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SOLVING THE DIGITAL DIVIDE IN NORTHERN CALIFORNIA:

THE CAPITAL NEEDED FOR BROADBAND INFRASTRUCTURE

**Corrected
August, 28 2020**

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EXECUTIVE SUMMARY

In December 2007, the California Public Utilities Commission (CPUC) authorized the California Advanced Services Fund (CASF) and in 2008 the Legislature reaffirmed that action in SB 1193. CASF has been designed to support projects that would a) provide broadband services to areas currently without broadband access and b) build out facilities in underserved areas. The goal of CASF has been to bridge the “Digital Divide”.

In 2020 the “Digital Divide” challenge still persists, especially in rural counties and inner cities across California. The major contributing factor is the lack of broadband infrastructure, or if it exists it is technologically antiquated.

This specific report has two foci. First, based on the official 2019 CPUC Data Availability and Mapping Report, this report presents the broadband infrastructure needs statewide and in 17 Northern California counties supported by four CPUC funded regional broadband planning consortia. Second, this report provides estimates of the capital funds that will be needed to deploy the broadband infrastructure statewide and in those 17 counties to solve the “Digital Divide”.

A. Status of Broadband Availability

Over the years CASF has been modified by legislative actions. Today, CASF is based on AB 1665, passed in 2017. The goal of CASF is to approve funding for broadband infrastructure projects that will provide broadband access to no less than 98 percent of California households in each of the 18 consortia regions, as identified by the commission on or before January 1, 2017.

As of January 1, 2019, 97.1% of the households statewide had broadband access at the California speed standards of 6 Mbps download and 1 Mbps upload. Three of the 18 regions, Los Angeles 98.9% (1st), Bay Area 98.4% (2nd), and the East Bay 98.4% (3rd) had achieved the 98% goal.

However, the four regions that encompass the 17 Northern California counties in this report have not come close to achieving the 98% goal. The lack of broadband infrastructure is the major reason for the four consortia regions not achieving the goal.

78.7% (18 th)	Upstate California	Lake, Colusa, and Glenn
89.0% (16 th)	Northeastern California	Plumas, Lassen, Butte, Modoc, Siskiyou, Shasta and Tehama
90.3% (13 th)	Redwood Coast	Del Norte, Humboldt, and Trinity
95.4% (11 th)	North Bay North Coast	Marin, Mendocino, Napa, and Sonoma

B. Estimated Capital Costs for CASF Eligible Households

Since inception CASF has been funded by a surcharge rate on revenues collected by telecommunications carriers from end-users for intrastate telecommunications services. No State General Fund budget funds have been allocated to CASF.

As of December 31, 2019, the CASF has funded 77 projects for \$270,733,063. AB 1665 authorized the Commission to continue the surcharge to collect \$330,000,000 for deposit into the CASF beginning January 1, 2018 and continuing through the 2022 calendar year.

Given the Legislature is currently considering changing the broadband speed standards set forth in AB 1665 the capital cost estimates in this report are based on three sets of speed standards: 1) Current Standards @ 6 Mbps download and 1 Mbps upload; 2) AB 570 Standards @ 25 Mbps download and 3 Mbps upload; and 3) SB 1130 Standards @ 25 Mbps download and 25 Mbps upload.

Table 1.0 - Estimated Capital Costs

	Total Estimated Capital Cost based on \$10,000 per CASF Eligible Household	Total Estimated Capital Cost based on \$25,000 per CASF Eligible Household	Total Estimated Capital Cost based on \$40,000 per CASF Eligible Household
	Dollars	Dollars	Dollars
COL 1	COL 2	COL 3	COL 4
Statewide			
6 Mbps download and 1 Mbps upload	\$1,219,082,800	\$3,047,707,000	\$4,876,331,200
25 Mbps download and 3 Mbps upload	\$2,287,082,800	\$5,717,707,000	\$9,148,331,200
25 Mbps download and 25 Mbps upload	\$6,145,832,800	\$15,364,582,000	\$24,583,331,200
17 Northern California Counties			
6 Mbps download and 1 Mbps upload	\$432,164,400	\$1,080,411,000	\$1,728,657,600
25 Mbps download and 3 Mbps upload	\$727,514,400	\$1,818,786,000	\$2,910,057,600
25 Mbps download and 25 Mbps upload	\$1,780,874,400	\$4,452,186,000	\$7,123,497,600

Based on the current California speed standards, the estimated capital costs Statewide range from \$1.22 billion at \$10,000 per household to \$4.88 billion at \$40,000 per household. For the aggregate of the 17 Northern California counties, the estimated capital costs range from \$432,164,400 at \$10,000 per household to \$1.73 billion at \$40,000 per household. The range of estimated capital costs for each county can be found in Table 3.0 (See Appendix) Column 12.

Based on the speed standards proposed in AB 570, the estimated capital costs Statewide range from \$2.29 billion at \$10,000 per household to \$9.15 billion at \$40,000 per household. For the aggregate of the 17 Northern California counties, the estimated capital costs range from \$727,514,400 at \$10,000 per household to \$2.91 billion at \$40,000 per household. The range of estimated capital costs for each county can be found in Table 4.0 (See Appendix) Column 12.

Based on the speed standards proposed in SB 1130, the estimated capital costs Statewide range from \$6.15 billion at \$10,000 per household to \$24.58 billion at \$40,000 per household. For the aggregate of the 17 Northern California counties, the estimated capital costs range from \$1.78 billion at \$10,000 per household to \$7.12 billion at \$40,000 per household. The range of estimated capital costs for each county can be found in Table 5.0 (See Appendix) Column 12.

C. Findings and Recommendations

As a result of developing this report we have concluded California has not been able to upgraded the infrastructure in rural California to solve the “Digital Divide” problem because:

- 1) the CASF program has never had sufficient funds to significantly address the overall “Digital Divide” challenge;
- 2) California has not benefitted significantly from Federal broadband programs;
- 3) incumbent telecommunications companies have not nor will make major investments of their own funds;
- 4) there has never been a comprehensive statewide strategic broadband plan; and,
- 5) there has never been an estimate of the capital costs and a funding strategy to deploy the needed infrastructure to solve the “Digital Divide”.

Once the Legislature decides on the speed standards going forward this report will be expanded to include data for all 18 regions across the state. The expanded report can be used:

- 1) as input into the development of the new State Broadband Action Plan Governor Newsom called for in a recent Executive Order; and,
- 2) to guide development of a strategy to finance the deployment of this needed broadband infrastructure.

INTRODUCTION

For nearly two decades a handful of organizations and individuals across California have been working diligently to solve the “Digital Divide” problem. Since 2007 the California Public Utilities Commission (CPUC) has been the state’s lead organization.

In December 2007 the CPUC authorized the California Advanced Services Fund (CASF) and in 2008 the Legislature reaffirmed that action in SB 1193. CASF has been designed to support projects that would a) provide broadband services to areas currently without broadband access and b) build out facilities in underserved areas. The goal of CASF has been to bridge the “Digital Divide”.

Since inception CASF has been funded by a surcharge rate on revenues collected by telecommunications carriers from end-users for intrastate telecommunications services. No State General Fund budget funds have been allocated to CASF.

Over the years CASF has been modified by legislative actions. Today, CASF is based on AB 1665, passed in 2017. The CASF funds are allocated to five CASF accounts:

- [Broadband Adoption Account](#)
- [Broadband Infrastructure Grant Account](#)
- [Broadband Public Housing Account](#)
- [Rural and Urban Regional Broadband Consortia Grant Account](#)
- [Line Extension Pilot Program](#)

The goal of CASF Broadband Infrastructure Grant Account is to approve funding for broadband infrastructure projects that will provide broadband access to no less than 98 percent of California households in each of the 18 consortia regions, as identified by the commission on or before January 1, 2017. Each year the CPUC publishes an official Data Availability and Mapping Report that shows how well we are doing statewide, by consortia region and by county. This report is based on the official 2019 CPUC Data Availability and Mapping Report.

In large part, the “Digital Divide” challenge persists today because of the lack broadband infrastructure or if it exists it is technologically antiquated, especially in rural counties and inner cities. The Covid-19 pandemic has spotlighted and amplified the extent to which broadband access is essential to: 1) delivery of quality public safety, education and health services; 2) personal productivity and well-being; and, 3) the state’s economic development and resiliency. Now, everyone wants action. And, several organizations have joined in to help address the problem.

Governor Newsom issued Executive Order on August 14, 2020, calling for the creation of a new State Broadband Action Plan by December 31, 2020. Hopefully, this first-ever organized effort led by the Executive Branch will be a major step forward to solving the "Digital Divide" problem.

This specific report focuses on two components of the proposed State Broadband Action Plan. First, based on the official 2019 CPUC Data Availability and Mapping Report, this report presents the broadband infrastructure needs statewide and the 17 Northern California counties supported by four CPUC funded regional broadband planning consortia.

Redwood Coast Connect Consortium Del Norte, Humboldt and Trinity
Upstate California Connect Consortium Lake, Colusa and Glenn
Northeastern California Connect Consortium Plumas, Lassen, Butte, Modoc, Siskiyou, Shasta, and Tehama
North Bay North Coast Broadband Consortium Marin, Mendocino, Napa and Sonoma

The broadband needs and capital funds estimates in this report are being based on three sets of speed standards:

Current Standards	@ 6 Mbps download and 1 Mbps upload
AB 570 Standards	@ 25 Mbps download and 3 Mbps upload
SB 1130 Standards	@ 25 Mbps download and 25 Mbps upload

In a separate report we estimate the capital costs to connect the locations in the recently FCC launched Rural Digital Opportunity Fund (RDOF).

BACKGROUND

A. State and Federal Awareness of the Need for Broadband

In its final report issued in January 2008, **“The State of Connectivity: Building Innovation Through Broadband,”** the California Broadband Task Force recommended seven key actions to help our state achieve fast, reliable, and affordable broadband services. The first recommendation was:

“Build out high-speed broadband infrastructure to all Californians.”

In making this recommendation, the Task Force stated, “Advancing new incentives for deployment and improving existing programs will create a world-class broadband infrastructure for California.”

In February 2011, the Federal Communications Commission (FCC) created the **National Broadband Plan (NBP)** wherein the FCC observed that “Broadband is the great infrastructure challenge of the early 21st century.” The NBP recommended seven long-term goals, of which the first is:

“At least 100 million homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speed of at least 50 megabits per second.”

B. Past and Present Efforts for Broadband in California

Over the past several years, three organizations have been promoting the needs for accelerating deployment of broadband across California--California Emerging Technology Fund (CETF), the California Public Utilities Commission (CPUC), and the Rural and Urban Regional Broadband Consortia.

CETF was formed in 2006 and for the past 14 years CETF has provided leadership statewide to close the “Digital Divide”. As part of the CETF’s initial program, regional consortia were created to promote the expanded availability of broadband Internet services. CETF funded these consortia to undertake studies to determine broadband demand aggregation, supply, and existing plans.

On December 20, 2007, the Commission authorized the California Advanced Services Fund (CASF) to bridge the “Digital Divide” in unserved and underserved areas in the state. In 2008 the Commission began awarding CASF Infrastructure grants.

In mid-2011, as part of the CASF, the Commission approved and funded Rural and Urban Regional Broadband Consortia to help promote broadband deployment, access, and adoption. As mentioned, since 2012 four of these regional consortia have been associated with the 17 counties in Northern California.

C. Past and Present Federal Efforts to Support and Fund Broadband

The American Recovery and Reinvestment Act of 2009, was a [stimulus package](#) enacted by the [111th U.S. Congress](#) and signed into law by [President Barack Obama](#) in February 2009. Developed in response to the [Great Recession](#), the primary objective of this federal statute was to save existing jobs and create new ones as soon as possible. Other objectives were to provide temporary relief programs for those most affected by the recession and invest in infrastructure, education, health, and renewable energy. Of the total of \$831 billion, \$7.2 billion was to complete [broadband](#) and [wireless](#) Internet access.

USDA has been investing in rural telecommunications infrastructure for decades. Currently there are five programs-ReConnect Program, Community Connect, Distance Learning Telemedicine and two loan programs. USDA’s current programs offer more than \$700 million per year for modern broadband e Connectivity in rural communities. In the coming months, USDA will almost double these longstanding programs with at least \$600 million of additional funds for expanding rural broadband infrastructure in unserved rural areas and tribal lands. This funding option was created by the United States Congress in the Consolidated Appropriations Act of 2018. It is an ambitious initiative to rebuild America’s infrastructure. Recommended by President Trump as a “first installment” of his bold proposal to restore and modernize the nation’s crumbling infrastructure, this pilot program will carry out our commitment to invest in rural America.

The **USDA Broadband ReConnect Program** furnishes loans and grants to provide funds for the costs of construction, improvement, or acquisition of facilities and equipment needed to provide broadband service in eligible rural areas.

The Connect America Fund (CAF) – a part of the Universal Service High-Cost program – is an FCC program designed to expand access to voice and broadband services for areas where they are unavailable. Through CAF Phase II, the FCC provides funding to service providers to subsidize the cost of building new network infrastructure or performing network upgrades to provide voice and broadband service in areas where it is lacking.

CAF Phase II support is being allocated in two stages. First, the funding was offered to primarily larger local telephone companies ("price cap carriers") on a state-by-state basis in certain high-cost unserved and underserved areas in exchange for those companies offering voice and broadband services meeting certain requirements to a required number of locations in eligible areas. Second, in areas where the support was declined and in certain other high-cost unserved and underserved areas located in the price cap carriers' service territories, support was allocated through the CAF Phase II auction. Service providers including electric cooperatives, wireless Internet service providers, cable operators, telecom carriers, and a satellite company — competed to receive funding in exchange for offering voice and broadband services meeting certain requirements to a required number of locations in the eligible areas covered by their winning bids.

Rural Digital Opportunity Fund (RDOF). On January 30, 2020, the Commission adopted the *RDOF Report and Order* ([Report and Order](#)) establishing a framework and rules for an RDOF auction to distribute support for connecting millions more homes and small businesses in rural areas to broadband networks. The Report and Order was released on February 7, 2020. In the item, the Commission established a total budget of \$20.4 billion, with up to \$16 billion for a Phase I auction to target wholly unserved census blocks; the methodology for compiling a list of eligible areas; the approach for calculating reserve prices in eligible areas; public interest obligations for recipients; the eligibility requirements; and the post-auction obligations and oversight measures. The Commission also adopted rules for competitive bidding for the RDOF auction and provided guidance about the procedures that it would use in the auction process. Phase II of the program will make available at least \$4.4 billion to target partially served areas, census blocks where some locations lack access to 25/3 Mbps broadband using the granular, precise broadband mapping data being developed in the FCC's Digital Opportunity Data Collection (DODC), along with census blocks unawarded in the Phase I auction.

STATUS OF BROADBAND AVAILABILITY

A. Statewide: Official CPUC Data Availability and Mapping Report for 2016 and 2019

The goal of the CASF is to achieve 98% broadband access. Annually the CPUC issues an official Data Availability and Mapping Report to show the number of households in each county being served by broadband. Table 2.0 depicts the changes in broadband availability between January 1, 2016 and January 1, 2019. On January 1, 2016, there were 12,941,948 households statewide (COL 2). 12,323,230 (COL 3), or 95.22 % (COL 4), were reported to be served at a minimum of the 6 Mbps download and 1.5 Mbps upload, the California speed standards at that time.

CPUC data as of December 31st, 2015 and 2018

County	All Households (CA DOF 1/1/2016)	2016 Served Households (Speeds are at least 6 Mbps down AND 1.5 Mbps up)		State Ranking by County (Highest Access to Lowest)	All Households (CA DOF 1/1/2019)	2019 Served Households (Speeds are at least 6 Mbps down AND 1 Mbps up)		State Ranking by County (Highest Access to Lowest)
		Number	Percent			Number	Percent	
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9
Statewide	12,941,948	12,323,230	95.22%		13,085,036	12,701,427	97.07%	
N. California	719,662	612,628	85.13%		712,628	655,159	91.94%	
No. CA % of State	5.56%	4.97%			5.45%	5.16%		
NORTHEASTERN								
Butte	88,666	78,330	88.3%	29th	79,452	76,115	95.8%	28th
Lassen	9,762	5,967	61.1%	51st	10,455	7,031	67.3%	54th
Modoc	4,072	1,695	41.6%	54th	4,312	1,914	44.4%	57th
Plumas	8,540	2,283	26.7%	55th	9,406	8,014	85.2%	49th
Shasta	70,426	54,965	78.0%	39th	71,534	64,834	90.6%	40th
Siskiyou	19,351	14,532	75.1%	43rd	19,932	16,890	84.7%	46th
Tehama	23,929	11,899	49.7%	53rd	24,366	20,582	84.5%	47th
Total	224,746	169,671	75.49%		219,457	195,380	89.03%	
UPSTATE								
Colusa	7,263	5,865	80.8%	36th	7,367	4,680	63.5%	55th
Glenn	10,019	6,370	63.6%	50th	10,222	9,154	89.6%	45th
Lake	26,537	22,116	83.3%	32nd	25,844	20,727	80.2%	50th
Total	43,819	34,351	78.4%		43,433	34,561	79.6%	
REDWOOD								
Del Norte	9,744	9,099	93.4%	19th	10,138	9,154	90.3%	42nd
Humboldt	55,986	43,696	78.0%	39th	57,757	53,503	92.6%	35th
Trinity	5,796	1,435	24.8%	56th	6,228	4,296	69.0%	53rd
Total	71,526	54,230	75.82%		74,123	66,953	90.33%	
NBNCBC								
Marin	103,127	100,250	97.2%	7th	104,289	102,041	97.8%	7th
Mendocino	34,226	23,006	67.2%	48th	35,361	26,595	75.2%	52nd
Napa	50,117	46,318	92.4%	22nd	49,581	48,245	97.3%	12th
Sonoma	192,101	184,802	96.2%	12th	186,384	181,384	97.3%	9th
Total	379,571	354,376	93.36%		375,615	358,265	95.38%	
Grand Total for 17 No. CA Counties	719,662	612,628	85.13%		712,628	655,159	91.94%	

Table 2.0 – 2016 Versus 2019 Broadband Availability

Table 2.0 depicts that 95.2% of the households statewide had broadband access as of January 1, 2016. There was nearly a two (2%) percent gain over the three years. However, some of the reported progress over the three-year period may be attributed to AB 1655 lowering the upload speed standard from 1.5 Mbps to 1.0 Mbps. The current pandemic highlights the growing importance of the upload

On January 1, 2019, there were 13,085,036 households statewide (COL 6). 12,701,427 (COL 7), or 97.07 % (COL 8), were reported to be served at the new California speed standards of 6 Mbps download and 1 Mbps upload, or better. The change in the standards was the result of AB 1665 in 2017.

B. 17 No. California Counties: Official CPUC Data for 2016 and 2019

Table 2.0 also depicts the changes in broadband availability between January 1, 2016, and January 1, 2019 for each of the 17 counties. For the aggregate of the 17 counties on January 1, 2016, there were 719,662 households (COL 2) representing 5.56% of the statewide total. 612,628 (COL 3), or 85.13 % (COL 4), were reported to be served at a minimum of the 6 Mbps download and 1.5 Mbps upload, the California speed standards at that time.

On January 1, 2019, there were 712,628 households for the 17 counties (COL 6). 655,159 (COL 7), or 91.94 % (COL 8), were reported to be served at the new California speed standards of 6 Mbps download and 1 Mbps upload, or better.

The changes for each of the 17 counties are also shown in Table 3.0. It interesting to note that while most individual counties improved broadband access over the three years their ranking against all 58 counties did not make much headway (COL 5 and COL 9). For instance, in the 2019 report all but one of the 10 counties in the Northeast and Upstate consortia regions and one of the three counties in the Redwood region fall in the bottom third of county rankings for broadband access.

Only in the NBNCBC consortium are three of the four counties in the top third of the county rankings. Mendocino County is ranked in the bottom group.

BROADBAND FUNDING PROGRAMS: IMPACT ON NO. CALIFORNIA

A. Federal Programs

Over the years California has not benefitted significantly from Federal broadband programs. For instance, in 2009 **ARRA Program** only awarded three (3) of 123 nationwide broadband infrastructure grants to California entities. These three projects included Digital 395, Central Valley and Plumas-Sierra middle-mile projects. The California ARRA grants totaled \$141.6 million of a reported \$3.5 billion nationwide. These ARRA grants were matched with grants from CASF. In addition, two of the three grant applicants provide matches.

- **Digital 395** \$109.1 million project---\$82 million from ARRA and \$29 million from CASF. Inyo did not match.

- **Central Valley** \$67 million project---\$46 million from ARRA, \$6.6 million from CASF, and \$6.6 million from CVIN.
- **Plumas-Sierra** \$17.2 million project---\$13.8 million from ARRA, \$1.7 million from CASF, and \$1.7 million from Plumas-Sierra.

Only the Plumas-Sierra project was in two of the 17 northern California counties.

In 2019 the **USDA Broadband ReConnect Program** awarded 79 projects in 33 states received grants for a total of \$698.0 million. None of projects were from California. To date in 2020 seven (7) projects have received \$77.7 million. None are in California.

As stated earlier, in the **CAF II Program** the FCC has allocated \$1.5 billion to 10 providers to provision broadband capabilities at 10/ speeds to potential identified unserved areas across the United States by the end of 2020. Three of those providers, Charter, AT&T and Frontier, had potential identified areas in the 17 northern California counties. According to the official 2019 CPUC Data Availability and Mapping Report these companies have deployed fixed wireless towers to reach 17,594 unserved households across the 17 counties. *NOTE: We are still in the process of verifying these actions of Charter, AT&T and Frontiers.*

B. State Programs

The **CASF** was started in 2008. As of December 31, 2019, the Commission has awarded CASF Infrastructure grants:

- 77 projects approved.
- \$270,733,063 awarded
- 23 projects approved in the 17 counties
- \$109,553,939 awarded

These 23 projects include:

- \$46,709,036-Route 299—Humboldt, Trinity and Shasta
- \$5,733,240-Route 36—Humboldt and Trinity
- \$68,168-Del Norte
- \$6,602,432-Karuk-Humboldt
- \$202,557-Petrolia-Humboldt
- \$61,952-Hopland-Mendocino
- \$18,392-Comptche-Mendocino
- \$108,000-Covelo/Laytonville-Mendocino
- \$12,652-Boonville-Mendocino
- \$7,687,016-Occidental-Sonoma
- \$1,491,078-Nicasio-Marin
- \$1,868,881-Bolinas-Marin
- \$57,596-Grenada-Siskiyou
- \$3,645,085-Happy Camp-Siskiyou
- \$545,690-Shingletown-Shasta

- \$2,295,687-Olinda-Shasta
- \$10,912,973-Lassen/Modoc
- \$41,192-Franville-Plumas
- \$1,512,163-Keddie-Plumas
- \$2,183,427-Mohawk Valley-Plumas
- \$1,118,873-Lake Davis-Plumas
- \$3,574,494-Elysian Valley-Plumas
- \$1,270,872-Plumas Eureka-Plumas

C. Telecommunication Providers' Investments

There does not appear to be any public mechanism to capture the investments from their own corporate funds. It does not appear to be significant, if any. We do know that Comcast and Sonic both have expanded services and infrastructure into some of the 17 counties. Neither company has participated in state or federal grant programs.

ESTIMATED CAPITAL \$\$ NEEDED

To our knowledge, no one has ever attempted to estimate the capital funds needed to achieve the 98% goal of broadband access by region set forth in AB1665. As shown earlier California did not fair very well in the ARRA program and has not benefitted significantly from the various USDA programs. At best the CAF II program maintained the status quo. Some would say they have hindered the deployment of broadband in rural California.

And, now we have another Federal Program, the Rural Digital Opportunity Fund (RDOF) that some feel is the answer. See the separate report on this topic.

The following attempts to estimate the capital funds needed to achieve the 98% goal. The estimates are based on the CPUC Official 2019 Data Availability and Mapping Report. Estimates are made for three sets of speed standards. Given the fact that the capital cost per household for recently funded CASF projects and those proposed in the latest round of applications ranged from slightly under \$10,000 to over \$50,000 per household our estimates use a low (\$10,000 per HH), a mid (\$25,000 per HH), and a high ((\$40,000 per HH) for each set of standards.

A. Current California Standards---@ 6 Mbps download and 1 Mbps upload

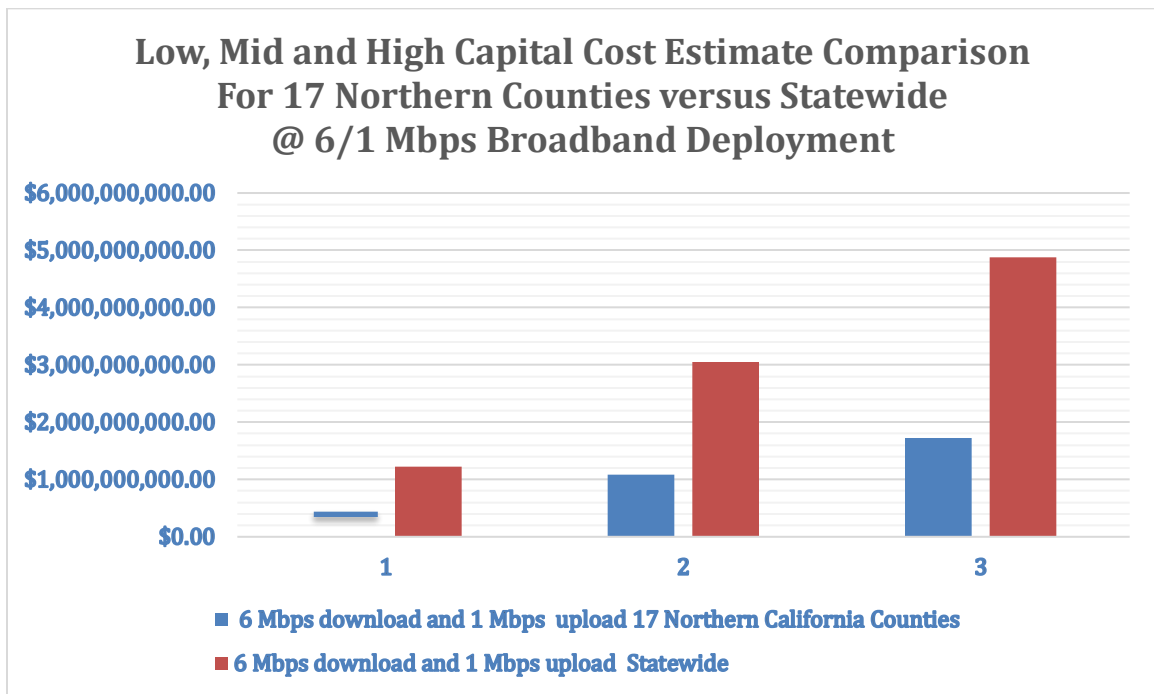
As shown in Table 3.0 (See Appendix) the data in Columns 1 through 8 were extracted directly from the CPUC Official 2019 Data Availability and Mapping Report. Column 9 was derived from the Report. Columns 10 and 11 were calculated based on the 98% goal. Applying the three-different capital cost per household factors resulted in the capital cost estimates in Columns 12, 13, and 14.

Based on using \$10,000 per household in Column 12 we estimate **Statewide** \$1.219 billion of capital funds would be needed to achieve the 98% goal. For the 17 **Northern**

California Counties in aggregate \$432,164,400 would be needed. The estimate for each county is also depicted in Column 12.

Based on using \$25,000 per household in Column 13 we estimate **Statewide** \$3.047 billion of capital funds would be needed to achieve the 98% goal. For the 17 **Northern California Counties** in aggregate \$1.080 billion would be needed. The estimate for each county is also depicted in Column 13.

Based on using \$40,000 per household in Column 14 we estimate **Statewide** \$4.876 billion of capital funds would be needed to achieve the 98% goal. For the 17 **Northern California Counties** in aggregate \$1.729 billion would be needed. The estimate for each county is also depicted in Column 14.



B. AB 570 Proposed Standards---@ 25 Mbps download and 3 Mbps upload

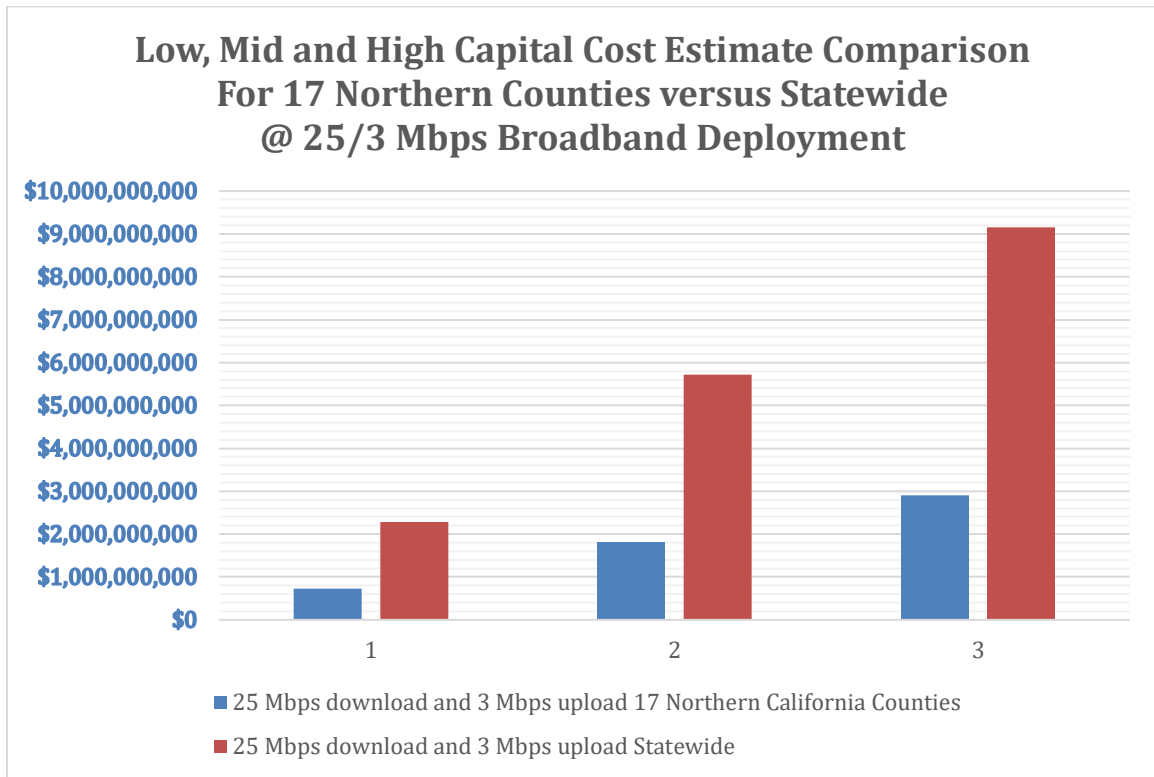
As shown in Table 4.0 (See Appendix) the data in Columns 1 through 8 were extrapolated from the CPUC Official 2019 Data Availability and Mapping Report. Column 9 was derived from that extrapolation. Columns 10 and 11 were calculated based on the 98% goal. Applying the three different capital cost per household factors resulted in the capital cost estimates in Columns 12, 13, and 14.

Based on using \$10,000 per household in Column 12 we estimate **Statewide** \$2.287 billion of capital funds would be needed to achieve the 98% goal. For the 17 **Northern California Counties** in aggregate, \$727,514,400 would be needed. The estimate for each county is also depicted in Column 12.

Based on using \$25,000 per household in Column 13 we estimate **Statewide** \$5.718 billion of capital funds would be needed to achieve the 98% goal. For the 17 **Northern**

California Counties in aggregate \$1.818 billion would be needed. The estimate for each county is also depicted in Column 13.

Based on using \$40,000 per household in Column 14 we estimate **Statewide** \$9.148 billion of capital funds would be needed to achieve the 98% goal. For the 17 **Northern California Counties** in aggregate \$2.910 billion would be needed. The estimate for each county is also depicted in Column 14.



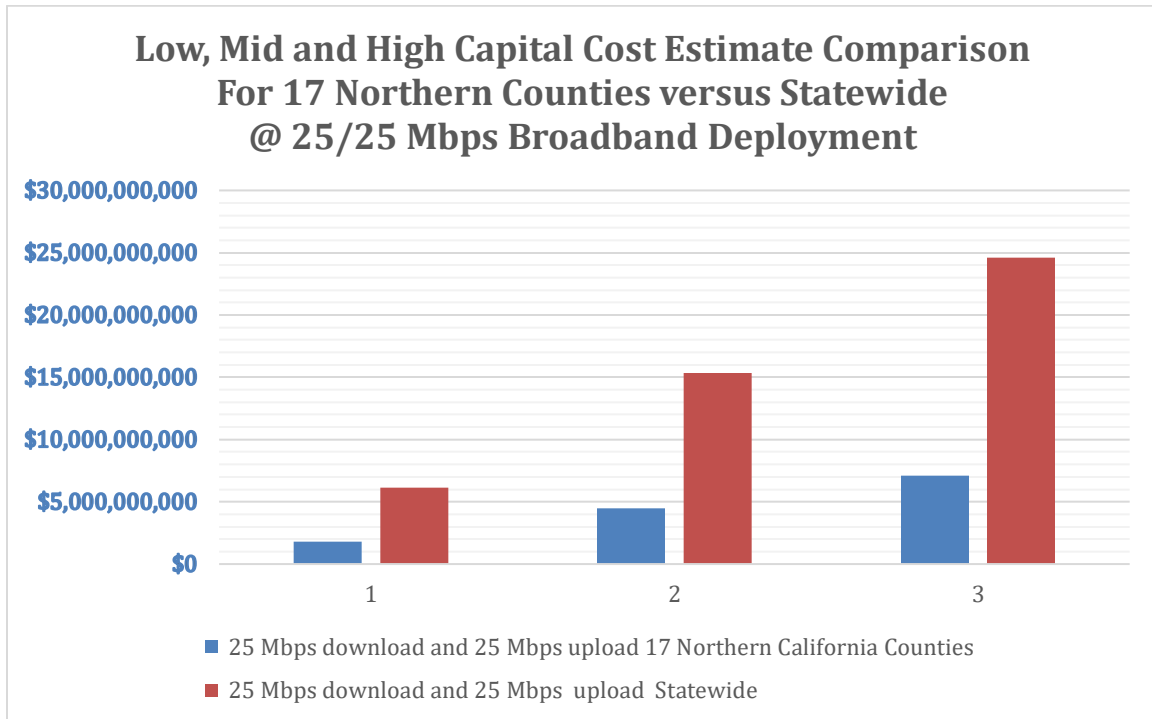
C. SB 1130 Proposed Standards---@ 25 Mbps download and 25 Mbps upload

As shown in Table 5.0 (See Appendix) the data in Columns 1 through 8 were extrapolated from the CPUC Official 2019 Data Availability and Mapping Report. Column 9 was derived from that extrapolation. Columns 10 and 11 were calculated based on the 98% goal. Applying the three different capital cost per household factors resulted in the capital cost estimates in Columns 12, 13, and 14.

Based on using \$10,000 per household in Column 12 we estimate **Statewide** \$6.146 billion of capital funds would be needed to achieve the 98% goal. For the 17 **Northern California Counties** in aggregate \$1.781 billion would be needed. The estimate for each county is also depicted in Column 12.

Based on using \$25,000 per household in Column 13 we estimate **Statewide** \$15.365 billion of capital funds would be needed to achieve the 98% goal. For the 17 **Northern California Counties** in aggregate \$4.452 billion would be needed. The estimate for each county is also depicted in Column 13.

Based on using \$40,000 per household in Column 14 we estimate **Statewide** \$24.583 billion of capital funds would be needed to achieve the 98% goal. For the 17 **Northern California Counties** in aggregate \$7.123 billion would be needed. The estimate for each county is also depicted in Column 14.



FINDINGS AND RECOMMENDATIONS

A. Findings

1. The CASF has never had sufficient funds to significantly address the overall “Digital Divide” challenge.
2. Historically, California has not capitalized on and/or qualified for major grants from Federal broadband programs.
3. There is little evidence the major incumbents have made or will make major investments of their own funds to upgrade the infrastructure in rural California.
4. After 40 years of relying on these companies to meet the broadband needs across California, we need to take control of planning our own future.
5. The magnitude of the capital cost estimates in this report point to the need for comprehensive planning and strategizing on how to best implement and fund the deployment of the needed broadband infrastructure. No more quick-fix attempts.

B. Recommendations

Once the Legislature decides on the speed standards going forward it is recommended this report be expanded to include data for all 18 regions across the state. The expanded report can be used:

- 1) as input into the development of the new State Broadband Action Plan Governor Newsom called for in a recent Executive Order; and,
- 2) to guide development of a strategy to finance the deployment of this needed broadband infrastructure.

APPENDIX

TABLE 3.0 Estimated Capital Cost by County @ 6/1 Based on CASF Eligible Households
CPUC data as of December 31st, 2018

County	All Households (CA DOF 1/1/2019)	Served Households (Speeds are at least 6 Mbps down AND 1 Mbps up)		Unserved Households with Slow Service (Speeds less than 6 Mbps down OR 1 Mbps up)		Unserved Households with No Service (Speeds less than 200 Kbps in both directions, or no service)		State Ranking by County (Highest Access to Lowest)	AB 1665 98% Goal Per Region	No of CASF Households Needed to Attain 98%	Low Projected Capital Cost per CASF Eligible Household	Mid Projected Capital Cost per CASF Eligible Household	High Projected Capital Cost per CASF Eligible Household
		Number	Percent	Number	Percent	Number	Percent						
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14
Statewide	13,085,036	12,701,427	97.07%	54,345	0.42%	329,259	2.52%		12,823,335	121,908	\$1,219,082,800	\$3,047,707,000	\$4,876,331,200
N. California	712,628	655,159	91.94%	13,883	1.95%	46,349	6.50%		698,375	43,216	\$432,164,400	\$1,080,411,000	\$1,728,657,600
No. CA % of State	5.45%	5.16%		25.55%		14.08%			5.45%	35.45%	35.45%	35.45%	35.45%
Capital Per CASF Eligible Household											\$10,000	\$25,000	\$40,000
NE & UPSTATE													
Bute	79,452	76,115	95.8%	1,343	1.7%	1,993	2.5%	28th	77,863	1,748	\$17,479,600	\$43,699,000	\$69,918,400
Colusa	7,367	4,680	63.5%	76	1.0%	2,611	35.4%	55th	7,220	2,540	\$25,396,600	\$63,491,500	\$101,586,400
Glenn	10,222	9,154	89.6%	362	3.5%	1,097	10.7%	45th	10,018	864	\$8,635,600	\$21,589,000	\$34,542,400
Lake	25,844	20,727	80.2%	2,371	9.2%	2,746	10.6%	50th	25,327	4,600	\$46,001,200	\$115,003,000	\$184,004,800
Lassen	10,455	7,031	67.3%	247	2.4%	3,177	30.4%	54th	10,246	3,215	\$32,149,000	\$80,372,500	\$128,596,000
Modoc	4,312	1,914	44.4%	60	1.4%	2,338	54.2%	57th	4,226	2,312	\$23,117,600	\$57,794,000	\$92,470,400
Plumas	9,406	8,014	85.2%	1,435	15.3%	1,373	14.6%	49th	9,218	1,204	\$12,038,800	\$30,097,000	\$48,155,200
Shasta	71,534	64,834	90.6%	579	0.8%	5,265	7.4%	40th	70,103	5,269	\$52,693,200	\$131,733,000	\$210,772,800
Siskiyou	19,932	16,890	84.7%	1,628	8.2%	2,463	12.4%	46th	19,533	2,643	\$26,433,600	\$66,084,000	\$105,734,400
Tehama	24,366	20,582	84.5%	2,912	12.0%	2,102	8.6%	47th	23,879	3,297	\$32,966,800	\$82,417,000	\$131,867,200
Total	262,890	229,941	87.47%	11,013	4.2%	25,165	9.6%		257,632	27,691	\$276,912,000	\$692,280,000	\$1,107,648,000
REDWOOD													
Del Norte	10,138	9,154	90.3%	0	0.0%	984	9.7%	42nd	9,935	781	\$7,812,400	\$19,531,000	\$31,249,600
Humboldt	57,757	53,503	92.6%	566	1.0%	3,688	6.4%	35th	56,602	3,099	\$30,988,600	\$77,471,500	\$123,954,400
Trinity	6,228	4,296	69.0%	153	2.5%	1,779	28.6%	53rd	6,103	1,807	\$18,074,400	\$45,186,000	\$72,297,600
Total	74,123	66,953	90.33%	719	1.0%	6,451	8.7%		72,641	5,688	\$56,875,400	\$142,188,500	\$227,501,600
NBNCBC													
Marin	104,289	102,041	97.8%	533	0.5%	1,715	1.6%	7th	102,203	162	\$1,622,200	\$4,055,500	\$6,488,800
Mendocino	35,361	26,595	75.2%	733	2.1%	8,033	22.7%	52nd	34,654	8,059	\$80,587,800	\$201,469,500	\$322,351,200
Napa	49,581	48,245	97.3%	176	0.4%	1,160	2.3%	12th	48,589	344	\$3,443,800	\$8,609,500	\$13,775,200
Sonoma	186,384	181,384	97.3%	709	0.4%	3,825	2.1%	9th	182,656	1,272	\$12,723,200	\$31,808,000	\$50,892,800
Total	375,615	358,265	95.38%	2,151	0.6%	14,733	3.92%		368,103	9,838	\$98,377,000	\$245,942,500	\$393,508,000
Grand Total for 17 No. CA Counties	712,628	655,159	91.94%	13,883	1.95%	46,349	6.50%		698,375	43,216	\$432,164,400	\$1,080,411,000	\$1,728,657,600

Table 3 1 Estimated Capital Cost by County @ 6/1 Based on CASF Eligible Households

TABLE 4.0 Estimated Capital Cost by County @ 25/3 Based on CASF Eligible Households

CPUC data as of December 31st, 2018

County	All Households (CA DOF 1/1/2019)	Served Households (Speeds are at least 25 Mbps down AND 3 Mbps up)		Unserved Households with Slow Service (Speeds less than 25 Mbps down OR 3 Mbps up)		Unserved Households with No Service (Speeds less than 200 Kbps in both directions, or no service)		State Ranking by County (Highest Access to Lowest)	AB 1665 98% Goal Per Region	No of CASF Households Needed to Attain 98%	Low Projected Capital Cost per CASF Eligible Households	Mid Projected Capital Cost per CASF Eligible Households	High Projected Capital Cost per CASF Eligible Households
		Number	Percent	Number	Percent	Number	Percent						
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14
Statewide	13,085,036	12,594,627	96.25%	161,150	1.23%	329,259	2.52%		12,823,335	228,708	\$2,287,082,800	\$5,717,707,000	\$9,148,331,200
N. California	712,628	625,624	87.79%	40,655	5.70%	46,349	6.50%		698,375	72,751	\$727,514,400	\$1,818,786,000	\$2,910,057,600
No. CA % of State Capital Per CASF Eligible Household	5.45%	4.97%		25.23%		14.08%			5.45%	31.81%	31.81%	31.81%	31.81%
NE & UPSTATE											\$10,000	\$25,000	\$40,000
Butte	79,452	76,089	95.8%	1,370	1.7%	1,993	2.5%	19th	77,863	1,774	\$17,739,600	\$44,349,000	\$70,958,400
Colusa	7,367	4,535	61.6%	221	3.0%	2,611	35.4%	51st	7,220	2,685	\$26,846,600	\$67,116,500	\$107,386,400
Glenn	10,222	8,752	85.6%	373	3.6%	1,097	10.7%	39th	10,018	1,266	\$12,655,600	\$31,639,000	\$50,622,400
Lake	25,844	20,443	79.1%	2,655	10.3%	2,746	10.6%	48th	25,327	4,884	\$48,841,200	\$122,103,000	\$195,364,800
Lassen	10,455	5,785	55.3%	1,493	14.3%	3,177	30.4%	52nd	10,246	4,461	\$44,609,000	\$111,522,500	\$178,436,000
Modoc	4,312	1,536	35.6%	438	10.2%	2,338	54.2%	55th	4,226	2,690	\$26,897,600	\$67,244,000	\$107,590,400
Plumas	9,406	7,383	78.5%	650	6.9%	1,373	14.6%	49th	9,218	1,835	\$18,348,800	\$45,872,000	\$73,395,200
Shasta	71,534	60,092	84.0%	6,177	8.6%	5,265	7.4%	41st	70,103	10,011	\$100,113,200	\$250,283,000	\$400,452,800
Siskiyou	19,932	9,457	47.4%	8,012	40.2%	2,463	12.4%	53rd	19,533	10,076	\$100,763,600	\$251,909,000	\$403,054,400
Tehama	24,366	19,352	79.4%	2,912	12.0%	2,102	8.6%	47th	23,879	4,527	\$45,266,800	\$113,167,000	\$181,067,200
Total	262,890	213,424	81.18%	24,301	9.24%	25,165	9.57%		257,632	44,208	\$442,082,000	\$1,105,205,000	\$1,768,328,000
REDWOOD													
Del Norte	10,138	9,154	90.3%	0	0.0%	984	9.7%	33rd	9,935	781	\$7,812,400	\$19,531,000	\$31,249,600
Humboldt	57,757	47,011	81.4%	7,058	12.2%	3,688	6.4%	44th	56,602	9,591	\$95,908,600	\$239,771,500	\$383,634,400
Trinity	6,228	1,707	27.4%	2,742	44.0%	1,779	28.6%	56th	6,103	4,396	\$43,964,400	\$109,911,000	\$175,857,600
Total	74,123	57,872	78.08%	9,800	13.22%	6,451	8.70%		72,641	14,769	\$147,685,400	\$369,213,500	\$590,741,600
NBNCBC													
Marin	104,289	101,931	97.7%	643	0.6%	1,715	1.6%	6th	102,203	272	\$2,722,200	\$6,805,500	\$10,888,800
Mendocino	35,361	25,394	71.8%	1,934	5.5%	8,033	22.7%	50th	34,654	9,260	\$92,597,800	\$231,494,500	\$370,391,200
Napa	49,581	47,537	95.9%	884	1.8%	1,160	2.3%	18th	48,589	1,052	\$10,523,800	\$26,309,500	\$42,095,200
Sonoma	186,384	179,466	96.3%	3,093	1.7%	3,825	2.1%	13th	182,656	3,190	\$31,903,200	\$79,758,000	\$127,612,800
Total	375,615	354,328	94.33%	6,554	1.74%	14,733	3.92%		368,103	13,775	\$137,747,000	\$344,367,500	\$550,988,000
Grand Total for 17 No. CA Counties	712,628	625,624	87.79%	40,655	5.70%	46,349	5.70%		698,375	72,751	\$727,514,400	\$1,818,786,000	\$2,910,057,600

Table 4 1 Estimated Capital Cost by County @ 25/3 Based on CASF Eligible Households

TABLE 5.0 Estimated Capital Cost by County @ 25/25 Based on CASF Eligible Households

CPUC data as of December 31st, 2018

County	All Households (CA DOF 1/1/2019)	Served Households (Speeds are at least 25 Mbps down AND 25 Mbps up)		Unserved Households with Slow Service (Speeds less than 25 Mbps down OR 25 Mbps up)		Unserved Households with No Service (Speeds less than 200 Kbps in both directions, or no service)		State Ranking by County (Highest Access to Lowest)	AB 1665 98% Goal Per Region	No of CASF Households Needed to Attain 98%	Low Projected Capital Cost per CASF Eligible Households	Mid Projected Capital Cost per CASF Eligible Households	High Projected Capital Cost per CASF Eligible Households
		Number	Percent	Number	Percent	Number	Percent						
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14
Statewide	13,085,036	12,208,752	93.30%	547,021	4.18%	329,259	2.52%		12,823,335	614,583	\$6,145,832,800	\$15,364,582,000	\$24,583,331,200
N. California	712,628	520,288	73.01%	144,089	20.22%	46,349	6.50%		698,375	178,087	\$1,780,874,400	\$4,452,186,000	\$7,123,497,600
No. CA % of State	5.45%	4.26%		26.34%		14.08%			5.45%	28.98%		28.98%	28.98%
Capital Per CASF Eligible Hhold											\$10,000	\$25,000	\$40,000
NE & UPSTATE													
Butte	79,452	70,578	88.8%	6,880	8.7%	1,993	2.5%	28th	77,863	7,285	\$72,849,600	\$182,124,000	\$291,398,400
Colusa	7,367	3,020	41.0%	1,736	23.6%	2,611	35.4%	47th	7,220	4,200	\$41,996,600	\$104,991,500	\$167,986,400
Glenn	10,222	6,500	63.6%	2,624	25.7%	1,097	10.7%	41st	10,018	3,518	\$35,175,600	\$87,939,000	\$140,702,400
Lake	25,844	19,348	74.9%	3,750	14.5%	2,746	10.6%	35th	25,327	5,979	\$59,791,200	\$149,478,000	\$239,164,800
Lassen	10,455	336	3.2%	6,941	66.4%	3,177	30.4%	53rd	10,246	9,910	\$99,099,000	\$247,747,500	\$396,396,000
Modoc	4,312	88	2.0%	1,887	43.8%	2,338	54.2%	54th	4,226	4,138	\$41,377,600	\$103,444,000	\$165,510,400
Plumas	9,406	476	5.1%	7,557	80.3%	1,373	14.6%	52nd	9,218	8,742	\$87,418,800	\$218,547,000	\$349,675,200
Shasta	71,534	52,028	72.7%	14,241	19.9%	5,265	7.4%	38th	70,103	18,075	\$180,753,200	\$451,883,000	\$723,012,800
Siskiyou	19,932	9	0.0%	15,459	77.6%	2,463	12.4%	58th	19,533	19,524	\$195,243,600	\$488,109,000	\$780,974,400
Tehama	24,366	11,901	48.8%	10,363	42.5%	2,102	8.6%	43rd	23,879	11,978	\$119,776,800	\$299,442,000	\$479,107,200
Total	262,890	164,284	62.49%	71,438	27.17%	25,165	9.57%		257,632	93,348	\$933,482,000	\$2,333,705,000	\$3,733,928,000
REDWOOD													
Del Norte	10,138	9,154	90.3%	0	0.0%	984	9.7%	25th	9,935	781	\$7,812,400	\$19,531,000	\$31,249,600
Humboldt	57,757	55	0.1%	54,015	93.5%	3,688	6.4%	56th	56,602	56,547	\$565,468,600	\$1,413,671,500	\$2,261,874,400
Trinity	6,228	94	1.5%	4,354	69.9%	1,779	28.6%	55th	6,103	6,009	\$60,094,400	\$150,236,000	\$240,377,600
Total	74,123	9,303	12.55%	58,369	78.75%	6,451	8.70%		72,641	63,338	\$633,375,400	\$1,583,438,500	\$2,533,501,600
NBNCBC													
Marin	104,289	100,323	96.2%	2,351	2.3%	1,715	1.6%	9th	102,203	1,880	\$18,802,200	\$47,005,500	\$75,208,800
Mendocino	35,361	23,515	66.5%	3,813	10.8%	8,033	22.7%	40th	34,654	11,139	\$111,387,800	\$278,469,500	\$445,551,200
Napa	49,581	46,162	93.1%	2,259	4.6%	1,160	2.3%	18th	48,589	2,427	\$24,273,800	\$60,684,500	\$97,095,200
Sonoma	186,384	176,701	94.8%	5,859	3.1%	3,825	2.1%	10th	182,656	5,955	\$59,553,200	\$148,883,000	\$238,212,800
Total	375,615	346,701	92.30%	14,282	3.80%	14,733	3.92%		368,103	21,402	\$214,017,000	\$535,042,500	\$856,068,000
Grand Total for 17 No. CA Counties	712,628	520,288	73.01%	144,089	20.22%	46,349	6.50%		698,375	178,087	\$1,780,874,400	\$4,452,186,000	\$7,123,497,600

Table 5. 1 Estimated Capital Cost by County @ 25/25 Based on CASF Eligible Households