STATE BROADBAND PROFILE: TENNESSEE

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Executive Summary

Notwithstanding some discrete challenges and areas for reform, the state of broadband in Tennessee is generally robust and continues to improve in response to a policy framework that has evolved over the years to reflect market realities and consumer demand.

This policy framework has yielded meaningful connectivity gains across the state:

- 93.1% of households have access to a broadband connection.

- Gaps in availability will continue to shrink as federal and state grant funding is deployed by ISPs in unserved areas. To date, Tennessee has allocated approximately $500M in grant funding and will soon distribute approximately $1 billion more via the BEAD and CPF programs to close remaining digital divides.

- Gains in broadband adoption have been evident across every demographic group, with 88% of all Tennesseans connected.

Much of this progress can be attributed to the sustained commitment of private ISPs to invest risk capital and to effectively leverage available grant funding to expand broadband infrastructure across the state. Broadband projects launched by non-traditional ISPs (*e.g.,* municipal electric utilities and electric cooperatives), many of which have been deployed in areas where broadband is already available, have contributed marginally to these gains.

Nevertheless, well-defined broadband challenges remain evident in the state. These include:

- 6.9% of the state's households remain unserved by broadband.

- The unique role played by the Tennessee Valley Authority (TVA) in regulating how municipal electric utilities and electric cooperatives lease access for broadband equipment on their poles and in greenlighting, without meaningful oversight, broadband projects by these non-traditional ISPs. In practice, TVA actions have resulted in (1) much higher-than-average pole attachment fees, which threatens to undermine further investment in rural broadband expansion, and (2) as observed in this Profile, higher electric rates paid by customers of municipal utilities that have deployed broadband networks.

- 12% of households have yet to adopt broadband despite ready availability and the ability to use federal subsidies to offset monthly costs. Among lower-income and older households, broadband adoption rates lag the overall rate, highlighting communities where additional focus and resources are needed.

To address lingering supply-side challenges, this Profile offers the following recommendations:

- **Prioritize grant funding for last-mile deployments in unserved areas**. In practice, this means avoiding the use of grant funding to subsidize overbuilding of duplicative last-mile and middle-mile networks.

- **Deploy a robust and inclusive challenge process** to ensure that available grant funding goes to areas of clear need (*i.e.,* those lacking any broadband options).

- **Use the BEAD process to address critical pole attachment issues**. In a state where 80% of utility poles are overseen by the TVA, Tennessee must be creative in how it addresses high pole fees. Among other items, the state could require municipalities served by a TVA-regulated electric utility broadband network to refund the difference between the TVA pole attachment rate and the FCC rate to ISPs. These funds could be reinvested in broadband connectivity initiatives. In addition, the state could articulate coherent pole access policies (*e.g.,* those impacting how a pole owner reviews and approves requests by attachers), an area where TVA has declined to act.

- **Revisit and strengthen policies relating to the broadband efforts of non-traditional ISPs (*e.g.,* municipal electric utilities)**. Tennessee allows these entities, which, as monopolies, are imbued with significant inherent advantages, to pursue broadband projects. Unfortunately, there are few meaningful procedures in place to oversee and hold non-traditional ISPs accountable once a network is operational. Both the state and the TVA should explore how to better monitor these networks to insulate captive electric customers from the many risks associated with municipal fiber.

To address lingering demand-side challenges, this Profile offers the following recommendations:

- **Assure robust, inclusive, and comprehensive planning** by deploying the ACLP's digital equity framework. This encompasses a holistic approach to planning that leverages the expertise of entities that have succeeded (versus firms with costly, untested models) in connecting the unconnected.

- **Promote the availability of subsidies**, which can offset or eliminate entirely the monthly cost of a broadband subscription. Unfortunately, current subsidy programs are significantly under-subscribed. More needs to be done to raise awareness.

- **Leverage available digital equity funds to scale proven programs**. Tennessee will receive upwards of $30M from NTIA to assist in digital equity initiatives. To ensure that these funds are put to their most effective and impactful uses, the state should seek to scale proven initiatives, like Comcast's Internet Essentials, Chattanooga's digital equity initiatives, and the Digital Navigator program.

1.   Introduction

Broadband connectivity in Tennessee is robust and continues to improve due in large part to a framework that has encouraged continued investment in and expansion of networks across the state. Unlike many other states, Tennessee has also had a long-term focus on demand-side issues, highlighting as far back as 2005 the importance of pairing supply-side policies and resources with a similarly comprehensive approach to improving broadband adoption rates and digital literacy skills. This dual focus, and a commitment to consistently adjusting legislative and regulatory frameworks in response to new market dynamics, places the state in prime position to successfully leverage available federal and state grant funding to further its gains for the benefit of all Tennesseans.

Too often, the broadband story in Tennessee is dominated by discussions of the fiber network built in Chattanooga by its municipal electric utility. This focus overshadows the considerable progress made elsewhere in the state, particularly in rural areas, which have benefited from the efforts of private ISPs, leveraging risk capital with public resources, to expand networks in hard-to-serve costly areas. As discussed in this Profile, the efforts of municipal electric utilities and electric cooperatives in Tennessee to deploy broadband represent a marginal portion of the state's considerable progress towards universal connectivity. Moreover, these projects raise more questions than they answer about: their ability to sustain over the long term; whether they harm or further competition; whether the perceived benefits of municipal fiber outweigh the substantial risks associated with building, operating, and maintaining a broadband network in markets already served by entrenched incumbents; and the potential for electric customers to be saddled with higher rates when their utilities enter the retail broadband market. Ultimately, more scrutiny of these systems is warranted by the public, state policymakers, and the Tennessee Valley Authority (TVA), which oversees these entities.

The focus on non-traditional ISPs like municipal electric utilities and cooperatives also obscures the fact that policymakers in Tennessee have mostly embraced and sought to further the efforts of expert ISPs to plug gaps in broadband availability and otherwise help to improve overall connectivity rates. The results – when measured in terms of steady increases in broadband availability, speeds on offer, and take-rates, among other metrics – are impressive.

At times, however, and especially over the last few years, disbursement of grant funding for broadband expansion in unserved areas has strayed from priorities set by the legislature. The result has been allocations to a curious mix of small, untested entities, some of which lacked the authority to offer broadband. Some of these grant recipients have sought to build networks in areas that were already served or where another ISP was using federal funding (*e.g.*, RDOF funds) to expand networks, resulting in taxpayers paying twice to deploy broadband to the same area. This dynamic necessitated further legislative action to adopt more precise language regarding how grant funding is to be allocated to ensure that areas without any broadband access receive priority.

As it continues to make progress towards universal broadband connectivity, additional work remains to be done on both the supply-side and demand-side in Tennessee. Pockets of the state remain unserved, reflecting the reality that some areas remain incredibly expensive, and therefore uneconomic, to serve in the absence of substantial subsidies. In addition, too many Tennesseans have yet to adopt broadband. Fortunately, the state is well positioned to address these issues in the coming years as it receives and disburses over $1 billion in federal resources.

As discussed herein, the optimal approach to maximizing investment of these once-in-a-lifetime funds is to entrust them with expert ISPs with a track-record of success in building networks in unserved areas and to supplement these efforts with ample funding for demand-side programs.

1.1. Profile Overview

This Profile proceeds as follows.

Section 2 examines the legislative, regulatory, and public policy environment within which broadband investments are being made. Overall, Tennessee state legislators have proven adept at monitoring broadband connectivity developments and adjusting relevant policy frameworks to reflect the market and address remaining issues on the supply-side and demand-side. At times, implementation of legislative mandates has fallen short, requiring additional action by the legislature. This section also explores how actions by the TVA on issues related to pole attachments and the ability of non-traditional ISPs to deploy broadband networks impacts connectivity efforts across the board.

Section 3 provides a data-driven assessment of how Tennessee's policy environment has translated into consistent gains in broadband availability and adoption. Well-defined challenges remain, but the state is well positioned to address those going forward. This section also evaluates the track-record of non-traditional ISPs in the state, with a particular focus on broadband systems deployed by municipal electric utilities.

Section 4 offers recommendations for addressing remaining broadband connectivity challenges in Tennessee. On the supply-side, these recommendations encompass ideas for further refining state grant processes to ensure that forthcoming federal funding is efficiently and effectively allocated. On the demand-side, the recommendations encourage the state to enhance its already robust approach to adoption and digital literacy issues by engaging in inclusive and comprehensive planning ahead of the disbursement of digital equity grant funding.

2. Legislative, Regulatory & Policy Environment

Over the past two decades, Tennessee state policymakers have taken an active but deliberate approach to bolstering broadband connectivity. This approach has involved:

- Careful, ongoing study of broadband-related issues;

- Precise identification of areas of need;

- The empowerment of expert ISPs to serve as the primary driver of broadband deployment across the state; and

- Calibrated legislative, regulatory, and executive action to address issues in the form of updated laws, funding for grant programs, etc.

Sections 2.1, 2.2, and 2.3 examine state efforts to adjust broadband policies between 2005 and present (the results of these actions, as measured using data regarding broadband availability and adoption rates, are assessed in Section 3).

Section 2.4 evaluates the role played by non-traditional ISPs in addressing broadband connectivity challenges in the state. Despite significant attention paid to fiber networks deployed by municipal utilities in cities like Chattanooga, most of the progress that has been made in closing connectivity gaps in the state is attributable to private ISPs. To address concerns about non-traditional ISPs leveraging advantages stemming from their monopoly status, state policymakers have developed a rational legislative framework to guide broadband efforts by these entities. Further enhancements of this framework may be necessary as interest in broadband among non-traditional ISPs continues to grow (potential enhancements are discussed in Section 4.1).

Complicating the ability of the state to positively influence broadband connectivity initiatives via tailored legislative and regulatory interventions is the significant role played the TVA in regulating the municipal electric utilities and electric cooperatives serving much of the state. In the broadband context, TVA has played an outsize role in two areas: (1) regulating the rates paid by private ISPs to attach equipment to utility poles owned by municipal electric utilities and electric cooperatives, and (2) greenlighting broadband projects by municipal electric utilities. These issues and the impacts of TVA actions on broadband deployment in the state are examined in Section 2.5.

Notwithstanding these unique dynamics, the broadband policy environment in Tennessee remains generally supportive of the continued investment of risk capital in support network expansion by established ISPs.

2.1. Establishing a Forward-Looking and Proactive Approach to Improving Broadband Connectivity: 2005-2015

Between 2005 and 2015, Tennessee policymakers engaged in a series of foundational inquiries to begin gathering data regarding broadband availability and adoption. The results of these inquiries would inform a series of decisions that established a solid foundation for broadband connectivity to thrive in the state.

2.1.1.   Tennessee Broadband Task Force

In 2005, the state legislature created the Tennessee Broadband Task Force to "examine the deployment of broadband in the state including, but not limited to...regulation, cost, access to facilities, and market competition."[1] The Task Force issued a final report in January 2007. The Task Force found high levels of broadband availability and adoption in urban areas and significant connectivity challenges in rural areas.[2] In particular, the report highlighted the need for a greater focus on:

(1) facilitating broadband expansion in sparsely populated rural areas; and

(2) enhancing broadband adoption in areas where the service was already available.[3]

The Task Force observed that, overall, "traditional [broadband] providers [were] doing a good job in supplying broadband service" in the state but that "the current level of broadband adoption [was] unacceptable."[4]

Among the Task Force's recommendations was for the state to focus more resources on identifying precisely where broadband remained unavailable and to deploy a public-private approach to addressing its supply- and demand-side issues.[5] The Task Force favorably profiled similar efforts in nearby Kentucky under the aegis of Connect Kentucky.[6]

2.1.2.   Connected Tennessee

Shortly after issuance of the Task Force report, the governor announced the launch of Connected Tennessee to "develop[] and implement[] effective strategies for technology deployment, use and literacy" in the state.[7] Over the next seven years, Connected Tennessee assisted in the development of more precise broadband availability maps; raised the profile of broadband among under-adopting populations and segments of the economy; and led the state's efforts to leverage available federal funding for broadband expansion. Connected Tennessee helped the state secure some $235M in broadband grants and loans stemming from broadband-focused programs established by the American Recovery and Reinvestment Act of 2009.[8] In addition, Connected Tennessee administered its own $2M+

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[1] Public Chapter 413 of 2015, https://capitol.tn.gov/bills/104/Chapter/PC0413.pdf.

[2] *Report and Recommendations,* Tennessee Broadband Task Force (Jan. 2007) (on file).

[3] *Id.* at p. 2.

[4] *Id.*

[5] *Id.* at p. 3-4.

[6] *Id.* at p. 11.

[7] Connected Tennessee, Our Mission, http://web.archive.org/web/20150906001955/http://www.connectedtn.org/our-mission.

[8] *Research Plan: Development and Deployment of Broadband,* TACIR (Sept. 2015), https://www.tn.gov/content/dam/tn/tacir/commission-meetings/2015-

grant focused on providing computers, workforce development training, and related resources to some 60,000 children across the state.[9]

2.1.3. Policy Reform

During this period, the legislature also enacted several laws aimed at supporting investment in broadband infrastructure by incumbent and emerging ISPs.

In 2008, for example, the state enacted the Competitive Cable and Video Service Act, a law that, among many other things, adopted statewide video franchising and updated a range of rules impacting providers of advanced communications services.[10] The Act also deregulated VoIP service in the state and clarified the role of regulatory entities vis-à-vis advanced communications service providers. Taken together, the Act's myriad changes and updates to the state regulatory framework for broadband sent a clear signal to ISPs that the state would not unduly intervene in its competitive, largely self-governing marketplace. In response, several ISPs significantly increased their investments in the state, including AT&T, which committed to investing $400M to expand its broadband network.[11]

2.2. Enhancing the Focus on Broadband & Setting a New Course: 2015-2020

As discussed in more detail in Section 3, broadband availability and adoption rates responded favorably to efforts by the state to target available resources at areas of greatest need. Further steps were taken in 2015, when state senator Mark Norris, who, at the time, chaired the Tennessee Advisory Commission on Intergovernmental Relations (TACIR), called for the development of an updated study of broadband connectivity issues in the state.[12] Over the course of the next few years, the state would gather considerably more data about broadband connectivity and use that information to chart its way forward.

2.2.1. TACIR 2017 Report

Development of the TACIR report, which was released in 2017, involved substantial collaboration with ISPs and other stakeholders in the broadband space. Among other things, the report observed significant and sustained progress in extending broadband

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september/2015SeptBroadbandResearchPlan.pdf ("*Research Plan*"). *See also Distribution of Broadband Stimulus Grants and Loans: Applications and Awards,* at p. 10, Congressional Research Service (Jan. 4, 2011), https://crsreports.congress.gov/product/pdf/R/R41164/16.

[9] Connected Nation, Grant Details, http://web.archive.org/web/20150906021843/http://www.connectedtn.org/grant-details.

[10] Competitive Cable and Video Services Act of 2008, codified at TN Code Ann. § 7-59-301 *et seq.*

[11] *AT&T to Invest $400M in Tenn. Infrastructure,* July 1, 2008, Nashville Business Journal, https://www.bizjournals.com/nashville/stories/2008/06/30/daily25.html.

[12] *Research Plan.*

availability to more parts of the state.[13] Rural areas, however, remained underserved. The report, citing to FCC data from 2014, noted that only about two-thirds of the population living in rural Census blocks had access to a broadband connection.[14] Low population density, geographic challenges, and high costs to build in those areas were cited as major barriers to rural expansion.[15]

The TACIR report also observed continued under-adoption of broadband in areas where service was already available. The Tennessee Broadband Task Force Report issued a decade prior noted a similar dynamic, suggesting that, despite upticks in overall adoption rates, many communities and socioeconomic groups continued to choose not to adopt broadband despite the service being readily available.[16] Echoing national surveys and takeaways from academic literature, the TACIR report concluded that several factors, including the cost of broadband and an access device, as well as a pervasive perception that broadband was irrelevant, negatively impacted broadband adoption in many communities.[17]

To address these issues, the TACIR report articulated a range of recommendations. On the demand-side, the report embraced a more robust focus on addressing adoption-related barriers by allocating more resources to tailored outreach and training efforts at the local level.[18] The report highlighted opportunities for leveraging public-private partnerships and encouraging greater use of available discount offerings by entities like Comcast, whose Internet Essentials program was cited as a model approach to improving broadband adoption.[19]

On the supply-side, TACIR recommended focusing attention and resources on empowering the efforts of private ISPs to continue extending networks into rural areas.[20] This reflected the significant ongoing progress that ISPs were making in bolstering availability across the state by investing additional risk capital and taking advantage of available public funds, like the FCC's CAF II. Indeed, TACIR recommended that the state "focus its efforts on supporting and coordinating these existing initiatives and on addressing any remaining coverage and adoption gaps. Any government response should focus on working with the

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[13] *Broadband Internet Deployment, Availability, and Adoption in Tennessee,* at p. 5, TACIR (Jan. 2017), https://www.tn.gov/content/dam/tn/tacir/documents/2017_Broadband.pdf (*"TACIR 2017 Report"*).

[14] *TACIR 2017 Report* at p. 5.

[15] *Id.* at p. 5-6.

[16] *Id.* at p. 6.

[17] *Id.* at p. 53-57.

[18] *Id.* at p. 59-63.

[19] *Id.*

[20] *See, e.g., id.* at p. 2.

private sector – both for-profit and non-profit – to fill the gaps in the manner least costly to taxpayers without expanding the role of government."[21]

In support of this recommended approach, the TACIR report detailed how the state and local governments could unlock new investment and otherwise facilitate deployment to unserved areas.[22] These included proposed modifications to pole attachment rules (discussed in detail in Section 2.4); local rights-of-way management; and the adoption of policies like "dig once." The report noted that non-traditional ISPs, like municipalities and municipal electric utilities, also played roles in helping to plug gaps in broadband availability (these entities are further discussed in Section 2.4 and Section 3).[23] The report, however, framed broadband efforts by these entities as especially risky since they are often deployed in served areas, which means they must compete with nimbler and more established private ISPs.[24] The report voiced support for allowing electric cooperatives to deploy broadband since many cooperative broadband networks are deployed in unserved and underserved areas (at the time of the report, cooperatives lacked legislative authority to offer broadband).[25]

2.2.2. Broadband Accessibility Act

Shortly after release of the TACIR report, a bill was filed in the state legislature that sought to implement several major changes to the state's approach to bolstering broadband. The bill – the Broadband Accessibility Act – was signed into law in April 2017 and amended state law in several important ways. The Act:

- *Established the state's first broadband grant program – the Broadband Accessibility Grant Program.*[26] Between 2018 and 2020, the program allocated $40M in state funds for broadband expansion.[27] Grants neared a combined total of $500M in 2021 and 2022 due to an influx of pandemic-related stimulus funding from the federal government.[28] In 2023 and beyond, the grant program will be used to distribute additional federal funding stemming from the ARPA Capital Projects Funding (CPF) program, administered by the

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[21] *Id.*

[22] *Id.* at p. 72-118.

[23] *Id.* at p. 119-136.

[24] *See, e.g., id.* at p. 129-130.

[25] *Id.* at p. 7.

[26] Tenn. Code Ann. § 7-3-708.

[27] TN Dept. of Economic and Community Development, Broadband Accessibility Act, https://www.tn.gov/ecd/rural-development/tennessee-broadband-grant-initiative/tennessee-broadband-accessibility-act-article.html.

[28] *Tennessee Awards Nearly $450 million to Providers to Expand Broadband Internet Access,* Sept. 12, 2022, WBIR, https://www.wbir.com/article/news/state/tennessee-broadband-expansion/51-f8fa0da3-a359-400d-a42f-6f77dd5335a4.

Department of Treasury, and the BEAD program, administered by NTIA. These programs will yield approximately $1 billion in additional grant funding for the state.[29] As discussed below, further legislature adjustment was needed in response to how grants underwritten with ARPA funds were distributed.

- *Created a "broadband ready community" designation for localities* that "adopt[] an efficient and streamlined ordinance or policy for reviewing applications and issuing permits related to projects relative to broadband services."[30] To receive the designation, localities must, among other things, designate a single point of contact for "all matters related to" a broadband project; establish a 30-day review period for permits and other applications; and allow for the electronic filing of documents.[31] To date, dozens of counties and municipalities across the state have availed themselves of this designation.[32] This program has helped to spearhead needed reforms across the state, providing increased predictability for ISPs looking to invest in new markets and expand networks. As discussed in Section 4.1, several adjustments to the designation program could help to further enhance broadband efforts in the state.

- *Amended state law to permit electric cooperatives to offer broadband services, subject to certain rules.*[33] These rules include territorial restrictions on network deployment (*i.e.,* confining networks to the co-op's service territory); a requirement that co-ops establish a separate subsidiary for their broadband business; and a prohibition on engaging in explicit or implicit cross-subsidization. To date, more than half of the state's cooperatives – 13 out of 23 – have deployed or are exploring a broadband network.[34]

2.3. Progress and Further Adjustment on the New Course: 2021-present

In recent years, policymakers have continued to adjust laws and regulations impacting the deployment and adoption of broadband in Tennessee. At times, however, implementation of certain programs has diverged with the vision for those initiatives set forth by the legislature. This has required additional refinement of laws on occasion to provide more clarity about how the state is to approach broadband expansion.

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[29] Tennessee will receive a total of $215M in CPF funds and $813M in BEAD funds.

[30] Tenn. Code Ann. § 7-3-709.

[31] *Id.*

[32] TN Dept. of Economic and Community Development, Broadband Ready Communities, https://www.tn.gov/ecd/rural-development/tennessee-broadband-grant-initiative/broadband-ready-community-article.html.

[33] Tenn. Code Ann. § 65-35-134(a)(2).

[34] TN Electric Cooperative Association, Broadband, https://www.tnelectric.org/broadband/.

2.3.1.   TACIR 2021 Report

The 2017 Act required TACIR to produce and submit to the legislature a second report on broadband connectivity within four years. TACIR's follow-up report, issued in January 2021, included observations about the state of broadband in Tennessee and recommendations for improving connectivity that echoed those made in previous reports by TACIR and the Broadband Task Force.[35] In particular, TACIR noted continued gains in broadband availability, leaving an ever-smaller share of areas unserved, and persistent though smaller gaps in adoption rates among certain demographic groups. Its recommendations revolved primarily around maintaining the state's current approach to broadband availability and adoption and furthering expansion efforts by allocating additional resources.[36]

TACIR also recommended that the legislature remove territorial restrictions on broadband networks deployed by municipal electric utilities and electric cooperatives in a manner that protected rate-payers from increased rates stemming from these ambitious and risky projects.[37] Echoing its previous report, TACIR noted that, even if these restrictions were removed, "the potentially high cost of building broadband networks introduces risks to which electric cooperatives and municipal electric systems are not immune. Who shoulders these risks is important."[38] Hence TACIR's recommendations to protect ratepayers from potential rate-shock arising from these projects (see Section 3.3 for further discussion and analysis).

Unlike its 2017 report, the 2021 follow-up report by TACIR did not spur sweeping legislative changes. Instead, the 2021 report has informed smaller adjustments aimed at enhancing the way broadband grants are allocated and improving the overall policy environment.

2.3.2.   Further Legislative Adjustments

Over the last several years, Tennessee state legislators have continued to update and refine the legislative framework impacting broadband deployment.

For example, in 2022, the legislature adopted a broadband equipment tax exemption. Framed as the "Broadband Investment Maximization Act," the legislature extended tax relief on certain broadband network elements for a three-year period.[39] The law exempts from sales and use taxes "all equipment, machinery, software, ancillary components,

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[35] *Broadband Internet Deployment, Availability and Adoption in Tennessee Four Years After the Broadband Accessibility Act,* TACIR (Jan. 2021), https://www.tn.gov/content/dam/tn/tacir/2021publications/2021_BroadbandUpdate.pdf (*"2021 TACIR Report"*).

[36] *Id.* at p. 4-6.

[37] *Id.* at p. 12-13.

[38] *Id.* at p. 12.

[39] Tenn. Code Ann. § 67-6-350.

appurtenances, accessories, or other infrastructure that is used in while or in part to" produce or provide broadband service.[40] The notion of addressing the tax treatment of broadband equipment and creating more incentives for deployment was initially discussed and supported by TACIR in its 2017 report.[41]

In 2023, Tennessee state policymakers updated and clarified the statutory provisions regarding administration of the state's broadband grant program.[42] Many of these changes were made to (1) finetune grant program administration in light of lessons learned since establishment of the program in the 2017 Accessibility Act, and (2) align core elements of the program with those of federal grant programs, notably the BEAD and CPF programs. Taken together, the primary thrust of these changes appeared to constitute a reaction to certain trends in how grant funding was being allocated.

For example, in September 2022, the broadband office announced the allocation of $447M in grants as part of its Emergency Broadband Fund program, which was underwritten with state ARPA funding.[43]Of the 36 entities that received grant funding, 16 were municipal electric utilities or electric cooperatives; 15 were telephone cooperatives; 3 were large private ISPs; and 2 were smaller private ISPs. Several of the municipal electric utilities that received funding, including those in Greenville and Lexington, had not, at the time the grants were announced, been formally approved by the state Comptroller or local officials, as required by statute, to build a broadband system. As a result of these allocations, significant grant funding was distributed in support of new network deployment in areas where existing broadband infrastructure was already available.

In response to what appeared to be concerns about the ways in which these allocations were made, the legislature in 2023 enacted several changes to the state grant program. These included:

- *Updated Definitions & Speed Thresholds.* The updated statute defines "unserved location" and, by extension, broadband service as a connection of at least 100/20 Mbps.[44] Previously, the statute indicated that unserved locations were those that lacked access to a broadband connection of at least 10/1 Mbps. During initial administration of the state grant program, officials raised that threshold to 25/3

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[40] *Id.*

[41] *See, e.g., TACIR 2017 Report* at p. 6.

[42] Public Chapter No. 320 of 2023, https://publications.tnsosfiles.com/acts/113/pub/pc0320.pdf ("*Public Chapter No. 320*").

[43] *Governor Lee, Commissioner McWhorter Announce $447 Million in Broadband Infrastructure Investments,* Sept. 12, 2022, Tennessee ECD, https://www.tn.gov/ecd/news/2022/9/12/governor-lee--commissioner-mcwhorter-announce--447-million-in-broadband-infrastructure-investments.html.

[44] Tenn. Code Ann. § 4-3-708(a)(4).

Mbps, which matches the current FCC definition of broadband.[45] The 100/20 Mbps standard captured in the updated statutory language matches the threshold for the BEAD program.

- *Clear Funding Priority for Unserved Areas.* Initially, the state grant program focused almost entirely on allocating funding to support broadband expansion in completely unserved areas. However, in 2022, the state changed its program guidelines to allow for grant-funded deployment in areas that were only 80% unserved.[46] In practice, this allowed for some measure of overbuilding in upwards of 20% of a grant-funded project area. In addition, grant criteria lacked strong safeguards to protect against funding allocations in areas where federal funding (*e.g.,* via RDOF) was already deployed.[47] In the updated statute, state policymakers clarify that all available grant funding from both state and federal sources must only go to areas that are 100% unserved by 100/20 Mbps broadband service.[48]

- *Additional Overbuilding Safeguards.* Overbuilding results when public resources are used to subsidize broadband network construction in areas where some form of service already exists. Overbuilding is wasteful because it reduces the amount of funds available to deploy broadband in unserved areas. The updated broadband grant program statute focuses on reducing opportunities for overbuild by limiting available funds to areas that are 100% unserved (discussed above) and ensuring that grant funded project do not overlap with other subsidized projects that might still be emerging. The primary illustrative example here is how the state has treated RDOF-funded projects. As noted above, the state had been willing to provide grants for projects that would deploy networks in areas where RDOF funding was also allocated.[49] In the updated statute, policymakers have curtailed this practice and, in line with BEAD mandates, prohibits the allocation of grant funds to areas where other subsidies (*e.g.,* RDOF) have been provided.[50]

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[45] Accessibility Grant Program, Guidelines, https://www.tn.gov/content/dam/tn/ecd/documents/broadband/Grant%20Program%20Guidelines%20FY21.pdf ("*Accessibility Grant Program Guidelines*").

[46] Tennessee Emergency Broadband Fund – American Rescue Plan, Guidelines (as of Jan. 2022), https://www.tn.gov/content/dam/tn/ecd/documents/broadband/tebf-arp/TEBF-ARP%20Program%20Guidelines%201.14.22.pdf ("*Emergency Fund Guidelines*").

[47] *See, e.g., id.* (noting that RDOF and similar allocations would only be "consider[ed]" as part of the grant review process).

[48] Tenn. Code Ann. § 4-3-708(i)(1).

[49] *See, e.g.,* Tennessee Emergency Broadband Fund – American Rescue Plan, FAQs (updated March 2022), https://www.tn.gov/content/dam/tn/ecd/documents/broadband/tebf-arp/TEBF-ARP%20FAQs%203.1.22.pdf ("*Emergency Fund FAQ*").

[50] Tenn. Code Ann. § 4-3-708(i)(2).

- *Enhanced Accountability Measures.* The updated statute includes provisions that seek to maximize the chances that grant-funded broadband projects succeed. Initially, the grant program limited disbursements to 50% of a proposed project's costs.[51] In practice, this meant that grantees would have to fund 50% of the project themselves – either directly, in cash, or via in-kind contributions. Over time, the "match" requirement was lowered to 30% with additional avenues for grantees, particularly municipalities, to offset those requirements.[52] The grant program rules, though, lacked meaningful remedies if a grantee was unable to meet its match.

  To reflect the parameters of recent federal grant programs like BEAD more accurately and to enhance accountability, the updated statute lowered the match requirement to 20% of the project cost but includes strong claw-back measures. Specifically, the updated statute says that, in the absence of a reasonable delay beyond the grantee's control, if a grant recipient fails to meet "the obligations of the award of funds within the time period outlined within the agreement to award," then the grantee must repay the entire grant plus 20% of the grant amount."[53]

The updated law retained a provision requiring the grant program to allow for the provision of funds to non-traditional ISPs, including municipalities, municipal electric utilities, and electric cooperatives.[54] This aligns with requirements in the BEAD program regarding the open nature of grant application process.

2.4. The Role of Non-Traditional ISPs in Tennessee's Broadband Expansion

Non-traditional ISPs – notably municipalities, municipal electric utilities, and electric cooperatives – have played limited roles in improving broadband connectivity in Tennessee (the track-record of these efforts is discussed more thoroughly in Section 3.3). While the state has long viewed these entities as supporting players in the expansion of broadband services, it also has regulations on the books designed to mitigate against potential harm. This likely reflects a recognition by state policymakers that, in the absence of close oversight, these entities could artificially skew market forces by unfairly leveraging significant advantages that are inherent in their monopoly status.

2.4.1. State's Focus on Safeguards

The advantages inherent to non-traditional ISPs revolve primarily around their ability to (1) control key infrastructure inputs (*e.g.,* poles) and (2) tap into a theoretically bottomless well

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[51] *Accessibility Grant Program Guidelines.*

[52] *Emergency Fund Guidelines*.

[53] Tenn. Code Ann. § 4-3-708(l).

[54] Tenn. Code Ann. § 4-3-708(d)(2)

of funding derived from captive customers/taxpayers.[55] Without adequate safeguards in place, these monopoly entities could use these advantages to tilt a local market in their favor by engaging in predatory pricing, using guaranteed electric revenues to artificially prop up a broadband system, or discriminate against competitors in how they grant access to poles and other critical rights-of-way.

These concerns have been top-of-mind for officials in Tennessee, a state that permits non-traditional ISPs to offer broadband, subject to reasonable safeguards.

For example, the major package of telecommunications and cable deregulation enacted by the state in 2008 included a provision that permits municipalities to deploy broadband.[56] These projects, however, must target the "historically unserved," which, according to the statute, narrows a municipal broadband project to areas without broadband service, areas that have been "developed for residential use for more than five years," and that are "outside the service area of a video or cable service local franchise holder or the franchise area of a holder of a state-issued certificate of franchise authority."[57] In addition, interested municipalities must form a joint venture with a private third-party entity for the provision of broadband services. These provisions largely reflect and further the approach to broadband expansion developed by Tennessee over the last two decades. To date, it appears that only one municipality in the state – Maryville – has pursued a broadband joint venture.

Municipal electric utilities have been permitted by statute to offer broadband services since 1999. The legal framework governing municipal electric broadband projects is more comprehensive than those governing municipal joint ventures and sets forth requirements aimed at guiding utilities through the vetting, approval, and operation of these networks. Statutory requirements include developing and submitting to the state comptroller a business plan for the proposed broadband network; public hearings; approval by the utility's governing board; and, in certain instances, a public referendum.

As previously noted, electric cooperatives received legislative permission to deploy broadband networks in 2017. Since then, some, including TACIR, have advocated for rolling back the statutory safeguards aimed at protecting ratepayers. To date, the state has maintained its approach to permitting co-ops to deploy broadband within their footprint in a manner that adequately insulates ratepayers from the financial fallout of a struggling

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[55] For additional discussion, see Charles M. Davidson & Michael J. Santorelli, *Realizing the Smart Grid Imperative: A Framework for Enhancing Collaboration Between Energy Utilities & Broadband Service Providers*, Time Warner Cable Research Program on Digital Communications (2011), http://comms.nyls.edu/ACLP/TWC_Davidson.pdf; Charles M. Davidson & Michael J. Santorelli, *Understanding the Debate over Government-Owned Broadband Networks: Context, Lessons Learned, and a Way Forward for Policy Makers*, ACLP at New York Law School (2014), http://comms.nyls.edu/ACLP/ACLP-Government-Owned-Broadband-Networks-FINAL-June-2014.pdf ("*Understanding the Debate*").

[56] Tenn. Code Ann. § 7-59-316.

[57] *Id.*

system. However, the state has not extended to cooperatives the same vetting and approval processes that municipal electric utilities must adhere to per state law (see Section 4.1 for additional discussion).

2.4.2. Preserving its "Careful" Approach to Broadband Provided by Non-Traditional ISPs

Shortly after permitting municipal electric utilities to deploy broadband, utilities in Covington and Memphis built broadband networks. The 2017 TACIR report documented the struggles and ultimate failure of these networks.[58] In both cases, the municipal electric utility's broadband network failed to attract enough subscribers to support itself financially. Both systems were eventually sold to private entities at a significant loss to ratepayers. The 2017 TACIR report included these and other examples to underscore the risks associated with municipal broadband. However, the TACIR report also observed that, since these early failures, several broadband projects by municipal electric utilities have managed to sustain themselves.[59] (As discussed in Section 3.3, it appears that an additional cost of these systems may be higher rates for electric customers.)

The state has not amended the legislative framework governing these projects, reflecting a wary regard for these systems' sustainability and their potential for undermining market forces by tapping into their myriad inherent advantages. In its 2021 report, TACIR recommended loosening the territorial restrictions on broadband networks deployed by municipal electric utilities and electric cooperatives. The state explored the potential for removing these restrictions in the early 2000s and decided to leave the restrictions in place. Legislators have since debated similar measures in several proposed bills over the years; in each case, the proposals did not advance.

In short, Tennessee has been a fierce defender of its approach to overseeing municipal electric broadband projects. In a legal filing defending state sovereignty in the regulation of its subdivisions and their broadband endeavors, Tennessee grounded its "careful" approach in a desire to protect taxpayers from "municipal broadband experimentation."[60]

This steadfast approach to closely overseeing the broadband initiatives of non-traditional ISPs strongly suggests that Tennessee policymakers are aware of and take seriously the risks associated with these projects – risks that have been astutely observed by TACIR and echoed by the state. A central concern of the state that has long informed its approach to these systems is the possibility that a failed system might harm taxpayers – and the state

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[58] *2017 TACIR Report* at p. 131.

[59] *Id.*

[60] *Brief of the Petitioner, State of Tennessee,* Tenn. et al. v. FCC et al., No. 15-3291 (6th Cir.). https://www.tellusventure.com/downloads/fcc/tennessee_brief_muni_broadband_18sep2015.pdf. The appeals court eventually ruled in Tennessee's favor. See *Tennessee v. FCC,* 832 F.3d 597 (6th Cir. 2016).

itself – in the form of unanticipated payments to artificially prop up a struggling system.[61] The legislative framework also includes protections against electric rate increases stemming from a struggling broadband project in the form of a ban on cross-subsidization (*i.e.,* using electric revenues to subsidize the provision of broadband services).

Failed systems like the one in Memphis often leave taxpayers to pay off the debt used to build the network, which is rarely recouped when the failed network is sold. Indeed, most failed networks are sold at a loss. Per TACIR, the failed network in Memphis was sold at a loss of $29 million.[62] A failed fiber system deployed in nearby Bristol, VA, by its municipal electric utility was sold at an $80 million loss.[63] Several other broadband networks built by municipal electric utilities have failed and were sold at a significant loss in places as varied as Braintree, MA,[64] Groton, CT,[65] and Opelika, AL,[66] among others.

Failed and struggling systems can also result in credit rating downgrades and the use of general tax revenues to subsidize networks. These actions can also negatively impact taxpayers in the form of higher borrowing rates or increased taxes.[67]

Viewed from this vantage, the state's legal framework for broadband delivered by non-traditional ISPs appears to be reasonable and in furtherance of core ideals that have informed many other economic policies (possible enhancements to this framework are discussed in Section 4.1).

2.5. The Role of the TVA in Tennessee's Broadband Expansion

A common thread across much of the state's analysis of broadband challenges over the last two decades is recognition of the significant role that the TVA plays in influencing broadband deployment decisions. As discussed below, TVA's actions have directly influenced (1) the increased pursuit of retail broadband by municipal electric utilities and electric cooperatives, and (2) the setting of higher-than-average rates to use electric poles for broadband deployment.

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[61] *See, e.g., id*. at p. 15, fn. 3.

[62] *2017 TACIR Report* at p. 131.

[63] *See, e.g., Updated Case Study of Bristol, VA,* ACLP at New York Law School (Dec. 2016), http://comms.nyls.edu/ACLP/ACLP-Bristol-Case-Study-Update-December-2016.pdf.

[64] *See, e.g.,* Fred Hanson, *Braintree, Mass., Sells Broadband Business to Comcast,* Dec. 2, 2021, Patriot Ledger, https://www.govtech.com/network/braintree-mass-sells-broadband-business-to-comcast.

[65] *See, e.g., Understanding the Debate*.

[66] *See, e.g.,* Jordyn Elston, *Opelika's OPS One to be Sold for $14 Million*, Oct. 20, 2018, WSFA.com, https://www.wsfa.com/2018/10/20/opelikas-ops-one-be-sold-million/.

[67] For examples, *see ACLP Tool Kit* at p. 78.

2.5.1. The Unique Relationship Between TVA and Tennessee's Electric Utilities

The TVA was established during the Great Depression to, among other things, bring affordable electricity to and spark economic development in Tennessee and surrounding areas. TVA is a private entity that is governed by federal law and overseen by federal energy regulators. Currently, over 98% of residents in Tennessee receive electricity from municipal or cooperative utilities that purchase power from TVA (there is only one private electric utility in the state; it operates in Kingsport).[68]

The ability of TVA to exert control over the actions and investments of the entities to which it sells power stems from the regulatory relationship between these entities. Pursuant to federal law, the TVA has the authority to "include in any contract for the sale of power [to these local utilities] such terms and conditions, including resale rate schedules, and to provide for such rules and regulations as in its judgment may be necessary or desirable for carrying out the purposes" of the Authority.[69]

An overriding concern of the TVA, and a major purpose of the federal laws governing the TVA, is to ensure that the distributors of its electric power – *i.e.,* municipal electric utilities and cooperatives in Tennessee – keep electric rates as low as possible. TVA boasts that its customers "enjoy electric rates lower than 70 percent of the country."[70] Its focus on keeping electric rates as low as possible for customers in Tennessee and elsewhere appears to have significantly shaped its actions in the broadband space.

2.5.2. Approving Broadband Projects by Municipal Electric Utilities

Until 2019, TVA did not have a formal policy in place for reviewing and approving the broadband plans of the utilities to which it sold power in Tennessee. To that point, at least 15 municipal electric utilities had launched broadband networks, including two that eventually failed (Covington and Memphis; for a list of the other 13 networks, see Section 3.3, below). In many cases, it appears that the TVA focused its oversight authority on approving requests by municipal utilities to loan funds from a utility's electric division to its emerging fiber business to assist with startup costs.[71] These actions appear to have stemmed from a desire to preclude cross-subsidization and thereby insulate ratepayers from shouldering any financial difficulties arising from this new line of business.

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[68] ACLP analysis of EIA data (on file).

[69] 16 U.S.C. § 831i.

[70] TVA, Rates, https://www.tva.com/about-tva/tva-rates.

[71] *See, e.g., Resolution No. 25440,* Chattanooga, TN (Feb. 26, 2008) (authorizing Chattanooga EPB's $60M loan to its new Fiber division), https://chattanooga.gov/city-council-files/OrdinancesAndResolutions/Resolutions/Resolutions%202008/25440%20Auth%20Mayor%20enter%20agmt%20with%20TVA%20&%20EPB%20Interdivision%20Loan%20for%20Cable%20&%20Internet.pdf.

In response to what it described as "growing interest" in municipal broadband in Tennessee, the TVA Board in 2019 began to explore a formal approach to vetting these projects.[72] The outcome was a clarification of its guidelines regarding the accepted uses of electric revenues for non-electric purposes. In the context of municipal fiber projects, the TVA concluded that municipal electric utilities "may invest electric system funds in commercial broadband provided that the risk to electric system ratepayers is sufficiently mitigated through appropriate risk mitigation and compliance oversight measures incorporated in a TVA review and approval process."[73] TVA went on to observe that these projects were "not without significant risk," including "higher than anticipated costs, lower than expected revenues, competitor pricing, or emerging technologies."[74] In response, TVA created a formal vetting process to ensure that investments of electric revenues in broadband projects by municipal utilities "are consistent with TVA's regulatory framework, do not result in subsidization by electric system operations and any such investments will be fully repaid."[75]

In practice, this process has required municipal electric utilities to submit appropriate paperwork and other materials stating, among other things: (1) the amount to be loaned by an electric utility to a fiber division; (2) when those loans are expected to be fully repaid; and (3) whether and how these actions will impact electric rates.[76]

Between August 2019 and early 2023, TVA had reviewed and approved 15 total broadband projects, 7 of which are in Tennessee.[77] Together with projects launched before 2019, there are currently about 20 broadband projects being spearheaded by municipal utilities in Tennessee and 13 by cooperatives.

Absent from TVA's review and approval processes for these broadband projects is a system for monitoring adherence to a utility's pledge that a retail fiber offering will not raise electric rates. Indeed, it does not appear that TVA has any accountability measures in place for these projects. Instead, TVA appears to be content to take utilities at their word regarding promises made for timely loan repayment and retail broadband costs not being borne by electric ratepayers. In light of the electric rate analysis included in Section 3.3, which observes slightly higher rates paid by customers of municipal utilities that offer retail

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[72] *TVA Memo*, TVA (July 16, 2019), https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/about-tva/guidelines-reports/lpc/broadband_resolution_memo.pdf?sfvrsn=2f3d6c92_2.

[73] *Id.*

[74] *Id.*

[75] *Id.*

[76] *See, e.g., TVA Disclosure of Johnson City, TN,* https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/about-tva/brightridge_disclosure7f30167b-719b-4254-9c0d-642f5fa39ce7.pdf?sfvrsn=97e8af9a_3.

[77] TVA, Commercial Broadband Authorizations, https://www.tva.com/about-tva/guidelines-and-reports/commercial-broadband-authorizations.

broadband than those that do not, TVA might wish to enhance its policies and deploy more robust oversight of these projects (see Section 4.1 for additional discussion).

2.5.3.   Pole Attachments

Utility poles play a central role in broadband deployment. Poles support equipment used for the delivery of a range of services, including electricity, telephony, cable TV, wireless, and broadband. Given the prevalence of utility poles across the U.S. – there are approximately 180 million poles scattered across the country – service providers of all kinds have leveraged this infrastructure to deploy the backbones of their networks more efficiently.[78]

Disputes between pole owners, typically an electric utility or telephone company, and those wishing to gain access to the pole (*e.g.,* broadband ISPs) are common and have led to numerous legal disputes, legislative action, and regulatory intervention by state PUCs and the FCC. These disputes usually revolve around (1) the time it takes for pole owners to approve requests by entities to attach things to poles and (2) the costs associated with using the pole. Lengthy reviews and high costs can result in delayed broadband infrastructure buildout or a decision by an ISP not to build in a certain area if the costs of pole access are too high.

Over the past two decades, the FCC and numerous states have acted to rationalize what had long been a chaotic framework for governing pole attachments.[79] These efforts have provided ISPs and pole owners with more certainty around approval processes, appropriate cost structures, and who is responsible for things like "make-ready" and pole replacement costs. Tennessee, however, has not benefited in a significant way from these actions because the TVA is the primary arbiter of pole attachments in the state.

In 2016, the TVA adopted rules concerning attachments on poles owned by those municipal electric utilities and cooperatives to which it sells power.[80] This was a significant action because some 80% of utility poles in the state are owned by municipal electric utilities and

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[78] *See, e.g.,* Lineman Central, Statistics, https://www.linemancentral.com/statistics.

[79] States can elect to regulate pole attachments directly. If they do not certify that they regulate pole attachments, then FCC rules will apply in those states. To date, 23 states have certified that they regulate pole attachments on their own, leaving 27 states, including Tennessee, that fall under the FCC's regulatory purview on these issues. *See* 47 U.S.C. § 224(c); *States that Have Certified that they Regulate Pole Attachments,* WC Docket No. 10-101, FCC (June 13, 2022), https://docs.fcc.gov/public/attachments/DA-22-630A1.pdf.

[80] *TVA Determination on Regulation of Pole Attachments,* TVA (2016), https://www.tn.gov/content/dam/tn/tacir/commission-meetings/2016-december/2016December_BroadbandAppJ.pdf (*"TVA Determination"*).

electric cooperatives, nearly all of which buy power from the TVA.[81] Citing the same "terms and conditions" authority that it used to justify adoption of rules governing loans from municipal electric utilities to their fiber divisions, the TVA adopted a pole attachment framework "to ensure that [municipal electric utilities and co-ops] are appropriately compensated for the use of electric system assets for non-electric purposes."[82] TVA justified its action as necessary to protect electric ratepayers and ensure that electric rates "are kept as low as feasible."[83]

TVA's distinct pole attachment formula is grounded in a desire to shift more pole attachment costs to those attaching equipment than the FCC's formula, which applies to poles owned by investor-owned electric utilities and telephone providers.[84] TVA rationalizes that this approach is essential to ensuring that electric customers do not subsidize the costs associated with providing non-electric services like telephony or broadband.[85] Conversely, the FCC approach is focused primarily on facilitating broadband deployment by reducing pole attachment rates as much as possible. The FCC has found that "the cost of deploying a broadband network depends significantly on the costs that service providers incur to access poles."[86]

In practice, TVA's approach consistently yields significantly higher pole attachment rates than the FCC's approach. Per TACIR, the difference between the TVA and FCC rates "can be several orders of magnitude higher."[87] TACIR calculated that it would cost four times more to attach communications equipment to a TVA-regulated pole than an FCC-regulated pole.[88]

The practical impact of this framework on ISPs wishing to leverage TVA-regulated poles for broadband expansion is considerably higher deployment costs.[89] Some have sought to downplay the negative impacts of these higher costs on ISPs.[90] However, in rural areas, where costs to build networks are already high, any additional cost can prove fatal to the

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[81] *See Small Cell Wireless Facilities and Public Rights-of-Way: Assessing the Effects of Public Chapter 819, Acts of 2018*, at p. 9, TACIR (Dec. 2020), https://www.tn.gov/content/dam/tn/tacir/2020publications/2020_SmallCell.pdf.

[82] *TVA Determination.*

[83] *Id.*

[84] *See, e.g., 2017 TACIR Report* at p. 102-108.

[85] *TVA Determination.*

[86] *Implementation of Section 224 of the Act,* Report and Order and Order on Reconsideration, at p. 3, WC Docket No. 07-245, FCC (April 7, 2011), https://docs.fcc.gov/public/attachments/FCC-11-50A1.pdf.

[87] *2017 TACIR Report* at p. 107.

[88] *Id.*

[89] *Id.*

[90] *See, e.g., 2021 TACIR Report* at p. 55.

financial feasibility of a given project. Moreover, the rules attached to forthcoming broadband grant funding, notably BEAD, require states to do everything they can to reduce the costs of deployment and thereby maximize the impact and reach of available funding. In Tennessee, a higher percentage of broadband funding will likely end up going to pole attachment fees than in other states. This may reduce the number of households that will benefit from these funds (see Section 4.1 for further discussion and recommendations for addressing these issues).

2.6.   Takeaways

Over the last two decades, Tennessee has deployed a generally consistent and calibrated approach to fostering more robust broadband connectivity. Key elements of this approach include a legislative and regulatory framework that supports private ISPs investing risk capital in upgrading and expanding their networks. At the same time, the state has employed legislative safeguards to ensure that municipal electric utilities and electric cooperatives compete on a level playing field with traditional ISPs. And unlike many other states, Tennessee has long recognized the importance of focusing attention on and allocating resources to addressing demand-side issues like broadband adoption.

As discussed in Section 3, this balanced approach has yielded significant gains and provides a strong foundation for the state as it begins to deploy substantial federal funding to further improve broadband availability, adoption, and informed use. Nevertheless, as discussed in Section 4, opportunities for further refinement of the legislative and regulatory framework remain, particularly as it relates to how the state administers forthcoming federal grant programs and the role played by TVA in the broadband space.

3.   The State of Broadband in Tennessee

With over $1B in new funding being made available for addressing broadband availability and adoption issues, Tennessee must determine how to best allocate those dollars. To do so effectively and efficiently, Tennessee's efforts (and the efforts of all states), should be guided by data. To prevent funds from being used to support duplicative buildouts – a key tenet of BEAD and a principle that should guide all funding efforts – the state must use the best available data to ensure that its allocations are targeted and effective.

As discussed in this section, the data make clear both that:

> (1) broadband connectivity – *i.e.*, the availability and adoption of broadband service – in Tennessee is generally robust; but

> (2) there are well-defined challenges on both the supply-side and demand-side that are amenable to targeted interventions.

This section also examines potential side effects of non-traditional providers, particularly municipal electric utilities, attempting to address broadband issues in the state.

3.1. Broadband Availability

Broadband connectivity delivered via an array of platforms is widely available across Tennessee. The following provides an overview of broadband availability in the state based on the most recent and accurate data.

As of December 31, 2022, approximately 92.1% of households in the state had access to a wireline broadband connection meeting or exceeding the FCC's broadband threshold of 25/3 Mbps.[91] Availability at higher speeds is similar, with 90.6% of households having access to a connection of 250/25 Mbps or greater.[92]

Expanding the above to include fixed wireless technologies, an increasingly effective and popular method for household broadband connectivity, the proportion of households with access to a 25/3 Mbps connection increases to 93.1%.[93]

These figures are based on data from the FCC's new Broadband Data Collection program, an enhanced location-based mapping effort that guided the allocation of BEAD, and which supplants previous mapping efforts by the Commission and the state.[94]

Competition among providers is also increasingly robust. For example, as of December 2021, 87.3% of households in the state had two or more fixed, terrestrial broadband connections of 25/3 Mbps or more available to them.[95]

Alongside wireline and fixed wireless offerings, the state also has widespread availability of both 4G and 5G wireless connections. As of June 30, 2022, FCC data indicates that 98.6% of the state's population lives in an area where 4G coverage is reported, and 91.9% of the population lives in an area where 5G coverage is reported.[96] These technologies, utilized

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[91] *National Broadband Map,* FCC, (data as of December 31, 2022; last updated by the FCC on June 15, 2023).

[92] *Id.*

[93] *Id.*

[94] This location-based mapping effort is intended to provide greater accuracy and granularity than previous availability mapping by the Commission. Motivated by concerns about the accuracy of previous mapping efforts, the Tennessee Department of Economic & Community Development undertook its own location-based mapping effort in 2021, with an online map being published in mid-2022. See, *e.g., TNECD Announces State Broadband Map Available for Public Comment*, TNECD, April 18, 2022, https://www.tn.gov/ecd/news/2022/4/18/tnecd-announces-state-broadband-map-available-for-public-comment.html.

[95] *2022 Communications Marketplace Report*, FCC, December 30, 2022. This figure includes both licensed and unlicensed fixed wireless, along with all wireline technologies. Excluded from this metric are satellite connections. These figures are based on Form 477 data – official competition metrics from the FCC's new Broadband Data Collection program have not yet been released as of this writing.

[96] ACLP analysis of FCC Broadband Data Collection wireless shapefile data (on file).

using a mobile device, or via the several recently launched in-home 4G/5G broadband offerings, are emerging as another effective method for households to access the internet.[97]

Efforts on the supply-side should continue to focus precisely on the less-than-10% of households that do not have a broadband connection readily available. Given the availability of new, accurate location-based maps, federal funding can be efficiently channeled through the state to experienced entities best suited to efficiently addressing those remaining gaps (for further discussion and recommendations, see Section 4.1).

3.2. Broadband Adoption

As discussed in Section 2, the state of Tennessee has aptly recognized that the availability of a connection is just one part of the complex dynamic involved in whether a given household ultimately utilizes a broadband connection. Equally as important is the willingness of consumers to subscribe to broadband and their ability to put those connections to meaningful uses.

Broadband adoption in Tennessee is strong and continues to improve. As of 2021, Census data indicate that about 88% of the state's households had adopted broadband, up from 76.7% in 2016.[98] Adoption in rural households, which comprise about one-third of the state's population, is 84.3%, lagging the 89.8% of urban households with a broadband subscription.[99]

Adoption rates in Tennessee appear to lag most among lower-income households. As detailed in Figure 1, broadband adoption generally increases as income increases, a trend that is pervasive across the country.[100] The figure also shows that the largest gains in broadband adoption over the past five years have been among lower-income households, though a large remaining gap and need for continued efforts is evident.

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[97] See, *e.g.*, *Cable Companies and Mobile Carriers Battle Over Fixed Wireless Internet*, April 26, 2023, Wall Street Journal, https://www.wsj.com/articles/cable-companies-mobile-carriers-battle-fixed-wireless-7dd189d7.

[98] ACLP analysis of American Community Survey data (on file).

[99] *Id.*

[100] *Id.*

Figure 1 – Percent of TN Households with a Broadband Subscription by Income Category[101]
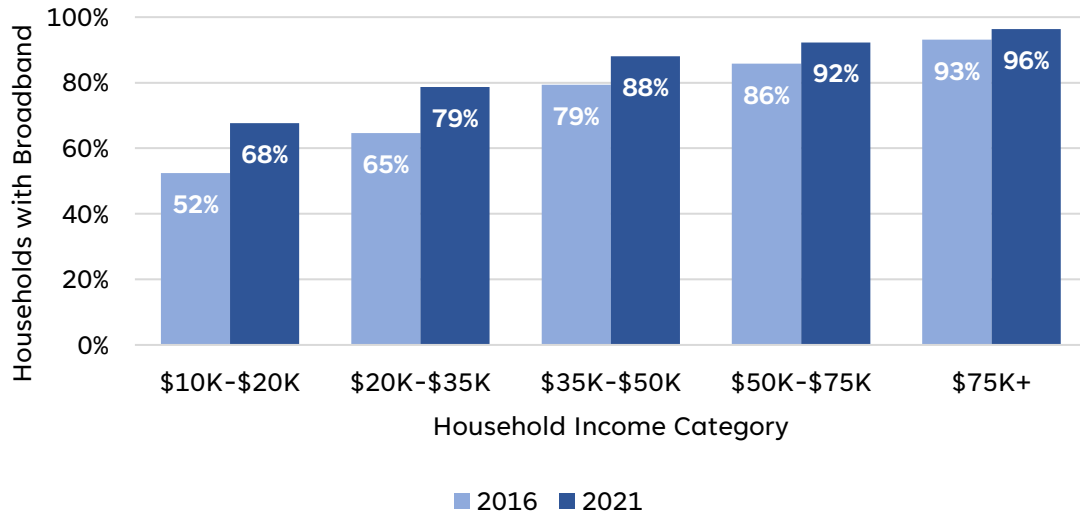
Another demographic group in Tennessee with lagging rates of broadband adoption is older individuals. As shown in Figure 2, households with a head-of-household aged 65 or older are 13% less likely to have a broadband subscription than those with a younger head-of-household. While significant progress is evident, older individuals continue to be a subset of the population particularly amenable to targeted digital literacy training and other adoption initiatives.

Figure 2 – Percent of TN Households with a Broadband Subscription by Age of Head of Household[102]

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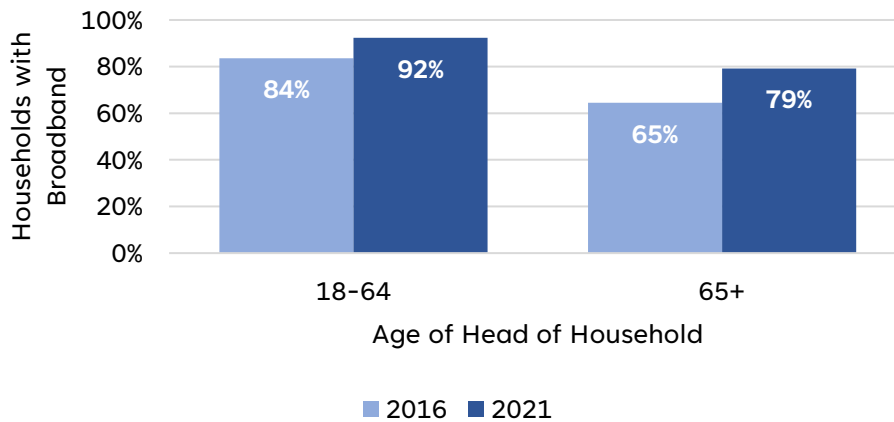
[101] *Id.*

[102] *Id.*

When examining how broadband adoption rates in the state vary by race/ethnicity of head-of-household, significant progress in closing that aspect of the digital divide becomes im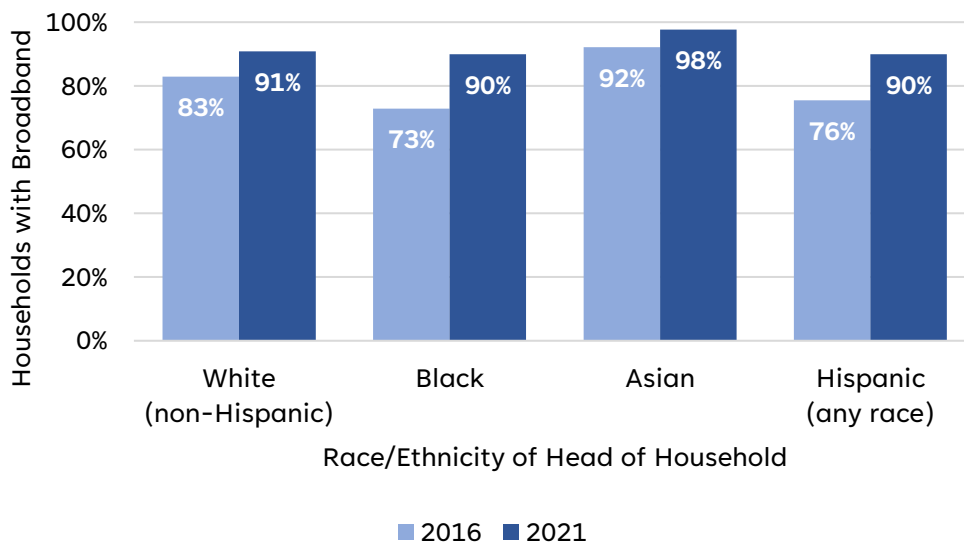mediately evident. As show in Figure 3, the gap in adoption between households with a Black or Hispanic head-of-household compared to their White counterparts all but closed between 2016 and 2021.

Figure 3 – Percent of TN Households with a Broadband Subscription by Race/Ethnicity[103]

Taken together, these data demonstrate the effectiveness of recent adoption efforts and initiatives and underscore the importance of continued funding and expansion of those efforts.

3.3.   Effects of Non-Traditional ISPs

As discussed in Section 2.4, non-traditional broadband providers play a niche role in the expansion of broadband service in the state. Alongside electric cooperatives, the efforts of municipal electric systems to deploy and provide residential broadband service have been the subject of careful oversight by state regulators.

As previously noted, one of the chief concerns regarding municipal utility broadband networks espoused by Tennessee policymakers and the TVA is the potential for cross-subsidization, and subsequent impacts on electric rates. While the fiber networks deployed by municipal electric utilities and cooperatives are intended to be siloed and accounted for separately from electric service, their shared use for smart grid, internal communications, linking together electric equipment, and other purposes can make it difficult to transparently and accurately segregate costs. Indeed, some have observed that the Electric Power Board (EPB) in Chattanooga may be engaging in cross-subsidization vis-à-vis its

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[103] *Id.*

retail broadband network, the fiber for which is also used to enable smart grid functions utilized by EPB Electric.[104] Chattanooga's network has served as a model and inspiration for several other municipal electric utility broadband projects across the state. The ACLP and others have discussed at length elsewhere that the Chattanooga "model" is not replicable due to a number of unique factors, most notably the receipt and use by the city of $111M in federal funding, which offset about one-third of its deployment costs.[105]

Even though Chattanooga has garnered many headlines for its fiber network, broadband provided by municipal electric utilities has done little to plug large gaps in unserved parts of the state (nearly every municipal utility broadband network has been deployed in markets that are already served by at least one other ISP). And even though 13 other municipal utilities have deployed broadband networks in other parts of the state, and several others, including Cleveland, Lexington, and Knoxville, are actively preparing to do so, there has been a distinct lack of detailed public accounting or investigation of how these efforts are impacting electric ratepayers.

In an attempt to examine these potential effects, the ACLP analyzed the cumulative growth in electric rates for Tennessee municipal utilities.

To do so, the ACLP first calculated the cumulative growth in electric rates for 14 Tennessee municipal utilities in the years following the deployment of their respective broadband networks.[106] An aggregated growth rate was computed for those 14 systems, with the growth rates aligned such that the 'base year' or 'year zero' for each system was approximately the first year of broadband deployment, and the average weighted by each system's number of customers. That aggregated rate of growth for broadband-offering utilities is shown in red in Figure 4.

To generate a suitable comparison average, a set of 14 cumulative growth rates were computed for the corresponding base years for all municipal electric systems that do not offer broadband. Each of these was then weighted based on the number of customers for the broadband-offering municipal electric to which it corresponded and was being compared to.[107] That aggregated comparison average is shown in blue in Figure 4.

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[104] See, e.g., T. Randolph Beard et al., *The Law and Economics of Municipal Broadband,* 73 Fed. Comm. L. J. 1, 45-46 (2020), http://www.fclj.org/wp-content/uploads/2021/01/73.1.1_Municipal-Broadband-Article-Final-Proof.pdf.

[105] See, e.g., *id.; Understanding the Debate.*

[106] ACLP analysis of U.S. Energy Information Administration EIA-861 data (on file; source data available at https://www.eia.gov/electricity/data/eia861/). The analysis included data from 2001 to 2021, encompassing a total of 60 municipal electric systems (as of 2021). Broadband-offering municipal utilities identified in the analysis included: Athens, Bristol, Chattanooga, Clarksville, Columbia, Erwin, Fayetteville, Jackson, Johnson City, Milan, Morristown, Newport, Pulaski, and Tullahoma.

[107] For example, for Clarksville, which began its broadband efforts in 2008, the corresponding comparison series is average cumulative rate growth for all non-broadband-offering municipal utilities, starting in 2008.

That calculation shows a divergence in rate growth of approximately 5% after six years. In other words, on average, electric rates for municipal electric systems that provided broadband service had, by the sixth year after deployment, increased by 5% more compared to the average rate of growth for all other municipal systems. That divergence in rate growth is shown below in Figure 4.

Figure 4 – Average Growth in Household Electric Rates - TN Municipal Utilities[108]
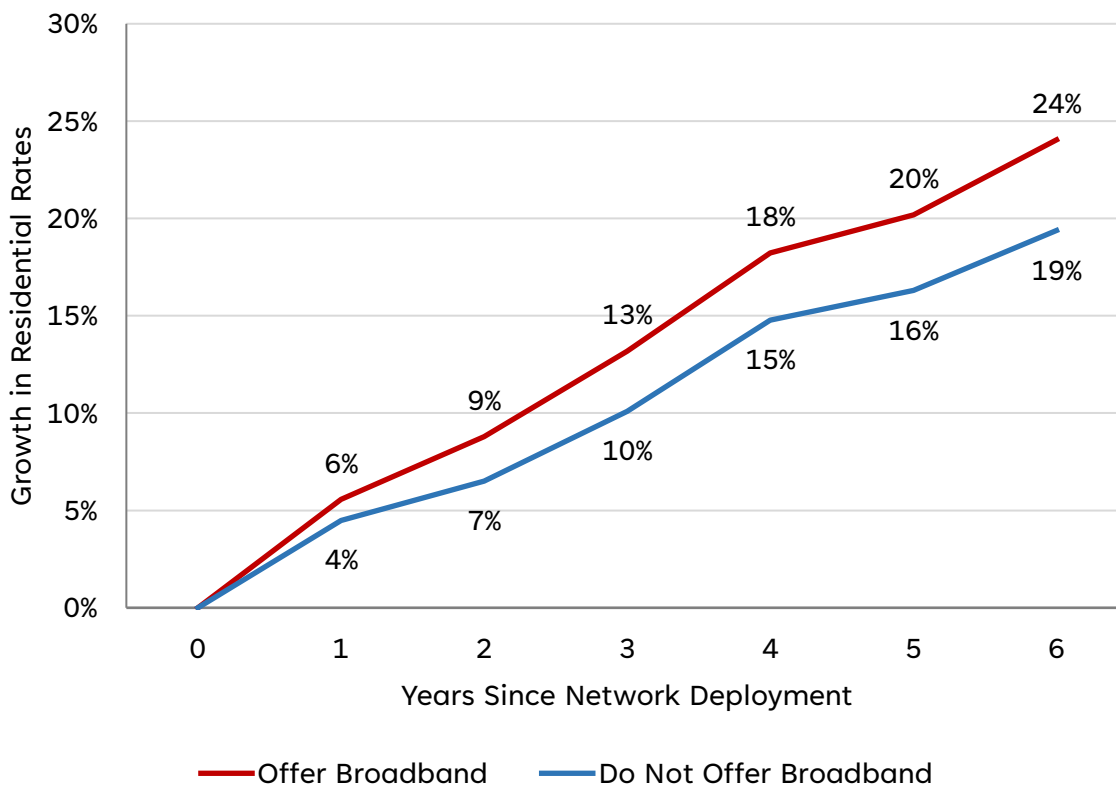
To further illustrate, Figure 5 shows the difference between rate growth for the 14 municipal utilities offering broadband and the statewide average cumulative rate growth over that same period. For example, by the eighth year after the utility in Bristol, TN, launched its retail broadband network, electric rates had grown 5.6% more than the statewide average for municipal utilities that do not offer broadband service over that same period.

This comparison of averages does not imply a causal relationship. However, the analysis does strongly support further investigation of the potential for cross-subsidization and other

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Clarksville received a weight of approximately 13% in the "offer broadband" average, and the 2008-base-year series, corresponding to Clarksville, was weighted approximately 13% in the "do not offer broadband" comparator group.

[108] ACLP analysis of U.S. Energy Information Administration EIA-861 data (on file; source data available at https://www.eia.gov/electricity/data/eia861/).

potential negative effects on captive electric ratepayers. Given the aforementioned limited data and small sample size, such an investigation should occur via a case-by-case look at the accounting practices of the state's municipal electric broadband networks.

Figure 5 – Cumulative Electric Rate Growth vs Statewide Average for TN Municipal Utilities that Do Not Offer Broadband Service[109]

Utility	Launch	Years After Deployment/Launch							
		1	2	3	4	5	6	7	8
Athens	2015	-0.8%	-1.4%	-1.5%	-1.6%	-2.3%	-3.6%		
Bristol	2005	-0.6%	-0.2%	2.3%	3.4%	1.2%	6.8%	7.0%	5.6%
Chattanooga	2010	1.1%	3.2%	2.7%	2.3%	3.6%	4.6%	3.5%	3.9%
Clarksville	2008	7.7%	10.6%	10.7%	13.6%	11.2%	10.1%	9.7%	9.2%
Columbia	2017	-0.5%	-1.2%	-1.2%	-1.3%				
Erwin	2014	-0.1%	0.7%	2.1%	2.9%	4.0%	3.6%	3.9%	
Fayetteville	2000	-0.8%	-1.2%	-1.6%	-2.1%	-3.5%	-5.2%	-2.7%	-2.6%
Jackson	2004	-0.8%	-1.5%	-2.8%	-1.4%	1.2%	2.9%	2.9%	2.3%
Johnson City	2019	-1.1%	-2.0%						
Milan	2018	1.2%	1.7%	1.7%					
Morristown	2006	-0.3%	3.5%	6.4%	6.6%	6.6%	6.7%	5.1%	4.3%
Newport	2018	0.6%	6.1%	9.0%					
Pulaski	2007	-2.0%	-2.5%	-3.9%	-1.4%	-1.0%	-0.3%	0.6%	0.6%
Tullahoma	2008	-0.3%	-1.6%	-1.8%	-2.0%	-3.1%	-1.9%	-2.2%	-3.3%

3.4. Takeaways

Broadband connectivity in Tennessee continues to improve due in large part to the sustained efforts of private ISPs to leverage available public funding to extend their networks further across the state. In light of these successes, the state appears to be well positioned to close most, if not all, remaining gaps in broadband availability by deploying BEAD and CPF funding (see Section 4.1 for additional discussion and recommendations).

In addition, and impressively, the state has made significant strides in closing the adoption gap across almost every demographic group. Pockets of under-adoption remain among low-income households and older adults, but as discussed in Section 4.2, the availability of federal subsidies and the use of targeted outreach and education promise to further these gains.

Finally, non-traditional broadband providers, particularly municipal electric utilities, continue to play a marginal role in addressing the state's broadband challenges. As

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[109] *Id.* In this table, a positive value means the utility's rates grew more quickly than the statewide average over that same period for utilities that did not deploy a broadband network; a negative value means they grew less quickly.

previously noted, few, if any, of these systems were built to serve unserved areas; instead, most were built to compete in markets that were already served by incumbent ISPs. More rigorous study of these systems is needed to ensure that they are not running afoul of the state's longstanding goal of protecting electric ratepayers from having to shoulder the costs of a utility broadband network.

4. Looking Ahead

Numerous opportunities exist for Tennessee to achieve its long-held goal of universal broadband deployment, adoption, and informed use. The following articulates best practices and guiding principles that might inform the state's efforts on these fronts going forward.

4.1. Opportunities to Address Remaining Supply-Side Issues

The torrent of federal broadband funding that is making its way to Tennessee promises to greatly accelerate expansion efforts in the state. As previously noted, the state could receive over $1 billion in federal funding – via BEAD and the CPF – for use in support of broadband deployment to unserved and underserved areas. This would come directly after the state leveraged over $400 million in ARPA funding for the same purpose and after having invested $40 million in state funds prior to that. Tennessee is thus well positioned to allocate new and future broadband funds in an efficient and effective manner due to the existence of an experienced broadband program that has been in place since 2017 and recent legislative adjustments to further enhance its grant program.

Even so, officials in Tennessee will have to navigate a BEAD process that many describe as among the most complicated grant programs ever to be launched. At the same time, the state will administer CPF-funded grant programs that operate under similar but distinct criteria set forth by a different federal entity (the Treasury Department). Accordingly, the state will have to make a number of critical decisions regarding the parameters of these programs. These decisions will impact how grants are awarded in the short-term and the extent to which the projects it elects to fund will be able to achieve their promised deployment goals over the longer term. The following offers guiding principles that might assist state officials in decision-making during these processes.

4.1.1. Prioritize Funding for Last-Mile Deployments in Unserved Areas

Given the well-defined broadband challenges that remain evident in Tennessee, an optimal use of available federal grant funding would be to support projects aimed at providing last-mile service to unserved households. As discussed in Section 2.3, Tennessee has recognized the importance of this focus in the form of legislation that requires state grant officials to

prioritize the allocation of funding for last-mile projects focused on areas that are 100% unserved.[110]

A focus on middle-mile networks would appear to contravene this clear statement of grant prioritization and would diverge from previous state grant program criteria, which clarified that "middle-mile expenses are eligible for grant funding only when they are necessary for the provision of the last-mile services described in the application."[111] Nevertheless, Tennessee will invest $125M in CPF funding into a middle-mile network program.[112] The competitive grant program is said to be "designed to deploy middle mile infrastructure in rural areas of the state to improve and expand last mile connections."[113]

In July 2023, the state detailed the structure of its middle-mile grant program.[114] Key elements include:

- A focus on areas lacking access to 25/3 Mbps broadband service;

- Grantees must build out the last mile – 30% of grant funding must be put towards last-mile deployment, which can be deployed by the grantee itself or a partner; and

- There is no open access requirement for funded networks.[115]

These elements appear to comport with recent amendments to state law, which clarified that it is a priority for the state to distribute available grant funding to last-mile deployment. That middle-mile grantees must buildout the last-mile by leveraging the newly deployed backbone infrastructure could help to protect against duplicative overbuild.

However, regardless of the robust guardrails attached to this program, it is unlikely that additional middle-mile investment in Tennessee is needed. Available broadband maps maintained by Tennessee and the FCC do not include data regarding the location of middle-mile infrastructure. However, given a lack of funding allocated to these projects in the past via the state grant program and previous federal grant initiatives (*e.g.,* the BTOP program in 2009), it is reasonable to assume that middle-mile infrastructure in the state is already extensive. In addition, no entity in Tennessee received funding from the NTIA Middle-Mile

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[110] *Public Chapter No. 320.*

[111] *Emergency Fund FAQ.*

[112] Tennessee received a total of $185M in CPF funding in February 2023. *Capital Projects Funds Award Fact Sheet – Tennessee,* U.S. Dept. of Treasury (Feb. 2023), https://home.treasury.gov/system/files/136/Batch-9-State-Award-Fact-Sheet-TN-Feb-2023.pdf.

[113] *Id.*

[114] Tennessee ECD, Grants, https://www.tn.gov/ecd/rural-development/broadband-office/grants.

[115] *Id.*

Grant Program to build new middle-mile networks, further suggesting that additional investment is likely unnecessary.

Grant allocations – via the state's CPF-funded program or the BEAD program – that result in the deployment of duplicative middle-mile infrastructure would be wasteful and could result in those networks struggling or failing over the long-term. This has occurred in several other states over the last decade. The following examples illustrate the many risks associated with funding duplicative middle-mile infrastructure:

- **KentuckyWired (Kentucky).** Perhaps the most infamous example of middle-mile overbuild is the KentuckyWired project, which has been labeled a "boondoggle" by many.[116] This statewide middle-mile network was launched to facilitate last-mile broadband service in unserved and underserved rural areas.[117] The project has gone significantly over-budget – it has cost more than five times as much as initially estimated – and was delayed for many years.[118] It is now mostly complete, but it has yet to forge meaningful partnerships with ISPs for the delivery of last-mile service.

- **EAGLE-NET (Colorado).** In 2009, a consortium of entities in Colorado successfully secured federal grant funding to build EAGLE-Net, a statewide middle-mile fiber network aimed at connecting every school district in the state and providing connectivity to various anchor institutions.[119] This $135 million project struggled from the start. Indeed, as the network was being built, it quickly became clear that, in many places, the infrastructure would be placed near existing middle-mile assets. Rather than "identify[] and adapt[] to these market changes, EAGLE-Net plowed forward," overbuilding private infrastructure and eventually triggering a federal investigation.[120] The investigation concluded that the project was engaging in inefficient overbuild, which contributed materially to the network's financial

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[116] *See, e.g.,* Karl Bode, *Kentucky Hopes to Shake Off KentuckyWired Boondoggle as State Gets Ready for BEAD Funding,* May 8, 2023, Community Networks, https://communitynets.org/content/kentucky-hopes-shake-kentuckywired-boondoggle-state-gets-ready-bead-funding. For an extended discussion of the struggles of middle-mile networks in Kentucky and several other states, *see Comments of the Advanced Communications Law & Policy Institute at New York Law School to the ALJ's Email Ruling Issued September 9, 2021,* California PUC (Oct. 1, 2021), https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M411/K510/411510548.PDF.

[117] *See, e.g.,* Alfred Miller, *Auditor: Kentucky Taxpayers Ripped Off as Price of Beshear Project Leaps,* Sept. 27, 2018, Courier Journal, https://www.courier-journal.com/story/news/politics/2018/09/27/kentuckywired-broadband-cost-taxpayers-1-5-billion/1436691002/.

[118] *Id.*

[119] *EAGLE-Net Project Overview,* BTOP, U.S. Dept. of Commerce, https://www2.ntia.doc.gov/sites/default/files/grantees/cboces.pdf.

[120] Kellen O'Brien, *EAGLE-Net's Never-Ending Odyssey: Addressing Colorado's Unique Broadband Infrastructure Challenges,* 12 J. on Telecomm. & High Tech. L 222, 240 (2014), http://www.jthtl.org/content/articles/V12I1/JTHTLv12i1_O%27Brien.PDF.

struggles.[121] Eventually, a private entity was engaged to "take[] over the responsibility of managing Colorado's beleaguered EAGLE-Net."[122]

▪ ***North Florida Broadband Authority (Florida).*** In 2009, 14 North Florida county governments and eight municipalities came together to build a "1,200-mile fixed wireless broadband network" that would connect "more than 300 community anchor institutions at speeds of 10 Mbps to 1 Gbps," all in an effort to "enhance economic development, education, and public services throughout the region."[123] The North Florida Broadband Authority (NFBA) received $30 million in federal grant funding to begin the project; the remaining $9 million was to come from members of the consortium.[124] Almost immediately, the NFBA project became financially unsustainable, due in large part to project mismanagement.[125] In response, the federal government froze its funding in September 2011 and opened an investigation.[126] Shortly thereafter, the project was described as stable and almost complete.[127] However, by 2013, a private entity was tapped to take over due to a "shortage of customers."[128] That entity "pulled out within a year after sourcing on the prospects of making a profit."[129] As a result, the network quickly became defunct – equipment was not maintained, making the system "unreliable" and forcing "some customers [to move] on to other sources for internet service."[130]

▪ ***MassBroadband123 (Massachusetts).*** The MassBroadband123 middle-mile network was built to connect anchor institutions and bolster last-mile rural broadband connectivity. It currently "consists of approximately 1,200 miles of fiber,

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[121] *See generally Letter from Todd J. Zinser, Inspector General, U.S. Department of Commerce, to the Honorable Greg Walden, et al.,* Jan. 23, 2014, https://www.oig.doc.gov/OIGPublications/OIG-14-011-M.pdf.

[122] Sean Buckley, *Zayo Takes Over Management of Colorado's Trouble EAGLE-Net Alliance,* July 20, 2015, Fierce Telecom, https://www.fiercetelecom.com/telecom/zayo-takes-over-management-colorado-s-troubled-eagle-net-alliance.

[123] *Project Fact Sheet: North Florida Broadband Authority,* NTIA, U.S. Dept. of Commerce, https://www2.ntia.doc.gov/sites/default/files/grantees/fl_nofloridabbauth_final.pdf.

[124] *Id.*

[125] *See, e.g., Testimony of the Hon. Lawrence E. Strickling, Assistant Secretary for Communications and Information, NTIA, U.S. Dept. of Commerce, Before the House Subcommittee on Communications and Technology,* at p. 11, Feb. 27, 2013, https://www.govinfo.gov/content/pkg/CHRG-113hhrg80019/pdf/CHRG-113hhrg80019.pdf#page=28 ("*Strickling Testimony*").

[126] *Id.*

[127] *Id.*

[128] Anthony Clark, *Rural Counties Struggle Getting 'Last-Mile' of Fast Internet,* Nov. 28, 2015, Gainesville Sun, https://www.gainesville.com/article/LK/20151128/News/604137522/GS.

[129] *Id.*

[130] *Id.*

connecting 123 communities in western and north central Massachusetts."[131] It was built at a cost of about $90 million, half of which was funded by the state and the other half via a federal stimulus grant.[132] The original vision for the MassBroadband123 network was to serve as a means of facilitating last-mile deployment by municipalities and other ISPs in unserved and underserved parts of the state. That effort quickly struggled due to, among other things, operational and sustainability concerns of some of the city-led broadband efforts.[133] Now, the state primarily focuses its resources on supporting last-mile deployment by private ISPs, either on their own or in partnership with municipalities.[134] This shift underscores the ability of public-private partnerships to serve as a viable solution in some unserved and underserved areas.

Given these struggles; the likelihood that the state is already well served by multiple providers in the middle-mile; and the clear intent of the legislature to direct available grant funding to last-mile projects, a better approach for the allocation of CPF and BEAD funds would be to exclude middle-mile networks altogether unless there is clear and compelling evidence that an area lacks this infrastructure. In those limited instances, grants should be awarded only if there are enforceable commitments by last-mile ISPs to leverage that infrastructure for use in delivering last-mile service. Otherwise, Tennessee risks subsidizing the construction of networks to nowhere.

4.1.2.   Deploying a Robust and Inclusive Challenge Process

Before allocating BEAD grant funding, Tennessee will be required to establish a "transparent, evidence-based, and expeditious challenge process" that allows an entity to "challenge a determination made by [the state]...as to whether a particular location" is unserved and therefore eligible for grant funds.[135]

BEAD challenges will be much more focused than the ones currently allowed by Tennessee as part of its state grant program. For example, the BEAD challenge process is not open to

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[131] Massachusetts Broadband Institute, Middle Mile Network, https://broadband.masstech.org/middle-mile-network.

[132] *Project Fact Sheet: MassBroadband 123,* NTIA, U.S. Dept. of Commerce, https://www2.ntia.doc.gov/sites/default/files/grantees/MA_MassBroadband123.pdf.

[133] *See, e.g.,* Lisa Gonzalez, *Shoot-Out Over the WiredWest: MBI Pulls Funding in Massachusetts Saga,* Jan. 27, 2016, Community Networks, https://muninetworks.org/content/shoot-out-over-wiredwest-mbi-pulls-funding-massachusetts-saga.

[134] *See, e.g.,* Diane Brancaccio, *MBI Changes Broadband Course,* May 10, 2016, Greenfield Recorder, https://www.recorder.com/MBI-changes-broadband-course-2046546. *See also* MBI, Flexible Grant Program, https://broadband.masstech.org/last-mile-programs/flexible-grant-program ("*Flexible Grant Program*"). The state's middle-mile network still serves as a means of facilitating deployment by municipal ISPs, but such uses appear to be limited.

[135] IIJA § 60102(h)(2).

the public; rather, it is limited to units of government, nonprofit organizations, and ISPs.[136] In addition, the scope of BEAD-related challenges and the data offered in support of those challenges will likely be more expansive than what Tennessee currently accepts.[137] Ultimately, whatever data is submitted as part of a BEAD challenge must be verified by the state. Hence the need for a robust challenge process.

What might such a process look like? At bottom, challenge processes help to ensure that grant funding goes to truly unserved areas, and then to underserved areas. A variety of factors make it difficult for any one source to correctly identify every unserved or underserved area in a state. For example, data from ISPs regarding their service territory might be inaccurate; areas that are technically served might only have access to unreliable broadband connections;[138] or an area that is currently unserved might be "subject to an enforceable federal, state, or local commitment [*e.g.,* a state grant; RDOF funding; an ARPA-funded project; etc.] to deploy qualifying broadband," which would render it served for the purposes of allocating BEAD funding.[139] Challenge processes that leverage localized knowledge of broadband deployment – *i.e.,* local officials and ISPs – can help to ensure that public funds are expended in a fiscally prudent manner and not used to enable unnecessary and inefficient overbuilding.

4.1.3. Using the BEAD Process to Continue Calibrating Regulatory Frameworks & Addressing Critical Pole Issues

As part of the BEAD application process, states are required to identify potential legislative and regulatory reforms that could help to reduce broadband deployment costs and hasten buildout.[140] This offers Tennessee an opportunity to continue calibrating its approach to broadband to reflect current dynamics. Among other areas ripe for reform, policymakers should use this opportunity to propose mechanisms for addressing TVA-related pole attachment issues.

As noted in Section 2.5, the pole attachment rates set by TVA and charged by the entities to which it sells power (*i.e.,* municipal electric utilities and cooperatives) are significantly higher than the rates charged by the private electric and telecommunications companies subject to FCC and state PUC cost structures. In practice, higher pole attachment rates increase the costs associated with broadband deployment and could lead to some ISPs

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[136] *Broadband Accessibility Grant – FAQs,* at p. 13-14, https://www.tn.gov/content/dam/tn/ecd/documents/broadband/FAQ%27s%20FY21%201.pdf.

[137] Compare *id.* with *Proposed BEAD Challenge Process Guidance,* NTIA (April 2023), https://www.internet4all.gov/sites/default/files/2023-04/BEAD_Challenge_Process_Policy_Notice_-_Public_Comment_Draft_04.24.2023_0.pdf.

[138] *See, e.g., BEAD NOFO* at p. 15, fn. 13 (noting that areas served only by DSL connections could be considered unserved if those connections are deemed unreliable).

[139] *BEAD NOFO* at p. 36.

[140] *BEAD NOFO* at p. 32.

choosing not to deploy networks in certain areas if those costs outweigh expected returns on investment. NTIA has urged states to propose ways for assuring "cost-effective access to poles" in their BEAD applications.[141]

It is unlikely that Tennessee itself can force the TVA to reconsider its pole rates.[142] Instead, Tennessee policymakers might revisit previous proposals to offset the difference between TVA pole rates and FCC pole rates.

The 2021 TACIR report highlighted a proposal that would have provided to private ISPs a tax credit "against franchise and excise taxes to help offset the greater pole attachment fees they pay under the TVA formula."[143] TACIR noted that a potential downside of this approach was an inability to require ISPs that benefited from the tax credit to use those savings for broadband deployment.[144] This idea has yet to be pursued in the legislature.

The legislature could capture the essence of this proposal in several ways. Options include legislation that:

- Requires municipalities where broadband is provided by a municipal electric utility or electric cooperative that is subject to the TVA pole formula to refund to private ISPs that have attached equipment to TVA-regulated poles the difference between the TVA rate and the FCC rate. To receive a refund, ISPs would have to formally request the funds and enter into enforceable agreements with the refunding entity to reinvest those funds in their broadband assets in the area or otherwise use those funds to enhance overall connectivity (*e.g.,* an ISP could use the funds to deploy a digital literacy program, bolster available subsidies, etc.).

- Clarifies that the source of these refunds cannot come from rate increases on electric customers, which would run afoul of TVA rules for poles and for using electric assets to subsidize non-electric activities. Instead, municipalities could draw from reserves or general revenues, or explore the use of a special fee or tax to generate the revenues needed to make the refund.

- Excludes municipal electric utilities and electric cooperatives from participating in the refund program because they are subject to TVA regulation.

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[141] *BEAD FAQ 2.0,* at p. 39, NTIA (Sept. 2022), https://broadbandusa.ntia.doc.gov/sites/default/files/2022-09/BEAD-Frequently-Asked-Questions-%28FAQs%29_Version-2.0.pdf.

[142] Any action by Tennessee would likely be preempted because it conflicts with the determination of a federally authorized entity. *See, e.g., State Regulation of Pole Attachment Rates of TVA-Supplied Electric Cooperatives,* Opinion No. 14-20, Office of the TN Attorney General (Feb. 19, 2014), https://www.tn.gov/content/dam/tn/attorneygeneral/documents/ops/2014/op14-020.pdf.

[143] *2021 TACIR Report* at p. 56.

[144] *Id.* at p. 56-57.

- The refund could be framed as opt-in in nature and tied to the designation of communities as "Broadband Ready." To incentivize adoption, the state could offer to offset some or all the costs associated with the refund. Alternatively, the opt-in nature of the refund could be triggered if a municipal utility or cooperative successfully receives a state or federal grant to support broadband deployment in a particular community.

- Allows municipalities to use the refund amount as an in-kind contribution to BEAD match requirements as part of a PPP with a private ISP.

- Creates a separate state fund to municipalities in paying for the refund. In theory, the refund would last for as long as an ISP has equipment on the pole and the TVA maintains its distinct pole formula. A state-level fund could create a reliable source of revenue for localities to assist in making these payments. An initial source of funding could come from CPF funds that were initially meant to support middle-mile deployments, a program that, as discussed above, is likely unnecessary.

The legislature should also consider rules related to the processes impacting how municipal electric utilities and electric cooperatives review and approve requests to access poles in the first place. FCC rules regarding these processes do not apply to municipal utilities and cooperatives. The TVA, however, has yet to offer guidance on the "terms and conditions" governing these critical aspects of pole access.[145] Formal guidance is necessary to create more consistency and predictability regarding the time that can be taken by pole owners to review and approve requests for pole access. A natural starting place for a law focused on pole access rules would be the relevant FCC rulings on these issues. Without a framework to guide administrative interactions between pole owners and would-be attachers, costs to deploy broadband networks in certain areas have risen due to the inability of some entities to act on requests in a timely manner.

Another potential way to reduce pole-related costs would be for the legislature to explore establishing a fund to support the undergrounding of broadband-related wiring. Removing all utility poles in favor of undergrounding would be enormously expensive. For example, it has been estimated that undergrounding the remaining 60% of power lines in Memphis alone could cost upwards of $6 billion.[146] A more targeted approach that allocates funding just for the undergrounding of broadband wiring, however, could be more cost-effective and would have the practical effect of reducing pole attachment disputes between ISPs and

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[145] *TVA Determination* ("Regulatory Staff noted that many regulatory bodies not only regulate the rate for pole attachments but also the terms and conditions for pole attachment, such as dismantling fees and penalties. Regulatory Staff contemplated a similar regulatory scope but determined that regulating beyond the rate is neither feasible nor appropriate at this time.").

[146] Samuel Hardiman and Corinne S. Kennedy, *Memphis Mayor John Strickland on Undergrounding Powerlines, 'Let's Have that Discussion,'* Feb. 7, 2022, Memphis Commercial Appeal, https://www.commercialappeal.com/story/news/2022/02/07/memphis-mayor-jim-strickland-power-outages-memphis-underground-power-lines/6693540001/.

pole owners subject to TVA pole rates. Several states have explored the establishment of such a fund. Ohio, for example, is considering a bill that would reimburse ISPs for undergrounding costs when building networks in unserved areas.[147]

In sum, there are many ways in which the legislature might address the issue of pole attachments fees in the state. Failure to do so could blunt the impact that forthcoming BEAD and CPF funding will have on helping the state bring broadband to remaining unserved areas.

4.1.4. Revisiting Policies Impacting Non-Traditional ISPs

As part of the BEAD application process, states must describe efforts taken to assure the participation non-traditional ISPs in the grant program.[148] This includes the potential waiver or removal of legal or regulatory requirements that NTIA views as exclusionary towards these entities.[149] Nothing in Tennessee law appears to exclude municipalities, municipal electric utilities, or electric cooperatives from participating in the BEAD program. However, in light of the discussion and analysis included in Section 2.4 regarding the role of non-traditional ISPs in deploying broadband in the state, policymakers might use the BEAD process as an opportunity to revisit and strengthen the framework governing broadband deployment by municipal electric utilities and other such entities.

For example, Tennessee might consider amending the statutory framework governing the process by which municipal electric utilities pursue broadband projects to encompass electric cooperatives. Doing so would create parity in the approach to overseeing broadband deployments by similarly situated entities.

Tennessee might also clarify and strengthen accountability measures applicable to these projects, especially those related to how municipalities account for costs attributed to fiber used for both electric and broadband purposes. There are currently no rules governing how utilities are to measure the amount of bandwidth used for certain applications enabled by a fiber network. Instead, the current legal framework appears to operate on an honor system, with no way to check whether a utility is over- or under-estimating its fiber cost allocation.

One potential approach could involve consultation with technical experts to determine the feasibility of metering the traffic traversing a network and devising methods to identify data stemming from smart grid applications. This type of approach, provided it is deployed in a manner that respects and protects consumer privacy, could yield more precise and measurable data regarding the actual uses of a fiber network. It would also create

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[147] Ohio House Bill 33 (2023), p. 420-431, https://search-prod.lis.state.oh.us/solarapi/v1/general_assembly_135/bills/hb33/PH/02/hb33_02_PH?format=pdf.

[148] *BEAD NOFO* at p. 48.

[149] *BEAD NOFO* at p. 51.

significantly more transparency and accountability in how utilities and cooperatives allocate their costs. Having such data at the ready would help to assure that utilities are not engaging in cross-subsidization, an outcome of interest to both the state and the TVA. If the state is unwilling or unable to enact policies addressing this issue, then the TVA could consider including similar requirements as part of their review of proposals for broadband deployment by municipal utilities and cooperatives.

In addition, Tennessee could provide the Comptroller with more authority over municipal broadband projects by, for example, making its determinations regarding the feasibility of a deployment binding on the utility (they are currently only advisory in nature) and requiring it to regularly audit these networks. To date, the Comptroller has only engaged in *ex post* oversight of municipal broadband projects on an *ad hoc* basis. The legislature could consider requiring utilities to submit annual fiber audits to the Comptroller. The legislature might also empower the Comptroller to issue rules to guide utilities in how they allocate fiber costs and otherwise gather the data needed to demonstrate that they are not engaging in cross-subsidization.

At the same time, the TVA should consider engaging in a similar strengthening of its approval and oversight practices for municipal and cooperative broadband projects within its purview. If its primary concern vis-à-vis the entities to which it sells power is to ensure that customers pay the lowest rates possible for electricity, then the TVA should do more to monitor and assess the impacts that the provision of broadband services might be having on rates.

4.2.   Opportunities to Address Remaining Demand-Side Issues

Unlike many other states, Tennessee has long identified demand-side issues as a priority. This focus has yielded impressive progress when measured in terms of broadband adoption rates. As discussed in Section 3.2, adoption rates have risen significantly in recent years. These gains are likely attributable to several related factors, including greater availability of broadband access; declining prices, when measured in terms of $/Mbps;[150] the availability of subsidies to offset subscription costs; and greater awareness of the importance of broadband stemming from the rapid shift to remote everything caused by the pandemic.

Further progress is possible. There is still ample room for adoption rates in some communities to climb, and a greater focus on digital literacy skills is needed. Fortunately, resources are available to assist in addressing these issues.

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[150] For national data on this trend, see Jason Shevik, *Broadband Pricing Changes: 2016 to 2022*, Oct. 13, 2022, BroadbandNow.com, https://broadbandnow.com/internet/broadband-pricing-changes.

4.2.1. Assure Robust, Inclusive, and Comprehensive Planning

To access available federal grant funding for broadband, state policymakers will have to collaborate with their counterparts at the local level, as well as stakeholders across the private and nonprofit sectors, to develop and deploy plans that detail how resources will be used to enhance digital equity and promote more robust broadband connectivity. Indeed, the IIJA positions equity as a primary consideration that must inform how BEAD funding is allocated – the statute requires states to ensure that whatever funding is distributed in support of broadband expansion is done in an "equitable and non-discriminatory manner."[151] Similarly, securing digital equity grant funding via the IIJA requires states to work with local counterparts to develop digital equity plans that cover the full range of broadband connectivity issues – *i.e.,* those on both the supply-side and demand-side.[152]

The products of these planning processes will be a digital equity plan that details how Tennessee will deploy this demand-side. To assure a robust, inclusive, and comprehensive plan, Tennessee might consider using or adapting the ACLP's digital equity framework. Core elements of the ACLP's digital equity framework include:

- *Availability Assessment*. At the outset, officials should undertake a comprehensive inventory of broadband availability in the city/county/region. This should encompass all forms of broadband regardless of technology and should catalog available speeds, price points, and service offerings. If the area is served (*i.e.*, if residents can readily subscribe to a broadband connection of some kind), then officials should continue forward with the framework. If the area is deemed unserved, different remedies are appropriate. This overlaps with BEAD planning, a dynamic reflected in NTIA's guidance to states encouraging them to develop their BEAD and digital equity plans in tandem. Doing so will allow broadband availability analyses to inform demand-side planning, and vice-versa. Ultimately, Tennessee should seek to deploy funding to areas of most need, as required by the IIJA (*i.e.,* BEAD funding goes first and foremost to unserved and undeserved areas; DE funding goes to certain covered populations).

- *Adoption Assessment*. In served areas, the next step is to evaluate broadband adoption in the community. What are the adoption rates across relevant demographic and socioeconomic groups? What kinds of services and speeds are consumers using? Who isn't online? Data should be derived primarily from the Census Bureau's ACS reports and supplemented with survey and anecdotal data collected by states, localities, and relevant community groups.

- *Barriers Assessment. For those who aren't online, understanding specifically why* they have not adopted broadband is essential. What are the major barriers impeding

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[151] IIJA § 60102(g)(2)(B).

[152] IIJA § 60304(c)(1).

their adoption? Is it the cost of a broadband connection? The lack of a computing device? A hesitance or fear of going online? A lack of appreciation for how broadband can positively impact one's life? General disinterest? A granular understanding of these issues within each under-adopting user group will increase the chances that policy responses are impactful.

- *Partnership Assessment*. Once the nuanced landscape of broadband connectivity is fully understood, the next step is to identify potential partners for bringing more people online. ISPs are natural partners given their presence in the locality. Partnerships with them could yield greater promotion of existing low-cost offerings, the availability of ACP subsidies, additional Wi-Fi deployments, or other appropriate responses to connectivity challenges facing certain communities. Currently, there appears to be a significant gap in awareness of the availability of low-cost broadband programs and subsidies among users who might qualify. Closing that gap should be a priority for policymakers and other stakeholders (see below for further discussion).

  On the demand-side, partners might include anchor institutions, nonprofits, foundations, healthcare associations, community groups, senior centers, and other stakeholders in the local social infrastructure with established roots in the community and demonstrated bona fides vis-à-vis bringing people online and delivering targeted digital literacy training. These entities should be among those positioned by Tennessee as ideal partners of inexpert entities seeking DE grant funding.

- *Strategy Development*. After the data has been gathered and assessed; the issues identified; and resources marshaled, state and local officials will then be in a better position to begin aligning these assets to address the challenges at hand. An inclusive process that brings all stakeholders to the table for collaborative, solution-focused discussions will be best vis-à-vis generating workable strategies.

- *Solution Deployment*. Once strategies have been developed, officials, in tandem with the network of partners convened to assist, can focus on the tactical deployment of actual solutions, including the securing and allocating of available grant funding. Priority should be assigned to those communities where broadband adoption rates are lowest.

4.2.2. Promote the Availability of Subsidies

A major source of recent progress on the broadband adoption front has been the availability of subsidies to offset the cost of a monthly broadband subscription and an access device. The FCC's Affordable Connectivity Program, which provides eligible low-income

participants with a $30/month subsidy, has enrolled some 17.5 million households[153] In Tennessee, about 358,000 households have enrolled.[154] Though of great help to qualifying households, the ACP is significantly undersubscribed. At the national level, 46% of qualifying households have enrolled; in Tennessee, that figure is 43%.[155] This means that about 500,000 households in Tennessee could benefit from ACP but have yet to enroll. More should be done to raise awareness about the availability of this subsidy.

For those enrolled in the ACP, many can also avail themselves of low-income programs offered by ISPs like AT&T, Charter, Comcast, and EPB. In many instances, broadband is provided for free to these customers. In short, the cost and perceived affordability of broadband is no longer an issue for many Tennesseans.

4.2.3. Leverage Available Digital Equity Funds to Scale Proven Programs

Empowering users with a core set of skills requires comprehensive planning, the development of curricula, and the provision of opportunities to acquire and hone these skills. Federal digital equity grants will be available to support many of these efforts. Tennessee could receive upwards of $30 million from NTIA for use as grants in support of digital literacy and related offerings.[156]

These funds could be used to scale impactful demand-side programs like Comcast's Internet Essentials, which has proven enormously successful in bringing millions of Americans online for the first time;[157] Chattanooga/Hamilton County's EMPACT, Tech Goes Home, and HCS EdConnect programs, all of which have received plaudits from state and local policymakers in Tennessee and elsewhere;[158] and the Digital Navigator program, which places digital literacy experts in community settings (*e.g.,* libraries, community/senior centers, etc.) to deliver hands-on training.[159] At a minimum, best practices should be

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[153] USAC, ACP Enrollment and Claims Tracker (as of April 24, 2023), https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/.

[154] *Id.*

[155] Based on a comparison of ACP enrollment data as of April 2023, *id.,* with the total number of households eligible for Lifeline, a program with similar eligibility criteria to the ACP. *See* USAC, Lifeline – Program Data, https://www.usac.org/lifeline/resources/program-data/. The ACP's eligibility criteria are broader than Lifeline's, so the enrollment rate for the ACP is likely even lower.

[156] *An Overview of the IIJA's Digital Equity Grant Programs,* at p. 5, ACLP at New York Law School (March 2023), https://digitalcommons.nyls.edu/cgi/viewcontent.cgi?article=1010&context=reports_resources.

[157] *2022 Internet Essentials Progress Report,* Comcast (June 2022), https://update.comcast.com/wp-content/uploads/sites/33/dlm_uploads/2022/06/IE-ProgressReport_6-23-22.pdf.

[158] See, e.g., *Chattanooga Named a '2022 Digital Inclusion Trailblazer,'* Aug. 22, 2022, The Enterprise Center, https://www.theenterprisectr.org/chattanooga-named-a-2022-digital-inclusion-trailblazer/.

[159] See, e.g., Matt Kalmus et al., *A Human Approach to Closing the Digital Divide,* June 13, 2022, BCG, https://www.bcg.com/publications/2022/how-to-close-digital-divide-with-human-approach.

distilled from these efforts and offered to other groups designing additional digital literacy programs.

Embracing and adequately funding a more robust and expansive digital equity and literacy vision is essential at a time when technology like broadband is becoming more and more central to every aspect of life. With greater use comes greater benefits, but also more risk in the form of privacy violations and cyber threats. In addition, as technology continues to advance, it will be essential for Tennessee to have a robust digital equity and literacy infrastructure in place to deliver updated training and education on issues like AI and protecting personal data when online.