Broadband Availability and Adoption: A State Perspective

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National Regulatory Research Institute

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About the Author

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Executive Summary

The Telecommunications Act charges the Federal Communications Commission (FCC) and the States with ensuring that all Americans have access to "reasonably comparable" communications services, including information services, at "reasonably comparable" prices regardless of where they reside.

> Consumers in all regions of the Nation, including low-income consumers and those in rural, insular and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas. (Telecommunications Act of 1934, as amended)

As the communications ecosystem transitions from a voice-centric to a broadband focused environment, these "comparable" telecommunications and information services have become a critical issue for federal and state regulators. Full participation in 21st century society increasingly requires high speed access to the civic, educational, and health services often available only through the internet. This has made increasing the availability and adoption of broadband a key goal of both the nation as a whole and the individual states on behalf of their citizens.

At the federal level, the FCC has used the Universal Service Fund (USF) for high cost support, rechristened the Connect America Fund (CAF), to extend broadband availability, redefine broadband speed requirements, and create initiatives to deploy broadband services in remote and high cost areas. Key FCC initiatives have included "transforming" the process for assessing access charges, allocating funding to broadband initiatives, establishing the CAF as a high cost support mechanism focused on extending broadband to rural areas via targeted investment; revising the way in which support is provided to rural carriers by moving from a rate of return mechanism to a model-based system; and redistributing unclaimed CAF funds to carriers willing to provide service to high cost areas where there are no unsubsidized providers. Under these programs, the FCC has also sought to fund broadband deployment on a more technology neutral basis, including proposing support for the deployment of mobile broadband services (commonly referred to as 5G) and supporting the use of fixed wireless and satellite providers to bring service to areas where building physical facilities would be too difficult or expensive. Finally, to increase broadband adoption, the FCC has revised the Lifeline program to focus on providing broadband to low income consumers by reducing and eventually eliminating funds for voice only programs while moving the program to broadband services.

According to the FCC's 2015 Internet Access Services Status Report, broadband penetration is increasing rapidly, at least in urban areas where carriers can establish a business case to support investment in the facilities necessary to support high speed service. Nearly 90% of Americans now have access to broadband at speeds of 25 Mbps/3Mbps or higher. But 10% of Americans, primarily those in rural, insular, or low income areas continue to be either without

service altogether or to have service only at lower speeds. These consumers remain on the wrong side of the digital divide, dependent of the federal government and the states to bring them closer to the "comparability" benchmark.

At the same time that penetration is increasing, studies show that the broadband adoption rate has slowed, with fewer first time customers adopting wired high speed service for a variety of reasons, including price and a preference for mobile alternatives. This leaves the States with the key tasks of supporting increased deployment while identifying strategies for ensuring service adoption.

The States have met the challenge of increasing broadband deployment and adoption through a variety of initiatives, including direct funding, partnering across state agencies and industry to fund broadband build-out, "retooling" state USF rules to include broadband deployment in programs like Lifeline, and refocusing existing universal service funds from voice support to broadband build out, particularly in those areas where competition allows the state to divert high cost funds from subsidizing incumbent carriers to supporting broadband deployment.

All 50 states and the District of Columbia participated in NTIA's broadband mapping initiatives to identify areas where broadband is, and, most importantly is not available in order to target areas in need of support. States like Virginia and Nebraska have used state funds to keep these maps up to date, while others, like Missouri, are moving to reestablish those programs as the need for broadband grows. The States are also providing grants and matching funds to incent broadband build-out and working through their state broadband councils and task forces to develop strategies for ensuring that broadband is available and useable. Although these organizations are important conduits for state funding and support, they are often separate from the state public utility commissions and thus may not benefit from their direct knowledge of consumer needs and issues. Closing the gap between these entities will ensure that broadband deployment and adoption address key constituent needs.

During the 2017 sessions, state legislators have continued to focus their efforts on increasing broadband deployment and availability through direct state funding, simplified deployment rules, and creating long term strategies to build state networks where federal initiatives do not provide sufficient support. Legislation in 2017 has increased funding for broadband deployment and proposed tax incentives for companies that provide broadband in unserved and underserved areas. Bill have also supported public/private partnerships to enhance broadband deployment by providing a path to municipal broadband installations in areas without unsubsidized competitors, creating middle mile networks open to all providers, and sharing unused state infrastructure with commercial deployments. Legislation in three states, New Mexico, Oregon, and Utah has revised the state universal service fund to include funding for broadband eligible telecommunications carriers. Finally legislation in seven states has charged state commissions, broadband task forces, and broadband councils with creating long term strategies to increase service availability and create plans for enhancing adoption.

This paper reviews these state efforts to increase broadband availability and adoption. It addresses both federal and State initiatives, examines the current status of state broadband

programs, and proposes ways in which the State Public Utility Commissions and work with the independently created state broadband organizations to align their missions to ensure the greatest benefit to citizens.

As the transition to broadband moves forward, states will need to address three key questions to meet their broadband goals:

- As broadband replaces voice as the primary focus of the federal universal service program, how should the states respond?
- How can state commissions measure and improve broadband adoption, particularly in rural areas and areas with lower economic status?
- How should state commissions work with broadband commissions, government task forces, and separately constituted broadband authorities to manage broadband deployment and adoption?

As the National Broadband Plan points out "broadband is a transformative general purpose technology" that will improve the life of all citizens if they can access and adopt it. The states play a crucial role in encouraging broadband deployment and creating programs to ensure that their citizens have the ability to fully adopt the changes it will make possible. By reviewing the ways in which the states have responded to the need to implement broadband and encourage service adoption, we can identify and promote best practices for embracing this critical new technology.

Broadband deployment and adoption will continue to be the key issues facing the states in the 21st century. By sharing information and best practices with each other, the states will continue to be the key laboratories for creating and testing the solutions to the problems of their citizens.

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Broadband Availability and Adoption:

A State Perspective

I. Introduction

The Telecommunications Act charges the FCC and the States with ensuring that all Americans have access to "reasonably comparable" communications services, including information services at "reasonably comparable" prices regardless of where they reside.

> Consumers in all regions of the Nation, including low-income consumers and those in rural, insular and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas.[1]

Revisions to the Act in 1996 created the Universal Service fund (USF) to support deploying communications services to high cost areas, providing affordable voice service to low income consumers, increasing the reach of telemedicine, and bringing advanced communications and data services to educational institutions.[2]

Originally directed at extending voice services to rural and remote areas and encouraging the availability of service to low income consumers, in 2009, the focus of the fund shifted from voice to broadband after the publication of the National Broadband Plan (NBP). The NBP recognized the growing importance of universal access to services provided over the internet and proposed that access to high speed data service (broadband) throughout the country was necessary to increase innovation and technological advancement and offer all Americans the ability to participate fully in the national economy.

> Broadband is the great infrastructure challenge of the early 21st century. Like electricity a century ago, broadband is a foundation for economic growth, job creation, global competitiveness and a better way of life. It is enabling entire new industries and unlocking vast new possibilities for existing ones. It is changing

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[1] Telecommunications Act of 1934, as amended, Section 254 (47 USC 254), Universal Service. The Act does not define "reasonably comparable," leaving the meaning of that phrase in the eye of the beholder.

[2] The Universal Service Fund includes four distinct "sub-funds", High Cost, Lifeline, Telemedicine, and Schools and Libraries.

how we educate children, deliver health care, manage energy, ensure public safety, engage government, and access, organize and disseminate knowledge.[3]

The NBP envisioned extending broadband availability throughout the country by encouraging the growth of broadband service by changing the focus of universal service from voice to data and by encouraging the deployment of broadband facilities to all areas of the country--urban, rural, and insular, including tribal lands.

At the federal level, the FCC has used the Universal Service High Cost Fund, rechristened the Connect America Fund (CAF), to meet the goals of the NBP by extending broadband availability, redefining broadband speed requirements, and creating initiatives to make broadband services available to remote and high cost areas. Key FCC initiatives have included the USF Transformation Order, revising the process for assessing access charges; establishing the CAF as a high cost support mechanism focused on extending broadband to rural areas via targeted funding; revising the way in which support is provided to rural carriers from a rate of return mechanism to a model-based system; redistributing unclaimed CAF funds to carriers willing to provide service to high cost areas where there are no unsubsidized competitive suppliers. The FCC has also sought ways to make broadband deployment technology neutral, including proposing support for the deployment of mobile broadband services (commonly referred to as 5G) and supporting the use of fixed wireless and satellite providers to bring service to areas where building facilities would be too difficult or expensive. Finally, to increase broadband adoption, the FCC has revised the Lifeline program to focus on providing broadband to low income consumers and reducing the funding of voice only programs.[4]

The States have met the challenge of increasing broadband deployment and adoption through a variety of initiatives, including direct funding, partnering across state agencies and industry to fund broadband build-out, "retooling" state USF rules to include broadband support in programs like Lifeline, and by refocusing existing funds from voice support to broadband build out. The states have also established programs directed toward increasing the adoption and use of broadband by their citizens. This paper reviews these state efforts to increase broadband availability and adoption.

Part I of this paper is this introduction.

Part II provides a brief overview of the current state of broadband in the United States. It examines current adoption and availability statistics and reviews the changing definition of broadband speed based on the funding criteria proposed by the FCC in the CAF orders.

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[3] Federal Communications Commission. Connecting America: The National Broadband Plan, 2009, available at https://www.fcc.gov/general/national-broadband-plan

[4] At this writing, the federal Lifeline program is being revised to return support decisions to the states and potentially to revise the services covered.

Part III discusses state broadband plans. It reviews broadband mapping activities, state grant programs, and the creation of broadband authorities outside the purview of the public utility commission. This section also discusses the distribution of Connect America funding not accepted by the incumbent carriers focusing on a review of New York's successful petition to apply funds refused by Verizon directly to the state broadband effort.

Part IV reviews 2017 broadband legislation, including legislation providing broadband support through state universal service funds.

Part V discusses three key questions facing the states as a result of the change from a voice-oriented communications ecosystem to a broadband focused one, including the impact of limiting commission participation in state broadband development organizations. These questions are:

- As broadband replaces voice as the primary focus of the federal universal service program, how should the states respond?

- How can state commissions measure and improve broadband adoption, particularly in rural areas and areas with lower economic status?

- How should state commissions work with broadband commissions, government task forces, and separately constituted broadband authorities to manage broadband deployment and adoption?

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As the National Broadband Plan points out "broadband is a transformative general purpose technology" that will improve the life of all citizens if they can access and adopt it.

> Broadband is changing many aspects of life—increasing business productivity, improving health care and education, enabling a smarter and more efficient power grid and creating more opportunities for citizens to participate in the democratic process. It is also fueling large global markets for high-value-added goods and services and creating high-paying jobs in important sectors such as information and communications technology (ICT).[5]

The states play a crucial role in encouraging broadband deployment and creating programs to ensure that their citizens have the ability to fully adopt the changes it will make possible. By reviewing the ways in which the states have responded to the need to implement broadband and encourage service adoption, we can identify and promote best practices for embracing this critical new technology.

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[5] Op.cit. NBP p. 29

II. Broadband connectivity: a brief review

The internet has become a critical part of our daily lives. It allows us to interact with government, apply for jobs, seek medical care, register for government services, obtain education, make telephone calls, watch TV, and more. Using data from the FCC and education sources, the National Education Association estimates that 70% of schools assign homework that requires internet access, creating a "homework gap" for students that do are not or are not able to connect from home.[6] And even McDonalds is experimenting with using an internet based application, Snapchat, to screen potential employees for jobs.[7]

Without access to the internet, consumers find themselves increasingly isolated from key parts of society and unable to take advantage of the fast-growing digital economy. Researchers estimate that the Internet and businesses based on e-commerce generated nearly 6% of the U.S. gross national product as of 2015, with the contribution growing yearly.

> The internet sector . . . is a top-20 industry within the United States economy . . . it is larger than powerhouse sectors such as Construction (3.6% in 2012), Transportation and Warehousing (2.9% in 2012), and others.[8]

Broadband connectivity provides the on-ramp to the internet, allowing us to connect easily and rapidly, without the constant "buffering" that slows applications and makes it difficult to interact with net-based services seamlessly and reliably. Broadband access is trending upward in urban markets, where speeds are increasing and competition, but remains more limited in rural and remote areas, reducing the ability of their population to participate in the internet economy. Both federal and state programs are increasingly focusing on this disparity, an issue we will focus on later in this paper. First, however, we provide some basic facts about national internet access, availability, and use.

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[6] McLaughlin, Clare. The Homework Gap: The 'Cruelest Part of the Digital Divide', NEA Today, April 20, 2016, available at http://neatoday.org/2016/04/20/the-homework-gap/

[7] Reisinger, Don. McDonald's Taps Snapchat to Recruit New Employees, Fortune Magazine, Apr 07, 2017, available at http://fortune.com/2017/04/07/mcdonalds-snapchat-jobs/ "According to Australian news site News.com.au,, applicants send a 10-second video to McDonald's, which functions as a preliminary application."

[8] Hooton, Christopher, Ph.D. Refreshing Our Understanding of the Internet Economy, The Internet Association, available at https://internetassociation.org/reports/refreshing-understanding-internet-economy-ia-report/?gclid=CjwKEAjw_bHHBRD4qbKukMiVgU0SJADr08ZZ09kJtWIn8hwHuJ1X08G7N612NX83IBTXUS4xJygGNxoC9Xbw_wcB

A. Defining Broadband

The FCC defines broadband as "high-speed Internet access that is always on and faster than the traditional dial-up access." The broadband speed requirements are subject to change as technology improves and faster access methods become available. The 2016 FCC Broadband Progress Report sets the minimum benchmark speed for broadband at 25 Mbps download/3Mbps upload (25Mbps/3Mbps) for fixed services, including cable modem service and fiber to the home,[9] up from 10Mbps/1Mbps in 2015 and previous reports. As we discuss later, the Connect America Fund CAF II Auction rules anticipate that federally-funded service will be built out at increasingly greater speeds over time, leading to an eventual change in definition. [10]

The states use similar (although often more refined) definitions. For example, West Virginia House Bill 3093 defines broadband as

> Any service providing advanced telecommunications capability with the same downstream data rate and upstream data rate as is specified by the Federal Communications Commission and that does not require the end-user to dial up a connection that has the capacity to always be on, and for which the transmission speeds are based on regular available bandwidth rates, not sporadic or burstable rates, with latency suitable for real-time applications and services such as voice-over Internet protocol and video conferencing, and with monthly usage capacity reasonably comparable to that of residential terrestrial fixed broadband offerings in urban areas.[11]

West Virginia anticipates the changes in the FCC definition by stating that it will update the state's definition each time the FCC makes changes.

Utah Bill SB 130 (4/2017) also uses the FCC definition for broadband service provided in the net neutrality order.

> Broadband Internet access service. A mass-market retail service by wire or radio that provides the capability to transmit data to and receive data from all or substantially all Internet endpoints, including any capabilities that are incidental

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[9] This definition would generally exclude DSL service, except in some instances where that service is fiber fed and thus capable of transmitting data at speeds of 25/3 or higher.

[10] FCC 2016 Broadband Progress Report, GN Docket No. 15-191, available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-6A1.pdf As in previous years, the report declines to set a speed definition for mobile services. The bias toward fixed services may change as a result of the CAF auctions, which are open to all providers that can meet speed and latency requirements.

[11] West Virginia House Bill 3093, Establishing Broadband Enhancement and Expansion Policies, available at http://www.legis.state.wv.us/Bill_Status/bills_history.cfm?INPUT=3093&year=2017&sessiontype=RS

> to and enable the operation of the communications service, but excluding dial-up Internet access service. This term also encompasses any service that the Commission finds to be providing a functional equivalent of the service described in the previous sentence, or that is used to evade the protections set forth in this part.[12]

Other states use similar language; the majority tracking the FCC definition, although some include mobile service in their definitions.

B. Broadband statistics

The FCC monitors broadband availability to "ensure that advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion," as required by Section 706 of the Act. The 2016 FCC Broadband Progress Report shows year over year improvement in broadband availability and speed in urban and suburban areas, but again finds that the deployment of advanced services remains slow in rural, remote, and tribal areas.[13]

This section reviews those statistics.

1. Broadband availability is increasing

Broadband availability and speeds are increasing in much of the country, although the "digital divide" persists in particular geographies and populations. The FCC's 2015 Internet Access Services Status Report shows that while nearly 90% of Americans have access to broadband at speeds of 25 Mbps/3Mbps or higher, 10 percent of Americans continue to be either without service altogether or to have service only at lower speeds.[14]

As then-Chairman Tom Wheeler pointed out in his statement approving the 2016 Broadband Progress Report, there has been significant progress in broadband deployment year over year, including increases in broadband penetration in previously unserved and underserved areas. Although these changes have had a positive effect on broadband availability overall, they have only narrowed (not closed) the digital divide. Much remains to be done to ensure that broadband is available to all Americans that want it.

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[12] Utah Bill SB 130, Universal Service Fund Amendments, March 2017, available at https://legiscan.com/UT/text/SB0130/2017

[13] FCC Broadband Progress report, p.3. Form 477 tracks broadband availability by company, It does not provide broadband adoption statistics. While service is "available" to a majority of urban Americans, according to recent Pew studies, fewer than 70% have chosen to purchase home broadband.

[14] FCC Wireline Competition Bureau. Industry Analysis and Technology Division, Internet Access Services: Status as of December 31, 2015, issued November 2016, available at https://apps.fcc.gov/edocs_public/attachmatch/DOC-342358A1.pdf

> The number of Americans lacking access to fixed broadband at the FCC's benchmark speed of 25 Mbps for downloads, 3 Mbps for uploads dropped from 55 million to 34 million. That's a nearly 40 percent reduction in the number of unserved Americans in only one year.[15]

The majority of consumers with broadband access at speeds that meet or exceed the 25Mbps/3 Mbps threshold continue to be located in urban/suburban areas close to major population centers. Consumers in these areas are also more likely to have a choice of more than one provider (generally the ILEC and a cable provider) than consumers in more rural areas, where the costs of deploying service are higher and subscribership (i.e., "take rates") may be more limited. The FCC's 2016 Internet Access Services Report shows that 20% of consumers in "developed census blocks" (i.e., those with housing units) have access to two broadband providers with upload speeds of at least 25 Mbps. An additional 4% of consumers in these locations are served by three providers.[16]

Despite the growth in broadband deployment, ten percent of Americans (approximately 34 million potential users) remain on what has been described as the "wrong side" of the Digital Divide, with access only at slower speeds or no access to broadband at all. Access in these areas is growing, albeit slowly, due to focused programs from both the FCC and the states. Most importantly many of these consumers are not completely without service; they simply do not have the full range of connectivity options. They can use the internet but cannot take advantage of the full range of services available, including video streaming and the access to the Internet of Things. Because these limitations will become more significant as more services are available only online, bringing high speed connectivity to these areas remains an important goal.

> Six percent of Americans lack access to fixed terrestrial service at 10 Mbps /1 Mbps, and 5 percent lack access to such services at 4 Mbps /1 Mbps.[17]

Americans with no or limited access to broadband are located primarily in rural, remote, and often low-income communities.

> The urban-rural digital divide persists and is significant. Thirty-nine percent of Americans living in rural areas and lack access to 25 Mbps/3 Mbps, compared to

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[15] 2016 Broadband Progress Report, Wheeler statement.

[16] Id. Internet Access Services Status, Figure 4. The report caveats its findings on the availability of multiple suppliers. "Accordingly, the number of providers shown in Figure 4 does not necessarily reflect the number of choices available to a particular household and does not purport to measure competition."

[17] 2016 Broadband Progress Report, page 33ff.

4 percent of urban Americans. On Tribal Lands in rural America, 68 percent lack access.[18]

A 2017 study of wireline broadband deployment in California, a state with strong government and PUC focus on ensuring broadband availability, finds a similar lack of broadband in more rural and low income areas.

> The data reveals disturbing trends that will exacerbate the digital divide in California. First . . . initial fiber to-the-home deployment is disproportionately focused on high-income communities. Second . . . too many Californians [are] stuck in the slow lane on the information highway, unable to participate fully in the expanding digital economy.[19]

Table 1 below shows areas with no or only limited access to high speed broadband service.

Table 1. Americans Without Fixed Broadband Access

	Population	Percentage of Population
United States	33.982	10%
Rural Areas	23.430	39%
Urban Areas	10.552	4%
Tribal Lands	1.574	41%
Rural Areas	1.291	68%
Urban Areas	0.283	14%
U.S. Territories	2.628	66%
Rural Areas	1.078	98%
Urban Areas	1.550	54%

Source: FCC 2016 Broadband Progress Report

2. Broadband access in schools has increased but further work is needed

The FCC's Broadband Progress Report also tracks broadband availability in anchor institutions, such as schools and libraries funded under the E-Rate program. Where broadband at home is not available, these "connected" institutions provide a portal for students and consumers to access online services. The FCC views an educational institution as "connected" if it meets

[18] Id. Wheeler statement.

[19] Strain, Garret, Eli Moore, and Samir Gambhir. AT&T's Digital Divide In California, Haas Institute, UC Berkley, May 2017, http://haasinstitute.berkeley.edu/sites/default/files/haas_broadband_042417-singles.pdf

the commission's short term goal of providing 100 Mbps per 1000 students. Over the long term, the FCC will view a school or library as "connected" if it meets the goal of providing 1Gbps service per 1000 students.FCC data from the Broadband Progress Report shows that while 59% of schools have met the short term goal, only 9 percent have met the long term goal.[20]

The growth in connectivity by these anchor institutions has filled some of the gaps in providing service in underserved and unserved areas, although there is still a long way to go to ensure full availability. We discuss broadband access for schools and libraries below. We review the state programs working to close the homework gap in Part III.

According to Education Superhighway, a non-profit dedicated to increasing broadband availability in schools, State, federal, and industry partnerships, have made high speed internet access available to 34.9 million students and 2.4 million teachers in 70,000 schools nationwide.

> Since 2013, the bipartisan effort to connect America's students to 21st century learning has delivered high-speed broadband to 88% of public school districts, representing an increase of 30.9 million students and 2.1 million teachers who are now meeting the FCC minimum Internet access goal of 100 kbps per student. This dramatic improvement in connectivity has leveled the playing field for students regardless of their affluence level or geographic locale1 and is catalyzing the adoption of digital learning across the country.[21]

But access remains limited for nearly 12 million students in19,000 schools across the country.[22] Like consumers without access to broadband at home, these students primarily attend schools in rural and hard to reach areas, including tribal locations, where the cost of connectivity remains high. Students in these areas remain unconnected or connected only via low speed services or by mobile access, a concern the FCC has sought to address via the Lifeline Broadband Program (LBP).

The cost of deploying fiber appears to be the most significant barrier to broadband access for schools and other anchor institutions. Education Superhighway estimates that

> Improving the affordability of broadband [by reducing pricing] to national benchmark price levels [would provide] 7.4 million additional students and 440,000 teachers . . . [with] the Internet access they need for a 21st century education.[23]

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[20] 2016 Broadband Progress Report ¶123

[21] Education Superhighway, State of the State Report 2016, available at https://s3-us-west-1.amazonaws.com/esh-sots-pdfs/2016_national_report_K12_broadband.pdf

[22] Id. p.11

[23] Id., p.14

Broadband Superhighway recommends state-industry/government partnerships, including matching funds programs, to increase broadband deployment in schools. Seven states (CA, ME, MA, NM, NY, NC, and OK) already support such partnerships. Seven additional states (AZ, IL, MD, MT, NH, TX, and VA) are considering providing schools with matching funds to increase broadband availability.

3. Mobile broadband may fill some coverage gaps

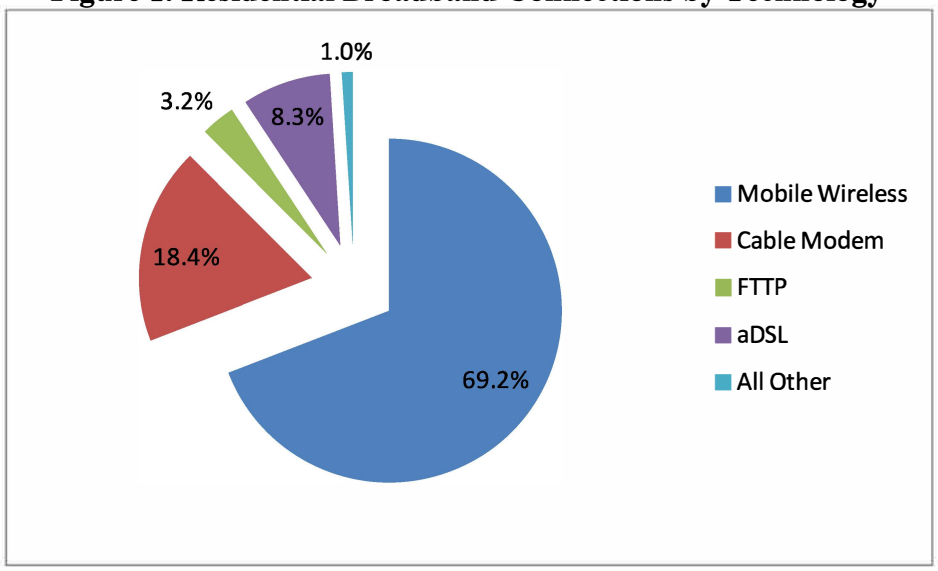
While wireline broadband connectivity remains out of reach for a significant portion of Americans, mobile broadband availability continues to increase.[24] Based on data from Form 477, the FCC estimates that residential mobile access lines have nearly doubled from 2011 to 2015, increasing from approximately 105M to 210M over that period. This growth has been steady, with mobile residential access lines increasing by 14% since 2014. The growth in wireless broadband subscribership suggests that consumers find mobile broadband an adequate substitute for wired service, either because of a lack of availability of the former or because they prefer the latter technology.[25]

As Figure 1 shows, nearly 70% of residential broadband connections are mobile wireless. despite the fact that these connections may not be comparable to fixed broadband in terms of speed or latency and may be subject to other limitations, such data caps or spotting service availability. The FCC considers mobile broadband "available" for consumers that can access LTE technology at advertised speeds of 10Mbps/1Mbps, although these speeds may vary depending on location and other conditions.

[24] It is important to note that while mobile broadband availability is increasing, the ability to access and use mobile services effectively may be limited in certain locations.

[25] The 2016 Broadband Progress Report does not find that wired and mobile broadband are substitutes for each other. This finding may change as the FCC under Chairman Pai begins to shift its focus from wired to wireless broadband. Chairman Pai's digital empowerment agenda focuses on increasing the deployment of 5G services, particularly in rural parts of the country, and the majority of providers seeking Broadband Lifeline designation offer a mobile rather than wired service. See Pai, Ajit, A Digital Empowerment Agenda, Remarks Of FCC Commissioner Ajit Pai At The Brandery, Cincinnati, Ohio, September 13, 2016, available at https://www.fcc.gov/document/commissioner-pais-digital-empowerment-agenda/summary.

Figure 1. Residential Broadband Connections by Technology



Source: FCC 2016 Broadband Progress Report

Despite the increase in mobile broadband availability, some consumers, particularly those in rural or other hard to reach areas, remain left behind. The FCC estimates that 53% of consumers lack access to mobile broadband at speeds sufficient for accessing the Internet and using key applications, such as those required to obtain social services. Eighty-seven percent of these consumers reside in rural areas.

> 1.7 million (1 percent) of Americans do not have access to a mobile provider using LTE technology, and . . . 171.5 million (53 percent) of Americans do not have access to [a] mobile service provider with . . . a minimum advertised speed of 10 Mbps/1 Mbps. In rural areas, 1.5 million (3 percent) of Americans are without access to LTE services, and 52.2 million (87 percent) of Americans are without access to a[n] LTE services with a minimum advertised speed of 10 Mbps/1 Mbps. In contrast, in urban areas, the estimates are, respectively, 163,000 (0 percent) and 119.3 million (45 percent).[26]

Although the 2016 FCC broadband study finds that mobile broadband is not a substitute for fixed broadband (and is not sufficiently deployed), consumers appear to have a different impression. Adoption data shows that consumers continue to transition to mobile services in increasing numbers; with many using wireless as their only means for accessing IP-based services. Thus mobile broadband usage continues to grow, while wired broadband service adoption has plateaued.

Pew estimates that as of 2015, smartphone adoption had reached parity with wired broadband adoption. Sixty-eight percent of Americans now use a smartphone, with 13% cutting

[26] Id. Broadband Progress Report, p.37.

the cord and becoming smartphone only consumers.[27] These consumers access the internet only with their smartphones, either because wireless connectivity is the only service available or because the cost of wireless connectivity is less and the service options more plentiful than traditional wired service.[28]

Pew's conclusions about the decrease in wired broadband adoption and the increase in mobile adoption are particularly important as the FCC and the states consider how to increase both broadband availability and adoption.

> The increase in "smartphone-only" adoption, along with the corresponding decline in home broadband subscriptions, captures two facets of contemporary society: rapid innovation in the information technology space and stagnant household incomes. The rate of adoption of smartphones since the introduction of the iPhone in 2007 has been striking. It has taken about half the time for smartphone adoption to double from one-third of adults to two-thirds than was the case for broadband – which was also a technology adopted by Americans at very rapid pace.[29]

The Pew surveys show that the largest percentage of "smartphone only" users is younger adults, non-whites, and lower income Americans.

> Some 13% of Americans with an annual household income of less than $30,000 per year are smartphone-dependent. Just 1% of Americans from households earning more than $75,000 per year rely on their smartphones to a similar degree for online access. . . 12% of African Americans and 13% of Latinos are smartphone-dependent, compared with 4% of whites.[30]

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[27] Horrigan, John B. and Maeve Duggan. Home Broadband 2015, Pew Research Center, December 21, 2015, available at http://www.pewinternet.org/2015/12/21/home-broadband-2015/

[28] The FCC's Copper Retirement NPRM appears to support this theory, since it proposes to consider both fixed and mobile wireless as substitutable services where a company proposes to eliminate service provided over traditional copper lines. See, In the Matter of Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment, Notice of Proposed Rulemaking, Notice of Inquiry and Request for Comment, WC Docket No. 17-84, April 20, 2017, available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0421/FCC-17-37A1.pdf

[29] Id., pg 10.

[30] The Smartphone Difference, April 2015, available at: http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/

Assuming historical trends continue, the number of smartphone only users will continue to increase as wireless connectivity improves. The transition of the Lifeline program from voice to broadband will also increase smartphone only adoption.[31]

The next generation of mobile service, referred to as 5G, is projected to increase broadband penetration in rural and hard to reach areas due to better connectivity and increased speeds. But "wireless" does not really mean without wires or without the need to build facilities. Wired facilities are necessary to "backhaul" the signal to reach the PSTN and the internet, so the lack of such facilities in rural and underserved areas will continue to constrain overall availability. To that end, the FCC's focus has been to fund broadband build out through the Connect America Fund (originally the USF High Cost Fund) to increase service options in rural and remote areas. We discuss those initiatives briefly below.

C. Federal Broadband Initiatives

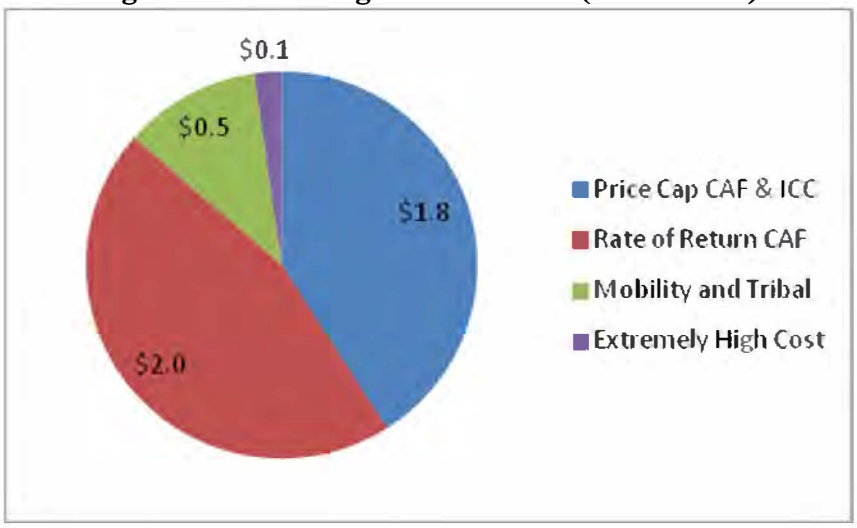
Federal broadband initiatives center on redirecting the high cost portion of the Federal Universal Service fund (USF) to increase broadband access by incenting carriers to extend the reach of their broadband networks. The Connect America Fund (CAF) initiatives address both fixed and wireless broadband build-out in order to meet the goal of the 1996 Telecommunications Act - to ensure that all Americans have access to the full range of advanced data and voice communications services.

> Consumers in all Regions of the Nation, including low income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rated charged for similar services in urban areas. (47U.S.C. 254 (b)(3))

The FCC has budgeted $4.5 billion a year for six years to fund the programs that make up the CAF. Figure 2shows the initial distribution of funds across the programs supported by the CAF.

[31] In the Matter of Lifeline and Link Up Reform and Modernization, Telecommunications Carriers Eligible for Universal Service Support, Connect America Fund, WC Docket No. 09-197 WC Docket No. 10-90, Third Report and Order, Further Report and Order, and Order On Reconsideration, April 27, 2016 (Broadband Lifeline Order), available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-38A1.pdf. The Broadband Lifeline Order limits and eventually discontinues federal support for voice only services in favor of broadband support. The Broadband Lifeline Order was remanded back to the FCC in April, 2017 and may change when it is reissued.

Figure 2. CAF Budget Distribution ($ in billions)



Source: FCC CAF Report and Order and NPRM

The initial CAF Order lists five program objectives:

1. Preserve and advance universal availability of voice service

2. Ensure universal availability of modern networks capable of providing voice and broadband service to homes, businesses and community anchor institutions

3. Ensure universal availability of modern networks capable of providing advanced mobile voice and broadband service

4. Ensure that rates for broadband service and rates for voice services are reasonably comparable in all regions of the nation

5. Minimize the universal service contribution burden on consumers and businesses[32]

The goal of the CAF initiatives is to extend internet access service at speeds of 25 Mbps/3Mbps to at least 7.3M users in unserved and underserved parts of the country.[33]

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[32] JSI Capital Advisors. Introducing the Connect America Fund, USF Fund Overview, 11/20/2011, available at http://jsicapitaladvisors.com/the-ilec-advisor/2011/11/20/introducing-the-connect-america-fund-usf-reform-overview.html JSI points out that the FCC's CAF framework goals leave out an explicit statement regarding " reasonably comparable services, although the FCC does address reasonably comparability in some interesting ways later in the document."

[33] Connected Nation. $9 billion in Connect America Fund subsidies accepted to serve over 4 million homes and businesses, Policy Brief, 8/28/2015, available at

We discuss the three CAF programs briefly here.

1. Fixed Broadband support

The CAF includes three fixed broadband programs addressing areas served by price cap carriers, the CAF I program, the Rural Broadband Experiments, and the CAF II program. The programs target areas with no "unsubsidized competitors," and require carriers to meet deployment objectives and speed and service quality requirements.

The CAF I program froze high cost loop support for price cap carriers.

CAF II provides support to price cap carriers to build out broadband service in unserved parts of their territories. FCC statistics show that 83% of the nation's 18 million of the nation's unserved users reside in territories served by the price cap carriers. To increase broadband availability in these areas, CAF II offered $9M in support to the price cap carriers (AT&T, CenturyLink, Cincinnati Bell, Consolidated Communications, FairPoint, Frontier, Hawaiian Telecom, Micronesian Telecom, and Windstream) to bring broadband to unserved portions of their regions.

> In each state they serve, price cap carriers were offered a support amount calculated using a cost model for a six-year term in exchange for offering voice and broadband services meeting the Commission's requirements to a defined number of locations in the eligible high-cost census blocks in that state.[34]

With the exception of Verizon, each of the price cap carriers accepted at least a portion of the offered support and have begun to build out their networks.[35]

Figure 3 shows the amount of funding accepted by the price cap carriers that chose to participate in the program.

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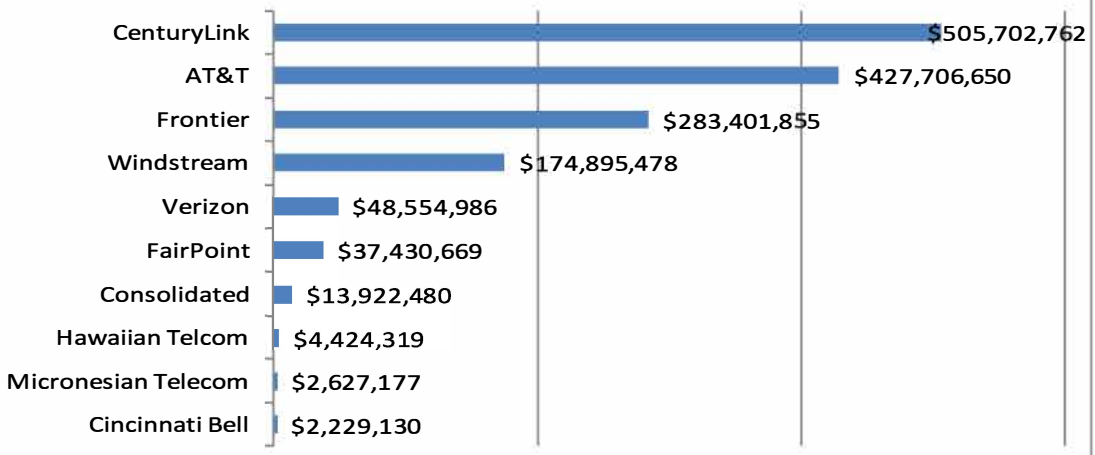
http://www.connectednation.org/sites/default/files/bb_pp/20150828_policy_brief_-_connect_america_fund_phase_ii_commitments.pdf

[34] In the Matter of Connect America Fund, ETC Annual Reports and Certifications, WC Docket No. 10-90; WC Docket No. 14-58, ORDER, January 26, 2017 (NY CAF Order), available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-17-2A1.pdf. The CAF also includes funds specifically dedicated to Alaska.

[35] AT&T and the other price cap carriers accepted varying amounts of support. Only Verizon rejected the offer of support. The price cap carriers, including Verizon, are eligible to bid in the CAF II auction for the rejected funds.

Figure 3: Price Cap Carrier Funding



Source: Author's construct based on FCC data.

The second phase of the CAF II program will distribute the approximately $2B in funds not claimed by the price cap carriers in the initial round of subsidies to other carriers via a "reverse auction," where support will go to the carrier that bids the least amount for the largest number of broadband installations. The Phase II Auction will be technology neutral, allowing wireline, wireless, and satellite providers to bid. Monies will be awarded only in areas wher3e there are no unsubsidized carriers, ensuring that funds

> In the Connect America Fund Phase II auction, providers will compete for support to expand broadband to unserved areas, along with voice service. The auction rules . . . aim to maximize the value the American people will receive for the Connect America Fund dollars spent by balancing deployment of higher-quality services with cost efficiencies.[36]

$170.4 million of this funding, representing the funds declined by Verizon in New York, will go directly to applicants selected in the New York state New NY Broadband Program.[37] We discuss the New York broadband program in Part III.

The funds remaining after the Phase II Auction (up to $100M) will be disbursed in the Remote Areas auction to address extremely high cost areas.

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[36] In the Matter of Connect America Fund, ETC Annual Reports and Certifications, WC Docket No. 10-90, WC Docket No. 14-58, REPORT AND ORDER AND ORDER ON RECONSIDERATION, Adopted: February 23, 2017 Released: March 2, 2017, available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-17-2A1.pdf

[37] Id. NY CAF Order. The FCC denied petitions from Pennsylvania and Massachusetts to receive the funds rejected by Verizon in those states.

2. Rural broadband support

The CAF program also provides support to rural rate of return carriers to encourage build-out in their territories. Funded at $2B/year over 10 years (with the potential for an additional $150M in later years), the Alternate Connect America Model (ACAM) and rural rate of return plan provides carriers with two support options. Carriers may choose from "model-based" support, based on a cost model developed by the FCC, or "legacy support" that continues (in part) the current rate of return process.

To maximize support, funding is available only in those areas where there are no "unsubsidized competitors." The focus on providing service only where there are no competitors ensures that support is provided only where a business case cannot be made for building unsubsidized service. According to the FCC, the Alternate Connect America Model (ACAM) provides carriers with "a forward looking, efficient method of distributing support in rate of return areas,"[38] by providing a "voluntary path" to accepting broadband build out obligations, and providing a "glide path" to model support for rate of return carriers.

Build out obligations include:

- Providing 10/1 Mbps service to locations that are "fully funded" by the model, with a requirement for higher speed service (25/3 Mbps) to a subset of those locations by the end of the 10-year program term
- Providing an initial minimum usage allowance of 150 GB per month, increasing over time based on actual average customer usage
- Providing service with latency low enough to allow adequate voice service
- Providing a defined deployment plan that meets specific milestones over 10 years, including providing service to 95% of all locations within 10 years.[39]

By the November 1, 2016 deadline, 216 rate-of-return companies elected 274 separate offers of model-based support in 43 states.[40]

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[38] In the Matter of Connect America Fund ETC Annual Reports and Certifications, Developing a Unified Intercarrier Compensation Regime, WC Docket No. 10-90, WC Docket No. 14-58, CC Docket No. 01-92, Report and Order, Order on Reconsideration, and Further Notice of Proposed Rulemaking (Rural Rate of Return Order), March 23, 2016, available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-33A1.pdf

[39] Overview of the FCC's Rate-of Return Reforms, Webinar, April 4, 2016, available at https://transition.fcc.gov/wcb/FCC-Rate-of-Return-Reform-Order-Webinar.pdf

3. Mobile broadband

As we noted earlier, Pew reports that while fixed wireline broadband usage has leveled off, mobile broadband usage, particularly among low income users, has increased.[41] The May 2017 CDC Wireless Substitution report confirms this finding, showing that 50.8% of Americans are now wireless only for both voice and broadband service.[42]

Despite the high adoption rate for mobile broadband, like wired broadband, wireless broadband coverage at speeds high enough to qualify as mobile broadband (generally 4G/LTE), continues to be limited in rural and tribal areas. To close that gap, the FCC created the Mobility Fund to incent mobile carriers to provide service to unserved areas. The fund will award support in two phases, with Phase I funds awarded in 2014, and Phase II planned for 2017.

> Mobility Fund I (2011) offered providers up to $350 million in one-time funding to spur deployment of advanced wireless services in unserved areas, including Tribal lands. Despite that support and extensive 4G LTE deployment by industry, approximately 575,000 square miles either still lacks access to 4G LTE service or only has 4G LTE coverage because of universal service support.[43]

Mobility Fund II will focus on those areas of the country where universal service support will be necessary to ensure the availability of LTE service and providers.

> Despite a surge in private investment in mobile deployment, recent analysis shows that at least 575,000 square miles (approximately 750,000 road miles and 3

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[40] The high ACAM acceptance rate has lead to a shortfall of $50M in the program. Press reports speculate that possible measures for dealing with the shortfall include "prioritizing" among electing carriers. Priority might be determined based on carriers' level of deployment – either their percentage of locations lacking 10/1 Mbps or the absolute number of such locations — or the average cost per location, the FCC notes. Telecompetitor, November 3, 3016, available at http://www.telecompetitor.com/carrier-elections-of-fcc-a-cam-model-based-broadband-support-exceed-budget-by-1-6-billion/

[41] Pew Research. Internet/Broadband Fact Sheet, January, 2017, available at http://www.pewinternet.org/fact-sheet/internet-broadband/

[42] National Center for Health Statistics. Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, July-December, 2016, available at https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201605.pdf

[43] FCC Advances Seamless Nationwide Access to Mobile Voice and Broadband Service through Mobility Fund II, Press Release, February 23, 2017, available at https://www.fcc.gov/document/mobility-fund-phase-ii-order-and-fnprm

million people) either lack 4G LTE service or are being served only by subsidized 4G LTE providers.[44]

The Mobility Fund II will provide $453M/year over 10 years through a reverse auction to increase wireless broadband deployment in unserved areas, including Tribal areas. Carriers participating in the program will receive funding to "preserve and extend 4G LTE in areas where the market can't sustain or extend service absent government support."[45] Eligible areas will include portions of census blocks not fully supported by an unsubsidized provider with a minimum download speed of 5 Mbps.

Successful bidders in the Mobility Fund II auction will provide service at data speeds of 10/1 Mbps, equivalent to the lowest speed tier for wired broadband in remote areas. Service must have a latency of less than 100 milliseconds and be provided at prices that are "reasonably comparable" to service provided in urban areas.[46] The date for the auction has not yet been determined.

III. State Broadband Initiatives

Federal broadband initiatives focus primarily on deploying high speed service to rural and unserved areas. State broadband initiatives build on this deployment by focusing specifically on increasing broadband availability for their citizens. State initiatives have included creating broadband task forces and councils to monitor and improve service deployment, performing studies to identify areas where broadband is and, more importantly, is not available, and creating public/private partnerships to increase service availability and adoption. While these councils and task forces are generally outside the direct control of the state public utility commission (PUC), in many cases, they depend on PUC actions to be successful, including USF funding. To that end, the states have used a number of vehicles, including Federal funding, primarily from NTIA and the American Recovery and Reinvestment Act (ARRA), state grants, and other sources to fund and maintain these initiatives.

In this section, we focus on several states whose programs provide templates for deployment and support and explore 2017 legislation directed toward increasing broadband deployment, access, and adoption. [47]

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[44] Connect America Fund et. al., Mobility Fund, Report and Order and Further Notice of Proposed Rulemaking, WC Docket 10-90, WT Docket 10-208, February 23, 2017, available at https://www.fcc.gov/document/mobility-fund-phase-ii-order-and-fnprm

[45] Id. Mobility Fund press release.

[46] "Reasonably comparable" pricing remains undefined.

[47] Data in this section is based on a 2016 NARUC survey of state broadband activity, updated by the author's research. This study appears in Appendix A.

A. Mapping broadband availability

The broadband mapping program began as one of many broadband initiatives under the Department of Commerce's National Telecommunications and Information Administration (NTIA). The goals of these initiatives were to determine broadband availability on a state by state, locality by locality basis, to incent availability and adoption, and to fulfill the promise of the Act and the National Broadband Plan to ensure reasonably comparable broadband access to all Americans, regardless of location or financial status. Funding for the program came from the American Recovery and Reinvestment Act (ARRA) and was delivered through the newly established Broadband Technologies Opportunities Program (BTOP).

> The Recovery Act appropriated $4.7 billion for NTIA to establish BTOP to increase broadband access and adoption; provide broadband access, training and support to schools, libraries, healthcare providers, and other organizations; improve broadband access to public safety agencies; and stimulate demand for broadband. In 2009 and 2010, NTIA invested approximately $4 billion in 233 BTOP projects and $293 million in 56 State Broadband Initiative (SBI) projects benefitting every state, as well as five territories and the District of Columbia.[48]

The state initiatives included the Broadband Development Program and the National Broadband Map.

All 50 states and the District of Columbia created broadband maps showing providers, available speed, and other information about broadband availability. Gathered together, these maps provide a picture of where broadband is available or, more importantly, not available. The national broadband map has been used to determine unserved areas where CAF funding will be provided.[49]

Data from NARUC's 2016 broadband survey shows that many broadband mapping programs expired with the end of BTOP funding in 2016, leaving the maps outdated or no longer active. [50] For example, while the Kansas broadband program, Connect Kansas continues, the

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[48] National Telecommunications and Information Administration, U.S. Department of Commerce,. Broadband Technology Opportunities Program (BTOP) Quarterly Program Status Report, March 2017, available at https://www.ntia.doc.gov/files/ntia/publications/ntia_btop_31st_qtrly_report.pdf

[49] The changing definition of "broadband" from 4Mbps/1 to 25Mbps/3, to faster speeds has clouded the mapping process. In addition, a "challenge" process allows competitive suppliers to question the map's accuracy by showing that they provide service in these areas. As noted earlier, the CAF provides funding only in areas where there is no unsubsidized carrier.

[50] Definitive information regarding the status of state mapping efforts is difficult to find, since the majority of these programs are (or were) managed outside of the public utility commission structure. Other sources, including the National Conference of State Legislatures (NCSL) and Blandin on Broadband, provide slightly different information.

state broadband map is updated only as providers provide new information. Other states, for example Alabama, Hawaii, and Maryland, update their maps only sporadically, if at all, while still others, such as Florida, Louisiana, and Missouri continue to have mapping websites but have not updated them since the BTOP program ended.

The broadband mapping program continues in states like Massachusetts, Michigan, Nebraska, and Virginia, which use both internal and external resources to provide updated information about broadband availability. The Massachusetts Broadband Institute continues to update the state's broadband map to show wireline broadband availability, with the most recent update in 2014. Michigan and Nebraska manage their state broadband programs through the public utility commission. Both states continue to update the broadband map and provide residents with information on broadband availability. [51] Virginia's program is managed by the state's Center for Innovative Technology (CIT) and Virginia Tech, which sources the map data from FCC Form 477. The most recent update to the map was released in November 2016.

> The new map, a product of CIT and its partners, Virginia Tech's Center for Geospatial Information Technology (CGIT) and the Virginia Geographic Information Network (VGIN), is a result of the team's experience working hand-in-hand with local and state government officials to address broadband access deficiencies.[52]

Missouri has recently launched an initiative to determine where broadband is available in the state and reinvigorate the mapping and adoption programs that lapsed after the end of the BTOP program.[53]

State broadband maps continue to be an important tool for determining where funding should be directed to increase both broadband penetration and adoption. State broadband programs and the state public utility commission can use these maps to target broadband outreach. Oversight by state public utility commissions will make these tools more useful.

B. State Broadband Offices and Task Forces

Beginning in 2010, all 50 states and the District of Columbia created state offices, task forces, or legislative committees to review, manage, and incent broadband deployment and adoption. Of these, 34 remain active; the others have lapsed, either because funding ceased at the end of the BTOP program or because the initiatives were completed. The state broadband offices have generally been standalone or embedded in existing state agencies, such as the state

[51] Funding for Michigan's broadband program expired September 30, 2016, leaving its future in doubt.

[52] Wired Virginia. The Latest Virginia Broadband Availability Map is Now Live, November 14, 2016, available at https://www.wired.virginia.gov/announcement

[53] Email from Janie Dunning, Missouri Farm Bureau.

IT office or the state management office, with only seven (California, Colorado, Nebraska, New Mexico, Oklahoma, Rhode Island, and Wisconsin) directly under the auspices of the state public utility commission.

Table 2 below shows active state broadband initiatives.

Table 2. Active State Broadband Initiatives

State	Broadband Initiative	On-going support	Structure
AL	Evaluate service availability; map availability	AL Broadband Initiative; Connecting AL	Task Force
AZ	Governance advice for BB stakeholders	Digital Arizona Council	Agency
AR	Develop state BB plan	Advisory Council; Monitor US broadband initiatives	Agency
CA	Increase BB availability	Coordinate BB support/funding	PUC
CO	Identify coverage gaps	Office of Information Technology; Broadband Fund	Agency
CT	Facilitate BB access	Office of State Broadband	Agency
DE	Identify coverage gaps; grants	DE Broadband Fund; DE Mapping Project	Task Force
DC	Connected DC- create city-wide connectivity	Training, reduced cost svc for low income users	Agency
HI	Identify ways to provide statewide high speed access	Hawaii Broadband Initiative	Task Force
ID	Study broadband priorities	LinkIDAHO	Task Force
IL	Improve broadband access	Broadband Deployment Council	Legislature
IN	Study USF, rural BB, BB adoption; federal funding	Broadband-ready communities	Legislature
IA	Increase BB availability	Connect Every Acre	Legislature
KS	Improve broadband access	Kansas Broadband Initiative	Agency
KY	Economic development partnership	ConnectKentucky	Task Force
ME	Expand broadband throughout the state	ConnectME Authority	Agency
MA	MA Broadband Institute	Infrastructure investments	Agency
MI	MI Collaborative BB Committee	Broadband planning and mapping	Task Force
MN	Office of Broadband Development	Unserved and underserved areas grants	Agency
MS	Gulf Coast Broadband Initiative; Connect Mississippi	Allocate oil spill funds to BB initiatives	Task Force
NE	Broadband Initiatives Team (PSC)	Internet Enhancement Fund	PUC
NV	Broadband Task Force	Create BB policy; evaluate infrastructure	Task Force
NM	Infrastructure funding	Broadband Executive Committee	PUC
NY	Broadband for All NY	NYS Broadband Program Office	Agency
NC	Broadband initiative to encourage adoption	NC Broadband Division	Agency
OK	Identify BB assets, gaps, opportunities for enhancement	OK BB Initiative	PUC
OR	Leverage deployment and utilization	BB Advisory Council	Legislature
PA	Mapping, BB oversight	Ch 30 ILEC BB commitments	PUC

State	Broadband Initiative	On-going support	Structure
TN	Accelerate technology availability	TN BB Accessibility Fund	Task Force
TX	Connect TX	Maximize use of ARRA funds	Task Force
UT	Study BB adoption and deployment	BB Advisory Council	Legislature
VT	Maximize BB deployment	VT Telecom Authority	Agency
VA	Develop state BB goals	BB Advisory Council - develop state goals	Legislature
WA	Local technology planning	State BB Office	Agency
WV	Administer and oversee BB deployment	BB Enhancement Council	Legislature
WI	2016 BB demand survey	BB Office in PUC	PUC
WY	Technology development	Technology collaboration	Agency

Source: 2016 NARUC Survey and author's research.

The state broadband offices and task forces work with the state commissions, local governments, broadband associations such as Connected Nation, and industry to identify areas where broadband is available, create and maintain state broadband maps, and, most importantly

> Promote and assist with [state] strategic broadband planning [initiatives] . . . [and] identify issues, priorities, and goals related to broadband deployment and adoption . . . [54]

The states began their initial broadband programs by mapping service availability using ARRA/BTOP funds. These programs have expanded in many states to include direct grants to companies and, in some cases, municipalities, to encourage broadband deployment and adoption. The grants include funds for middle mile networks, broadband literacy training, and service deployment.

We examine the California, Colorado, Maine, Minnesota, and New York programs here.

1. California

In 2007, California became one of the first states to create a dedicated broadband funding program, the California Advanced Services Fund. [55]

> The goal of the [CASF] is . . . to approve funding for infrastructure projects that will provide broadband access to no less than 98 percent of California households.[56]

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[54] Office of Information Technology (OIC), Colorado State Broadband Portal, available at http://broadband.co.gov/about/

[55] CA Public Utility Code section 281 (b)(1). The program was extended indefinitely by Senate Bill (SB) 1040 approved on September 25, 2010.

The $315M CASF program consists of three separate accounts managed by the CPUC as part of the state's universal service program:

- **Infrastructure grant and revolving loan account** - $275M, supporting 56 projects covering 12,000 square miles, connecting 10,986 households, with additional grants in 2016 adding nine new projects and potentially benefitting 16,337 additional households

- **Public housing account** - $7.64 M for building infrastructure to the state's public housing units and $1.9M for broadband adoption, including digital literacy training

- **Rural and regional urban consortium fund** - $15M, to provide grants to advance broadband access, deployment and adoption[57]

As of December 2016, broadband was available to 95% of Californians, although as in other states, access is greatest in urban areas. According to the CASF 2016 end of year report, 98% of urban Californians have access to broadband at speeds of 6 Mbps/1.5Mbps or greater, although rural areas still lag behind. According to the report, "only an estimated 47 percent of households in rural areas have access to broadband at served speeds."[58]

In addition to the direct financial support provided through the CASF, broadband availability and adoption in the state are supported by the California Broadband Council, a non-profit organization established by legislation to implement the state broadband availability report in 2010. The California Broadband Council works to provide guidance and support to identify government structures available for collocating broadband infrastructure, increase broadband literacy and adoption, and increase broadband availability in tribal areas. The Council works closely with the CPUC to ensure that their goals are aligned.

2. Colorado

Colorado's broadband efforts are managed primarily through the Governor's Office of Information Technology (OIT). OIT provides a "Broadband Portal" that allows users and providers to identify relevant support opportunities. It also supports a broadband strategy team

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[56]California Advanced Services Fund. .Annual Report, April, 2017, available at ftp://ftp.cpuc.ca.gov/Telco/CASF/Reports%20and%20Audits/CASF%202016%20Annual%20Report.pdf

[57] CASF 2016 Status Report presentation, available at http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Communications/ServiceProviderInfo/CASF/Doc/CASF%20Fact%20Sheet.pdf

[58] Id. p.4. It is important to note that the California PUC's definition of broadband differs from the FCC definition. The CASF considers an area to be "served" if broadband is available at a speed of 6 Mbps/1.5 Mbps or greater. This is true in a number of other states as well.

that coordinates the state's overall broadband effort. Colorado's program has expanded from the initial mapping and evaluation stage to take on the responsibility for all broadband activities in the state, as well as to encourage local communities to create their own broadband planning and adoption teams. The program also includes a Broadband Fund to allocate monies to broadband projects in unserved areas of the state.

Created by House Bill 1328 (2014), the foundation of Colorado's broadband program is the Legislature's finding that

> To promote the state policy of providing universal access to broadband service . . . it may be necessary to provide financial assistance through additional support mechanisms if competition for local exchange services fails to deliver broadband service throughout the state.[59]

Like California, Colorado uses universal service funds to provide grants to companies (including telecommunications cooperatives) to increase broadband availability and adoption. Unlike California, which created separately funded broadband USF programs with finite support amounts, the Colorado Broadband Fund consists of high cost USF monies reallocated from areas with effective competition to support broadband initiatives in unserved areas across the state (as well as additional state funding where appropriate).

> The fund consists of all moneys allocated from the HCSM to provide access to broadband services through broadband networks in unserved areas pursuant to [a decision that the area has "effective competition" and, therefore, is no longer eligible for state high cost funding] . . . The moneys in the fund are appropriated to the Broadband Deployment Board . . . [to] fund . . . the deployment of broadband service in unserved areas of the state.[60]

The 16 member Broadband Deployment Board established by HB 1328 includes representatives from the OIT, the State Office of Economic Development, the Department of Local Affairs, and a non-voting representative from the PUC, as well representatives from industry and the members of the public that reside in unserved areas of the state, both rural and urban.

The Colorado Broadband Fund awarded $2.1M in grants to seven rural companies in 2016.[61]

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[59] Colorado House Bill 1328, May 2014, available at http://www.leg.state.co.us/clics/clics2014a/csl.nsf/fsbillcont3/1E390935433C251F87257C620063CC4A?Open&file=1328_enr.pdf

[60] Id. at 40-15-509.5.

[61] Colorado Department of Regulatory Agencies, Broadband Fund, available at www.colorado.gov/pacific/dora-broadband-fund/how-fund-works

3. **Maine**

Maine promotes broadband availability and adoption through the ConnectME Authority,

> A public instrumentality of Maine state government whose mission is to facilitate the universal availability of broadband to all Maine households and businesses and help them understand the valuable role it can play in enriching their lives and helping their communities thrive.[62]

The ConnectME program was initially created by the Maine legislature in 2005 and revised by of Public Law Chapter 284 in 2015 (passed over the Governor's veto).[63] The 2015 legislation defined the goals of the program as ensuring that

A. Broadband service be universally available in this State, including to all residential and business locations and community anchor institutions;

B. There be secure, reliable, competitive and sustainable forward-looking infrastructure that can meet future broadband needs; and

C. All residents, businesses and institutions in the State be able to take full advantage of the economic opportunities available through broadband service.[64]

The Authority includes seven members appointed by the Governor, the Chair of the Public Utilities Commission; the Chief Information Officer; a consumer representative, "two members with significant knowledge of communications technology," the Commissioner of Economic and Community Development; and one member with "significant knowledge of telemedicine."[65] ConnectME has provided $8 million in broadband grants to 99 projects since its inception, helping to significantly increase broadband availability in the state.

> Nearly five years ago, approximately 86% of the state had access to high-speed Internet service with an adoption rate of approximately 40%. In the five years since the Authority was established, broadband access or availability has risen to

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[62] About ConnectME, available at http://www.maine.gov/connectme/index.shtml .

[63] Maine Public Law, Chapter 284‘ An Act To Promote Community Broadband Planning and Strengthen Economic Opportunity throughout Maine, June 30, 2015, available at https://legiscan.com/ME/text/LD1063/id/1253493/Maine-2015-LD1063-Chaptered.pdf The Maine legislature is currently considering a replacement bill, SB 1399, which would replace ConnectME with a similar non-profit organization, the Maine Broadband Initiative.

[64] Id. at §9202-A(1). State broadband policy.

[65] Id. About ConnectME.

over 91% with 73% of Maine households subscribing to some type of broadband service (compared to 68% nationally).[66]

ConnectME is funded through a 0.25 percent surcharge on intrastate retail communications services, provided as a line item on customer bills. Wireless providers may contribute to the fund but are not required to do so.

Because ConnectME funding comes from a surcharge on wired telephone service, overall funding is declining as the shift from wired telecommunications service to wireless and non-telecommunications services such as texting are reducing the amount of monies available to incent broadband deployment.

As Maine Public Radio pointed out in a February 2017,

> Six years ago, the fee on charges for in-state telephone calls brought in just over $4 million to help pay for the fiber connections that are the backbone of the broadband system. But by last year, those revenues had dropped to under $3 million, as more and more Mainers have moved from making calls to texting or other forms of cell phone messaging.[67]

This problem is not isolated to Maine but has also affected other states, leading them to consider amending state USF rules to move from an intrastate revenue-focused plan to one based on connections.

4. **Minnesota**

Minnesota's goal is to provide all citizens with access to broadband service at speeds of 25 Mbps/3 Mbps by 2022, increasing to 100 Mbps from at least one provider by 2026. The state supports broadband deployment and adoption through its Border to Border Broadband Grant Program, which is funded by a legislative appropriation. Minnesota's broadband program is managed by the Office of Broadband Development a separate, broadband-focused office in the Department of Employment and Economic Development (DEED). In addition to the Office of Broadband Development, the Governor's Task Force on Broadband, established by Executive Order 11-27 in 2011, is charged with developing, implementing, and promoting state policy, planning, and initiatives to achieve these goals. The Task Force also makes policy

[66] Id. About ConnectME.

[67] Maine Public Radio. Maine Schools, Libraries Facing Dwindling Broadband Subsidy, February 13, 2017, available at http://mainepublic.org/post/maine-schools-libraries-facing-dwindling-broadband-subsidy#stream/0. The Maine response to the NARUC State Broadband Survey echoes this concern, noting that assessments received for 2016 have declined to slightly less than $1.2M and are expected to continue on this path.

recommendations to the Governor for increasing Broadband deployment and adoption. [68] The Task Force does not include representation from the MN Public Utility Commission or the MN Department of Commerce.

As noted in the 2016 Broadband Task Force report, Minnesota has made significant progress toward meeting its broadband deployment goal, at least in the state's urban areas.

> As of July 2016, 89.98 percent of Minnesota households have broadband access available at a speed of at least 25 megabits per second (Mbps) download and 3 Mbps upload (25 Mbps/3 Mbps), while 77.45 percent of rural Minnesota households have a broadband connection that meets these speeds (these figures include broadband service provided by wired, fixed wireless and wireless technologies as Minnesota Statutes did not specify a technology). As of July 2016, speeds of 100 Mbps/20 Mbps, from fixed, non-mobile service, were available to 52.46 percent of rural households in Minnesota; statewide, 70.83 percent of households have access to these speeds. [69]

The state's Border-to-Border broadband development grants (created in 2014) provide support for extending broadband to both unserved and underserved areas of the state. Minnesota law defines "unserved" areas as those that do not have access to fixed broadband at speeds of 25 Mbps/3 Mbps , while "underserved" areas have not yet met the higher speed goal of 100 Mbps/20 Mbps. [70] The grant program was initially funded at $20M and provides grants to businesses, towns and cities, Indian tribes, and non-profit organizations.

> During the first two years . . . the Legislature allocated nearly $31 million to the program . . . making service available to more than 9,000 households and more than 900 businesses. The 2016 Legislature allocated $35 million to the grant program, with $500,000 directed at delivering broadband to low-income areas of the state.[71]

During the 2017 session, the legislature included $20 million in funds for the Border-to-Border Broadband Grant program.[72]

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[68] Minnesota Governor's Task Force on Broadband, Annual Report, 2016, available at https://mn.gov/deed/assets/2016-bbtf-report_tcm1045-268826.pdf

[69] Id. Executive Summary.

[70] These speeds match the FCC's broadband speed benchmark for fixed broadband service in the 2016 Broadband Progress Report. See Federal Communications Commission, 2016 Broadband Progress Report, available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-6A1.pdf

[71] Task Force Report, p. 18.

[72] https://mn.gov/deed/programs-services/broadband/grant-program/

The Minnesota Broadband Task Force focuses on broadband adoption as well as broadband availability. As many commenters have noted, broadband adoption requires access to computers, reduced broadband prices for low-income citizens, public access to broadband for those that cannot afford to have it at home, and training to ensure that non-adopters understand the importance of internet access and are equipped to take advantage of the resources available to them. The Task Force provides recommendations to the Legislature for increasing broadband adoption. These recommendations include

- Developing state programs to make computers available to low income citizens at low or no cost
- Increasing funding for state programs to offset the cost of internet access in schools that participate in the E-rate program, and
- Continuing and potentially increasing funding for programs to offset the cost of internet access for libraries.

The Task Force has also recommended increasing broadband adoption by modifying the state's Telephone Assistance (State Lifeline) program to expand the program to include broadband.

5. **New York**

New York established the New NY Broadband program in 2015 to close the state's digital divide by providing $500M in matching grants to companies participating in a public-private partnership to expand broadband availability in unserved and underserved areas. The program's goal of New NY is to bring broadband access to all state residents with limited or no access to high-speed services.

> Despite their urgent need for broadband, approximately 2.5 million Housing Units4 (HU's) in New York State have either limited, or no access to high-speed Internet. It is for this reason that Governor Andrew M. Cuomo, with legislative support, established the $500 million New NY Broadband Program (the Program); the largest and most ambitious State investment in broadband in the nation.[73]

The program is administered by the NY State Broadband Program Office in the state Urban Development Corporation Office and

> Calls for applications for funding to provide access to broadband at speeds of at least 100 megabits per second (Mbps) (download) in most places, and 25 Mbps (download) in the most remote unserved parts of the State . . . The funding will

[73] New NY Broadband Program, Phase 2 Request for Proposal Program Guidelines, available at https://nysbroadband.ny.gov/sites/default/files/documents/new-ny-broadband/New-NY-Broadband-Program-Phase-2-RFP-Guidelines-8-3.pdf

> support Last-Mile solutions, including Middle-Mile and other connectivity to deliver Last-Mile services, to expand broadband connectivity in Unserved and Underserved areas of New York State.[74]

Phase 1 of the program prioritized providing service to unserved communities, libraries, and Educational Opportunity Centers (EOC's).

A key aspect of New York's program is the requirement that providers match state grant funds with private investment and meet

> An aggressive build out schedule that requires funded networks to be completed by the end of 2018 . . . to ensure that providers quickly use State funding to deploy broadband facilities to communities most in need of them.[75]

The program was officially launched in January 2016, with the first awards in August 2016. Phase 1 of the program awarded $54.2M in state funds matched by $21,6M in private investment to bring "18,000 miles of broadband infrastructure [to unserved and underserved areas in] the State and the connection of nearly 34,000 homes to high speed broadband for the first time."[76] Phase 2 will expand service to those areas where Verizon did not accept CAF funds.

As we noted in Part II of this paper, the FCC CAF program includes a fund similar to the New NY project to give incentives for broadband deployment in rural and remote areas of the country. As part of the program, Verizon was offered but did not accept $170.4 million in funding for unserved areas in New York, the majority of which overlap with Phase II of the New NY program. The FCC determined to auction those funds to other carriers to provide funding for broadband build out in areas that cannot support un-subsidized carriers due to their location, population density, or other conditions. The funds would be placed into a single disbursement pool, which could result in states like New York not receiving the sum total of the monies rejected by Verizon.

Based on this concern and the state's aggressive plan for the New NY broadband auction, NY petitioned the FCC to grant those funds to the state to increase the size of the grants that

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[74] Op. Cit. Broadband Program Request for Proposals.

[75] New York State Petition for Expedited Waiver, In the Matter of Connect America Fund ETC Annual Reports and Certifications Rural Broadband Experiments ,WC Docket No. 10-90 WC Docket No. 14-58, WC Docket No. 14-259, available at https://ecfsapi.fcc.gov/file/101269201866/New%20York%20State%20Petition%20for%20Expedited%20Waiver.pdf

[76] Id.

could be offered under the NY program and thus expand both broadband penetration and the speed of service availability. [77]

> New York requests that the Commission waive the rules and make the entire amount of CAF funding declined by Verizon ($170.4 million) available to New York for allocation as part of its upcoming competitive reverse auction. Given the overlap between the CAF auction and the State's broadband program, a federal-state partnership would unquestionably be a more efficient means to distribute the declined CAF funding than for both the State and the FCC to conduct separate auctions. Importantly, New York State's distribution of CAF funding in connection with its upcoming award of State broadband funds would not sacrifice Commission speed and build out goals; indeed they would be enhanced as the requirements of the New York broadband program are more rigorous than those applicable to the CAF.[78]

The FCC granted New York's petition.

> We find that New York is uniquely situated to quickly and efficiently further our goal of broadband deployment. New York has committed a significant amount of its own support—at least $200 million—to Phase 3 of its broadband program that is designed to be compatible with and achieve the goals of Connect America Phase II. Moreover, New York is poised to quickly implement the next phase of its program in a matter of months so that deployment of broadband of speeds that meet or exceed the Commission's baseline requirements for Connect America can be achieved while the Commission is in the process of finalizing and implementing the Connect America Phase II auction.[79]

The FCC decision to make additional funding available to the New NY program and will increase the speed and reach of broadband deployment in the state. It may also incent other states to determine how to leverage the funds not claimed by the Price Cap carriers in their territories to extend broadband build out in their states. For example, Verizon also refused funding for other parts of its territory, including Pennsylvania and Massachusetts. Both states have petitioned the FCC to grant them that funding directly but have not yet been successful in their request.

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[77] New York delayed the award of grants for areas where Verizon did not accept funding in order to ensure that State funding and federal funding could be rationalized.

[78] Op. Cit., NY Petition, III,B.

[79] Op. Cit., NY Order.

IV. 2017 State Broadband Legislation

The states continue to move forward aggressively to increase broadband deployment by providing state funding and initiating legislation to study broadband availability and suggest ways to improve coverage and adoption. The 2017 legislative sessions included bills proposing state broadband support, including allowing municipal broadband to be deployed where commercial entities have not built out service and amending the state USF funds to include broadband as a supported service.

Of the legislation passed during this term, three bills direct the state to use state universal service funds for broadband adoption, eleven create broadband grant programs, six address the extension of municipal broadband services, three would provide tax credits for broadband deployment, one creates a plan for determining whether a municipality is "broadband ready," and ten direct the PUC or a special committee/task force to develop strategies for broadband deployment and adoption[80]

Table 3 provides an overview of the programs enacted during the 2017 legislative session to dat. We discuss the enacted and pending legislation in this section.

Table 3 - 2017 Broadband Legislation (Enacted as of 6/14/17)

State	Legislation
ID	SB 1034, Modify broadband improvement grant rules to remove open use req.
IN	HB 1626, Develop a procedure to promote BB-ready communities
KY	HB 343, (Ch 89) Establish public-private broadband partnerships
MD	SB 717, Rural internet task force
MN	SF 1937, Border to border broadband grants
NM	SB 308, Use State USF funds for rural broadband
NM	SB 24, Broadband Grants to Local Governments
NV	SB 53, Broadband strategic plan
OR	HB 2091, USF funding for voice and broadband
TN	SB 1215, BB grants; electric co-ops may provide svc in unserved areas that have not received other funding
UT	SB 130, Provide USF support for BB
WV	HB 3093, Re-establish BB Council; allow muni broadband
WY	HB 253, Provide $25M to fund economic investment, including tech projects

A. Universal Service Funding for Broadband

Universal service contribution requirements and the initiatives supported by the state USF program continue to be a key concern for state legislators. Indiana established a legislative study committee to review universal service funding during the 2017 session. New Mexico.

[80] Legislation as of 6/14/17. The legislative session continues through July in CA, DE, KS, LA, ME, NV, OR, and RI. The legislative session is year round in MA, MI, NY, and WI.

Oregon, and Utah amended their state universal service fund requirements to provide high cost funding for broadband deployment and to expand the availability of broadband to the state's low income citizens. We discuss these bills below.

Indiana House Enrolled Act No. 1626 addresses both universal service and broadband adoption, including developing a process for designating "broadband ready communities." To be designated as broadband ready, a community must implement procedures to increase broadband adoption, create a single point of contact for the program, and

> Ensure that each communications service provider that already provides broadband services in the unit will be notified that the unit is applying to be a broadband ready community [and] that the unit will work with communications service providers to promote broadband adoption in the unit.[81]

Act 1626 also establishes a legislative committee to examine the state's universal service program and make recommendations on contribution and disbursement requirements. The committee will consider both the types of services on which USF charges should be assessed and the eligibility requirements for carriers requesting disbursement. The committee will also:

> Address broadband deployment and adoption, barriers to broadband adoption and broadband deployment; and [other matters] concerning: (i) universal service reform; (ii) high cost or universal service funding mechanisms; or (iii) rural broadband in Indiana.[82]

> Oregon House Bill 2091 also amends the states universal service fund to add broadband.

> In addition to using the universal service fund to ensure basic telephone service, the Public Utility Commission may use the universal service fund to encourage broadband service availability and to provide support to telecommunications carriers that provide both basic telephone service and broadband service.[83]

The Oregon bill also limits the type of carriers that must contribute to the fund. It specifically excludes wireless carriers from the definition of "retail telecommunications providers," and the contribution requirement.

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[81] Indiana House Enrolled Act No. 1626, An Act to amend the Indiana Code concerning telecommunications, available at https://legiscan.com/IN/text/HB1626/id/1586672/Indiana-2017-HB1626-Enrolled.pdf

[82] Id.

[83] Oregon House Bill 2091, Relating to Telecommunications carriers, amending ORS 759.425, 3/14/17, available at https://legiscan.com/OR/text/HB2091/id/1607240/Oregon-2017-HB2091-Enrolled.pdf

> Retail telecommunications service" does not include radio communications service, radio paging service, commercial mobile radio service, personal communications service or cellular communications service.[84]

Wireless carriers may "choose" to be designated as ETCs and receive support from the state fund if they voluntarily contribute to the fund for one year prior to their designation.

> A person that primarily provides radio communications service, radio paging service, commercial mobile radio service, personal communications service or cellular communications service may request designation as an eligible telecommunications carrier by the commission for purposes of this section if the person imposes the universal service surcharge . . . and transmits the moneys collected to the commission for deposit in the universal service fund . . . for at least one year immediately prior to requesting the designation.[85]

Bills in New Mexico and Utah also add broadband to the list of services supported by the state fund. Unlike Indiana and Oregon, these bills expand the definition of access lines subject to universal service contribution to include not only traditional TDM services, but also VoIP and other "uniquely identifiable functional equivalents." Most importantly, both bills provide the option of creating a connection-based rather than a revenue-based state fund.

New Mexico Bill SB 308 redefines "universal service" to include both basic local exchange service and

> Comparable retail alternative services at affordable rates, service pursuant to a low-income telephone assistance plan and **broadband internet access service** to unserved and underserved areas as determined by the commission. (Emphasis added)[86]

The bill directs the New Mexico Public Regulation Commission (PRC) to establish a surcharge to be applied to each "communications connection" in the state. The charge may be a percentage of intrastate revenue or a fixed amount per connection, a departure from traditional methods of determining the amounts to be collected for the state USF and must be assessed in a competitively neutral fashion against all "communications connections."

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[84] Id. Section 759.423.

[85] Id. Section I.b.7.

[86] New Mexico SB 308. An Act Relating To Telecommunications; Amending A Section Of The Rural Telecommunications Act of New Mexico to Update State Rural Universal Service Fund Provisions And Establish A Broadband Program, available at https://legiscan.com/NM/text/SB308/id/1587331/New_Mexico-2017-SB308-Enrolled.pdf

The definition of "communications connection" is particularly important as providers move toward offering new and enhanced services and consumers continue to abandon traditional switched telecommunications services for VoIP and other products.

> For purposes of this section, a "communications connection" means a voice-enabled telephone access line, wireless voice connection, unique voice over internet protocol service connection or other uniquely identifiable functional equivalent as determined by the commission.[87]

Utah bill SB 130 uses a similar definition.

> Access line means a circuit-switched connection, or the functional equivalent of a circuit-switched connection, from an end-user to the public switched network.[88]

Given that definition, the bill requires

> Each access line or connection provider in the state [including broadband providers] to contribute to the Universal Public Telecommunications Service Support Fund; [and] requires the Public Service Commission to develop a method for calculating the amount of each contribution charge assessed to an access line or connection provider.[89]

It is too early to determine whether these bills represent a change in the way in which USF contribution is assessed; however, declining intrastate revenues and the increasing use of non-traditional services such as texting, FaceTime, and Facebook messaging suggests that both the definition of communications services and the assessment methodology do need revision. To that end, California has opened a proceeding to determine whether texting should be included in the revenue to be assessed for state public purpose programs.[90] Nebraska has already begun

[87] Id. 63-9H-6.B.

[88] Utah bill SB 130, Universal Service Fund Amendments, 2017, available at https://legiscan.com/UT/text/SB0130/2017

[89] Id. Highlighted Provisions.

[90] California Public Utilities Commission. Petition 17-02-006, Petition to Adopt, Amend, or Repeal a Regulation Pursuant to Pub. Util. Code Section 1708.5, Order Instituting Rulemaking to Consider Whether Text Messaging Services Are Subject to Public Purpose Program Surcharges, Proposed Decision Of Commissioner Picker (Mailed 5/12/2017), available at http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M186/K580/186580353.PDF

studying the question of connection-based contribution,[91] and Utah has opened a proceeding to determine how to implement the connections-based methodology enacted in SB 130.[92]

B. Broadband incentive programs

Broadband grant, loan, and incentive programs remain key subjects for state legislation. Idaho, Minnesota, and Wyoming enacted legislation addressing the issue of broadband funding in 2017. Idaho SB Bill 1034 addresses the Idaho Broadband Infrastructure Improvement Grant fund. Administered by the state department of education, the fund provides monies to "invest in special construction projects for high-speed broadband connections to E-rate eligible entities that receive E-rate funding."[93] SB 1034 amends this legislation to remove a requirement that providers building networks funded with Department of Education monies open them for use by other entities. The stricken language required that in

> [O]rder to receive moneys from the fund, the contract for such construction project must contain a provision that the constructing provider of the project will make any dark fiber laid pursuant to the contract available for use by any other provider.[94]

Minnesota included a $20M grant for the state's Border to Border broadband program in the state budget bill, SF1937. This grant will assist new and existing providers in deploying facilities to unserved and underserved areas of the state. The grants can provide up to 50 percent of project development costs, with a maximum per project grant of$5 million.

New Mexico bill SB 24 would have amended existing statutes to allow local governments to invest in municipal broadband infrastructure. The bill would have added "cable or other telecommunications lines and related equipment, including fiber optic transmission facilities designed to carry communication signals such as voice, data and video and any broadband technology infrastructure" to the infrastructure that could be supported by a state

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[91] Nebraska Public Service Commission. In the Matter of the Nebraska Public Service Commission, on its own motion, to consider revisions to the universal service fund contribution methodology, Application No. NUSF-100, PI-193, Order Opening Docket and Seeking Comment, 11/13/2014, available at http://psc.nebraska.gov/orders/ntips/NUSF-100.PI-193.3.pdf.

[92] Public Service Commission of Utah. In the Matter of the Utah Administrative Code R746-360, Universal Public Telecommunications Service Support Fund, DOCKET NO. 17-R360-01, Notice of Rulemaking and Response to Comments, available at https://pscdocs.utah.gov/Rules/17R36001/29400317R36001nofartc5-16-2017.pdf

[93] Idaho Senate Bill No. 1034. An Act Relating To Education, available at https://legiscan.com/ID/text/S1034/id/1516982/Idaho-2017-S1034-Engrossed.pdf

[94] Id. Idaho Bill SB 1034.

infrastructure development zone. [95] Although the bill passed both houses by a substantial margin, it was vetoed by Governor Susana Martinez, raising the possibility of litigation to override the decision.[96]

Wyoming Enrolled Act No. 98 provides a $25M grant to the state's economic development fund. While not specifically dedicated to broadband development, the fund provides monies for public utility infrastructure development.

In addition to the legislation enacted during the 2017 legislative session, bills providing grants for broadband deployment and adoption remain pending in North Carolina and Wisconsin (2 bills). [97] Table 4 below shows the bills that remain pending; we discuss these bills here.

Table 4. Pending Broadband Grant Legislation

State	Pending State Legislation - Grants (as of 6/14/2017)
NC	HB 896, BB grants $50,000 to allow communities to contract with BB providers
WI	SB 26, BB grant appropriation, $1.5M yr/PUC
WI	AB 123, Eliminates $1.5M/yr grant limit; appropriates $17M for BB grants

Source: Author's research

Pending North Carolina Bill HB 639 would allocate $900K in FY 2018 and FY 2019 from the General Fund to the state's regional councils of government to support economic and technical assistance in broadband deployment and technical assistance. The bill focuses on helping jurisdictions work with commercial providers to increase broadband deployment and adoption. It requires grant recipients to

(1) Develop . . . multijurisdictional broadband deployment plans
(2) Convene coalitions of local governments, private sector broadband providers, and users . . . to set strategies for adequate broadband access
(3) Implement multijurisdictional projects in cooperation with the private sector providers and users

[95] New Mexico SB 24. An Act Amending the Infrastructure Development Zone Act, available at https://legiscan.com/NM/bill/SB24/2017

[96] Oxford, Andrew. "Court fight possible over validity of governor's vetoes." The New Mexican, March 17, 201, available at http://nmpoliticalreport.com/219256/court-fight-possible-over-validity-of-governors-vetoes/

[97] We do not include CA bills AB 928 and SB 514 in this discussion, since they would make only minor changes to the California Advanced Services Fund (CASF). AB 928 would reduce the state's broadband coverage goal from 98.5% of the population to 98% of the population. SB 514 would require fund recipients to provide service at speeds matching the FCC definition of broadband.

(4) Identify opportunities for connections between local governments, businesses, and broadband providers to achieve efficiencies and make broadband more available in unserved and underserved rural areas[98]

Broadband grants in Wisconsin are awarded from the state USF fund. Wisconsin bills SB 26 and AB 123 (both pending) would address the process the Wisconsin PSC should use to award broadband grants. These bills remove the $1.5M limit on funding that can be awarded to broadband projects. The bills provide additional monies for the grants by transferring $6M to the program from the state USF fund and $5M to the program from E-rate funding.

Most importantly, the Wisconsin bills change the definition of "underserved areas" that may receive grants from the program from an area with "no broadband providers," to an area

> That is not served by an Internet service provider offering Internet service that 1) is wired service or fixed wireless service; and 2) is provided at actual speeds of at least 20 percent of the upload and download speed for high-speed, switched, broadband telecommunications capability as designated by the Federal Communications Commission in its annual inquiries regarding advanced telecommunications capability.[99]

SB 26 defines underserved areas similarly to AB 123, but includes a challenge process similar to that in the CAF rules. Before it makes a grant under the program, the PSC would be required to determine if there are other providers in the area and to evaluate

> The degree to which the proposed projects would duplicate existing broadband infrastructure, information about the presence of which is provided to the PSC by the applicant or another person within a time period designated by the PSC.[100]

C. Municipal Broadband

State legislatures continue to consider bills that would allow municipalities to deploy broadband, either directly or through cooperative utilities. Municipal broadband projects have generally been proposed in areas where commercial competitors have not deployed or expressed a plan to deploy service. Eight states introduced bills that would have established or modified rules governing the ability of municipalities to provide broadband in underserved and unserved areas. Three of these bills, Kentucky HB 343 (Ch. 89), Tennessee bill SB 1215, and West

[98] North Carolina HB 639. An Act to Appropriate Funds to the State's 16 Regional Councils, available at https://legiscan.com/NC/text/H639/id/1589623/North_Carolina-2017-H639-Amended.html

[99] Wisconsin Assembly Bill 123, available at https://legiscan.com/WI/text/AB123/id/1545013/Wisconsin-2017-AB123-Introduced.pdf

[100] Wisconsin Senate Bill 26, available at https://legiscan.com/WI/text/SB26/id/1503959/Wisconsin-2017-SB26-Introduced.pdf

Virginia HB 3093, were enacted during the 2017 legislative sessions. Bills proposed in Alaska, Alabama, Maine, and Missouri failed. In addition, bills remain pending in North Carolina and Washington.

We discuss this legislation below and Table 5 summarizes these bills.

Table 5 - Municipal Broadband Legislation

State	Muni Broadband Legislation
AK	HB 246, Create a Broadband Development Commission (failed)
AL	SB 151, allow muni broadband, TV, phone in competition w private providers (failed)
KY	HB 343 (Ch 89), Establish public-private partnerships (enacted)
ME	LD 1516 - Encourage private BB investment by limiting municipal broadband (failed)
MO	SB 186 -prohibit muni BB where there is retail provider (failed)
NC	HB 68, local Gov may lease BB facilities to private providers (pending)
WA	SB 5483, Allow muni service in underserved and unserved customers (pending)
WV	HB 3093, Re-establish broadband council; allow muni broadband (enacted)

Source: Author's research

1. 2017 Enacted Legislation

Kentucky House Bill 343 (Ch 89) establishes the board for the Kentucky Communications Network Authority, an open network built by the state in cooperation with Macquarie Capital to provide middle mile broadband access to state agencies and others. Excess capacity on the network will be offered at wholesale rates to private and public providers to encourage broadband deployment by providing middle mile connectivity to carriers that will offer last mile service to homes and businesses.[101]

> KentuckyWired is unique in that it will be an "open access" network. This means cities, partnerships, private companies or other groups may acquire access to these "middle-mile" lines, but the network will not be providing "last mile" services, or the lines that run to individual homes or businesses.[102]

Middle mile networks are critical to providing service in rural and other underserved areas, since they provide the connectivity necessary to create a "complete" service without requiring carriers

[101] Kentucky House Bill 343 (Ch 89). An Act related to reorganization, available at https://legiscan.com/KY/text/HB343/id/1539831/Kentucky-2017-HB343-Draft.pdf

[102] KentuckyWired Broadband Network Authority Overview, available at http://kentuckywired.ky.gov/about/Pages/default.aspx

to build facilities in remote area. Shared facilities of the type envisioned by KentuckyWired may be an excellent way to bring broadband connectivity to areas where there is no business case to provide commercial service. The KentuckyWired project is expected to have a lifespan of at least 30 years.

Tennessee bill SB 1215 (Ch 228) encourages broadband deployment by allowing the state's electric cooperatives to provide broadband service in unserved areas. The Act rescinds the prohibitions against electric utilities providing service both within and without their territory.

> Every cooperative has the power and is authorized, acting through its board of directors, to acquire, construct, own, improve, operate, lease, maintain, sell, mortgage, pledge, or otherwise dispose of any system, plant, or equipment for the provision of telephone, telegraph, telecommunications services, broadband internet access or related services, or any other like system, plant, or equipment within and/or without the service area of such cooperative with the permission of any municipal electric plant or cooperative in whose service area the services will be provided.[103]

The bill also provides $45 million in grants and tax credits over three years to assist service providers in extending broadband to unserved homes and businesses, primarily in rural parts of the state. The passage of SB 1215 represents a departure from previous years where the legislature voted against bills designed to promote broadband availability by increasing the penetration of successful municipal broadband systems like Chattanooga's Municipal Broadband Authority.

In West Virginia, the legislature passed HB 3093, which authorizes the development of cooperative associations for the purpose of bringing broadband service to unserved locations. The bill supports the creation of

> Pilot projects for municipalities and counties to form non-profit cooperative associations for internet services; . . . [and authorizes] the creation of guidelines and recommendations to the Legislature for voluntary pipeline donation program to facilitate broadband services.[104]

The bill allows cooperative associations to seek funding for broadband expansion programs from both the State Treasury and outside entities, including issuing bonds and other funding instruments. In addition, the bill encourages broadband development across the state by establishing a broadband mapping project, supporting microtrenching, simplifying access to

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[103] Tennessee Broadband Accessibility Act of 2017, Ch. 28, available at https://legiscan.com/TN/text/SB1215/2017

[104] West Virginia House Bill 3093. Establishing Broadband Enhancement and Expansion Policies, available at http://www.legis.state.wv.us/Bill_Status/bills_history.cfm?INPUT=3093&year=2017&sessiontype=RS

poles and conduits, and defining procedures for attaching items to third-party facilities and poles in order to extend broadband service in unserved areas.[105]

2. Pending Legislation

Municipal broadband legislation remains pending in North Carolina and Washington. Like Kentucky, North Carolina bill House Bill 68 creates public-private partnerships to provide broadband service in underserved and unserved areas. The bill would allow municipalities to lease parts of their own broadband networks to "be operated and used as a component of a wired or wireless network" to provide service in unserved or underserved areas.[106] The leases would be competitively neutral and, like Kentucky's open network structure, would be available to all providers.

> The term "public-private project" shall also include a capital improvement project undertaken for the benefit of a city or county pursuant to a development contract that includes construction of components of a wired or wireless network in conjunction with or part of another construction project undertaken by the city or county. Nothing in this subsection authorizes a city or county to unilaterally provide high-speed Internet broadband service, or infrastructure needed to support broadband, computing, and communications components.[107]

Washington Senate Bill 5483 would also create public-private partnerships to provide broadband service. SB 5483 would allow public utility districts to provide retail telecommunications services to both end users and to "dominant internet service providers" that would utilize the district's infrastructure to provide service to their own end users.[108]

In addition to providing facilities that may be used by private providers to create or extend their networks, the bill addresses service quality and pricing issues. Customers receiving service from carriers using public utility district infrastructure may bring service complaints directly to the utility district.

Interestingly, the bill also offers consumers protection in the event that providers contracting with the public utility district to offer service fail. Should a private provider cease to

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[105] Id. Executive Summary.

[106] North Carolina HB 68. An Act Encouraging the Establishment of Bright Markets, available at https://legiscan.com/NC/text/H68/id/1597148/North_Carolina-2017-H68-Amended.html

[107] Id. Section 3.(b).

[108] Washington State Senate Bill 5483. Ensuring economic development through the provision of telecommunications services to underserved and unserved customers, available at https://legiscan.com/WA/text/SB5483/id/1481693/Washington-2017-SB5483-Introduced.pdf

offer service, the public utility district may offer service directly to customers of that provider for 30 days while seeking a replacement provider.

> Within thirty days of a dominant internet service provider ceasing to provide access to the internet, the public utility district must initiate a process to find a replacement internet service provider or providers to resume providing access to the internet using telecommunication facilities of a public utility district. Until a replacement internet service provider is, or providers are, in operation, the district commission may establish a rate for providing access to the internet and charge customers to cover expenses necessary to provide access to the internet.[109]

Senate Bill 5483 did not pass during the initial 2017 legislative session but has been reintroduced for consideration in the next legislative session.

Municipal broadband networks have been the subject of much debate within the telecommunications community, with both sides marshalling arguments for and against. Public-private partnerships may bridge the gap between municipal networks and commercial network providers, thus increasing the availability of broadband to those communities that most need them. Should SB 5483 be enacted, it could serve as a template for future public-private broadband development.

3. **Other Legislation**

Legislation addressing municipal broadband similar to that described above failed in Alabama, Alaska, Maine, and Missouri.

Alabama Senate Bill 151 would have removed the state's current restrictions on municipal broadband, allowing existing municipal carriers to extend service outside of their territory, including areas where there are competitive suppliers, and to expand their offerings to include cable TV and other enhanced services.[110]

Alaska House Bill 246 would have made the Alaska Broadband Development Commission an eligible telecommunications carrier (ETC) for the purpose of obtaining state and federal funds to provide broadband to unserved communities. The bill would have allowed the broadband development commission to create a middle mile network to

> (1) provide or enable affordable and nondiscriminatory access to high-speed, low-latency telecommunications connectivity between points in the state that are unserved or underserved by high-speed, low-latency telecommunications connectivity to existing fiber-optic cables that connect to the Internet; (2) deploy

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[109] Washington Senate Bill 5483, Section 2(8).

[110] Alabama Senate Bill 151, available at https://legiscan.com/AL/text/SB151/id/1508529/Alabama-2017-SB151-Introduced.pdf

> the necessary broadband networking facilities to provide high-speed, low-latency telecommunications connectivity in a coordinated manner.[111]

On the other side of the equation, bills in Maine and Missouri attempted to strengthen the prohibition on municipal broadband services. Maine Senate Bill 1516 would have limited the provision of municipal services by adding new rules for their implementation.

> Except as provided in this chapter, a municipality may not provide broadband service to a subscriber or, for the purpose of providing broadband service to a subscriber, purchase, lease, construct, maintain or operate a facility that is designed to provide broadband service. A municipality may not offer to provide or provide broadband service to a subscriber that does not reside within the geographic boundaries of the municipality.[112]

Missouri Senate Bill 186, an Act relating to the authority of local governments to offer certain services, would have limited the provision of new municipal broadband installations after August 2017. Existing services could continue to be upgraded, but the implementation of new services would require financial studies and voter approval.[113]

D. Tax Credits

During the 2017 legislative session, three states – Alabama, New Jersey, and New York – proposed tax credits for companies building broadband facilities in unserved and underserved areas. Of these, Alabama's bill SB 253 failed, while bills in New Jersey and New York remain pending.

Alabama bill SB 253 would have exempted companies building new provide broadband facilities in rural areas from state tax. The exemption would stimulate broadband deployment by relieving companies of the tax burden associated with

> Electronics, equipment, transmission facilities, fiber optic and copper cables, fixed wireless facilities, mobile wireless facilities, and any other real or personal property forming part of a system used directly or indirectly to transmit broadband signals capable of speeds at least 10 megabits per second of download speed and one megabit per second of upload speed to end user locations in rural

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[111] Alaska HB 246, An Act creating the broadband development commission, available at https://legiscan.com/AK/text/HB246/id/1613425/Alaska-2017-HB246-Introduced.pdf

[112] LD 1516, An act to encourage broadband development through private investment, available at https://legiscan.com/ME/text/LD1516/2017

[113] Missouri Senate Bill 186, An act relating to the authority of local governments to offer certain services, available at https://legiscan.com/MO/text/SB186/2017

> areas purchased, constructed, or installed for use in Alabama after December 31, 2016.[114]

In a similar vein, New Jersey Bill AB 2229 would provide tax credits for building facilities in rural parts of the state.

> This bill allows a corporation business tax credit for 25 percent of the costs of the installation, construction, reconstruction, erection of improvements or additions of broadband telecommunications infrastructure that result in the provision or expansion of broadband telecommunications service in municipalities in this State having a population of less than 10,000.[115]

First introduced in 2016, this bill remains pending.

Finally, the New York legislature has proposed offering tax credits to companies that build broadband facilities to unserved and underserved areas. The proposed legislation creates a two tiered structure, offering a basic credit to those who build "standard" facilities and an enhanced credit to those that offer higher speed facilities.

> (1) A provider shall be allowed a current generation broadband credit equal to ten percent of the qualified expenditures incurred with respect to qualified equipment of a telecommunications provider delivering current generation broadband services to rural subscribers or under-served subscribers. (2) A provider shall be allowed a next generation broadband credit equal to twenty percent of the qualified expenditures incurred with respect to qualified equipment of a telecommunications provider delivering next generation broadband services to rural subscribers, underserved subscribers, or any residential subscriber.[116]

The New York legislature is in session year round. Bill A 2048 remains pending.

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[114] Alabama Senate Bill 253, Alabama Rural Broadband Amendment to the Alabama Renewal Act, available at https://legiscan.com/AL/text/SB253/id/1593667/Alabama-2017-SB253-Engrossed.pdf

[115] New Jersey Assembly Bill 2229, AN ACT providing a corporation business tax credit for certain investment in broadband infrastructure in underserved communities, available at http://www.njleg.state.nj.us/2016/Bills/A2500/2229_I1.PDF

[116] New York Assembly Bill A 2048, AN ACT to amend the tax law, in relation to creating a tax credit for people who deliver broadband services to a targeted group of subscribers, Section 1, §43. Broadband development tax credit, available at https://legiscan.com/NY/text/A02048/id/1463030/New_York-2017-A02048-Introduced.html

E. Broadband Strategy

State legislatures continue to focus significant effort on determining where broadband is and is not deployed and developing strategies for encouraging service expansion and deployment. Six states, (Maryland, Nevada, New Hampshire, New York, Oklahoma, and Vermont) proposed legislation either tasking the state PUC with developing a state broadband strategy or creating an independent Broadband Strategy Task Force to identify opportunities for increasing the availability and adoption of broadband service. Of these bills, three, Maryland SB 717, New Hampshire House Bill 238, and Nevada SB 53, have been enacted. Three bills remain pending in New York. Bills failed in Oklahoma (SB 528) and Vermont (H 406).

Table 6 summarizes these bills. We discuss them in detail below.

Table 6. Broadband Strategy Legislation

State	State Legislation - Broadband Strategy
MD	SB 717, Establishes a task force on rural internet - passed both houses - Enacted
NV	SB 53/ Ch 120, Create broadband strategic plan - Enacted
NH	HB 238, Establish a committee to study broadband access - Pending
NY	AB 7530/SB 6114, PUC study of fiber availability; require provider to build in unserved areas - Pending
NY	SB 5004, Study approaches to providing statewide broadband - Pending
NY	AB 4606, Create a task force to study broadband and develop policies to increase; reports 7/18 and 7/19 - Pending
OK	SB 528, Create Connect OK BB program; identify beneficial and problematic regulations - Failed
VT	H 406, Create Telecom Technology Council - Failed

Source: Author's research.

1. Maryland SB 717

Maryland Bill SB 717 establishes a Task Force to

> Study and make recommendations regarding how [rural parts of the state], including Western Maryland counties, Southern Maryland counties, Eastern Shore counties, and Frederick, Carroll, and Harford counties can work together to obtain federal assistance to improve Internet, Broadband, wireless, and cellular services and accessibility in Western Maryland, in Southern Maryland, on the Eastern Shore, and in Frederick, Carroll, and Harford counties.[117]

[117] Maryland Senate Bill 717 (Ch 621), Connecting Rural Maryland Act of 2017, available at https://legiscan.com/MD/text/SB717/id/1573023/Maryland-2017-SB717-Engrossed.pdf

The Task Force will include members from the state's rural counties, as well as industry representatives, and a representative from the PUC. It will assess current internet, broadband, wireless, cellular, and landline service connectivity, including the level of service provided in each of these locations. The task force will examine potential sources for funding broadband expansion as well identify coverage gaps. The Task Force will report its findings and recommendations to the Governor and the legislature by November 30, 2017.

2. New Hampshire HB 238

New Hampshire bill HB 238 establishes a legislative task force to

> I. Explore the changes needed to establish a governmental structure to facilitate and coordinate broadband technology as recommended in the final report of the New Hampshire broadband mapping and planning program.
> II. Explore opportunities for public/private partnerships to facilitate broadband availability in underserved areas.
> III. Facilitate the adoption of wireless technologies to expand the reach of broadband access into rural areas.[118]

The bill seeks to identify ways in which state regulations may be simplified or rewritten to encourage companies to increase broadband deployment. The Task Force will also study whether wireless technologies can replace wired service in areas where deploying wireless infrastructure may not be possible. The Task Force will report to the Legislature in November, 2017.

3. Nevada Bill 53

The Nevada legislature also passed a bill in 2017 directed at expanding broadband access. Nevada Senate Bill 53 (Chapter 120) directs the Director of the Office of Science and Technology to develop a strategic plan for the use of broadband services in the state. The bill authorizes the office to apply for funding to expand service in unserved and underserved areas, expand telemedicine service, expand the states fiber infrastructure to support public safety, and create a policy for using the state's fiber optic infrastructure.[119] To increase broadband availability, the bill also streamlines the site permitting process and the state right of way process to provide telecommunications providers access to spare conduit to allow service installation.

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[118] New Hampshire House Bill 238, An Act establishing a committee to study broadband access to the internet, available at https://legiscan.com/NH/text/HB238/id/1441813/New_Hampshire-2017-HB238-Introduced.html

[119] Nevada Senate Bill 53, An Act relating to telecommunications facilities, Chapter 120, available at https://legiscan.com/NV/text/SB53/id/1618915/Nevada-2017-SB53-Enrolled.pdf

4. New York AB 7530, SB 5004, AB 4606

The New York legislature has proposed a package of bills directing studies of the status of broadband service in the state. Of these, SB 7530, an Act to amend the public service law, in relation to providing broadband and fiber optic services, is the most relevant to our discussion of the role of state commissions in facilitating broadband access and adoption. The Act requires the PUC to

> Determine . . . the status of broadband and fiber optic services in New York state . . .[and] identify communities without access to broadband and fiber optic services, communities in which insufficient telecommunications service has caused social or economic impacts, communities where local franchises have not been complied with, and communities in which the commission believes such broadband and/or fiber optic service is necessary for the successful implementation of commission policies on competition, affordable, and adequate service.[120]

The commission would have six months to study the issue and then be authorized to

> Require construction or installation of broadband and fiber optic services by an internet service provider in communities in which broadband and fiber optic services are determined to be absent, insufficient, or inadequate, so as to ensure the availability of broadband and fiber optic services to the greatest number of New York state residents possible.[121]

The aggressive stance of this proposed bill is unusual and underlines the Legislature's impatience with current providers and its intent to provide the PUC with the tools (and the power) necessary to actually compel them to deploy broadband in unserved areas. The bill was withdrawn by its sponsor in mid June 2017 but may be reissued later in the session.

Proposed New York Assembly Bill 4006, although less aggressive than AB 7530, would also direct the state PUC to study broadband access and identify ways to increase service availability, including creating public/private partnerships and identifying changes to regulations that would encourage broadband deployment. AB 7530 would also direct the PUC to identify and compare

[120] New York Assembly Bill 4606, AN ACT to amend the public service law, in relation to providing broadband and fiber optic services, § 224-c, available at https://legiscan.com/NY/text/A07530/id/1605670/New_York-2017-A07530-Introduced.html

[121] Id.

> [S]tate policies that have aided the increase in broadband speeds in other states, and [determine] whether such measures would be similarly effective in this [New York].[122]

Finally, proposed bill AB 4606 creates a 31-memberTask Force to

> Develop policies that will benefit NY residents by fostering the free market development and beneficial use of advanced communications networks and information technologies.[123]

The New York legislature remains in session throughout the year, so action on these bills may come later in the session.

V. Key questions facing state public utility commissions

As state legislators focus their efforts on increasing broadband deployment by creating special task forces, grant programs, and broadband authorities separate from traditional public utility regulation, state public utility commissions must define their role in this new environment. How can the state public utility commission work with these new entities to manage service deployment, encourage broadband adoption, ensure consumer protection, and meet the goal of providing universal service, while still protecting and supporting traditional services? Is there a conflict between the traditional role of public utility regulators to ensure the public good and the new entities charged with increasing broadband availability outside the current regulatory structure? Over the long term, what changes might state commissions make to their traditional oversight role to enhance broadband deployment and adoption?

This section discusses these issues. It reviews the key questions facing the states as the nation moves from a voice-focused telecommunications ecosystem to a broadband focused one, including assessing the impact on regulators and consumers of limitations on state oversight of IP-enabled service.

1. As broadband replaces voice as the primary focus of the federal universal service program, how should the states respond?

It is clear that the focus of federal communications support is changing from voice to broadband. CAF funding is directed toward broadband deployment, including supporting

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[122] Assembly Bill 5004, An Act to require the public service commission to undertake a study on various approaches to increasing broadband access within this state, available at http://assembly.state.ny.us/leg/?default_fld=&bn=S05004&term=2017&Summary=Y&Actions=Y&Text=Y&Committee%26nbspVotes=Y&Floor%26nbspVotes=Y

[123] New York Assembly Bill AB 4606, Task force on information services technology development. available at https://legiscan.com/NY/bill/A04606/2017

standalone broadband in rural areas. Changes to the Lifeline program focus on providing low income and disadvantaged consumers with access to the internet rather than supporting the pure voice and mixed offers of the past. How can state commissions respond to these changes?

First, state commissions may consider ways in which they can move the focus of their current support efforts from voice to broadband, including developing state supported incentive programs that include voice but focus on broadband. As discussed earlier, states like New Mexico, Oregon, and Utah have modified their state USF programs to provide support for broadband as well as voice. In addition, states like New York, Pennsylvania, and Massachusetts have petitioned the FCC to direct the state CAF funding rejected by their incumbent carriers directly to their states outside of the CAF II auction format so that it may be used to support state-managed broadband deployment programs.[124]

Other states may consider moving in a similar direction, whether by supporting state legislation or, where possible, revising the rules governing the State universal service funds to include support for broadband, including standalone broadband initiatives such as those proposed by companies seeking to bring broadband facilities to low income housing projects in the state. California's broadband support programs, under the purview of the PUC, have carved out a specific state USF program to direct funding to these projects.

Second, state commissions can embrace the transition to broadband by focusing on state initiatives that will increase broadband adoption at the state level by simplifying the process for broadband deployment wherever possible. State legislation directing the commission to study ways to further broadband deployment by reviewing and potentially revising rules for overseeing broadband deployment represents a first step in this direction. Commission initiatives already underway in this area include reviewing rules for ETC designation, working with local government to bring the rules for municipal broadband facilities into parity with rules for competitive systems, and developing a clear broadband support strategy.

It is important to note that these changes do not mean abandoning the support of voice services in favor of broadband; rather, they mean determining how to identify those areas where broadband deployment has been slow to occur and focusing voice support there. For example, as carriers transition from a copper network to a fiber network, state commissions should examine how they can identify where broadband facilities cannot or will not be provided, identify features and functions of those systems that may not adequately transition, and work with carriers to determine how to support consumers who will not or cannot transition.

[124] To date only New York has been successful in this effort, although Pennsylvania and Massachusetts consider ways in which the CAF II auction may be modified to direct support to those states where carriers have not accepted funding.

2. How can state commissions improve broadband adoption, particularly in rural and economically disadvantaged areas?

Current federal and state programs and legislation focus primarily on deploying broadband facilities, placing less emphasis on increasing the use of those facilities through enhancing broadband adoption. As studies by Public Knowledge, the Pew Foundation, and others point out, broadband adoption has slowed, even as deployment has increased, opening the door to creative ideas for improving adoption and, ultimately ensuring that all state residents share in the benefits of being online.

> Home broadband adoption seems to have plateaued. It now stands at 67% of Americans, down slightly from 70% in 2013, a small but statistically significant difference which could represent a blip or might be a more prolonged reality. This change moves home broadband adoption [back] to where it was in 2012.[125]

This change is particularly evident in low income communities, where cost is one of the most important drivers of broadband adoption.

> Research shows that the causes of the failure to adopt broadband service at home involve a combination of price, availability, and perceptions of difficulties of use or lack of value of the service. There is no doubt that achieving universal service in the digital era is more complex than it was in the days of plain old telephone service (POTS), but, that is not a reason, or an excuse to abandon the goal.[126]

Since "all broadband adoption is local," the state public utility commission can take a leadership role in ensuring that the availability of broadband facilities leads to the adoption of broadband. To that end, state commissions can partner with local support organizations to increase broadband adoption rates by supporting broadband training and can encourage ways to increase the availability of equipment such as computers and tablets, potentially including these tools in their lifeline and other support programs. Most importantly, state universal service funds can be adapted to encourage broadband adoption.

Finally, state public utility commissions may consider adding tracking the level of broadband adoption across the state to the data collected by state mapping programs. While it is important to know where broadband is available, it is perhaps more important to know who is actually using the service and to what end. By actually identifying the "take rate" of broadband services built with state funds, the state commissions can determine the success of these programs and modify them to ensure the widest level of support.

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[125] Horrigan, John B. and Maeve Duggan. Home Broadband 2015, Pew Research Center, December 21, 2015, available at http://www.pewinternet.org/2015/12/21/home-broadband-2015/

[126] Cooper, Mark. "Overcharged and Underserved." Roosevelt Institute, December, 2016, available at http://rooseveltinstitute.org/wp-content/uploads/2017/02/Overcharged-and-Underserved.pdf

3. How should state public utility commissions work with broadband commissions, government task forces, and separately constituted broadband authorities to manage broadband deployment and adoption?

One of the key concerns facing state public utility commissions as the country continues to transition to a broadband ecosystem is the division of broadband objectives and management between the state commission and the independently formed state broadband authorities. Although both organizations ultimately support the same objective of increasing broadband availability and adoption, they often take divergent paths to reach this goal. Most importantly, while the state commission is often charged with providing the funding to support broadband through the state universal fund, the decision on where to expend those funds rests with the state broadband oversight agency.

The 50 states and the District of Columbia have broadband development authorities of some type to direct and manage grant funds. Of these, only six, California, Nebraska, New Mexico, Oklahoma, Pennsylvania (under its Chapter 30 authority), and Wyoming vest this oversight in the state public utility commission. The others include PUC input in their deliberations but distribute grant monies and determine funding independently. This may lead to a situation where the PUC may hold one view of funding requirements and the independent board another, causing a push-pull that may impact both program efficiency and effectiveness.

Colorado and California represent the two different sides of this coin.

In Colorado, funding for state broadband initiatives is largely provided by high cost monies redirected from areas deemed to be effectively competitive by the Colorado PUC, but the decisions on how and where to use these funds are vested in the Broadband Deployment Board, an independent organization composed of voting representatives from cities and counties across the state and industry. The PUC provides a non-voting representative for the Board. This organization limits the input that the PUC can provide and thus reduces its ability to use its insight to guide the work of the Board.

As in Colorado, Minnesota has established a standalone Office of Broadband Development (OBD) under the state Department of Employment and Economic Development (DEED) to determine how broadband grant funds should be deployed. The OBD functions independently of the PUC. Minnesota also has a Broadband Task Force appointed by the Governor to make recommendations to policy makers and stakeholders for legislative consideration. The Task Force has recommended increasing broadband adoption expanding the State Lifeline program to include broadband.

California provides a different process. The $315M California Advanced Services Fund, CASF, is managed by the PUC, which determines how and where to provide funding. The CPUC works with the California Broadband Council, established by the state to provide guidance and support for broadband initiatives. The Council works with the PUC to identify government structures available for collocating broadband infrastructure, increase broadband literacy and adoption, and increase broadband availability in tribal areas.

Nebraska also defers decisions regarding broadband funding and grants to the state commission, ensuring that the state's expert telecommunications agency guides funding and adoption decisions.

As the California and Nebraska examples show, granting the state PUC a lead role in determining where funding should be directed ensures that the PUC's expertise in telecommunications issues will help to create a coherent, need-based, broadband plan.[127] Although legislation and the transition to IP-enabled services have placed limits on the PUC's ability to oversee the transition to broadband, its breadth of knowledge and understanding of this area makes it a critical part of ensuring that broadband is universally available, comparably priced, and provides service quality that will support the needs of its citizens.

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The transition to a broadband-centric universe has identified new issues, opportunities, and responsibilities for state regulators. By studying the ways in which other states are addressing the questions of increasing broadband deployment, coordinating with outside organizations to encourage and manage broadband adoption, and determining how best to use state universal service funds or other state funds to increase broadband deployment and adoption, state regulators can craft the responses to these issues best suited to their individual citizens.

Broadband deployment and adoption will continue to be the key issues facing the states in the 21st century, by sharing information and best practices with each other, the states can continue to be the key laboratories for creating and testing the solutions to the problems of their own citizens.

[127] Interestingly, the FCC's Broadband Deployment Advisory Council (BDAC) also focuses on the role of federal broadband oversight and the need for independent broadband development agencies, leaving the PUC far down the list. One of the goals of the BDAC is to increase deployment by removing unnecessary (state) regulation.

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