HOW TO CONNECT THE UNCONNECTED: BROADBAND POLICY IN COLORADO

NICOLE ELA*

Broadband infrastructure is poised to expand in the next five years. With the influx of federal funding, hopeful states (including Colorado) are bringing the last unconnected residences online. However, there are several potential issues the state should consider. While private providers may be able to build out the infrastructure, the lack of business incentive or long-term federal support may make it difficult for companies to maintain these services over time. Additionally, barriers such as cost of a subscription or lack of digital literacy may result in low adoption rates by residents. To combat the problem of providing sustainable service, the state should consider the role of community-owned infastructure. While a publicly owned network needs support for the capital expenditure, they may have less profit motive, ultimately leading to more sustainable service. Additionally, the state should consider service to community anchor institutions and creation of digital literacy programs to ensure the newly connected residents have the tools to take advantage of the broadband infrastructure.

* J.D. Candidate, University of Colorado Law School, Class of 2025. Thank you to Gabrielle Daley for her support and encouragement in writing this article.s

INTRODUCTION

The Broadband, Equity, Access, and Deployment (BEAD) Program represents the opportunity of a generation to install broadband internet infrastructure for previously unconnected residents. States, like Colorado, will receive an unprecedented level of federal funding to build the networks needed to bring households online with fast and reliable internet service. However, the funding is limited to projects deployed over the next five years. The program largely focuses on infrastructure creation, though there are some provisions for training and other community support. A general concern exists that, while helpful and a very important step, the time limit of the program makes it difficult to address broadband adoption issues such as affordability and digital literacy in a lasting way. While the program will build more physical networks, if people cannot afford the service, lack devices like modems and computers, or do not know how to use the tools, there will still be insufficient broadband for households.

The State of Colorado should take measures to ensure that the BEAD funding goes to programs which will be the most sustainable after BEAD expires. The Colorado State Legislature and the Colorado Broadband Office should heavily consider the need for maintenance and upgrades over time. For many unserved or underserved locations, a private company has no strong business case to provide broadband access. There may be too few paying customers, whether due to population density or economic status, to support sufficient revenue generation. While the federal coverage of the initial installation costs may alleviate the issue, the risk still exists that private companies will lack financial incentive to maintain portions of the network going to such areas. One option is to provide funding to community-owned Internet Service Providers (ISPs) or public-private partnerships to ensure that not only the infrastructure gets built, but the future service is affordable and sustainable. Community driven ISPs are not beholden to shareholders and profit margins in the same way as private companies; instead, the community model may ensure positive

revenues from one area cover higher costs of another essentially breaking even. Furthermore, some community ISPs, such as the municipally owned setup in the City of Fort Collins, built into their business model sufficient revenue to subsidize service costs for low-income users. Fort Collins streamlined the application process so residents may apply for the subsidy at the same time, in the same portal, as other local programs. The State of Colorado may ensure the longevity of the networks as well as affordability of service by preferencing BEAD funding towards expansion of community networks.

BEAD restrictions disallow entities to direct funding to build in areas already adequately served by incumbents; however, the funding is the perfect opportunity for municipal-to-municipal or municipal-to-county partnerships to extend community networks to unserved or underserved areas. In areas where such community-based ownership is not feasible, the state should support projects providing service to anchor institutions, such as libraries and community centers. High-quality community access points may provide individuals with internet when the household cannot afford service costs, or the household lacks the digital skills to set up and use the service. While not a perfect solution, community anchor institutions may meet the needs for a segment of the population which would otherwise be very difficult to bring online.

The time limit on the BEAD funding makes it best suited for infrastructure projects; however, the BEAD Program funding should consider future service costs and adoption challenges when deciding what infrastructure to fund. Colorado also maintains several other broadband initiatives which could be used where BEAD funding faces restrictions. Between a policy of supporting community projects and anchor institutions, Colorado may increase the long-term efficacy of the BEAD funding.

I. BROADBAND INFRASTRUCTURE AND ITS IMPORTANCE

A. Broadband Infrastructure

Broadband is a data transmission method, and it enables users to obtain a high-speed internet connection; the connection is provided through physical infrastructure such as fiber or coaxial cables.[1] Broadband requires a connection to a vast global network.[2]

1. FEDERAL COMMUNICATIONS COMMISSION, GETTING BROADBAND Q&A (2024).

2. *Broadband Basics: How it Works, Why It's Important, and What Comes Next*, THE PEW CHARITABLE TRUSTS (Aug. 18, 2023), https://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2023/08/broadband-basics-how-it-works-why-its-important-and-what-comes-next [https://perma.cc/A6MF-PC7T] [hereinafter *Broadband Basics*].

At the municipal scale, broadband connections can be visualized like a city's water system.[3] A water main runs down a street with smaller pipes branching off the central line to provide service to each building on the road. Like a water main, broadband infrastructure has a fiber branch running down a road, or other right of way, and smaller fiber or coaxial connections branching off to connect to each building. The fiber branch connects to nodes and eventually back to a main fiber line, usually called a fiber backbone. The fiber backbone is like the river where a city's water comes from; the city connects to the river, but the river also runs to other towns. The backbone links the city to other metropolitan backbones and data centers in other geographic areas, ultimately forming a web of connections that span the globe. From the perspective of a state, this complex system is usually described as a series of fiber backbones, middle mile infrastructure running from a backbone to a smaller area such as a section of the city, and finally the last mile infrastructure running down city streets and into a residence.[4] Line extensions are used to reach individual homes when they are located far from other buildings.[5]

Typically, Internet Service Providers (ISPs) build out and maintain many portions of these networks.[6] In Colorado the main private ISPs are CenturyLink and Xfinity.[7] The state also owns infrastructure such as the 600 miles of fiber owned by the Colorado Department of Transportation (CDOT).[8] Within a municipality, public or public-private partnerships are common.[9] A community-owned network means that some portion of the infrastructure is owned and operated by a municipality or co-operative group as opposed to a private, for-profit company.[10] For example, the City of Boulder has a municipally owned fiber backbone,[11] while the City

3. *See generally id.* (comparing broadband to a road network).

4. *See id.*

5. *See id.*

6. *Id.*

7. Amanda Koser, *Best Internet Providers in Colorado*, CNET (July 17, 2024), https://www.cnet.com/home/internet/best-internet-providers-in-colorado [https://perma.cc/J2E9-RMR4].

8. *Fiber Optics – The Golden Threads of CDOT Operations*, COLORADO DEPARTMENT OF TRANSPORTATION, https://www.codot.gov/programs/dmo/fiber-optics-golden-threads [https://perma.cc/CB6V-L2AK] (last visited Jan. 3, 2025).

9. *See Broadband Basics, supra* note 2 (explaining that where there are challenges in rural infrastructure, states might not be able to rely on commercial ISPs, private companies, so employ other strategies including federal support to expand private infrastructure, cooperatives, regional districts, and investor-owned utilities).

10. *Our Vision*, COMMUNITY NETWORKS, https://communitynets.org/content/our-vision [https://perma.cc/RVD7-U3MX] (last visited Sep. 2, 2024).

11. *Community Broadband Connectivity*, CITY OF BOULDER, https://bouldercolorado.gov/projects/community-broadband-connectivity [https://perma.cc/5KMV-8BHC] (last visited Feb. 16, 2025)

of Longmont owns a fiber loop and infrastructure running to Longmont premises.[12]

B. Broadband as a Critical Service

Today, high-speed internet access represents a critical service as government services and information move largely online.[13] While users often contact the government agencies on the phone or in-person, the number of online transactions with the government rose significantly over the last decade.[14] In theory, online government efforts are "expected to improve public services and [the] social value is related to . . . achieving better outcomes in areas like security, poverty, public health, employment or better educational achievements."[15] For example, broadband facilitates government services such as enrolling in health care, disability services, or paying fines.[16] Yet, this requires individuals to possess internet access including a reliable and fast enough connection to take advantage of the services. Users without an adequate connection may be left behind. Furthermore, the internet provides a critical source of information on public policies and government alerts. [17] According to one study, "48% of internet users have looked for information about a public policy or issue online with their local, state, or federal government" and nearly as many searched government agency services or downloaded forms.[18]

COVID-19 highlighted and exacerbated inequities related to broadband access[19] which in part prompted the federal move to

12. NEXTLIGHT, *About Us*, CITY OF LONGMONT, https://mynextlight.com/about [https://perma.cc/UTH3-XTLV] (last visited Feb. 16, 2025).

13. Aaron Smith, *Government Online*, PEW RESEARCH CENTER (April 27, 2023), https://www.pewresearch.org/internet/2010/04/27/government-online [https://perma.cc/X4MS-FD8Y].

14. *Id*.

15. Tamara Morte-Nadal & Miguel Angel Eseban-Navarro, *Digital Competences for Improving Digital Inclusion in E-Government Services: A Mixed-Methods Systematic Review Protocol*, 21 INTERNATIONAL JOURNAL OF QUALITATIVE METHODS, Jan. 2022.

16. *Who we are*, CONNECT FOR HEALTH COLORADO, https://connectforhealthco.com [https://perma.cc/77P4-QSDB] (last visited Sep. 3, 2024) (Colorado's insurance marketplace); *Benefits assistance*, COLORADO DEPARTMENT OF HUMAN SERVICES, https://cdhs.colorado.gov/benefits-assistance [https://perma.cc/2TYQ-ND52] (last visited Sep. 3, 2024) (Colorado's website for signing up for disability assistance and other benefits); *Pay a City of Denver parking ticket*, COLORADO OFFICIAL STATE WEB PORTAL, https://co.colorado.gov/pay-city-denver-parking-ticket [https://perma.cc/43TS-7PWD] (last visited Dec. 24, 2024) (City of Denver site for paying fines).

17. Smith, *supra* note 13.

18. *Id*.

19. Julia Shaver, *The State of Telehealth Before and After the COVID-19 Pandemic*, 49 PRIMARY CARE 517, 521 (Dec. 2022); Cory Turner, *6 things we've learned about how the pandemic disrupted learning*, NPR (June 22, 2022), https://www.npr.org/2022/06/22/1105970186/pandemic-learning-loss-findings [https://perma.cc/8MD6-B444].

create the BEAD Program. One of the more publicized issues was related to remote learning when schools either closed physical locations entirely or engaged in a hybrid system of in-person and online education. While estimates vary, one survey found "[o]nly 24 percent of public school teachers reported that all of their students had a computer or tablet to use for school work."[20] Furthermore, high poverty schools generally spent more time in remote instruction and had lower rates of engagement for remote learning, often citing issues like lacking internet.[21] This put students in high poverty areas even further behind than students who were more economically well off.[22] While internet access was certainly not the only barrier students faced, it represented a significant problem.

Telemedicine or telehealth services are also a critical service provided via broadband. Prior to the spread of COVID-19, telemedicine use was increasing but faced limitations arising from restrictions on health care reimbursement and inconsistent services.[23] During the pandemic, however, it became critical to offer services remotely in order to reduce contact, so reimbursement regulations were changed and the industry rapidly adapted.[24] Providing health services through a remote, online connection is often still a safe and convenient method of care.[25] While some services can be provided over the telephone, broadband enables more in-depth assessments.[26] The result is that telemedicine is "more accessible to certain groups of patients than others."[27] More recent studies have concluded that the "most vulnerable, marginalized, and chronically ill patients will need additional attention and funding dollars to understand all their barriers (digital and otherwise) to this type of care," and this effort must be made in order to "prevent telemedicine from becoming yet another wedge to widen medical disparities."[28] Areas such as remote

20. Javeria Salman, *Hundreds of thousands of students still can't access online learning*, THE HECHINGER REPORT (June 4, 2020), https://hechingerreport.org/hundreds-of-thousands-of-students-still-cant-access-online-learning/#:~:text=He%20estimated%20some%20600%2C000%20students,are%20sometimes%20hard%20to%20find [https://perma.cc/QV2Y-2PWB].

21. Cory Turner, *6 things we've learned about how the pandemic disrupted learning*, NPR (June 22, 2022), https://www.npr.org/2022/06/22/1105970186/pandemic-learning-loss-findings [https://perma.cc/8MD6-B444].

22. *Id.*

23. Julia Shaver, *The State of Telehealth Before and After the COVID-19 Pandemic*, 49 PRIMARY CARE 517, 518 (Dec. 2022).

24. *Id.* at 519.

25. *Id.*

26. *Id.* at 521.

27. *Id.* at 517.

28. *Id.* at 521.

learning and telehealth highlight the importance of ensuring that all people in the United States have equitable broadband access.

The importance of broadband will likely continue to grow as more services move online. For example, the Colorado court system allowed remote appearances during pandemic closures.[29] Courts using online access capabilities "found a significant decrease in the number of failures-to-appear in both criminal and civil cases."[30] Such an improvement to accessing the justice system resulted in the court system continuing to allow virtual appearances at the discretion of the judge.[31] Movements towards online services may greatly improve Colorado residents' access to justice and other government support; however, to avail themselves of these benefits, residents must have a reliable and fast internet connection.

Gaining internet access requires a physical connection to the building, hardware in the residence, as well as a service plan usually purchased monthly. Each of these requirements pose different barriers to an individual ultimately benefiting from the internet. One way to analyze the barriers is through dividing them into questions of access versus adoption. *Access* deals with the requirements for physical infrastructure supporting a fast and reliable connection.[32] This includes connections running from the fiber backbone to the residence. Once within the residence, internet access requires additional hardware, like a modem. *Adoption* assesses if people use the service.[33] Barriers to adoption generally include the reoccurring cost of the monthly subscription; high costs of hardware and devices like a modem, router, and laptop; and lacking digital skills to set up and navigate the online services.[34]

Inequitable access and adoption of technology, the "digital divide," represents a pervasive problem in the U.S.[35] Generally, the divide falls along geographic and socio-economic lines.[36] Rural

29. COLO. ACCESS TO JUST. COMM'N, REMOTE COURT PROCEEDINGS: OPPORTUNITIES AND CHALLENGES IN COLORADO 3 (Dec. 2022), https://www.coloradoaccesstojustice.org/_files/ugd/c659b2_a6f97bc9edc84f9294a6d415cf3aec3a.pdf?index=true [https://perma.cc/4ZFB-F5LX].

30. *Id.* at 12.

31. Virtual Proceedings Policy, Chief Justice Directive 23-03 (Aug. 1, 2023), https://www.coloradojudicial.gov/sites/default/files/2023-07/23-03%20%20Signed%206.20.2023%20eff.%208.1.2023%20WEB.pdf [https://perma.cc/P2JD-X5FR].

32. COLORADO BROADBAND OFFICE, BROADBAND EQUITY, ACCESS, AND DEPLOYMENT PROGRAM FIVE YEAR ACTION PLAN 4 *passim* (Aug. 14, 2023) [hereinafter COLORADO FIVE YEAR ACTION PLAN].

33. *Id.*

34. *Id.*

35. Charlie Muller, *What is the Digital Divide*, INTERNET SOCIETY (Mar. 3, 2022), https://www.internetsociety.org/blog/2022/03/what-is-the-digital-divide [https://perma.cc/J2JT-P29X].

36. *Id.*

regions and low-income areas tend to lack access and adoption.[37] Unfortunately, a lack of internet access may exacerbate existing structural inequities.[38] For example, people are less able to physically access healthcare services when living in a rural area and inadequate broadband removes the possibility of a telemedicine option.[39]

Some of these problems are perpetuated by private companies running the broadband industry. Installation costs for the network is much higher in rural locations since the distances between residences are greater.[40] The cost may be compounded for sparsely populated areas in the mountains due to the difficulty of building in the terrain.[41] While urban low-income areas come with cheaper installation costs, there may still be relatively few people who can afford the service which can lead to a negative business case.[42] While the population density is higher, the customer density may not provide a strong enough business incentive for a private operation to build or maintain high-quality networks.[43] Economies of scale have not enticed businesses to cover all residents.[44] Without government intervention, the digital divide will continue.

II. FEDERAL PROGRAMS IN COLORADO

A. BEAD Program

Congress established the BEAD Program in November 2021 via the Infrastructure, Investment and Jobs Act (IIJA).[45] The federal legislature appropriated $42.45 billion amounting to the "single largest federal broadband investment to date."[46] The IIJA also delegated administration of the BEAD program to the National Telecommunications Information Administration (NTIA).[47]

37. *Id*.
38. *Id*.
39. Shaver, *supra* note 23, at 521.
40. COLORADO FIVE YEAR ACTION PLAN, *supra* note 32, at 43.
41. *Id*. at 42.
42. *Id*. at 42-43.
43. *Id*. at 43.
44. *See id*.
45. *What States Need to Know About Federal BEAD Funding for High-Speed Internet Expansion*, THE PEW CHARITABLE TRUSTS (Feb. 8, 2023), https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2023/01/what-states-need-to-know-about-federal-bead-funding-for-high-speed-internet-expansion#:~:text=In%20November%202021%2C%%2020President%20%20Joe,speed%2C%20affordable%20internet%20to%20date [https://perma.cc/XLT7-77N4] [hereinafter *What States Need to Know*].
46. LING ZHU, BROADBAND EQUITY, ACCESS, AND DEPLOYMENT (BEAD) PROGRAM: ISSUES AND CONGRESSIONAL CONSIDERATIONS, CONG. RSCH. SERV., 1 (June 15, 2023).
47. *Id*.

"Congress directed NTIA in the IIJA to make grants to 56 states and territories . . . to bridge the digital divide by facilitating access to affordable, reliable, high-speed internet throughout the United States, particularly in communities of color, lower-income areas, and rural areas."[48] The goal of the BEAD Program is to ensure that all Americans have access to broadband; the federal slogan for the project being "Internet for all."[49]

The BEAD Program sets specific requirements defining what "internet for all" means. Of particular importance are the speed and reliability of the network required for a household to be considered having adequate internet access. A residence is categorized as served, underserved, or unserved depending on the quality of the broadband connection going to the location.[50] This is not defined based on what service tier, if any, the household purchases from the ISP but instead on what speeds and reliability are theoretically possible based on the infrastructure to the residence. An "underserved location" receives less than one hundred megabits per second for downloads and twenty megabits per second for uploads.[51] An "unserved location" receives no service or has service so slow it does not support the usage of broadband for critical needs; the technical standard is slower than twenty-five megabits per second for downloads and three megabits per second for uploads.[52] An additional requirement is that the service must be reliable, which is defined as less than forty-eight hours of outage per 365 days.[53] These values are set based on the idea that this speed and reliability is needed to receive the full benefits of broadband access such as remote schooling, telehealth, and government services. By Colorado statute, broadband is defined as downloads over ten megabits per second with uploads over one megabit per second.[54] States with slower speed definitions, like Colorado, will need to meet the BEAD Program standards for BEAD funding purposes.[55]

While the NTIA administers the BEAD Program, much of the implementation will be conducted by eligible entities: in other words, states and territories.[56] The FCC developed broadband maps

48. *Id* (internal quotations omitted).

49. INTERNET FOR ALL, *Broadband Equity, Access, and Deployment (BEAD) Program*, https://www.internetforall.gov/program/broadband-equity-access-and-deployment-bead-program [https://perma.cc/9RHU-ASSC] (last visited Nov. 8, 2024).

50. *Id*.

51. *Id*.

52. *Id*.

53. Zhu, *supra* note 46.

54. COLO. REV. STAT. §40-15-102 (West 2023) (The Colorado statute matches the broadband definition set by the FCC, but the BEAD program and NTIA has increased the standard.)

55. *What States Need to Know*, *supra* note 45.

56. *Id*.

to assess what level of service existed nationwide and the NTIA used the maps to allocate funding to eligible entities.[57] On June 26, 2023, NTIA released a Notice of Available Amounts with each state receiving a baseline of $100 million with additional funds allocated based on the number of unserved residences and anticipated high cost installation areas.[58] Following the allocations, eligible entities had 180 days to submit an Initial Proposal.[59] The proposals include plans for building infrastructure to unserved or underserved communities and programs to target other challenges associated with the digital divide.[60] Following approval, the NTIA provides states twenty percent of the funding so eligible entities can begin executing their plans.[61] The entities then submit a Final Proposal for the remainder of their funding.[62] The entities and their subgrantees have regular reporting requirements to the NTIA to ensure the projects are progressing according to schedule and cost.[63] Additionally, "[d]ue to the size of the program, Congress may consider oversight of NTIA's implementation of the BEAD Program and its progress toward achieving the stated goal of addressing the digital divide."[64] Colorado produced a Five-Year Action plan followed by an Initial Plan. At the time of this article, Colorado is working on its Final Plan.

1. Colorado's Five-Year Action Plan Summary

Colorado received an allocation of $826.5 million in funding on June 26, 2023.[65] Following this, the state released the Colorado BEAD Five-Year Action Plan on August 14, 2023.[66] The Five-Year Action Plan was produced by the Colorado Broadband Office (CBO) to provide a framework for implementing the BEAD Program.[67] The

57. Edgar Class et al., *White House and NTIA Announce BEAD Funding Allocations*, WILEY (June 27, 2023), https://www.wiley.law/alert-White-House-and-NTIA-Announce-BEAD-Funding-Allocations [https://perma.cc/G8A5-CX9D].

58. *Id*.

59. TIMELINE, BROADBAND EQUITY, ACCESS, AND DEPLOYMENT (BEAD) PROGRAM, https://broadbandusa.ntia.doc.gov/funding-programs/broadband-equity-access-and-deployment-bead-program/timeline [https://perma.cc/B9F5-C3HM] (last visited Nov. 8, 2024).

60. *Id*.

61. *Id*.

62. *Id*.

63. *Id*.

64. ZHU, *supra* note 46.

65. Teralyn Whipple, *Colorado Broadband Officer Lays out BEAD Hurdles (Corrected Story)*, BROADBAND BREAKFAST (Aug. 8, 2023), https://broadbandbreakfast.com/colorado-broadband-officer-lays-out-bead-hurdles-corrected-story [https://perma.cc/GT9Q-HEM4].

66. COLORADO FIVE YEAR ACTION PLAN, *supra* note 32, at 1.

67. *Id.* at 4.

Five-Year Action Plan summarizes the current state of broadband access in Colorado, challenges for implementation, and lays out goals and strategies for achieving the BEAD objectives.[68]

i. Current Status of Broadband in Colorado

In 2023, Colorado ranked eleventh out of the states and Washington D.C for broadband service based on factors such as a high-speed, low-latency data connection and low-priced services.[69] In 2021, 90.9 percent of Colorado households had access to a broadband internet service.[70] About ten percent of Colorado (190,850 locations) is unserved or underserved, meaning there is no internet access or inadequate internet access.[71]

There are two large challenges in the current landscape. First, "only approximately 76% of households in Colorado subscribe to broadband despite over 90% having access."[72] Lack of adoption stems from issues such as affordability of the service, ownership of computers or other devices, and the skills to use the connection and devices (also referred to as digital literacy).[73] Second, there is the challenge of geography. Some of the highest rates of service coincide with the Front Range (the most populated are of the state), whereas many of the rural or mountainous regions measure between zero and twenty percent of the population having access.[74] Generally, this occurs because infrastructure is more difficult to build in rural areas, and a lower population density leads to less potential customer.[75] As a result, there is little business incentive to expand networks.[76] Government intervention will need to overcome these challenges with the BEAD Program or other funding sources to achieve internet for all.

Colorado already has several state initiatives to improve broadband access which the CBO will continue to use alongside the BEAD Program. Existing programs cover a variety of subjects within broadband including data aggregation efforts, funding for

68. *Id.*

69. Jason Shevik, *Best & Worst States for Broadband, 2023*, BROADBAND NOW RESEARCH (Apr. 5, 2024), https://www.benton.org/headlines/best-worst-states-broadband-2023#:~:text=The%20best%20states%20for%20broadband,%2C%20West%20Virginia%2C%20and%20Alaska [https://perma.cc/4JZL-JBRX].

70. COLORADO FIVE YEAR ACTION PLAN, *supra* note 32, at 28.

71. *Id.* at 4.

72. *Id.* at 28.

73. *Id.* at 29.

74. *Id.* at 28. The Front Range Urban Corridor is the most populous region of Colorado and includes cities like Denver, Colorado Springs, and Fort Collins. The area is largely non-mountainous terrain.

75. *Id.* at 42.

76 *Id.*

last-mile projects, technology support for historically marginalized individuals, and grant management.[77] The Five-Year Action Plan thoroughly identifies additional sources of funding (federal and state) beyond the $826.5 million from the BEAD Program.[78] As of August 5, 2023, these grants and programs represent an additional $531.5 million to be spent on broadband in Colorado.[79] The size of the financial backing places the state in a unique position to make great strides in broadband.

ii. Goals and Strategies

The Five-Year Action Plan lays out four goals to guide the broadband planning in the state. The goals are as follows: 1) "build a network for future generations," 2) "expand digital inclusion and adoption to achieve affordability, access, and digital literacy," 3) "enable Colorado to thrive by fostering and supporting a digital economy," and 4) "strengthen resilience across Colorado communities through broadband."[80]

To achieve these goals, the Five Year Action Plan also highlights the strategic partnerships with the Colorado Department of Transportation and the Department of Local Affairs Energy for "middle mile grants, infrastructure development, community broadband strategies, and fiber leases for rights-of-way (ROW) and state-owned properties."[81] The CBO emphasizes the importance of collaborating and consolidating efforts with these groups given the need for more middle-mile fiber and the desire to use existing state-owned infrastructure and property.[82] Furthermore, the Five-Year Action Plan lays out the need for broadband workforce development, identifying a gap in skilled workforce of between 2,500 and 3,500 positions over the five years.[83]

77. *Id.* at 7-10. The list of existing Colorado programs includes: Broadband Deployment Fund and Board Grant Program focused on last-mile projects; Broadband Ready Community Certification Program designed to prepare and support underserved communities in applying for federal funding; Broadband Technical Assistance Program also helping communities prepare for and execute federal grants; Digital Navigator Program for providing technology support for historically marginalized individuals and communities; Department of Local Affairs Energy/Mineral Impact Assistance Grant Program which assess and ensures compatibility between state and federal efforts; Colorado Department of Transportation Middle Mile Partnership supporting broadband implementation; Colorado Broadband Mapping Hub for data on broadband deployment and use; and Promoting Affordable Connectivity Program addressing affordability issues through helping individuals enroll for the federal Affordable Connectivity Program.

78. *Id.* at 14-19.

79. *See id.* (values totaled from Table 4 of other funding sources).

80. *Id.* at 5.

81. *Id.* at 24.

82. *Id.*

83. *Id.* at 27.

A Workforce Development Plan is presented to fill this need with a heavy emphasis on training programs.[84]

2. Colorado's Initial Proposal and Other Initiatives

In June 2024, Colorado received NTIA's approval on the Initial Plan which provides more specifics on how the CBO will meet the BEAD Program requirements.[85] The Initial Proposal was put out for public comment from September 8, 2023 through October 9, 2023.[86] The CBO submitted the final version to NTIA on December 28, 2023.[87]

There are a few other ongoing activities in the State of Colorado which are important for understanding concurrent initiatives and the future of funding. For ten years, Colorado used the Broadband Deployment Fund to help finance last mile connectivity.[88] The Broadband Deployment Fund came from telephone service fees and "[d]espite a decline in landlines annually, the fund still generate[d] $12 million each year for grant distribution."[89] However, the fund sunsetted in September 2024.[90]

Additionally, the CBO allocated $113 million from the state's Capital Projects Fund for building out broadband around the state.[91] While the awards list is still in the appeals process, some of the recipients included the Southern Ute Indian Tribe, Fort Collins municipally owned broadband, and Loveland's municipally owned utility.[92] The CBO used selection criteria including projects providing fiber to underserved areas, plans focused on affordable connectivity, and community support.[93] The State of Colorado is actively working to provide service to all households using a variety

84. *Id.*

85. Teralyn Whipple, *NTIA Approves Colorado BEAD-Eligible Locations* (Aug. 9, 2024), https://broadbandbreakfast.com/ntia-approves-colorado-bead-eligible-locations [https://perma.cc/AVP7-UBJV].

86. *BEAD Volume 1 is Here*, COLORADO BROADBAND OFFICE (Sept. 13, 2023), https://broadband.colorado.gov/news-article/bead-volume-1-is-here [https://perma.cc/9QE4-856W].

87. COLORADO FIVE YEAR ACTION PLAN, *supra* note 32, at 5.

88. *Id.* at 26.

89. *Id.*

90. *Broadband Deployment Board & Fund*, COLORADO BROADBAND OFFICE, https://broadband.colorado.gov/broadband-deployment-board-fund [https://perma.cc/NS48-JR7D] (last visited Feb. 16, 2025).

91. Masha Abarinova, *Colorado unleashes $113M for broadband projects,* FIERCE NETWORK (Jan 5, 2024, 11:01 AM), https://www.fierce-network.com/broadband/colorado-unleashes-113m-broadband-projects [https://perma.cc/Q7HC-9YLM].

92. *Id.*

93. Tamara Chuang, *Rural Colorado awarded $113.5 million to build better broadband, but most applicants left empty-handed*, THE COLORADO SUN (Jan. 17, 2024, 4;50 AM), https://coloradosun.com/2024/01/17/rural-colorado-million-broadband-capital-project-fund [https://perma.cc/MY85-CMJ7].

of programs and funding sources but is relying on the incoming BEAD funding to complete a lot of the efforts.[94] This makes the selection of projects for BEAD funding a critical task. The CBO received 185 applications during the fall of 2024, and as of this article, the CBO is reviewing the funding requests.[95]

B. Affordable Connectivity Program

The first step to addressing the lack of broadband is to build the fiber or wireless networks; however, an issue with adoption also exists because, as noted above, about twenty-four percent of Colorado's population lacks internet subscriptions despite the availability.[96] Often, limited broadband adoption relates to service costs.[97] "Among non-broadband users, 45% say a reason why they do not have broadband at home is that the monthly cost of a home broadband subscription is too expensive, while about four-in-ten (37%) say the same about the cost of a computer."[98]

Many households relied upon the federal Affordable Connectivity Program (ACP) which subsidized service costs for low-income families.[99] The ACP arose as an extension of the Emergency Broadband Benefit Program (EBB Program) which came out of the dire need for improved connectivity during COVID-19 shutdowns.[100] Effective on December 31, 2021, the ACP designated some broadband providers as eligible telecommunications carriers and other provides could apply for approval from the FCC.[101] After the provider registered, qualified low-income users received a federal subsidy for internet service costs of up to $30 per month, or up to $75 per month for households on qualifying Tribal lands.[102] Over twenty million households received the benefit.[103] An FCC assessment of the ACP demonstrated the efficacy of the benefit;

94. *Id.*

95. *BEAD Grant Program Application Summary*, COLORADO BROADBAND OFFICE, https://broadband.colorado.gov/funding/advance-BEAD [https://perma.cc/2ZTW-H7Y3] (last visited Jan. 3, 2025).

96. COLORADO FIVE YEAR ACTION PLAN, *supra* note 32, at 28.

97. *Id.* at 29.

98. Andrew Perrin, *Mobile Technology and Home Broadband 2021*, PEW RESEARCH CENTER (June 3, 2021), https://www.pewresearch.org/internet/2021/06/03/mobile-technology-and-home-broadband-2021 [https://perma.cc/NE6Y-HPAM].

99. FCC, *Affordable Connectivity Program*, https://www.fcc.gov/acp [https://perma.cc/G3L2-78P5].

100. FCC, WIRELINE COMPETITION BUREAU SEEKS COMMENT ON THE IMPLEMENTATION OF THE AFFORDABLE CONNECTIVITY PROGRAM 2-3 (2021), https://docs.fcc.gov/public/attachments/DA-21-1453A1_Rcd.pdf [https://perma.cc/Y6R9-LHGT].

101. *Id.* at 4.

102. FCC, MORE THAN 20 MILLION HOUSEHOLDS ENROLL IN NATION'S LARGEST BROADBAND AFFORDABILITY PROGRAM, 1 (2023), https://docs.fcc.gov/public/attachments/DOC-395990A1.pdf [https://perma.cc/WAU9-5JS4].

103. *Id.*

sixty-eight percent of enrolled households reported inconsistent or no connectivity prior to the support.[104]

Despite the program's success, the ACP's funding expired in April 2024.[105] The FCC advocated for the program to continue; however, Congress failed to provide further appropriations.[106] In the FCC's survey of users, seventy-seven percent of respondents reported that losing the ACP would result in them changing their plan or dropping their service.[107] Another study found that seventy-five percent of enrolled households feared loss of healthcare services and sixty-five percent feared losing their jobs or income source with the end of the ACP.[108] The consequences of the program ending demonstrate the still lacking solutions for boosting broadband adoption.[109] In Colorado specifically, as of November 2023, over 219,000 households enrolled in the ACP.[110] Some of these people also benefit from subsidized costs provided by their ISP, but the expiration of the ACP left many of the subscribers with higher costs.[111]

It is important to note that while BEAD addresses issues of physical connectivity, other barriers to adoption must be considered in the effort to provide internet for all. While some BEAD funding is allocated to affordable connectivity questions, the BEAD Program is not a replacement for the ACP. The BEAD funding is focused primarily on infrastructure. As a result, it does not provide a lasting solution for reducing costs for users, ensuring people own the devices necessary to connect, or supporting training for effectively and safely using the internet. This is where other federal or state programs need to work in conjunction with the BEAD build-out.

104. FCC, NEW FCC SURVEY SHOWS OVER TWO-THIRDS OF ACP HOUSEHOLDS HAD INCONSISTENT OR ZERO CONNECTIVITY PRIOR TO ACP ENROLLMENT, 1, 2 (Feb. 29, 2024), https://docs.fcc.gov/public/attachments/DOC-400836A1.pdf [https://perma.cc/7LHS-XXM4] [hereinafter FCC SURVEY].

105. *Affordable Connectivity Program*, *supra* note 99.

106. FCC, AFFORDABLE CONNECTIVITY PROGRAM TO END SOON BARRING CONGRESSIONAL ACTION (Jan. 11, 2024), https://docs.fcc.gov/public/attachments/DOC-399712A1.pdf [https://perma.cc/L526-4GSC].

107. FCC SURVEY, *supra* note 104, at 1.

108. BENENSON STRATEGY GROUP, *The Impact and Importance of the Affordable Connectivity Program*, BENTON INSTITUTE (Jan. 25, 2024), https://www.benton.org/headlines/impact-and-importance-affordable-connectivity-program [https://perma.cc/24V5-VCUB].

109. *See generally* Nicol Turner Lee, *Everyone loses if the Affordable Connectivity Program ends*, BROOKINGS (Feb. 6, 2024), https://www.brookings.edu/articles/everyone-loses-if-the-affordable-connectivity-program-ends [https://perma.cc/85Z2-8MAX].

110. Tamara Chuang, *Discounted internet on track to end for 250,000 Colorado households in April*, THE COLORADO SUN (Feb. 6, 2024, 3:53 AM), https://coloradosun.com/2024/02/06/acp-colorado-affordable-connectivity-program-broadband [https://perma.cc/Y2ZY-LM4B].

111. *Id.*

III. COLORADO BROADBAND REGULATION

The Colorado state government plays an active role in broadband regulations including control over ISPs and putting state resources towards closing gaps in access. For many years, the Colorado General Assembly maintained restrictive laws on local government funds going towards community broadband projects.[112] In 2005, Senate Bill 152 mandated voters pass a ballot initiative prior to a municipality expending any money on investigating in or building their own broadband network.[113] This applied to both fully municipally owned projects and public-private partnerships.[114] The bill originally purported to protect the private companies;[115] however, while the law remained in place, more than 120 local governments passed votes to avoid the restrictions.[116] The effort of passing these initiatives demonstrates the value municipalities place on evaluating and implementing community based broadband solutions. The General Assembly eventually repealed the law in 2023.[117] Based on the law passed in 2023, cities may now standup municipally owned ISPs and build their own middle mile infrastructure without first putting the question to voters.[118] Generally, local governments maintain municipal rule except in matters of statewide concern in which case the local government rules must be consistent with state; here, the Colorado General Assembly determined broadband internet service is a statewide concern so both local and state government may regulate.[119]

The Colorado Governor's Office also plays an active role in the administration of broadband. Through executive order, Governor

112. *SB05-152 Opt-Out Kit: A Local Government Blueprint for Improving Broadband Service in Your Community*, COLORADO MUNICIPAL LEAGUE, 1-3 (May 2017), https://www.cml.org/docs/default-source/uploadedfiles/issues/telecommunications/sb-152-opt-out-kit.pdf?sfvrsn=6ee62fa2_2 [https://perma.cc/93RS-XF5H].

113. *Id.*

114. *Broadband in Colorado,* COLORADO MUNICIPAL LEAGUE, https://www.cml.org/home/topics-key-issues/broadband-in-colorado [https://perma.cc/XGJ4-Z9UQ] (last visited Sept. 6, 2024).

115. Tamara Chuang, *Colorado repealed law limiting municipal internet, making it easier for towns to build their own*, THE COLORADO SUN (May 24, 2023, 4:11 AM), https://coloradosun.com/2023/05/24/municipal-internet-sb-152-repealed-colorado/#:~:text=Open%20dropdown%20menu-,Colorado%20repealed%20law%20limiting%20%20municipal%20internet%2C%20making%20it%20easier%20for,other%20reasons%20for%20the%20repeal [https://perma.cc/9BYW-SZLS].

116. *Broadband in Colorado, supra* note 114.

117. Colo. Rev. Stat. § 40-15-102 (2023); Tamara Chuang, *Colorado repealed law limiting municipal internet, making it easier for towns to build their own*, THE COLORADO SUN (May 24, 2023, 4:11 AM), https://coloradosun.com/2023/05/24/municipal-internet-sb-152-repealed-colorado/#:~:text=Open%20dropdown%20menu-,Colorado%20repealed%20law%20limiting%20%20municipal%20internet%2C%20making%20it%20easier%20for,other%20reasons%20for%20the%20repeal [https://perma.cc/9BYW-SZLS].

118. Colo. Rev. Stat. Ann. §29-27-101 (West 2023).

119. *See id.*

Hickenlooper first directed the Information Technology segment of his office to coordinate the state's broadband activities.[120] Recognizing the increasing need, the Colorado Broadband Office was created in 2016.[121] House Bill 1289 in 2021 codified the existence of the CBO through legislation and delegated broadband responsibilities to the state agency.[122] Additional executive orders directed the activities of the CBO including requiring the CBO to produce the Broadband Strategic Plan and to coordinate federal and state funding sources.[123] The CBO officially allocates funding, such as the BEAD funding, though the CBO may be controlled through legislation passed by Colorado's General Assembly or further executive orders.[124] The relatively active history of executive orders and state legislation indicates the importance Colorado places on broadband connectivity.

IV. COMMUNITY-OWNED BROADBAND NETWORKS

To ensure the BEAD Program funding is spent in a way that builds the network to be sustainable, responsible entities must consider where best to allocate the money. Given that cost of service and other barriers, such as digital literacy, could still block the goal of internet for all, these issues need to be considered as much as possible in allocating the BEAD funding. One possible method for ensuring that the installed infrastructure can best meet the goals is to prefer investment in community-owned broadband networks where possible. Though some of these investments may come at a higher initial cost, broadband as a public utility may ultimately provide cheaper and more reliable services. The City of Fort Collins will serve as a case study for the installation of broadband as a community network. Municipalities, such as the Town of Estes Park, are building models like Fort Collins, while other local governments, such as the City of Boulder, elected to build a publicly owned fiber backbone leaving the last mile connections to private ISPs. Overall, effectiveness of community-owned networks will be assessed through additional factors such as the relative cost of

120. Colo. Exec. Order No. D 2012 037 (2012).

121. *About the Colorado Broadband Office*, COLORADO BROADBAND OFFICE, https://broadband.colorado.gov/about-the-cbo#:~:text=In%202012%2C%20Executive%20Order%20D,2016%20to%20support%20this%20responsibility [https://perma.cc/SM4Q-7FQD] (last visited Sept. 1, 2024).

122. H.R. 1289, 2021 Leg., 71st Sess. (Colo. 2021).

123. Colo. Exec. Order No. D 2022 023 (2022).

124. S. 083, 2022 Leg., 72nd Sess. (Colo. 2022); H.R. 1306, 2022 Leg., 72nd Sess. (Colo. 2022) (as examples of General Assembly legislation).

installation, maintenance, and the ability to subsidize costs for low-income households.

A. Case Study: City of Fort Collins

The City of Fort Collins deployed a community-owned network which provides a case study for Colorado.[125] Fort Collins began the project with a research and outreach team formed in 2015 and released a report on their findings in 2016.[126] The city went to voters for benchmarking and received an 83 percent approval rate for the project.[127] Based on this, the city undertook extensive studies and planning on installing a fiber-to-the-premise broadband network.[128] In 2017, the city voted for final approval of the plan.[129] Now, Fort Collins has deployed their service, "Connexion."[130] The network is composed entirely of fiber, a technology choice that the city made out of a desire to "future proof" the installation.[131]

In deciding to pursue a community network, the City of Fort Collins cites dissatisfaction with the services and prices provided by existing private companies in the market.[132] Incumbents in the city would not commit to providing full fiber networks and instead only offered to upgrade networks as customers required.[133] The city was concerned this would not support economic and community needs, and that the "existing coax and copper cable systems [were] at the end of their technological life and [would] not support speeds that [would] be needed throughout the next 20 years."[134] A lack of competition gave private companies little incentive to upgrade the infrastructure on their own.[135] The City of Fort Collins also noted that from the incumbent providers, "[p]ricing is very dynamic within the market and can change frequently."[136]

125. BROADBAND BUSINESS PLAN, CITY OF FORT COLLINS (Aug. 31, 2017), https://fcconnexion.com/wp-content/uploads/2021/11/broadband-business-plan.pdf [https://perma.cc/7JB9-GFD5].

126. *Id.* at 7, 5.

127. *Id.* at 7.

128. *Id.* at 5 ("After extensive research and due diligence, municipal deployment of a FTTP network is a viable alternative to produce meaningful sustainable benefits for the City of Fort Collins.")

129. *About Fort Collins Connexion*, FORT COLLINS CONNEXION, https://fcconnexion.com/about [https://perma.cc/NBN3-9MZE] (last visited Sept. 1, 2024).

130. *Id.*

131. *Id.* (fiber is typically seen as a broadband solution that will last longer than other solutions such as wireless technologies).

132. BROADBAND BUSINESS PLAN, *supra* note 125, at 6.

133. *Id.*

134. *Id.*

135. *Id.*

136. *Id.* at 27.

The municipality established cost estimates before beginning the project.[137] The total capital requirement was estimated between $130 million and $150 million with the largest allotment for the network construction at $80 million dollars.[138] The city contains around 62,000 premises. To build the network amounts to an estimated $984 for building past each location and an additional $591 for connecting each premise.[139] As the project completes initial capital expenditures and brings customers online, Connexion's cash flow has improved.[140] While still negative in 2024, Connexion anticipates positive cash flow by 2027.

Control of the network by the municipality also allows for the city to subsequently control pricing. One of the goals of the project is to ensure consistent and affordable costs for users.[141] Fort Collins has been able to directly subsidize service costs for low-income users through Connexion's Digital Inclusion Program avoiding reliance on the federal ACP.[142.] In 2023, about 500 Connexion users were in the program.[143] It is critical the state and municipalities find methods like this model because funding for the ACP has run out.[144]

B. Additional Community-Owned Models

Fort Collins represents a relatively urban project providing services on a larger scale, but the concept of community broadband shows up in smaller local governments as well. Estes Park is currently installing a broadband service owned by the town which will help evaluate the potential for the model in a mountainous

137. *Id*. at 40.

138. *Id*. at 31.

139. *Id*. at 32-33.

140. *Q2 Connexion Report*, FORT COLLINS CONNEXION (2024), https://fcconnexion.com/wp-content/uploads/2024/08/24-26840-Connexion-Q2-Financial-Report-WEB.pdf [https://perma.cc/QSH8-477L].

141. BROADBAND BUSINESS PLAN, *supra* note 125, at 7.

142. *Fort Collins Connexion Aims to Bridge the Digital Divide with Digital Inclusion Program as National Program Concludes*, FORT COLLINS CONNEXION (Apr. 24, 2023), https://fcconnexion.com/2024/04/25/fort-collins-connexion-aims-to-bridge-the-digital-divide-with-digital-inclusion-program-as-national-program-concludes [https://perma.cc/79JG-V8U8] [hereinafter *Connexion Digital Inclusion*].

143. *End or Year Report,* FORT COLLINS CONNEXION (2023), https://fcconnexion.com/wp-content/uploads/2024/04/24-26298-Update-to-Connexion-2023-financial-report.pdf [https://perma.cc/DC74-E4SZ].

144. Nicole Ferraro, *Rosenworcel warns Congress that not funding ACP will 'cut families off*', LIGHT READING (June 21, 2023), https://www.lightreading.com/broadband/rosenworcel-warns-congress-that-not-funding-acp-will-cut-families-off-# [https://perma.cc/EZ56-ZY46].

geography.[145] Another variation of the municipality-owned model arises in Loveland and Timnath. The City of Loveland established a community-owned network, Pulse, in 2018.[146] In 2023, the local governments of Loveland and Timnath formed an agreement to share services.[147] Pulse will be expanding into Timnath.[148] This concept allows the smaller neighboring municipalities to capitalize on economies of scale. Timnath and Loveland will also share the revenue from the service.[149]

Other local governments approached the problem differently, while still recognizing the value of publicly owned infrastructure. The City of Boulder elected to leave the last or middle mile services to existing, private companies but determined the region would benefit from a community-owned fiber backbone.[150] Municipalities like Fort Collins and Loveland own their own utilities, making it easier to install a full network. On the other hand, Boulder does not own the electric infrastructure, so a fiber backbone was a more feasible method of improving broadband in the area. While different models exist, the number of community-owned infrastructure projects demonstrates the popularity and viability of the system.

V. POLICY FOR LONG TERM AFFORDABLE, ADOPTABLE SERVICE

The question remains, what policies should Colorado adopt in order to encourage sustainable network expansion? If it becomes too costly to maintain or prices are too high for consumers to purchase internet service, the infrastructure projects may ultimately fail. Colorado can address some of these challenges up front by supporting the expansion of community-owned networks and ensuring community access points receive quality service.

145. *Trailblazer Broadband Initiative*, TOWN OF ESTES PARK, https://estespark.colorado.gov/broadband [https://perma.cc/KQ2W-2QH6] (last visited Sept. 1, 2024, 1:59 PM).

146. *About Pulse*, LOVELAND PULSE, https://pulsefiber.org/about-loveland-pulse/#:~:text=Pulse%20is%20a%20trusted%20local,residents%20and%20businesses%20of%20Loveland [https://perma.cc/6572-HK7Z] (last visited Sept. 1, 2024).

147. Sean Gonsalves, *Timnath, Colorado and Loveland Team Up to Further Expand Celebrated Municipal Fiber Network*, COMMUNITY NETWORKS (Aug. 24, 2023), https://communitynets.org/content/timnath-colorado-and-loveland-team-further-expand-celebrated-municipal-fiber-network [https://perma.cc/YM6X-9QGY].

148. *Id.*

149. *Id.*

150. *Community Broadband Connectivity*, CITY OF BOULDER, https://bouldercolorado.gov/projects/community-broadband-connectivity [https://perma.cc/6RZA-KWFA] (last visited Sept. 1, 2024).

A. Expansion of Community-Owned Networks

Preferencing the expansion of community-owned networks to cover unserved and underserved locations allows for a policy that will ensure the most sustainable projects. First, community-owned networks are a logistically and financially viable option for meeting the requirements of the BEAD funding and the networks may be more likely to be maintained and updated in the future. Second, while private companies have provided subsidies to low-income customers, municipal services can effectively do the same, and the integration of the subsidies with other local government services may make the distribution of benefits more efficient.

First, the success of community-owned networks demonstrates that they are capable of expansion. Without government subsidies, build out in low-income and rural areas have been lacking.[151] Private service providers "have little incentive to invest in improving Internet networks in sparsely populated or low-income areas, and every incentive to raise prices as much as possible in areas where they have a monopoly (or duopoly)."[152] Without customers who can pay for the services, private providers cannot make a business case for the upfront costs required to install a network.[153] Another issue to contend with is that in rural areas, the buildout costs can be significantly higher due to larger distances between residences requiring more physical infrastructure, and higher capital expenditure, for fewer customers. Many municipalities have turned to establishing their own broadband networks.[154] While providing government funding to private providers overcomes the initial lack of business incentive, the corporations are still for-profit companies. The benefit of investing in community-owned networks is that a profit incentive is not required.[155]

One potential challenge of preferencing community-owned networks is that small internet service providers may struggle to meet project demands relative to the capabilities of large private companies. For example, "[e]arly efforts to build municipally-owned broadband networks struggled to find the appropriate level of solvency after huge sunk costs and debt loads."[156] However, in

151. COLORADO FIVE YEAR ACTION PLAN, *supra* note 32, at 29.

152. Thomas M. Hanna & Christopher Mitchell, UNITED STATES: COMMUNITIES PROVIDING AFFORDABLE, FAST BROADBAND INTERNET, 138, 141 (2020), https://www.municipalservicesproject.org/publications/futureispublic_chapter_9.pdf [https://perma.cc/VB4S-TJBM].

153. COLORADO FIVE YEAR ACTION PLAN, *supra* note 32, at 43.

154. Hanna, *supra* note 152, at 141.

155. *Id*. at 142; *See* COLORADO FIVE YEAR ACTION PLAN, *supra* note 32, at 43.

156. Lee, *supra* note 109.

typical projects, much of this debt is generated during the initial construction because the heaviest capital expenditures are required before the network generates any revenue.[157] Here, the BEAD funding covers the initial costs allowing the municipal service to survive the period of financial strain and not bear a long lasting burden of repaying debt. Prior financial analysis of municipal networks suggests that some community-owned ISPs struggle to ever fully repay the debt through generated revenue.[158] Government funding circumvents the issue by allowing already existing municipal networks to generate additional revenue through expanded customer bases while not requiring additional bonds or tax allocations.

Note, for an entity to receive BEAD funding, they must obtain a letter of credit.[159] While BEAD funding may counteract a financial issue typically associated with municipal networks, they may face challenges in qualifying in the first place. That said, areas deemed high cost by the NTIA (regions where projects are expensive due to the distances or terrain involved) receive an exemption from the credit requirement.[160] Community-owned networks expanding to cover neighboring rural or mountainous regions may be able to use the bypass should they fail to qualify otherwise.

A second reason for preferencing funding to community-owned projects relates to the ability of communities to offer subsidized rates. These subsidized rates may be covered by revenue, and the benefits may be integrated with other government programs to increase the efficiency of distributing services. Comcast as a private ISP offered subsidized costs to 650,000 Coloradans.[161] Community networks such as Fort Collins Connexion also offer lower costs to qualifying residents.[162] For qualifying users, Connexion provides gigabit speed for only $20.[163] One major difference to private ISPs is that the City of Fort Collins integrated the benefits with other local programs to streamline applications and provisions.[164] While outside the question of broadband specifically, this type of integrated program offers a significant benefit for residents.

157. Christopher S. Yoo et al., *Municipal Fiber in the United States: A Financial Assessment*, PENN CAREY LAW: LEGAL SCHOLARSHIP REPOSITORY 5, 37 (June 15, 2022).

158. *Id*. at 24.

159. Karl Bode, *Expert Coalition Says Existing BEAD Rules Harm Small ISPs, Municipalities*, COMMUNITY NETWORKS (Sept. 11, 2023), https://communitynets.org/content/expert-coalition-says-existing-bead-rules-harm-small-isps-municipalities [https://perma.cc/ZD6N-M6Q4].

160. *Id*.

161. Chuang, *supra* note 110.

162. *Connexion Digital Inclusion*, *supra* note 142.

163. *End or Year Report, supra* note 143.

164. *Id*.

B. Community Access Points

In addition to preferencing community-owned networks, there are additional steps the state can take to ensure that the BEAD funding has the greatest impact. Some areas which should be considered are ensuring quality broadband service at community access points and provisions for digital literacy training. Putting BEAD funding toward these issues, and planning for programming beyond BEAD, will help ensure continued improvements in adoption.

Community access points are a critical method of providing service for difficult to reach populations. The access points include locations like a "school, library, health clinic, health center, hospital or other medical provider, public safety entity, institution of higher education, public housing organization, or community support organization."[165] Ensuring high-speed internet in these locations may allow the most vulnerable populations to get online and access critical services. For example, for people experiencing homelessness or for those who cannot afford service, a community access point is critical.

Beyond this, there is some indication that ensuring hubs have access to broadband may result in better adoption of broadband in the surrounding community generally. Enrollment rates in the ACP depended on many factors, but one interesting finding is that more households enrolled if they were in proximity to a library.[166] There are many potential reasons for this correlation, but this could indicate that libraries teach people the importance of internet access and make residents aware of the government benefits for which they may qualify. While the ACP funding has expired, broadband service in anchor institutions may help residents sign up for services and take advantage of other subsidies.

Additionally, preferencing funding for community anchor points may improve adoption by helping to improve digital literacy.[167] Digital literacy encompasses all the knowledge necessary to use a device and access online services.[168] Residents may find digital literacy training or resources at community access points.[169]

165. NAT'L TELECOMM. AND INFO. ADMIN., FREQUENTLY ASKED QUESTIONS AND ANSWERS DRAFT VERSION 2.0, at 6.

166. John B. Horrigan, Brian Whitacre & Hernan Galperin, *Understanding the Affordable Connectivity Program Enrollment: Drivers of Uptake,* TELECOMMUNICATIONS POLICY RESEARCH CONFERENCE, 12 (Aug. 1, 2023).

167. COLORADO FIVE YEAR ACTION PLAN, *supra* note 32, at 26.

168. *Digital Literacy*, AM. LIBRARY ASS'N, https://literacy.ala.org/digital-literacy [https://perma.cc/B8N3-3DCK] (last visited Jan. 3, 2025).

169. COLORADO FIVE YEAR ACTION PLAN, *supra* note 32, at 31.

Digital literacy may be one of the greatest barriers to broadband adoption. However, this is a particularly difficult problem to quantify because the populations who may have the lowest digital literacy coincide with the populations who have the least physical access to broadband. Experts believe there are several "common reasons for non-adoption including a lack of awareness of the benefits of broadband, unfamiliarity with digital devices, and insufficient digital skills and digital literacy . . . ."[170] Once the BEAD funding fills in some of the lacking infrastructure, this may expose how many households have the skills and means to adopt.

CONCLUSION

The BEAD Program takes unprecedented steps towards closing the digital divide; however, it is unrealistic to expect any time-limited program to solve such a significant challenge. Careful planning of BEAD funding distribution will make the program effects as long-lasting as possible. Community-owned networks, prioritization of service to community access points, and concurrent programs for digital literacy are methods the state can use to produce the most value from the funding. Existing case studies on implementing community-owned networks demonstrate that this model has several advantages over private companies, such as community investment, consistent pricing, and incentives to maintain a modern network. Though government funding provides a business case for private companies to build out their networks to underserved and unserved populations, the private companies are still operating with shareholders in mind. Looking forward, private companies have little competitive incentive to provide clear, consistent pricing or to upgrade their networks. A community network bypasses some of these business considerations and instead can focus on a public good. Ultimately this makes these investments more sustainable in the future and helps solve some of the non-infrastructure challenges in broadband adoption.

Additional measures of allotting BEAD funding for service to community hubs and for digital literacy will also aid in long term broadband adoption. Community hubs can help people take advantage of government services so that they can later afford connectivity in their own residences. Broadband in community hubs is also critical for populations without permanent residences. Finally, programming on digital literacy will be an ongoing

170. Kevin Schwartzbach, *How Government Can Make Broadband More Affordable*, ROCKEFELLER INSTITUTE OF GOVERNMENT (May 5, 2022), https://rockinst.org/blog/how-government-can-make-broadband-more-affordable [https://perma.cc/HL3J-R2AQ].

challenge, but by highlighting its importance, the state can begin to remove the non-infrastructure barriers to adoption.

Overall, the goal of providing "internet for all" is ambitious but inspiring for many communities. With careful planning, the BEAD Program has the potential to close several aspects of the digital divide.