delta communities are in particular jeopardy because of inadequate and/or unreliable broadband. As an example, it was reported that the Hood fire department relies on sirens to communicate with volunteer fire fighters because Internet and wireless devices have unreliable connectivity. Workshop attendees in Walnut Grove and Isleton both reported that there have been increasing discussions with the County Sheriff about utilizing more technology to monitor remote areas since there are limited resources from the sheriff's department to monitor or reach these areas directly. But such activities require strong, reliable Internet service.

The community workshops clearly identified resident's priorities around educational broadband needs. In 2014, the California Assessment of Student Performance and Progress

(CAASPP) was adopted. This requires students (grades 3–8) to take a computer adaptive test and performance task delivered online. As educational authorities update testing requirements to prepare students for the growing technology usage in the workforce, communities with limited/inadequate broadband services struggle to provide the resources necessary to properly facilitate and support students.

A participant at the Isleton workshop shared that 10% of students in Isleton Elementary School's computer lab commonly lose connection when the lab is full (capacity at 30 students). Additionally, community members throughout the Delta shared common incidences of students and families sitting outside of public libraries to gain access to the Internet for homework or to Skype family members from afar. This gap in access between students who actively use technology in contrast to those who have limited resources to engage with technology (such as the experiences of students in the Delta) is commonly referred to as the Digital Divide. This divide follows other systemic inequalities and reinforces differences in school ratings and related student outcomes, including preparedness for higher education and/or job readiness.

Community Assets and Strengths

In March 2019, the Delta was the first national heritage area (NHA) designated in California. Only 55 NHAs have been designated since 1984 and this designation hosts many opportunities for funding and economic development. [*The Economic Impact of National Heritage Areas*](#) provides six case studies that represent the potential revenue, job growth, and partnership opportunities this designation holds for the Delta.

On a local scale, communities in the Delta have proven willingness and ability to come together to drive priorities to action. Issues from youth recreation to preserving and restoring the Delta's waterways have banded Delta towns together for the betterment of their communities. Additionally, young families and businesses are moving into the community that have and can continue to reenergize efforts to improve the quality of life for Delta residents. When residents are passionate about an issue, they will organize. Landing on the message and rationale that will resonate with the appropriate champions is an important first step.

Although the five Delta legacy communities are served by two different counties, Sacramento and Yolo County are both connected to the California Research and Education Network (CalREN) through their public library main branches and county offices of education. CalREN is a high-capacity computer network with more than 8,000 miles of optical fiber operated by CENIC, a nonprofit organization that connects educational and research institutions to broadband. With this network, both counties have access to resources to help educators implement the Common Core and improve teaching and learning. Such connectivity presents potential opportunities for schools in the Delta to further expand their networks to this resource.

RECOMMENDATIONS FOR IMPROVING BROADBAND INFRASTRUCTURE & ACCESS

Findings from the assessment lead to three key recommendations that will have the greatest impact on the Delta communities' ability to secure improved broadband infrastructure. The first priority centers on establishing governance; the second on leveraging existing development opportunities; and the third on pursuing support funding.

Establish Broadband-Focused Leadership

A designated body is needed to drive broadband development among all of the legacy communities. Models such as public private partnerships (P3) and community services districts (CSDs) are able to provide recognized governance authority, access public funding, and create and update policy. These potential models should be considered for improving broadband infrastructure in the Delta.

BroadbandUSA published [*The Power of Broadband Partnerships*](#) in 2017, which provides a simple breakdown of steps for establishing broadband partnerships (Figure 2). A broadband partnership for the Delta community should be deeply rooted in public interests surrounding educational and safety priorities, while maintaining the flexibility needed to adapt to the fast-paced nature of innovative broadband technology.

Figure 2 – Building Partnerships

Four Steps to Building Successful Broadband Partnerships
1. Understanding typical broadband partnership structures
2. Finding the right partners
3. Determining each partner's contribution
4. Developing the partnership framework

Source: *The Power of Broadband Partnerships* by BroadbandUSA, May 2017

Benton Foundation's publication, [*The Emerging World of Broadband Public-Private Partnerships: A Business Strategy and Legal Guide*](#), provides detailed insight on the processes, benefits and risks in establishing P3s (Figure 3). P3s have varying structures of public-private investment and governance. These organizational structures/models are typically differentiated as the following:

- Model I: Public Facilitation of Private Investment
- Model II: Public Funding & Private Execution
- Model III: Shared Investment & Risk/Joint-Ownership

Due to limited resources of local public agencies, large ISP investment, and infrastructure in the Delta, a P3 that follows a joint-ownership model can be mutually beneficial for all participating parties. Joint-ownership models have been utilized for many infrastructure-oriented partnerships and can alleviate time and financial investment burdens on local county governments. Also, P3s incentivize project completion and provide contractual certainty on budgets, schedules, and long-term asset maintenance. In this structure, county governments could serve community institutions – addressing the educational and public

safety concerns of Delta residents, and a private/non-profit entity could target services towards residents and businesses.

Figure 3 – Public-Private Partnership Models

	MODEL I	MODEL II	MODEL III
RISK	LOW	HIGH	MODERATE
BENEFIT	POTENTIAL BUT NOT ASSURED	HIGH	HIGH
CONTROL	NONE	MODERATE	MODERATE

Source: Benton Foundation, May 2017

According to Benton’s publication, “joint-ownership broadband partnerships are hybrid arrangements where a locality and private partner find a creative way to share the capital, operating, and maintenance costs of a broadband network.” This model is commonly found in metropolitan areas where large ISPs project a high return in investment, however there are rural examples of this model that have been successful through thoughtful public partner planning and research on the front end. Examples of rural joint-ownership partnerships and other P3 models are described in the *Public Private Partnerships Models* section later in this report.

BroadbandUSA also published [An Introduction to Effective Public-Private Partnerships for Broadband Investments](#), which provides a guide to establish P3’s with proven practices from successful partnerships that have received federal funding. This publication lists activities that localities should consider early to provide a clear prospectus for private partners, including, but not limited to, identifying committed, community champions and issuing a Request for Information (RFI) to gauge potential partnerships and assess P3 feasibility.

Although Frontier Communications is the only large ISP reported serving all five of the Delta legacy communities, there are other various local ISPs and/or energy/utility-providing companies that serve the community that should be pursued for partnerships. Additionally, partnership with River Delta Unified School District (which serves all five communities) and the county library systems can be beneficial partners to advocate for further CENIC E-rate investment into the community (E-rate funding described later within the report). Public partners should also reflect diverse expertise with representation and support from county supervisors, technology, economic development, land use, transportation, municipal utilities and law enforcement departments. The local broadband consortium, the Connected Capital

Area Broadband Consortium – which is funded through the CPUC’s Advanced Services Fund to support the development of broadband infrastructure project applications – and the CPUC itself are additional considerations for further funding and advocacy opportunities.

As public pressure for broadband investment persists, key stakeholders need to be identified to mobilize efforts – beginning with committed community partners. The stakeholders can then determine which public and private entities to engage and build prospectuses, accordingly. The community must emphasize cultivating partnerships that diversify competencies and funding resources. Yolo County developed a [Broadband Strategic Plan](#) in 2015 and may serve as a great public leader in establishing a Delta broadband P3.

If formal entities like P3s are not possible, informal networks could still be advantageous. A core group committed to sustained advocacy can help prompt public sector and service provider action. To achieve this, the group must be active, must be vocal, and must be continuously involved in all channels of communication that may present opportunities.

Whether a formal or informal broadband-focused leadership structure is established, it must work closely with the respective county governments, with economic development and the elected supervisors offices being key points of contact. In particular, for activities in Yolo County, actions should be married to the concepts presented in the Yolo Broadband Strategic Plan referenced above.

Piggyback on All Infrastructure Opportunities

The Delta communities can dovetail broadband efforts onto existing and planned capital improvement projects. [Section 14051 of the California Government Code](#) (added through the Statutes of 2016, Chapter 505 from California Assembly Bill 1549) authorizes broadband deployment companies to coordinate conduit installation with the Department of Transportation (Caltrans), requiring Caltrans to report highway projects in advance. This is one of many “Dig Once” policies that aim to minimize the number and scale of excavations when installing telecommunications infrastructure.

Local governments can adopt further Dig Once/Climb Once policies that can support coordinated capital investment projects by calling for broadband fiber or cable (or conduit) to be laid whenever ground is opened or wires hung for other utility or infrastructure purposes. Within California, [Santa Cruz](#) and [San Benito](#) Counties have implemented ordinances that reinforce these dig/climb once policies. Also, the [City of Brentwood](#), located in the Delta, has had a conduit policy in place since 1999, and has extended conduit to over 8,000 homes and businesses, initially established through new home development installations¹. This approach may be plausible in Isleton through City policy as development in the area increases and possible in the unincorporated areas through county adoption of such ordinances. Additionally, streamlining permitting processes will accelerate projects, making them more attractive to service providers and others by reducing person-hours and duration of time required to move projects to completion.

¹ Kruse, D. *Policies and Ordinances that Facilitate Broadband Deployment*. NEO Connect.

Several capital improvement projects are currently in planning or under consideration. These could present rich opportunities for expanding fiber conduit. Examples include:

- Yolo County's [Countywide Transportation Capital Improvement Plan](#) includes designated roadways (Highway 84/Jefferson Blvd) approaching Clarksburg as a key corridor to upgrade. This presents opportunities for concurrent conduit installation along a major roadway within one of the Delta communities.
- California's [Statutes of 2006, Chapter 839](#) (from Senate Bill 1556) designated the Delta Protection Commission to plan the California Delta Trail, a 1,000-mile trail system along the Delta. As further development on this project continues, conduit installations could be appropriate in some segments.
- Sacramento County has a pending project to allow an existing 82-foot monopole to be used as a permanent cell facility (Oxbow Wireless Communication Facility) for the Delta community.
- Residents shared plans for sewer line development in Hood that county officials should consider for concurrent broadband infrastructure expansion.
- The Sacramento Area Council of Government (SACOG) is responsible for the Metropolitan Transportation Plan / Sustainable Communities Strategy (MTP/SCS). Cities, counties, and public agencies that plan on using federal transportation funding for transportation projects or programs must include those projects in the MTP/SCS project list. In this role, SACOG both holds information on planned transportation infrastructure projects – which could be leveraged for broadband infrastructure co-development – and routinely gathers community input on priorities for development. As of the drafting of this report, SACOG was in the process of updating the MTP/SCS.

Taking advantage of dig-once/climb-once opportunities requires committed advocacy and proactive communication. An organization, such as a P3, needs to actively research and monitor capital planning discussions and serve as an advocate to shepherd service providers to take advantage of these opportunities.

Secure Funding/Resources to Plan and Implement Projects

Although Delta residents have expressed the need for improved infrastructure in the past, financial barriers have prevented the community from acting on these issues. Broadband deployment and partnership development will require significant financial investment and labor that the community will need in order to move the needle forward on this issue. To help contextualize the scale of resources needed, BroadbandUSA breaks down broadband network deployment types and estimated infrastructure costs in their summary [Costs at-a-Glance: Fiber and Wireless Networks](#).

Federal financial resource considerations are listed below. Federal funding resources were compiled from the newly released (June 2019) federal funding database created by the National Telecommunications & Information Administration (NTIA).

Table 2 – Federal Funding Resources

Federal Funding Resources		
Program Overview	Program Purpose	Eligible Recipients
<p>E-Rate Program: The Federal Communications Commission (FCC) provides school and library discounts (support dependent on the level of poverty and rural/urban designation, ranging from 20-90% of the costs of eligible services).</p>	<ul style="list-style-type: none"> - Broadband infrastructure - Public computer access 	<ul style="list-style-type: none"> - Libraries - K-12 schools <p>Note: School districts and libraries may apply individually or as part of a consortium</p>
<p>Small, Rural School Achievement (SRSA) Program: The US Department of Education provides rural educational agencies and schools with financial assistance to fund initiatives aimed at improving student academic achievement.</p>	<ul style="list-style-type: none"> - Broadband adoption - Digital skills training 	<ul style="list-style-type: none"> - Rural recipients - K-12 schools
<p>BUILD Program: The US Department of Transportation funds multi-modal, multi-jurisdictional infrastructure projects that have a significant local or regional impact.</p>	<ul style="list-style-type: none"> - Planning - Broadband infrastructure 	<ul style="list-style-type: none"> - State governments - Local and tribal governments - U.S. territories - Transit agencies - Port authorities - MPOs - Other public subdivisions of State or local governments
<p>Healthcare Connect Fund Program: The FCC provides a flat 65% discount on an array of communications services for the provision of health care.</p>	<ul style="list-style-type: none"> - Broadband infrastructure - Broadband adoption 	<ul style="list-style-type: none"> - Higher education institutions - Hospitals - Non-profit organizations <p>Note: Available to both individual rural health care providers and consortia, which can include non-rural health care providers.</p>
<p>State Community Development Block Grant: The US Department of Housing and Urban Development (HUD) funds rural cities and counties to improve the lives of their low- and moderate-income residents through the creation and expansion of community and economic development opportunities in support of livable communities.</p>	<ul style="list-style-type: none"> - Broadband infrastructure 	<ul style="list-style-type: none"> - Non-entitlement cities/counties (i.e. cities and counties that have not received a direct allocation) - Non-federally recognized Native American communities - Colonia as defined by the National Affordable Housing Act of 1990
<p>Rural Economic Development Loan and Grant Program (REDLG): The U.S. Department of Agriculture (USDA) provides funding for rural projects through local utility organizations through grants and loans.</p>	<ul style="list-style-type: none"> - Broadband infrastructure 	<ul style="list-style-type: none"> - Commercial/Internet Service Providers - Electric Utilities/Co-ops

Federal Funding Resources		
Program Overview	Program Purpose	Eligible Recipients
<p>Community Connect Grant Program: The USDA helps fund broadband deployment in rural communities where it is not yet economically viable for private-sector providers to deliver service. The grants offer financial assistance to eligible service providers that will construct, improve, or expand broadband networks in rural areas.</p>	<ul style="list-style-type: none"> - Broadband infrastructure - Broadband adoption 	<ul style="list-style-type: none"> - State and local governments - Tribal entities - Commercial/Internet Service Providers - Non-Profit Organizations - Small Businesses
<p>Rural Broadband Access Loan and Loan Guarantee Program (Broadband Program): The USDA furnishes loans and loan guarantees for the costs of construction, improvement, or acquisition of facilities and equipment needed to provide service at a minimum speed (which is set/updated by the USDA).</p>	<ul style="list-style-type: none"> - Broadband infrastructure 	<ul style="list-style-type: none"> - State and local governments - Tribal entities - Commercial/Internet Service Providers - Non-Profit Organizations - Small Businesses - Electric Utilities/Co-ops
<p>ReConnect: The USDA offers three types of funding options for broadband infrastructure to connect rural families, businesses, farms, ranches, schools, libraries, and public safety facilities to modern, high-speed Internet. A rural area is eligible if it currently does not have sufficient access to broadband.</p>		<ul style="list-style-type: none"> - State and local governments - Tribal entities - Commercial/Internet Service Providers - Non-Profit Organizations - Small Businesses - Electric Utilities/Co-ops - Financial institutions

Source: <https://broadbandusa.ntia.doc.gov/new-fund-search>

Additionally, the State of California provides further funding opportunities through CPUC’s California Advanced Services Fund (CASF). The CASF provides grants to bridge the “digital divide” in unserved and underserved areas throughout the state. The CASF allocates funding to the following programs to address barriers of broadband access and digital equity.

[Broadband Adoption Account](#) provides grants to increase publicly available or after-school broadband access and digital inclusion, such as grants for digital literacy training programs and public education to communities with limited broadband adoption. The CPUC will give preference to programs and projects in communities with demonstrated low broadband access, including low income communities, senior citizen communities, and communities facing socioeconomic barriers to broadband adoption.

[Broadband Infrastructure Grant Account](#) provides funding for infrastructure projects that provide last-mile broadband access to households that no facility-based broadband provider offers service at speeds of at least 10Mbps download and 1Mbps upload.

[Broadband Public Housing Account](#) is available for network projects to be installed in unserved housing developments, with the term 'unserved' defined as a housing development where at least one housing unit is not offered broadband service. A housing unit is “not offered broadband Internet service” if the unit does not have access to a commercially available broadband Internet service, such as Digital Subscriber Line (DSL), a cable modem, or another protocol, available at the unit.

[Line Extension Pilot Program](#) provides funding to an individual household and/or property owner who qualifies for California LifeLine or CARE Program for an infrastructure grant to offset the costs of connecting a household or property to an existing or proposed facility-based broadband provider.

[California Emerging Technology Fund](#) makes investments in programs and projects to improve access, applications, affordability, accessibility and assistance, in order to achieve greater broadband adoption and close the digital divide. CETF's direct investments evolve based on the genesis of the funding.

PUBLIC-PRIVATE PARTNERSHIP MODELS

Below are a list of public-private partnerships and applicable joint-ownership models for the Delta community to consider for rural broadband development. These case studies are drawn from California and other parts of the nation, and offer successful practices and important lessons learned that can be adopted or adapted for use in the Delta.

[California Broadband Cooperative, Inc.](#)

California Broadband Cooperative, Inc. (CBC) was a National Telecommunications and Information Administration (NTIA) Broadband Technology Opportunities Program (BTOP) grant recipient in 2010. CBC partnered with the CPUC, California State Office of the Chief Information Officer, Caltrans, Nevada Department of Transportation, Inyo County, Mono County, Kern County, Praxis Associates, Communications Workers of America, and Inyo Networks to build a 553-mile middle-mile network along U.S. Route 395 between northern and southern California. You can learn more about CBC's expansion strategy and BTOP grant project at www.cbccoop.com.

[Tehama Colusa Canal Authority, California](#)

The Tehama Colusa Canal Authority partnered with the CSU Chico Geographical Information Center, a private consultant, and the water district members to study and develop practices that would allow broadband infrastructure equipment to be deployed along the canal rights of ways to provide broadband access to remote agriculture lands. The project was funded by the US Department of Agriculture Rural Development program. The entities examined the feasibility and possible fund centers, as well as existing assets that could be used to support the infrastructure. This partnership is shaping a new model for how broadband assets could be developed and deployed by utilities and other special districts.

[Anza Electric Cooperative, California](#)

In 2015, the Anza Electric Cooperative, its member-owners, and the residents who receive electricity from the Cooperative chose to add fiber optics and high speed Internet into the scope of the Cooperative. The broadband infrastructure now serves more than 4,000 rural members of the Cooperative. Some of the funding to develop the infrastructure was awarded from the California Advanced Services Fund, While this example is specific to electric cooperative, similar approaches could be used for other existing or to be developed utility cooperatives.

[OpenCape Corporation, Massachusetts](#)

OpenCape Corporation was awarded a federal grant from NTIA’s Broadband Technology Opportunities Program (BTOP) in 2010 to deploy a 350-mile fiber-optic and microwave broadband network, directly connecting anchor institutions in the Cape Cod region to 100 Mbps speeds. OpenCape Corporation is a 501(c)(3) non-profit organization that partnered with Barnstable County, Massachusetts Broadband Institute, RCN Metro Optical Networks, and Woods Hole Oceanographic Institution to receive the BTOP grant. You can learn more about OpenCape Corporation’s history and network development at <https://www2.ntia.doc.gov/grantees/opencape>.

[The Emerging World of Broadband Public-Private Partnerships: A Business Strategy and Legal Guide](#) also provides two case studies of successful rural joint-ownership partnerships, which are discussed below.

[Garrett County, Maryland](#)

Garrett County, Maryland has partnered with Declaration Networks Group (DNG) and Microsoft to provide broadband to residents and businesses. The County conducted a feasibility study prior to developing private partners to determine the best technology to address the needs of their rural community - fixed wireless technology (TV white space and unlicensed spectrum) were identified. *[The Economic Significance of License-Exempt Spectrum to the Future of the Internet](#)* details the economic potential of license-exempt radio spectrum. Additionally, the feasibility study determined six target unserved and underserved areas that the County prioritized broadband efforts in within a three-phase plan. You can read more about Garrett County’s broadband expansion efforts at <https://www.garrettcountry.org/broadband/press>.

Swift County, Minnesota

Swift County, Minnesota partnered with Federated Telephone Cooperative and Minnesota’s Office of Broadband to deploy a broadband network throughout the county. Federated Telephone Cooperative was able to receive a grant from the state in 2015 and the County supplemented costs through a bond. You can learn about the cost sharing of the projects at <https://www.benton.org/sites/default/files/partnerships.pdf>.

Table 3 – Key Takeaways from Public-Private Partnership Models

Model	Lessons Learned
CA Broadband Cooperative, Inc.	<ul style="list-style-type: none"> Partnered with private ISPs to plan, build, manage, and operate network
Anza Electric Cooperative	<ul style="list-style-type: none"> Mobilized a vote of the members to assess interest and level of commitment Secured funding through multiple sources, including public sources, private sources, and reserves Deliberate process for prioritizing and sequencing roll out of fiber infrastructure to homes within the service area
Tehama Colusa Canal Authority	<ul style="list-style-type: none"> Partnership of canal authority, water districts, university GIS mapping department, and consultant to design and conduct assessment Pre-established audience of interested stakeholders wanting to make use of service

Model	Lessons Learned
Open Cape Corporation, MA	<ul style="list-style-type: none"> • Developed a business & engineering plan with stakeholders • Partnered with a middle mile builder and operator • Partnered with an anchor institution for grant support
Garrett County, MD	<ul style="list-style-type: none"> • Contracted with a business & engineering consultant • Partnered with a private ISP and a large tech company • County funds matched with grants encourage private investment
Swift County, MN	<ul style="list-style-type: none"> • Partnered with private company to deploy broadband • Issued and sold County bond • County loan supplemented local telecom coop grant

CONCLUSION

As technological advancement persists, dependence on high-speed Internet access/broadband is crucial to the economic sustainability and competitiveness of communities, both locally and globally. Delta communities and stakeholders must prioritize and advocate for digital equity to ensure that these important legacy communities continue to thrive.

As described in this action plan, there are models to follow and resources to pursue to help improve the status of broadband for households, businesses, and others in the Delta. The recommendations presented in this action plan for achieving improved broadband are straightforward: (1) organize for action; (2) leverage existing opportunities; and (3) pursue and secure funding. The first of these recommendations cannot be emphasized enough. Because infrastructure development is such a time and resource intensive process, there must be champions from within the community who are committed to driving the research and advocacy that will be required. At the same time, the champions must know that they do not have to charge forward alone. Advisors and technical assistance can be found through local sources such as the Connected Capital Area Broadband Consortium (<https://valleyvision.org/projects/connected-capital-area-broadband-consortium/>).

GLOSSARY

Anchor institutions

Flagship community institutions, including but not limited to: schools, health care centers, and libraries. Anchor institutions are sometimes connected to fiber even when fiber service is not commercially available in the community. Because of this, they can act as a connection to the Internet backbone.

Bandwidth

The rate at which the network can transmit information across it. Generally, higher bandwidth is desirable. The amount of bandwidth available to you can determine whether you download a photo in 2 seconds or 2 minutes.

Broadband Consortia

Representatives of organizations including, but not limited to, local and regional government, public safety, elementary and secondary education, health care, libraries, postsecondary education, and community-based organizations, who facilitate the deployment of broadband services by assisting infrastructure grant applicants in the project development or grant application process under the California Advanced Services Fund.

Conduit

A reinforced tube through which cabling runs. Conduit is useful both to protect fiber-optic cables in the ground and because one can place the conduit underground when convenient and later "blow" or "pull" the fiber cabling through the conduit.

Cooperative (co-op)

A non-profit, member-owned organization that provides a needed service. Members pay a small fee to join and have voting rights within the organization.

Digital equity

The state of all members of a community having equal access and sufficient digital literacy to use communications technologies.

DSL

Digital Subscriber Line - or Internet access offered over the phone lines. DSL allows users to use the Internet at speeds greater than dial-up while also using the phone line for telephone conversations. DSL uses frequencies not used by human voices. Unfortunately, these frequencies degrade quickly over distance, meaning customers must live within a mile of the central office to get the fastest speeds.

Fixed wireless

A connectivity model that uses stationary wireless technology to bridge the "last mile" between the Internet backbone and the subscriber.

Middle mile

Middle mile is a term most often referring to the network connection between the last mile and greater Internet. For instance, in a rural area, the middle mile would likely connect the town's network to a larger metropolitan area where it interconnects with major carriers.

PPP

A public-private partnership divides risks and responsibilities of an infrastructure project between public and private entities.

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