

From: Keith Taylor
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To Whom It May Concern:

I write in submission of a co-authored public comments with my colleague, Ricardo Lainez. Our public comment is attached in PDF format.

I am pleased to provide more information, commentary, and testimony upon request.

Thank you in advance.

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Keith Taylor, MPA, PhD
Community Economic Development Specialist
Department of Human Ecology
UCDavis & UC Cooperative Extension
External Affiliate, [IU Ostrom Workshop](#)

Title: Achieving Universal Broadband Coverage: Enhancing Public Private Partnerships by
Engaging the Utility Cooperative Sector

Keith Taylor, MPA, PhD
Community Economic Development Specialist
Department of Human Ecology
UCDavis & UC Cooperative Extension
External Affiliate, [IU Ostrom Workshop](#)

Ricardo Lainez
Senior Fiber/Broadband Development Executive

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Overview

This white paper brief from UC Davis Extension Professor Keith Taylor and Senior Fiber/Broadband Development Executive Ricardo Lainez is intended to inform and introduce Governor Newsom's Broadband Council (GBC) to the variety of community broadband utilities around the United States. In Dr. Taylor's three years in California, he has observed that California's numerous utility challenges in broadband, water, and electricity is missing the voice of one of the nation's most innovative groups in utility entrepreneurship: the National Rural Electric Cooperative Association (NRECA) and its California equivalent, [Golden State Power Cooperative](#). It is Dr. Taylor's intention to catalyze an ongoing dialogue between California policymakers, ratepayers, the NRECA, and its member utility co-ops that could inform the GBC.

Introduction

The current conditions of Broadband infrastructure that is available in the rural and underserved areas have created an environment that is unfair and ultimately responsible for the lack of opportunities to a great number of our citizens who are at a disadvantage in various sectors of daily life, not limited to the gig-economy, e-commerce, and now -because of the current pandemic- telehealth and distance learning.

While all of those citizens are being affected by the technological singularity, some, in particular, are at a higher disadvantage. These groups, particularly youth and students, are not able to keep up with the growth that the Gig-world has to offer. If the singularity theory is our guide, this access and opportunity gap will grow exponentially.

To address this, work needs to be done at the local level to see that telecommunication infrastructure is robust. A new approach must be taken as past solutions or the status-quo model does not. Prior efforts at the national, state, and local levels have been gamed by incumbents due to abuse or lack of accountability.

The reality is that upgrading the current infrastructure is difficult due to many variables that do not cash effectively to the various providers that have held the market-place for over 40 plus years. When you take into account that many cities have been built on top of conduits that currently provide broadband access and specific speeds, it is easy to see why many nodes or trunks are maxed out, which affects upgrades or speed increase to certain areas.

We need new players, new institutional structures, and a reconfiguration of control over these key public assets.

Current technologies and solutions exist today that can facilitate the expansion of broadband to those that have a real need. This is achievable if policymakers will look at opportunities that move away from sole reliance on oversimplified investor-ownership and towards an approach that focuses on end-user goals, benefits, and opportunities for governance. This shift in sector strategy will focus investment on solutions that achieve an overall end goal of greater connectedness at high bandwidth for those communities of highest need. We need to allow other proposals that may be seen as out of the box solutions; a combination of various technologies and sector strategies to create the right solutions that involve a new Office of Broadband at the Federal or State level.

There is no time to lose, as technology does not wait and will continue to leave those in our rural areas behind with no prospect to look forward to. California, one of the world's great economic and technological centers must recalibrate how it provides broadband to rural and under-served regions, and must embrace new institutional models so that all of our citizens can have a chance to develop their full potential.

California's Challenges & Needs

Broadband Challenges

- Broadband deployment in underserved regions
 - Under resourced communities compound challenges
- Capital intensity
 - Rough-cost of \$100-300 million per project
- Need for values-aligned public private partnerships.
 - To serve as
 - the vehicles for implementation
 - coordinating mechanisms across underserved region
 - Inject competitive pressure with incumbents, to incentivize their participation
 - The “it doesn’t pencil out” line is misleading (incumbents can make a profit), and demonstrates lack of will by incumbents to move.

Overlapping Utility Challenges

- Under-resourced water systems
 - Similar issues to broadband
 - Existing water systems are highly fragmented and uncoordinated
 - Numerous ownership models (ex. over 800 small water mutuals) with unique policy and business development needs
- Tensions in California electricity policy
 - The role of the CCAs
 - PG&E question

The Needs of California Broadband

Under the Governor's directives, California broadband needs:

- reliability and predictability, particularly with establishing and maintain a floor for broadband speed.
- a true *public*-private partnership that is;
 - values-aligned with community economic development needs, and;
 - not shareholder dictated (e.g. governed by the needs of money, as opposed to broadband consumers).
- a partnership that;
 - is a worthy vehicle for public investment (will need to have high degrees of public trust and **buy-in**)
 - can make inroads with
 - DC and across partisan divides
 - has extensive experience with the human and geographic diversity of rural landscapes;

- has experience and utilized methods for analyzing broadband accessibility, with integrity;
- is willing to share validated operational and performance data;
- has the desire to collaborate, form associations, and has scale “baked-in” to its very institutional design. This includes;
 - experience in delivering public private partnerships;
 - piggybacking on complementary utility infrastructure.

There is another area that the casual broadband observer might overlook, and that is that *broadband is like a shot of adrenaline for advancing climate and economic equity aims*. By itself, fast, affordable, and upgradable broadband injects an enormous amount of economic and civic capacity into the community, acting in an almost symbiotic relationship. Telework becomes more and more feasible, drawing in high-paid employment by complementing workforce development initiatives (fast, reliable broadband also [has the potential](#) to reduce commuting traffic volume, particularly when paired with policy incentives for employers). The ability to deliver e-learning and online education is limited only by student preference (we inject more choice to be in person, or remote).

What is more, *community-owned* broadband is built on a mission and structure of values better aligned with community needs. The importance of mission alignment was [highlighted](#) during a recent wildfire season when Verizon throttled CalFire’s broadband in the midst of emergency response. There are numerous other stories of the investor-owned incumbents counting on the isolated nature of rural regions in keeping stories of their under-investments from being heard (AT&T has retreated from upkeeping rural telephone service in the Plumas-Sierra region, forcing the hand of the local Plumas-Sierra Electric Cooperative

“Stacking” broadband on top of existing utility providers is another tool for enhancing California’s climate and equity goals. First, a single utility provider could leverage its right-of-ways and back office support system to provide multiple lines of business to consumer households (NineStar Connect is an exemplary model). When paired with under-resources water systems, this could provide new revenue streams to improve the total consumer utility experience, and increase overall performance (e.g. smart water systems, in terms of efficiency, leaks, contaminants, and so on). Second, many existing investor-owned electric utilities are already running fiber throughout their systems for smart grid purposes. California could mandate complete smart grid enhancements, and provide the incumbents the option of extending into broadband service, or seek out a vendor to tap into the remaining broadband capacity for last-mile consumer service.

Utility Cooperatives as a California’s Missing Public Private Partnership

The Governor’s Council would benefit immensely from the inclusion of national utility cooperative interests. Utility co-ops have a history of being valuable partners for advancing public policy with a bend toward public benefit and conservative use of public resources (user-owned, not-for-profit¹). For example, one such association, [NRTC](#), could contract with the state to deploy

¹ Note: many confuse not-for-profit as “not profitable.” Many utility co-ops *do make a profit*. Unlike the investor-owned utilities, many states do not regulate the end price-point for utility co-ops. Whereas the investor-owned utilities are often “permitted” by the state PUCs to seek 9-12% margins (which is outrageous considering the density of consumers/mile of line efficiencies they are provided), electric co-ops typically self-regulate for a margin of 1-4%, moving revenues back into operations for ongoing, vigilante upkeep.

universal 5G, but is absolutely the first group to caution against the overblown promises of the investor-owned broadband companies. NRTC's Greg Santoro has said

“5G is a great tool *applied to a specific situation*. But if people believe it can be applied universally at affordable costs, they are mistaken. We have to use an array of tools in the toolbox in order to achieve universal access.”

It cannot be overstated is that a dialogue with the utility cooperatives on the broadband issue can absolutely assist California policymakers to deliver on broadband. And it has to be conveyed that other areas of the Governor's utility development initiatives - such as investing in California rural water (over 800 of which are mutuals) and holding problematic invest-owned electric utilities to account now and into the future – would assist in other major policy priorities of the Governor.

What the Electric Co-op Sector Has to Offer

The U.S. electric co-op sector exhibits latent potential to establish new standards for California's electric utility sector. The electric co-ops then provide key insights as to how electric and other utilities can set new yardsticks for delivering on climate and economic justice. The electric co-op industry adage of *once you've seen one co-op, you've seen one co-op*, speaks to the decentralized nature of the sector. According to the National Rural Electric Cooperative Association (or NRECA, the premier trade association for the sector):

“[the] nation's more than 900 rural electric utilities [are] responsible for keeping the lights on for more than 42 million people across 48 states. Electric cooperatives are member-owned, private, not-for-profit small businesses serving member-consumers facing significant economic challenges, especially in rural areas which are primarily served by co-ops. They are driven by their purpose to power communities and empower their members to improve quality of life. Affordable electricity is the lifeblood of the American economy, and for 75 years electric co-ops have been proud to keep the lights on. Given this critical responsibility to provide affordable, reliable, and universally accessible electric service, cooperatives are vital to the economic health of the communities they serve.”

These local, distinctive utility co-ops federate into a series of associations, with a collective annual revenue of \$42 billion, employing a rural workforce of over 70,000, and governed by over 7000 democratically elected board directors, representing 40 million Americans across 53% of the U.S. landmass. The deep local ownership and community control at-scale translates into a distributed network of innovation and policy experimentation on topics from microgrids, to energy efficiency, community

The cooperative difference



Electric co-ops are local energy and technology providers. They are shaped by the specific needs of the communities they serve. This local, member-owned structure is one reason why cooperatives enjoy the highest consumer-satisfaction scores within the electric industry, according to J.D. Power and Associates and the American Consumer Satisfaction Index.

- Co-ops **earned the top spot** in the J.D. Power and Associates 2017 Electric Utility Customer Satisfaction Study.
- Electric cooperatives, on average, **score three points higher** than all other energy utilities, according to the 2017 American Consumer Satisfaction Index.

Committed to serving the last mile

- Co-ops serve an average of **8 consumers per mile** of electric line; collect annual revenue of \$19,000 per mile of line.

- All other utilities average **32 customers** per mile of line; collect \$79,000 per mile.

Electric cooperatives are guided by seven principles:

1. Voluntary and open membership
2. Democratic member control
3. Members' economic participation
4. Autonomy and independence
5. Education training and information
6. Cooperation among cooperatives
7. Concern for community

Electric cooperatives are economic engines in their communities

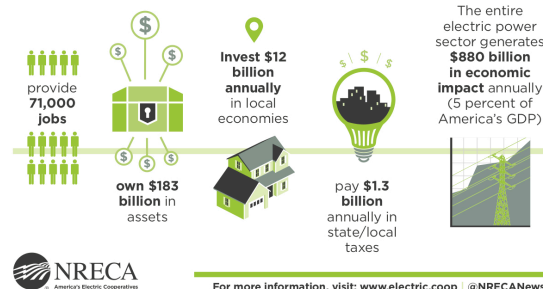


Figure 1 - Electric Co-op Contribution to Economic Development

economic development, and knowledge diffusion. Particularly relevant is the emphasis electric cooperatives are placing on deploying rural broadband.

“The members of NRECA are also active in rural economic development efforts. Currently, more than 150 electric co-ops are working toward meaningful and diverse solutions to provide broadband services, which can help bridge the digital divide and jumpstart local economies. Another 100 to 200 are exploring the feasibility of providing broadband, either on their own or through partnerships. This cooperative commitment is vital for some 30 percent of rural Americans that still lack access to broadband, compared to about 2 percent in urban areas. Allowing up to 10 percent of an RD loan to go directly for retail broadband will not only speed deployment of smart grid but will also help bring desperately needed vital broadband to unserved rural communities.”

For further contextualization of the scale, scope, and innovations originating from the electric co-op sector, see the set of infographics attached to the end of this white paper.

The electric co-ops also provide for innovations in public private partnerships that California could adapt to the unique socio-economic terrain

Finance

Utility co-ops, municipal, and rural utilities have access to an array of financing which flies under the radar. First, the USDA’s Rural Utility Service provides significant financing for such utilities. Second, co-ops have their own banks: CoBank is valued at over \$140 billion; NRUCFC is valued at over \$30 billion; the Dutch-based Rabobank is comparable to CoBank in its lending capacity.

Groups such as [Post Road Foundation](#) (PRF) are driving innovative public-private financing relationships with incumbent utility providers to stack broadband, through creative financing (off-balance-sheet). The PRF model could be coupled with impact investing by Silicon Valley tech giants, particularly those seeking access with rural utility providers in order to negotiate favorable electric utility contracts. In this manner, big-tech could at once provide patient capital for rural broadband, and seek out new business opportunities with the electric co-op sector.

Efficiency and Equity Goals

California has stated policy goals of carbon neutrality, broadband accessibility, and safe drinking water accessibility. The electric co-ops have implemented and studied the effects of “stacking” broadband on existing electric infrastructure, and demonstrated across the board efficiencies. From [NRECA](#):

“The Value of a Broadband Backbone study evaluates the smart grid use cases enabled by a broadband backbone, and estimates the cost avoidance or revenue enhancement associated with each of these applications, on a per-meter basis. The study calculates total benefits of \$185 to \$317 per meter. This corresponds to an average of approximately \$2.4 million per year for a 10,000 member cooperative, and \$13 million per year for a 50,000 member cooperative. The value of a broadband backbone for electric cooperatives is demonstrated by its essential contribution to achieving these economic benefits.”

Application	Annual Valuation per Meter
DA	\$20–\$30
SA	\$1–\$3
AMI	\$12–\$18
VVO	\$14–\$29
DM	\$88–\$140
Outage Reduction	\$1–\$3
AM	\$45–\$85
DER	\$3–\$6
Carrier Cost Replacement	\$1–\$3

Figure 2 - Ratepayer Value of Stacked Broadband in Electric Co-ops

Virginia passed laws requiring largest investor-owned electric utilities to undertake feasibility studies in playing a role in deploying broadband. Dominion put out an RFP, leveraging their assets for project partner to provide broadband. A number of electric co-ops are partnering, notably Prince George which is deploying broadband to 6000 Dominion ratepayers, over Dominion's lines. This is no doubt a model that could be explored over PG&E service territory.

Figure 2 - Ratepayer Value of Stacked Broadband Electric Co-ops

Business Support Systems: Practices and Procedures

Partnering with NRECA and Golden State Power Cooperative would ease the pressure of adapting to California's municipal, consumer-choice aggregator, investor-owned, and mutual utilities to provide additional services and take on new risks. The electric co-ops have a significant Cooperative Business Network that provides an array of business, governance, and management services. And as the rate of technological change and climate adaptation needs speed up, the Cooperative Business Network's massive purchasing co-ops can be utilized for collective and bulk purchasing power, thereby providing marginalized communities with access to affordable technology upgrades.

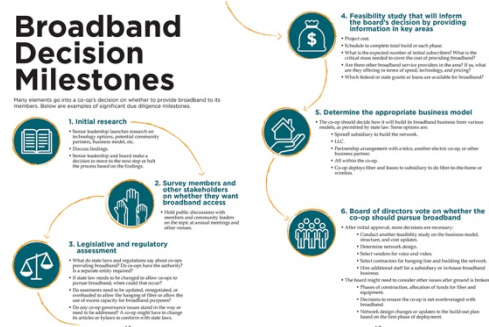


Figure 3 - Example of Stakeholder Guidance Provided by Cooperative Business Network

Resources

<https://www.youtube.com/watch?v=SZ3idBGF1WQ>

How to Give Rural America Broadband? Look to the Early 1900s

Why Broadband Isn't Like 1930s Rural Electrification

“When we started 80 years ago, we were investing in poles and wires and transformers that had a very long shelf life. We’ve got some of that equipment still on our systems,” NRECA Vice President Curtis Wynn said Sept. 13 at the Senate Democratic Rural Summit.

“With telecommunications, this is a completely different story. The shelf life for 5G—we don’t know if it’s going to be five years, three years, or what the case may be,” said Wynn.

That hardly means broadband should be ignored; quite the opposite, said Wynn, noting it's vital to running a modern electric utility.

“Broadband and cooperative operations are beginning to merge together. To run a smart utility you have to have access to broadband,” said Wynn, who is CEO of [Roanoke Electric Cooperative](#) in Aulander, North Carolina.

Electric Co-op Case for stacking broadband -

<https://www.cooperative.com/topics/telecommunications-broadband/Pages/The-Value-of-a-Broadband-Backbone-for-Electric-Cooperatives.aspx>

Broadband Case Studies

<https://www.cooperative.com/programs-services/bts/Pages/Broadband-Co-op-Case-Studies.aspx>

California's Anza Electric –

<https://www.cooperative.com/programs-services/bts/Documents/Advisories/Tech-Advisory-Broadband-Case-Study-Anza-April-2018.pdf>

NineStar –

<https://www.cooperative.com/programs-services/bts/Documents/Advisories/Advisory-Broadband-Case-Study-NineStar-July-2018.pdf>

Partnership & Resource Opportunities with

- NRECA, NRTC, and NISC, and key utility co-op leaders
 - Tricounty Electric Cooperative in South Carolina
 - NineStar electric/water/broadband cooperative in Indiana
 - Golden State Power Cooperative
 - Plumas-Sierra Electric Co-op
 - Anza Electric Co-op
- Financial partners with CoBank, CFC, and RUS
- Other
 - Platform Corporativism Consortium
 - Purdue University (WHIN Purdue 10 County approach)
- Municipal advisement
 - Gonzalez, CA
 - Independence, OR
 - Amman ID
 - Chattanooga, KY
- Academic and Ag Tech Partners
 - UC Davis/ UC ANR's Alirezza Poureza
 - Harvard Law Professor Susan Crawford
 - National Council of Farmer Cooperatives
 - California Agriculture
 - CHS
 - Land O Lakes

- Reassessment of exclusive vendor contracts for Cal OES and CalFire. Often, the incumbent telco providers are tasked with exclusive contracts that often fall short of contractual obligations. One area Dr Taylor has observed is in the public service mandates, which bestow generous contracts upon incumbents, in return for providing emergency responders services, as well as extending rural telephone and broadband. However, in recent years, incumbents have been stretching the clauses in these contracts, and [unilaterally ending low-margin](#) service provision (as in *they are still profitable, but not profitable enough for the shareholder preferences*).

California could instead leverage community broadband providers as a new yardstick for broadband connectivity, speed, reliability, and consumer access. The vendor contracts could

- seek proposals from the broadband utility associations, and leverage them to set higher standards of service;
- reduce both the likelihood of bad faith activity by incumbents and the burden placed upon regulators with excessive monitoring by injecting competition into the system, or (and this is a powerful tool);
- prioritize or direct state and local emergency funding toward the broadband associations to
 - enhance emergency management communications, and
 - direct another revenue stream to the community broadband providers to enhance their overall capacity, while also delivering further economic impact.

Key California institutions/collaborators

- California San Joaquin Valley (8 counties of the largest agricultural region in the U.S.)
- UC Cooperative Extension as broadband provider. Potential to serve an association role for public broadband organizations. Local UCCE offices could serve as service centers.
 - UC Merced, Fresno State, West Hills Coalinga College
- California's 109 Tribal entities could make use of FCC's 2.5 GHz tribal free spectrum opportunity
- County fairgrounds (78) leveraged as natural disaster evacuation sites, for high speed broadband for public safety and economic development
- California tribes united on 2.5 GHz spectrum
- Irrigation or Water Districts. Already co-op like. Add broadband
- County or Municipal broadband. (Vermont is talking about statewide broadband – about the size of a California County)
- CENIC – It is a non profit broadband service provider. Could be a connective link between broadband.
- Military bases
- Police and fire
- Water, sewer, and electric
- Government buildings
- Health care facilities
- Postal Offices
- Libraries

- Transit center/systems