



Turn On, Tune In, and Drop Out

Broadband Access in Santa Cruz County

Summary

For over a decade Santa Cruz County has worked to expand broadband access for its residents. The efforts of the county were laudable but limited due to regulatory and funding limitations. The COVID-19 crisis changed the funding and regulatory environment drastically to favor local governments establishing, managing, or possibly owning access infrastructure.

In 2015 the county had a Broadband Master Plan drafted. There have been substantial changes in the funding, regulatory, and technological landscape since then and an updated plan is needed. The most important consideration to be addressed is how much responsibility the county is willing and able to take towards the establishment and operation of broadband connectivity infrastructure.

Funding opportunities are becoming available from the state of California and the federal government that were inconceivable before 2020. Legislative and regulatory obstacles have been eliminated that blocked a county or other local government entity from getting deeply involved in the build out, management, and even ownership of broadband infrastructure. No consistent answer or plan was found on how far the county is ready and willing to pursue these opportunities. This should be decided quickly, and executed promptly.

Background

Santa Cruz County has a long history of seeking opportunities to provide access to broadband for its residents. In June of 2015 the county was given an Achievement Award from the National Association of Counties for its efforts in this area.^[1] This statewide effort, which Santa Cruz County has participated in to lay broadband infrastructure, dates back more than a decade.^{[2] [3]}

A frequently cited analogy to the situation we currently find ourselves in with broadband access is to the establishment of access to electricity starting in the 1920s through the 1930s. The cost and difficulty in establishing access to electricity in rural areas was a major obstacle. It took the intervention of the federal government in 1936 to bring electricity to rural America.^{[4] [5]} Building out internet access is now as important as distributing electricity was then.

The dominant Internet Service Providers (ISPs) have been large nationwide companies who only build infrastructure where it can be profitable.^[6] Municipalities have a stake in providing connectivity to their residents without consideration of lack of profitability. For many years the political landscape was controlled by the large ISPs, and many states had restrictive laws hindering or even banning municipal broadband.^[7] Large ISPs such as Comcast and AT&T have hindered efforts at formation of municipal internet utilities. They have declined to install higher speed technology in rural areas in order to maintain income from existing older infrastructure.^{[8] [9] [10] [11]}

After two years in development, a final draft of a Broadband Master Plan was presented to the Board of Supervisors on the March 24, 2015 agenda.^[12] The report comprehensively addressed general business and residential needs and laid out alternatives for funding and managing the infrastructure. The report included estimates of how much bandwidth will be needed as internet technology progresses. The report contains projections for five and 10 years into the future after 2013. This was based on the improvement of internet and computer capability from 2009 to the time of completion of the report in 2015.^[13]

The plan also concluded that the upload speed of data from the computer being used must be as high as the download speed of data to the computer. This is called symmetric bandwidth. The evaluation of the necessity of this capability is worded in the report as "...a critically important issue..."^[14] Residential needs in 2009 were estimated to be "25-50 megabits of symmetric bandwidth" as reported in the Broadband Master Plan.

On the other hand, twelve years later, on March 26, 2021, AT&T argued that such speed isn't necessary and that a 10Mbps upload speed would be "good enough."^{[8] [9]} Municipalities are concerned with the longest lasting and best performing infrastructure, while ISPs maximize profit by using obsolete infrastructure as long as possible.^{[10] [11]}

The master plan points out the divergence of the priorities and needs of municipal residents and businesses, and the priorities and business models of the large ISPs. Up until 2020, the large ISPs had the upper hand on the legislative and regulatory functions of government at all levels.^{[15] [16] [17]}

A nationwide change in these priorities began before 2020, but the COVID-19 crisis and the requirement for universal distance learning dramatically changed the landscape. This happened nationwide, but again the county excelled in this changing environment.^{[18] [19] [20]} Santa Cruz County was able to develop a coordinated response by the end of 2020 in which everyone who wanted broadband connectivity in its neediest area, the Pajaro Valley Unified School District, got it.^{[19] [20] [21]}

During the last half of 2020 and the first quarter of 2021 the political, financial, and regulatory landscape for broadband access turned on its head. Governor Gavin Newsom issued an executive order mandating high speed broadband connectivity for all Californians.^[22] Seven pending bills in the California legislature address infrastructure and funding to implement Governor Newsom’s executive order as follows:

- Senate Bills SB4, SB28, SB275 and SB378,^{[15] [23]} and
- Assembly Bills AB14, AB537 and AB34.^{[15] [16] [24] [25]}

States all across the country are sponsoring bills to increase access to broadband.^{[26] [27]} Bipartisan bills in the U.S. Senate and House are under consideration to increase federal funding, some of which will ultimately be available to develop local broadband internet access.^{[28] [29]}

Scope and Methodology

Interviews of responsible government and county school administration officials were performed. Research of relevant articles and statutes was conducted with internet resources and findings discussed by phone, email, and Google Meet.

Our research verified that there are many newly available sources of funding for municipalities at every level of government. Examples of these are described, but no comprehensive effort was undertaken to identify all the new potential sources of funding for municipalities from state or federal sources.

How effectively is the county positioned to address the different challenges that exist in the urban and rural parts of the county? What is the strategy for outreach to underserved populations? This report looks to answer how effectively the county will be able to scale up its efforts dramatically in these areas. The pandemic crisis and requisite needs it created for distance learning and working remotely served as both a stimulus to develop these services, and a measure of how well the county can respond.

Investigation

Before the Deluge

What was accomplished prior to 2020 by Santa Cruz County to extend internet service was limited to what was possible before state and federal legislation and agencies began changing how internet access can be provided. As *The Atlantic* article “America’s Terrible Internet Is Making Quarantine Worse” explains: “Experts and former Federal Communications Commission officials describe a federal government that has neglected to treat broadband as a public utility, instead relying on the largely

self-regulated internet industry to provide service wherever it wanted, for the price of its choosing.”^[17]

The needs of municipal residents and businesses and the business models of the large ISPs diverge. Up until 2020, the large ISPs had the upper hand on the legislative and regulatory functions of government at all levels.^{[15] [16] [17]} During most of the last decade the large ISPs had tight controls in many states that protected their exclusive control over the establishment and ownership of broadband networks.^[30] As late as 2019, many states had legal barriers or even complete bans on publicly owned networks.^{[10] [11]}

The large ISP companies have positioned themselves as the first choice to establish and maintain internet access, including rural internet. Comcast proposed to extend cable to about 30 homes for a cost of \$600,000, of which the customers would be responsible for about half. Comcast’s standard estimate is \$80K to \$120K per mile, if the existing poles are adequate for mounting the fiber cable. If there are not sufficient existing power poles that can accommodate more wires as is common in rural areas, customers would be responsible for the additional cost of installing or replacing poles. This could also add “a few years” onto the timeline of the project.^[31]

The actual timeline to complete the project without having to replace poles would not be addressed until the customers committed to moving forward with the project. If the cost was “substantially” higher than the estimate, then customers would be released from their commitment.^[31] Between the high cost and the long indeterminate timeline for completion, this is not a viable alternative for most rural internet customers.

A good faith attempt was recently made by county leadership to negotiate internet infrastructure installation for a rural neighborhood with Comcast in February of 2021. Negotiations are still underway but the prognosis is not good.^[31]

Careful What You Wish For...The Move Toward Local Control

In the last year many bills in the California and federal legislatures and actions by agencies such as the Federal Communications Commission (FCC) are striving to stop the business models of large ISPs from controlling where internet access is available.^{[15] [16]} On the federal level, President Biden is proposing a massive two trillion dollar infrastructure bill, one goal of which is to deliver “universal” broadband.^[32]

Universal means including the 35% of Americans living in rural areas who currently lack access. Under the new acting chair of the FCC, through grants and fixing the flaws in mapping the availability of internet access, the FCC will be actively promoting affordable and accessible broadband.^[33]

The Broadband Master Plan developed in 2015 had a section on the available scenarios for Municipal Broadband Business Models, Ownership and Management based on the experience of municipalities at that time.^[34] Now municipal leadership is having to decide between a sudden availability of a constellation of potential involvement, roles, and sources of funding.^{[15] [16] [26] [27] [28] [29]}

Santa Cruz County was successful in providing broadband access for the thousands of school children who could only attend school through distance learning.^{[21] [35] [36]} Two

approaches, wireless connection to homes and cell tower service for hotspots, predominated in delivering broadband for distance learning. Probably the most common approach, especially by the end of 2020, was to use cell phone service for hotspots for broadband. This required the least effort to provide, the cost was reasonable and predictable, and the infrastructure was already in place. In many cases in the Pajaro Valley this service was paid for in advance for a two year period and will continue past the crisis.^[36] In many cases the service could be provided to the student's home along with their existing cell service.^{[21] [35] [36] [37]}

The potential roles of the county and municipal leadership in promoting and managing the establishment of broadband infrastructure and delivery have expanded immensely in the last year. County leadership has expressed great enthusiasm for taking a larger role in this rapidly changing landscape.^{[38] [39] [40] [41]}

What Have Municipalities Outside of Santa Cruz Done?

Eighteen municipalities in California address broadband access through one or more of the following four levels of increasing commitment.^[42]

- 1) Advocacy for the county to seek opportunities for funding or infrastructure installation arising from other levels of government. This is viewed as a major responsibility of elected officials, and their aid has been solicited by many groups to lobby California State Officials to release funds for broadband infrastructure development.^{[43] [44]} Communication with the public to build and sustain support is an important element for the success of any broadband access project.^[45]
- 2) Identification and prioritization of the needs of residents and businesses within the county.^[12]
- 3) Direct involvement of county entities in the installation, delivery, and fee structuring of broadband access.^{[42] [46]}
- 4) Establishment of entities that function as broadband utilities on the municipal level or across local government entities.^{[42] [46]}

The methods that existing California local government or non-profit broadband carriers employ are quite diverse. There are two local electricity utility cooperatives (co-ops) that also supply broadband access to co-op members. There are public utilities established as special districts. There are several small cities that manage their own fiber networks. Some cities just install and lease dark fiber to ISPs or businesses.^[42]

What has Santa Cruz Done?

The company hired by Santa Cruz County to create its Broadband Master Plan (Design Nine) in 2013 specializes in planning local government broadband projects. The company still performs planning, design, and build out of broadband networks. It would make sense to investigate the alternatives available in 2021 before undertaking a major broadband project.^[47]

Limited progress was made toward the goals of the Broadband Master Plan before 2020.^{[3] [48]} If an urban street within a city jurisdiction was being trenched for any reason,

fiber cable was laid by the municipality that had jurisdiction. In urban unincorporated Santa Cruz County significant stretches of fiber cable were installed by contractors hired by the county.

Less progress has been made for rural networks since they pose special challenges and are more expensive to install.^{[49] [50]} Some small rural neighborhoods were supplied with broadband; the county aiding in the negotiations of the cost for infrastructure with the ISPs. More progress has been made in building urban and business networks due to their relative ease of construction and lower cost.

Conclusion

From limited allowable activities during the last decade, local government leadership is having to make many decisions about sudden availability of a constellation of potential newly allowed roles they can perform. They are faced with a huge array of sources of funding to pursue.^{[15] [16] [26] [27] [28] [29]} The circumstances that erupted in 2020 could not have been anticipated before 2020. The plan has not been replaced or updated to reflect any changes since 2015, let alone the major funding and regulatory shifts since 2020. The world-wide COVID-19 pandemic and its consequences provided unanticipated opportunities along with the death and disruption it brought.^{[15] [16]} Figuring out which opportunities to pursue, and how far the county can commit itself to each opportunity is by itself quite a challenge, but one that our county's leadership must address.

Findings

- F1.** The Broadband Master Plan developed and updated in 2015 is obsolete due to subsequent actions and events.
- F2.** There has been insufficient official and public advocacy for broadband access. Advocacy cannot succeed without communication about what is being done for constituents and their input into the efforts being performed for them.
- F3.** Starting in 2020, large increases in potential funding and across the board regulatory reform have widened the opportunity for local governments to implement broadband access.
- F4.** An important beneficial outcome of the COVID-19 pandemic has been broadband access and computers for distance learning. Underserved areas, such as the Pajaro Valley where the county's need was the greatest, were significantly improved.
- F5.** The Board of Supervisors hasn't done enough to take advantage of the growing opportunities to promote broadband access for the county.
- F6.** The challenges for the establishment of rural broadband networks are significantly different for residential and business use. Coordination and funding is needed from both government and private entities.

Recommendations

- R1.** The Board of Supervisors needs to update the 2015 Master Plan within the next six months including, but not limited to:
- 1) the special difficulties and costs posed by rural broadband infrastructure;
 - 2) the challenges and infrastructure achievements in 2020 due to the COVID-19 crisis; and
 - 3) opportunities for new funding sources and due to regulatory changes from the California State and Federal Government and how they are to be coordinated with the efforts to date to provide distance learning and broadband access. (F1, F2, F3, F6)
- R2.** Within the next six months the Board of Supervisors should identify and apply for all available broadband access funding. (F3, F5)
- R3.** Within the next six months the Board of Supervisors should establish a program to educate the public concerning the need for expanded broadband access, the importance of obtaining outside funding, and the decisions to be made concerning the role of commercial ISPs. (F2, F3)
- R4.** Within the next six months the Board of Supervisors should determine whether it is feasible for the county to establish, own, manage, or operate broadband access systems. (F3, F5, F6)
- R5.** Within the next six months the Board of Supervisors should coordinate with the County Office of Education to determine the costs and logistics for continuing internet access in time for the 2022-2023 school year. (F4)

Required Responses

<i>Respondent</i>	<i>Findings</i>	<i>Recommendations</i>	<i>Respond Within/ Respond By</i>
Santa Cruz County Board of Supervisors	F1–F6	R1–R5	90 Days September 20, 2021
Superintendent, Santa Cruz County Office of Education	F3, F4	R5	60 Days August 23, 2021

Definitions

- **Cell Tower:** A cell tower houses the electronic communications equipment along with an antenna to support cellular communication in a network. A cell tower is usually an elevated structure with the antenna, transmitters and receivers located at the top. A cell tower is also known as a cellular tower or cell site.^[51]

- **Co-op: Utility Cooperative.** In the context of this report, Co-op refers to a Utility Cooperative which is a type of cooperative that is tasked with the delivery of a public utility such as electricity, water, or telecommunications to its members. Profits are either reinvested for infrastructure or distributed to members in the form of "patronage" or "capital credits," which are dividends paid on a member's investment in the cooperative. Each customer is a member and owner of the business.^[52]
- **Dark Fiber:** Pre-existing underground infrastructure which does not yet have the hardware or software to enable it to run services.^[53]
- **Hotspot:** A specific location that provides internet access via a wireless local area network (WLAN). The term is generally synonymous with a Wi-Fi connection. A network that creates a hotspot primarily includes a modem and wireless router. The radio frequency (RF) waves sent by the wireless network extend in different directions from its centralized location. These signals become weaker as they travel, either further from the central location or due to interference. A cellular hotspot converts cellular signals to Wi-Fi and vice versa to provide internet access for email, websites and other data transfers. In some cases, Hotspots are "hard wired" to the Internet. Smartphones have both cellular and Wi-Fi built in, and most phones can cross-connect the two to become a portable hotspot for laptops and tablets. Also called "tethering."^{[54] [55]}
- **ISP: Internet Service Provider** An organization that provides a myriad of services for accessing, using, or participating in the internet. Internet service providers can be organized in various forms, such as commercial, community-owned, non-profit, or otherwise privately owned.^[56]
- **Symmetric Bandwidth:** Upload and download speeds are equal, i.e., the data speed and file transfer rate to and from a computer are the same. Typically fiber optic internet connections offer this, while methods such as DSL and satellite connections do not.^[57]

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