OKLAHOMA STATE BROADBAND PLAN

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Contents

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Office of the Governor
State of Oklahoma

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As our nation has evolved into a digital economy, many areas of Oklahoma have been left behind, largely in our rural communities. Broadband access is critical in the 21st century for providing a quality education, affordable healthcare, enhanced agriculture, and expanded economic opportunity.

Across the state of Oklahoma, towns and communities are putting forward their own limited resources to invest in expensive infrastructure to improve their own opportunities. Private partners are stepping up to the plate to ensure not only their own businesses can thrive, but also the communities surrounding their operations. Since 2009, the state has pursued grants to support these partners, and by 2013, the state completed a middle-mile infrastructure of 1,005 miles of high-speed broadband fiber reaching 35 counties and connecting 92 community anchor institutions.

Over this period of time Oklahoma's ranking moved 3 points from 48th to 45th for broadband connectivity. We still have progress to make, especially when one in three Oklahomans have fewer than two providers to choose from. Outlined in my plan, the *Oklahoma Broadband Plan,* is my commitment to improve connectivity for all 4 million Oklahomans by pursuing more federal funding, partnering with local municipalities, and better aligning the state's assets in all 77 counties.

The plan focuses on state grants in rural communities, encourages public-private partnerships in the 117 Opportunity Zones, and streamlines permitting in the state's rights-of-way. We have also launched a collaborative task force comprised of state and local leaders and the private sector to fine tune broadband mapping to meet our critical goals in underserved areas.

With Oklahoma having one of the lowest regulatory and legal barriers to installing broadband, I am confident we can make significant strides in this next phase of partnership and investment. With the teamwork that has been underway over the past few years, and our effort to bolster continued collaboration, the State of Oklahoma is well positioned to address our broadband needs.

Thank you for your interest in and continued support of the *Oklahoma Broadband Plan.*

Sincerely

J. Kevin Stitt
Governor

Introduction

Oklahoma is still a young state of nearly 112 years. Its very name is reflective of its Indian heritage as Oklahoma is a Choctaw word meaning Red People. Oklahoma is the 28th largest state in the nation with a population of just over 3.5 million people. Sixty percent of the population resides within two metropolitan areas of Tulsa and Oklahoma City. The remaining forty percent are spread across the state in communities ranging in size from a few hundred people to 25,000. Rich in native culture, Oklahoma was originally created as Indian Territory by the federal government where tribal nations from across the country were forced to relocate in the 1800's. Their resilience and perseverance have resulted in a tapestry of languages and cultures represented by 39 federally recognized and sovereign tribes. The diverse and innovative spirit of the Oklahoma people has strong roots originating from the Native American Indians who were forced to adapt to the freed slaves who formed successful African American communities.

The Dust Bowl image of Oklahoma is a distant memory. Biotech startups and nanotechnology are revolutionizing how Oklahoma views itself and the world beyond. Medical breakthroughs spurred by Oklahoma research institutions are changing the face of medicine as well as saving lives. Information technology, aviation and aerospace are accelerating change while renewable energy creates potential for new jobs in rural Oklahoma. These new industries and others have joined Oklahoma's great economic drivers of oil, natural gas and agriculture. The action plan for Oklahoma's future is focused squarely on today's knowledge-based economy requiring highly educated, technology proficient Oklahomans who can access and use investments in technology infrastructure to not only their benefit but the states as well.

A state with inadequate broadband capacity means its citizens are at an extreme disadvantage. Economic development, educational, public health and safety services depend upon the ability to interconnect and communicate effectively. With Oklahoma's significant rural base across a geographically large area, access to broadband is the key to growth and prosperity. Creating access to basic services through technology means Oklahomans in the most remote areas of the state can be in contact with public service providers, can access distant learning and health care services and can communicate with their government and one another more readily.

The Oklahoma State Broadband Plan will create the roadmap to coordinate efforts in the deployment of high-speed broadband connectivity so that all Oklahomans have access to health care, education, economic growth and expansion, and other quality of life essentials.

Purpose of Oklahoma State Broadband Plan

The Oklahoma State Broadband Plan highlights the objectives and activities of the State of Oklahoma to enhance broadband access and adoption in areas identified as unserved or underserved as defined by the Federal Communications Commission ("FCC"). The purpose of the Oklahoma Broadband Plan is to outline efforts necessary to deploy high-speed broadband connectivity and to identify remaining obstacles and challenges to achieving coverage and connectivity for all Oklahomans.

The Oklahoma state broadband coordinator will coordinate activities among state agencies that either own fiber assets or have access to certain assets that can be utilized to expand public-private partnerships to support this broadband plan. These agencies include, but are not limited to, the Oklahoma State Regents for Higher Education, OneNet, the Office of Management and Enterprise Services, the Oklahoma Department of Transportation, the Oklahoma Turnpike Authority, Oklahoma Department of Commerce, and the Oklahoma Department of Agriculture, Food and Forestry. The state broadband coordinator will also work with tribal governments, the federal government, and other state governments to gain insight into potential assets and best practices that can be utilized for funding and implementing broadband expansion in Oklahoma. Additionally, broadband roundtables consisting of representation from private telecom and cable providers, local governments and electric cooperatives will be scheduled to ensure proposed solutions are useful and practical.

This Broadband Plan will outline additional initiatives of the state, including enhanced mapping of unserved areas, assistance with local broadband planning and development of programs and incentives to maximize broadband coverage.

This plan supports broadband providers who pursue grant and loan funding through the United States Department of Agriculture ("USDA") programs. In addition to the coordination of efforts among state agencies and broadband providers, Oklahoma is working closely with the USDA, the Federal Communications Corporation ("FCC") and other federal entities to access all available resources to bridge the broadband gap in unserved or underserved communities.

Oklahoma Broadband Initiative

In 2009, Oklahoma was awarded funding from the National Telecommunications and Information Administration (NTIA) to map broadband coverage in the state. The first phase of the Oklahoma Broadband Initiative was the creation of the broadband map for the entire state. This map depicted areas that were served, unserved and underserved as defined by the FCC. The Oklahoma broadband mapping project was achieved through a partnership comprised of local, state and tribal governments, non-governmental agencies, private sector and industry representatives, as well as the educational community including early, common and higher education, career technical training and workforce development. A technical working group reviewed proposals and recommended the selection of a professional firm to collect and compile the necessary data to map broadband accessibility and to submit this data to the NTIA for preparation of the national broadband map.

The second phase of the Oklahoma Broadband Initiative was the formation of public/private partnerships with vendors to deploy infrastructure necessary for broadband access to community anchor institutions such as hospitals, universities, libraries and public safety. In this phase, the demand for better access to broadband infrastructure was addressed. The process included:

1) Analyzing the mapping data,
2) Defining the challenges and opportunities to adoption of broadband,
3) Collecting consumer data concerning the use of broadband in underserved and unserved areas, including information technology capabilities,
4) Identifying priorities and strategies for expanding broadband in the underserved and unserved areas and
5) Developing a consumer education and awareness initiative to increase the adoption and utilization of broadband throughout Oklahoma.

In 2010, the state submitted and was awarded a Broadband Technology Opportunities Program ("BTOP") grant of $74 million from NTIA to construct the Oklahoma Community Anchor Network ("OCAN"). A key component to this application was the coordination of data, mapping information, strategic focus and user interests. Leadership from the public and private sectors worked in a collaborative way to combine resources for the expansion of broadband services.

Completed in July 2013, OCAN is a middle-mile infrastructure of approximately 1,100 miles of high-speed broadband fiber optic cable. Prior to OCAN's construction, several state agencies operated technology networks throughout Oklahoma. OCAN bridges these disparate networks to form an aligned network reaching remote areas of the state not served by the existing networks. The network reaches 35 Oklahoma counties and interconnects 92 community anchor institutions.

Types of Broadband Connectivity

Internet connectivity is provided by several different technologies. These technologies basically provide access to all of the resources that the internet has to offer. While the signal takes different forms, it is translated at the endpoints into the same digital data format usable by all end user devices. Technologies that are used to deliver broadband currently are:

1. Digital Subscriber Line

2. Cable Modem or CATV

3. Fiber Optics

4. Fixed Terrestrial Wireless

5. Mobile or Cellular

6. Satellite

While most broadband connections are easy to identify as such, the definition of broadband has been a subject of considerable debate. The FCC currently categorizes a broadband internet service if it transmits at a speed of at least 25 megabits/second (Mbps) for downloading data throughput and at least 3 Mbps for uploading data throughput.

DSL

Digital Subscriber Line uses telephone infrastructure to deliver internet service. DSL connections use twisted pair copper wires to transmit signals. Over the years, DSL has advanced to deliver faster speeds, however it is restricted by distance. Because the telephone network was constructed more comprehensively than the CATV network, some areas that have DSL are unlikely to ever have access to CATV. Where CATV and DSL compete, DSL tends to provide internet service that is lower in performance but less expensive.

CATV

Cable internet is currently the most common form of internet access in the United States, serving an estimated 194 million Americans. The latest cable technology, DOCSIS 3.0, can support download data throughput speeds as fast as 100 Mbps. Cable technology uses fiber from the central point out to the nodes where coax provides the service to the end point.

Cable internet uses coaxial cables, composed of a central copper conductor in a sheath of insulating and protective materials. While coaxial cables are made of copper, like the older twisted pair copper telephone wires, their better shielding enables them to transmit more data. Access to cable internet is provided over a shared pipe and is most common in urban areas.

Fiber Optics

Fiber-optic cables can carry enormous quantities of data using light frequencies as the transmission source and is widely considered to be the next generation technology for communications. Fiber optics can offer internet speeds well over 1 Gbps. While only about 25% of Americans have access to fiber-to-the-home internet ("FTTH"), fiber dominates the backbone of the internet. When DSL and CATV provide the last-mile connections, they usually rely on fiber to move data most of the distance between source and the destination.

Fixed Terrestrial Wireless

Fixed terrestrial wireless technology achieves last-mile delivery by sending a radio frequency signal from an access point, such as a tower, to a reception device attached to a consumer residence or business. Unlike mobile data, fixed wireless usually involves point to point broadcasting, which enables the provision of far higher bandwidth data throughput than mobile data. Fixed terrestrial wireless employs IEEE 802.11 standards much like a home wireless router. Using advanced antennae technology allows for a more wide area network ("WAN") type of deployment in addition to local area network ("LAN") use.

Mobile Data CMRS

Over three-quarters of American adults now own smartphones, according to the Pew Research Center. Mobile data has the advantage of being available for people on the move. CMRS is currently in its fifth generation, allowing for data throughput speeds of up to 100Mbps of downloadable data throughput. CMRS is a point to multi-point technology relying heavily on traffic engineering to avoid congestion and oversubscription. The roaming nature of this technology, although convenient, makes it difficult to allocate reliable data throughput speeds on a consistent basis. Most CMRS providers seek to offload their customer traffic to fixed wireless 802.11 access in an effort to remedy oversubscription issues.

Satellite

Satellite internet today shoots a signal from a point on Earth to a satellite in geostationary orbit more than 20,000 miles above Earth's surface, which sends the signal back to the customer. Internet usage via satellite involves four trips between an input and a response, which causes substantial delays, or latency, even though the signals travel at the speed of light. High latency and data caps put geostationary orbit satellite internet at a serious disadvantage relative to other technologies. Satellite internet is mainly used in remote areas where there are no other options.


Service Availability: Oklahoma

Service Availability vs. National Average
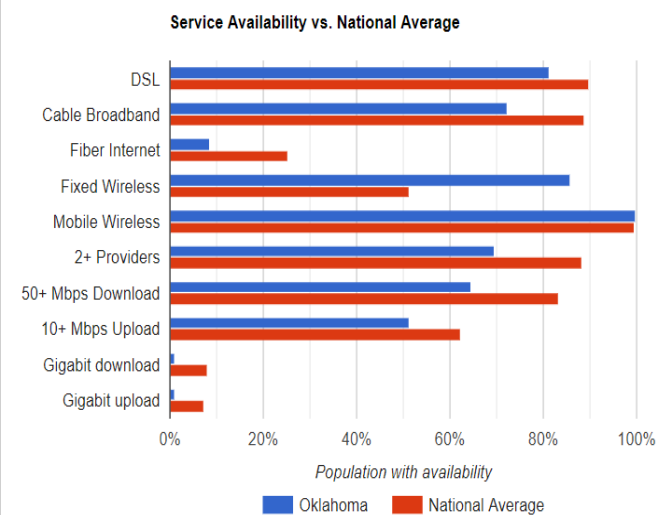
Oklahoma Broadband Connectivity

In 2011, 35% of Oklahomans reported that they did not use the internet at all with a larger percentage of rural Oklahomans (40%) reporting nonuse than those living in urban areas (33%). The percentage of rural nonusers in Oklahoma was not only greater than that of urban Oklahomans, but also greater than rural U.S. residents in general. As more services move online, residents of all age groups must use the internet in their interactions with employers, schools or government. It is important for Oklahomans to understand that broadband services do not serve and benefit a particular group, but are a necessity for everyone. Key issues and recommendations include the following:

- The most significant barrier to adoption for urban Oklahomans appeared to be lack of availability, awareness, knowledge of services available, and key differences between technologies and uses supported.
- Many rural Oklahomans were not aware of the range of tasks and activities that can be accomplished using the internet. A sizable portion of rural non-adopters focused on social media applications and entertainment with little knowledge of more practical daily uses such as online education, telehealth and telemedicine, economic development and interaction with local businesses, governments and utility companies.
- Older individuals in rural areas who were knowledgeable usually worked in professions that made use of the internet in some capacity or had support from younger relatives or individuals who assisted them.
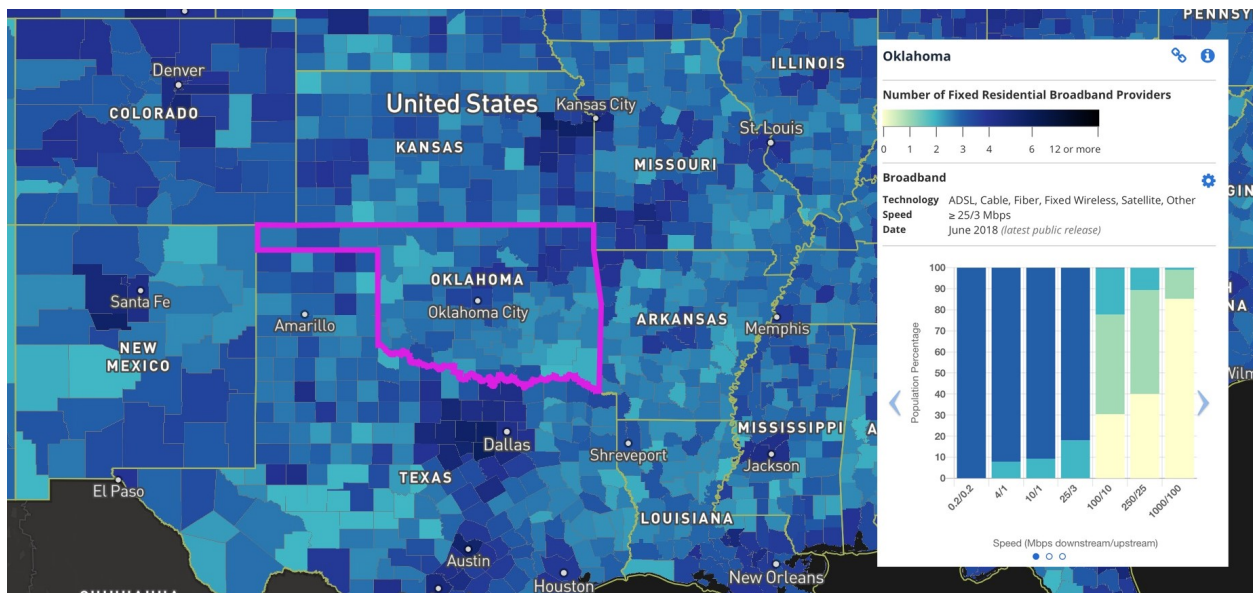
*Oklahoma broadband availability/providers compared to other regional states.
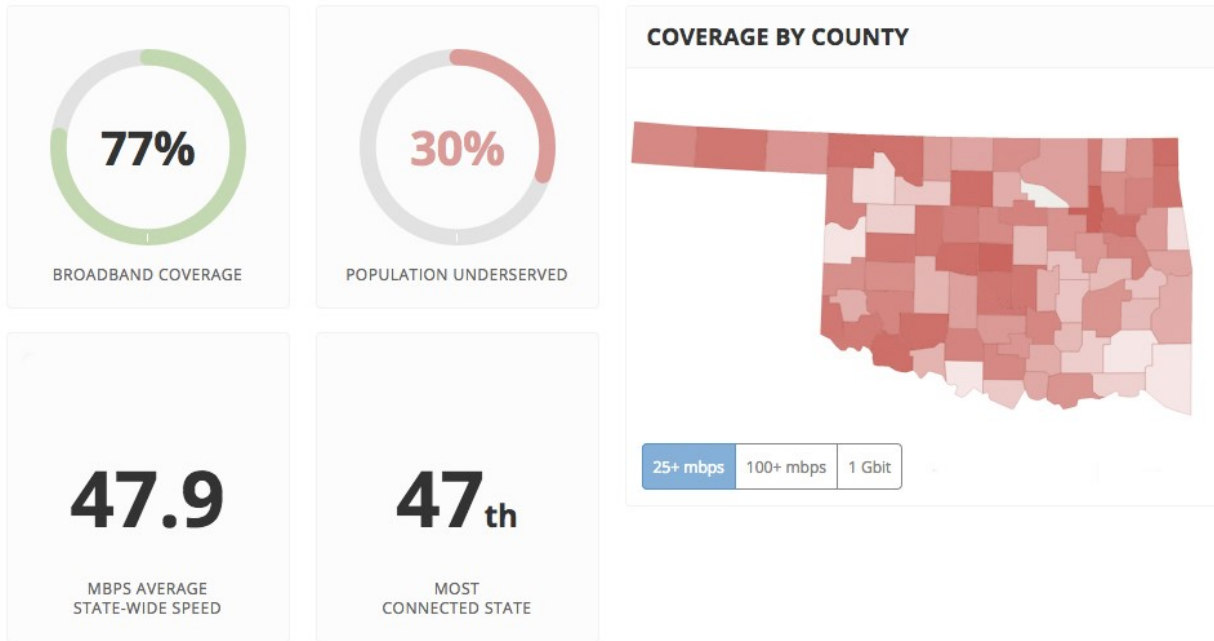
BROADBAND SPEEDS

78.6% of Oklahomans have access to wired broadband 25mbps or faster.

71.9% of Oklahomans have access to broadband 100mbps or faster.

22.7% of Oklahomans have access to 1 gigabit broadband.

WIRED COVERAGE

90.5% of Oklahomans have access to wireline service.

12.3% of Oklahomans have access to fiber-optic service.

72.3% of Oklahomans have access to cable service.

84.0% of Oklahomans have access to DSL service.

WIRELESS COVERAGE

100.0% of Oklahomans have access to mobile broadband service.

67.6% of Oklahomans have access to fixed wireless service.

Source: Reese, N. (2019, September 11). Internet access in Oklahoma: stats & figures. Retrieved from https://broadbandnow.com/Oklahoma

Federal Funding Sources for Rural Broadband

In order to close the digital divide in Oklahoma, federal funding can play a key role.   Skillful utilization of such programs will be a crucial means for the state of Oklahoma to bring broadband access to its citizens.

There are eight agencies that have been identified that financially support the deployment, adoption and use of broadband. These agencies are:

- Federal Communications Commission (FCC)
- US Department of Agriculture, Rural Utilities Services (USDA, RUS)
- US Department of Commerce, Economic Development Administration
- US Department of Housing and Urban Development
- US Department of Labor, Employment and Training Administration
- Institute of Museum and Library Services, Office of Library Services
- Appalachian Regional Commission
- Universal Service Administrative Company (USAC)

Federal Communications Commission

The Federal Communications Commission (FCC), a federal agency, and the Universal Service Administrative Company (USAC), a non-profit that administers programs in partnership with the FCC, collect and disburse billions of dollars annually as part of their long-standing mission to regulate telecommunications in the public interest and promote access and innovation. They have long been and will continue to be a major source of financial support for better telecommunications and broadband deployment. Programs administered by the FCC include:

Lifeline Program

The purpose of the Lifeline program is to provide a discount on phone service for qualifying low-income consumers. Since 1985, it has sought to ensure that all Americans have opportunities to connect to jobs, contact family or emergency services and other consumer needs. The Lifeline program, administered by the Universal Service Administrative Company (USAC), is a part of the Universal Service Fund. In 2016, the program began to include broadband as a support service.

High Cost Support

The FCC has long subsidized rural communications in pursuit of the goal of "universal service," by adding charges to customers' phone bills. These funds are utilized through Connect America Cost Model-based funding, Broadband Loop Support, and Intercarrier Compensation.

Connect America Fund Model-Based Support

The Connect America Fund is a $4.5 billion per year national program to expand access to broadband and voice services for areas where they are unavailable. It is the latest chapter in the
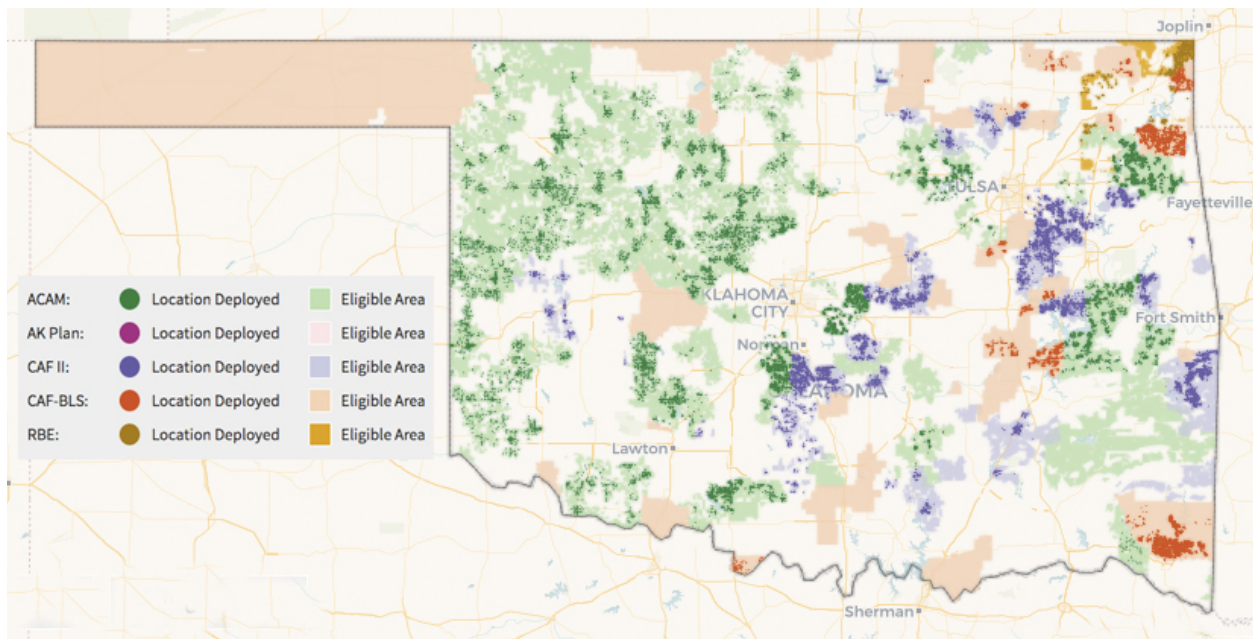

history of the Universal Service High Cost program, which seeks to realize the "universal service" principle that has long animated telecommunications policy. The CAF I and CAF II programs provide funding to local telephone companies to subsidize the cost of building new network infrastructure or performing network upgrades to provide voice and broadband service in areas where it is lacking.

CAF II Auction 903

For areas where the price cap carrier declined model-based support, and in certain other areas, the FCC conducted a competitive bidding process, the Connect America Fund Auction 903 (CAF II Auction 903). The CAF II Auction 903 is a reverse auction, where the FCC set up the auction, and the sellers (such as cable companies, telecoms companies, rural electric cooperatives) bid. Nationally, 103 bidders won $1.49 billion over 10 years to provide fixed broadband and voice services to over 700,000 locations in 45 states. Winners will provide 25/3 Mbps to households.
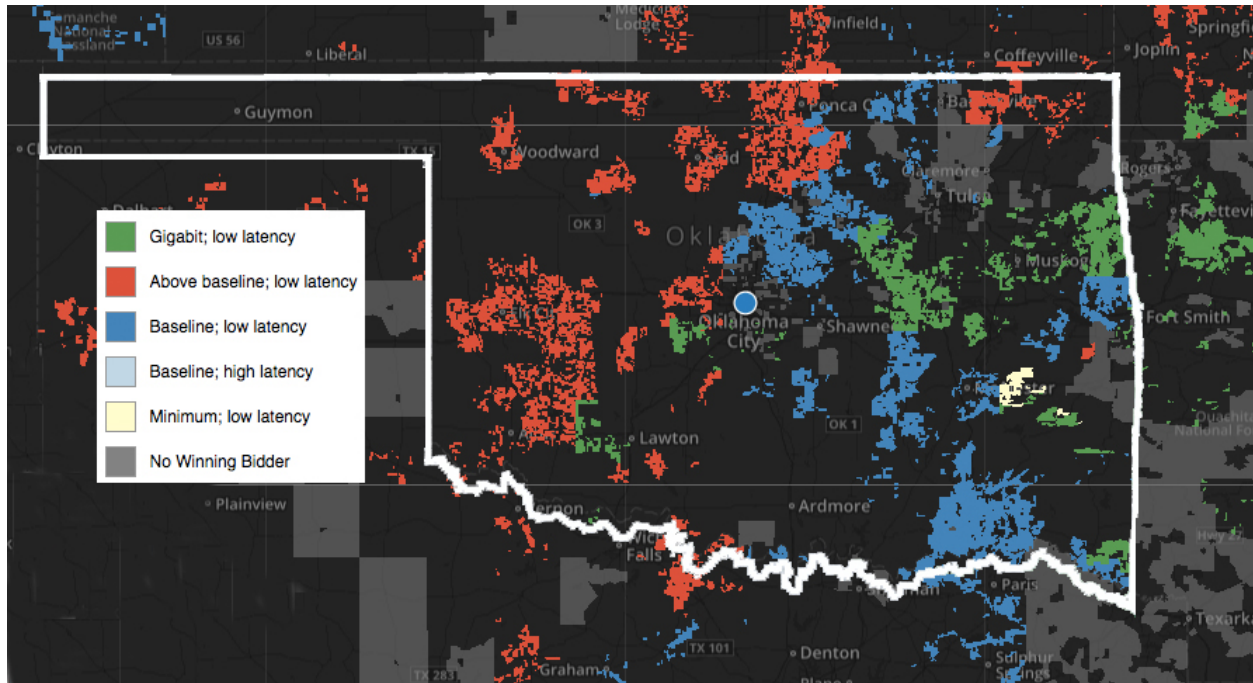
A-CAM and Legacy Support

Another program under USAC's High-Cost Support program is the Alternative Connect America Cost Model (ACAM). It funds $578 million annually, and the fund has a length of 10 years. ACAM began in January 2017 and supports voice and broadband infrastructure. ACAM supports rate-of-return carriers that elected to transition to the new cost model for calculating high cost funding. Carriers must maintain 10/1 Mbps to all locations fully funded by the model, and they must offer 25/3 Mbps to a certain percentage of those locations by the end of the support term. In 2019 the FCC offered ACAM service providers the ability to receive increased support for two additional years in areas where additional 25/3 Mbps locations are passed.

Smaller carriers that do not receive ACAM support remain on the USF Legacy ROR support program. The support was extended for a six-year period.

Spectrum

The FCC administers the nation's use of radio frequency spectrum. The FCC has recognized fallow usage of spectrum resources such as the Educational Broadband Spectrum ("EBS") and Citizens Broadband Band Radio Service. The FCC is developing programs to better utilize this natural resource more effectively. This will enable Oklahoma to improve access to areas in the state that cannot be reached with wired technology.

USDA Rural Utilities Service

The USDA RUS was founded in 1935 with a mission of helping rural communities access the modern utilities that were beginning to define modern life in America's cities. Originally called the Rural Electrification Administration and focused on electricity, it began in 1949 to provide loans to support rural telephony as well. Building on its long-established relationships, it continues to seek to modernize rural utilities, usually in partnership with local governments and/or private companies and nonprofits. Compared to FCC programs, USDA programs tend to be less technical and more community-oriented. RUS has five active programs designed to promote rural broadband deployment.

ReConnect

The USDA ReConnect program is the newest broadband funding opportunity provided by the USDA. Congress provided $600 million in 2018 and $550 million in 2019 for the program. Through the ReConnect program, crucial rural premises such as homes, community facilities, farms and businesses may be able to gain access to sufficient broadband coverage.

The goal of the ReConnect program is to expand broadband access to rural areas without sufficient access to broadband. Sufficient access is defined as speeds of at least 10/1 Mbps. The program has three different options for funding:

1. 100% grant - Maximum $25 million per applicant
2. 100% loan (fixed interest rate of 2%) - Maximum $50 million per applicant
3. 50% loan, 50% grant (interest rates set at the US Treasury rate) - Maximum $50 million per applicant

Each of the three funding options will have $200 million nationally to disburse. Awardees will provide their coverage area speeds of at least 25/3 Mbps.

The USDA has several requirements that limit eligibility for the ReConnect program. To be eligible, an area must:

a) Be "rural," in the sense of not being part of an urban cluster of 20,000 people or more;
b) Not be a beneficiary of CAF II Auction 903 funds;
c) Not be a protected broadband borrower service area;
d) Not be an area with a pending application for USDA support under another program; and
e) Be 90% (loan and combination loan/grant options) or 100% (grant option) unserved by 10/1 speeds under the 2018 broadband program.

Community Connect

The Community Connect Grant program provides assistance to eligible entities to construct, improve or expand broadband networks, specifically in rural areas. This program focuses on smaller projects, and the maximum grant amount is $3 million. These projects can help rural residents tap into the potential of the internet for jobs, education, health care, public safety and community development.

Distance Learning and Telemedicine Grants

There are two funding opportunities under the Distance Learning and Telemedicine Grants (DLT) program. One is for the traditional DLT program and one is for opioid DLT (projects related to prevention, treatment or recovery for opioid use disorder in rural areas). Awards can range from $50,000 to $500,000. Applications submitted under this announcement should address how they will strengthen local capacity to address one or more of the focus areas. For both programs, the focus areas are:

1. Prevention—Educating community members and care providers or implementing harm reduction strategies to reduce the number of fatal opioid-related overdoses and the occurrence of opioid use disorder among new and at-risk users.

2. Treatment—Implementing or expanding access to evidence-based practices for opioid use disorder treatment, such as medication-assisted treatment.

3. Recovery—Expanding peer recovery and treatment options that help people with opioid use disorder start recovery and avoid relapse.

Rural Broadband Access Loan and Loan Guarantee

The Rural Broadband Access Loan and Loan Guarantee Program furnishes loans and loan guarantees to provide funds for the costs of construction, improvement or acquisition of facilities and equipment needed to provide service in eligible rural areas. This program is funded through the Farm Bill.

Telecommunications Infrastructure Loans and Guarantees

This program provides financing for the construction, maintenance, improvement and expansion of telephone service and broadband in rural areas. This program is for areas with populations less than 5,000, and the area must lack a telecommunications provider and telecommunications facilities.

Universal Service Administrative Company

USAC administers the Education Rate (E-Rate) program and the Health Care Connect Fund to provide funding for schools, libraries and healthcare providers. Both of these programs bring vital funds into local communities to provide internet and broadband services.

Education Rate (E-Rate)

The FCC created the Education Rate (E-Rate) in 1997 as part of the implementation of the Telecommunications Act of 1996, making billions in funding available for a wide range of telecommunications services. Schools, libraries and consortia-groups of eligible entities can apply for E-Rate funding. Discounts range from 20% to 90% of eligible costs. The discount is determined by the percentage of students eligible for the National School Lunch Program and the urban or rural location of the school or library. E-Rate eligible services include internet access, internal connections and managed internal broadband services. In addition, E-Rate provides some funding for construction costs for broadband services.

Healthcare Connect Fund

The Healthcare Connect Fund (HCF) provides support for broadband connectivity to eligible healthcare providers (HCPs) and encourages the formation of state and regional broadband networks. Under the HCF, eligible HCPs can apply as individuals or as part of a consortium. Individual HCPs applicants receive a 65% discount on all eligible services. Consortium applicants receive a 65% discount on all eligible services and equipment, as well as HCP constructed and owned network facilities.

State Broadband Assets

A number of state agencies own or operate and maintain telecommunications infrastructures. These agencies include the Oklahoma State Regents for Higher Education, Office of Management and Enterprise Services, Oklahoma Department of Transportation, and the Oklahoma Turnpike Authority. In addition, OneNet operates and maintains the Oklahoma Community Anchor Network – the fiber infrastructure that was constructed with federal funding through the Broadband Technology Opportunities Program. There is significant potential to better utilize these state assets for the purposes of facilitating the deployment of broadband to areas of Oklahoma that remain unserved or underserved.

Oklahoma Community Anchor Network

The Oklahoma Community Anchor Network (OCAN) is a project of the state of Oklahoma, comprised of a partnership among the Oklahoma State Regents for Higher Education/OneNet, the Office of Management and Enterprise Services and the Oklahoma Department of Transportation. OCAN was funded by a $74 million grant from the National Telecommunications and Information Administration (NTIA) in 2010 and is designed to deliver reliable, affordable broadband services throughout Oklahoma. OCAN was completed and became operational in August 2013. The OCAN network, depicted below, consists of approximately 1,100 miles of fiber infrastructure throughout Oklahoma, which is comprised of constructed fiber and indefeasible rights of use (IRUs). OCAN provides direct fiber connectivity to community anchor institutions in Oklahoma. The number of community anchors connected to OCAN has increased from 33 original connections in 2013 to 92 connections in 2019.

OCAN is Oklahoma's lead for establishing the state's national fiber footprint. The footprint brings parity to those in underserved areas, dramatically improving opportunities for professional, personal and economic growth.

OCAN promotes the growth of intellectual capital in rural and underserved areas of the state, fosters economic development and stimulates research opportunities. OCAN provides a key middle-mile infrastructure that includes multiple interconnection points for private providers to utilize for last-mile services. OCAN's fiber assets are leveraged to expand broadband to commercial and residential communities along the targeted route and increase Oklahoma's competitiveness in the internet-driven, global economy.
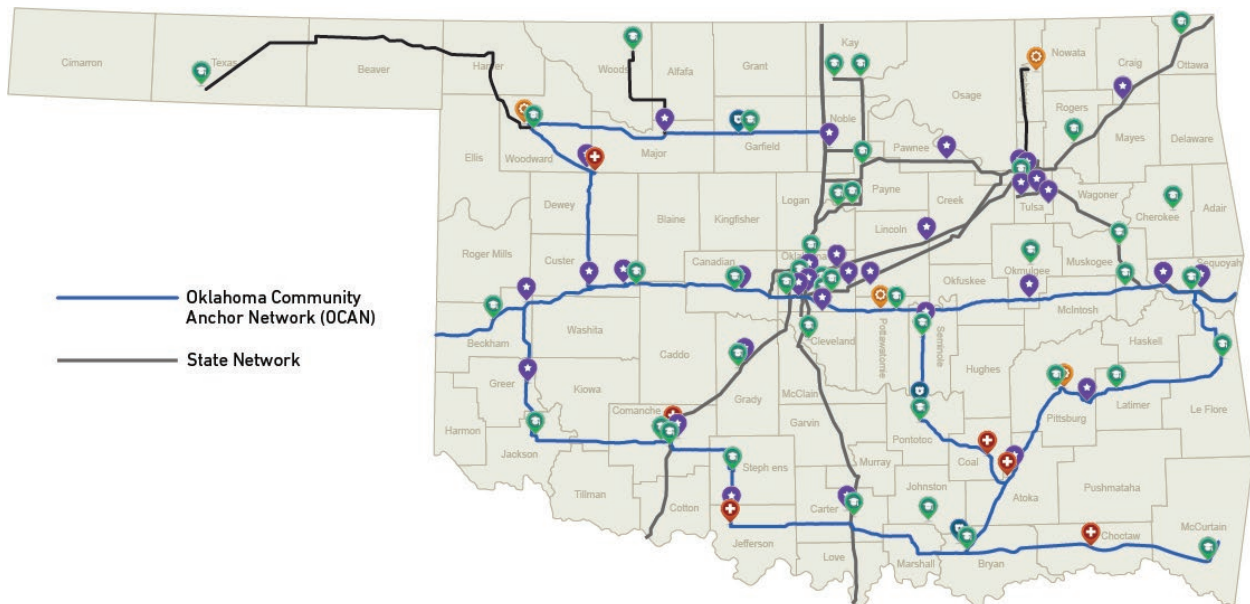
OneNet

OneNet is the comprehensive digital communications initiative of Oklahoma State Regents for Higher Education and Oklahoma's only statewide internet service provider. OneNet leverages local, national, public and private partnerships to provide world-class broadband connectivity to institutions that sustain communities and enrich lives. OneNet's mission is to advance technology across Oklahoma. OneNet's high performance optical network meets the mission-critical needs of Oklahoma's education, research, health care and public service communities. OneNet also partners with other research and education networks across the country to connect Oklahoma to research programs throughout the nation and around the globe.

OneNet developed and currently operates a statewide fiber backbone with a 100Gbps infrastructure that serves Oklahoma's largest research institutions and directly connects to other statewide research networks through Internet2, a 100Gbps nationwide network designed for research and education. OneNet has regional partnerships through the Great Plains Network and Western Regional Network that provides high-speed connections west of the Mississippi. OneNet is also connected to the Pacific Wave International Exchange and its peering and high-performance scientific networks in the Asia-Pacific Region. Oklahoma's researchers leverage these regional and global connections for scientific discovery in areas such as high-energy physics, atmospheric science and predictive modeling, hydrology and water resources, machine learning, bioinformatics and genomic research.

Regional Connectivity
OneNet's regional partnerships power high-speed bandwidth, connecting Oklahoma to surrounding state networks, Internet2, the Western Regional Network and the Pacific Wave International Exchange.

Delivering high-speed fiber bandwidth options to rural schools and libraries through public/private partnerships is a priority for OneNet. OneNet serves 356 K-12 schools and libraries in both rural and urban areas of the state. For the past 20 years, federal funding OneNet receives through the E-Rate program to serve schools and libraries has increased by an average of 6% each year. Currently OneNet is assisting with bringing $9 million into the state through the E-Rate program. Since 2012, OneNet has assisted approximately 1,000 clients, including many schools and libraries, upgrade from legacy copper technology to today's fiber broadband standards. OneNet has also been a vital partner in bringing the percentage of schools meeting broadband standards by the State Education Technology Directors Association (SETDA) to 99%.

OneNet currently administers Oklahoma's first Internet Exchange Point ("IXP"). OneNet serves as the trusted third party ("TPP") assisting with peering arrangements between carriers. OneNet has played a key role in creating peering agreements between Oklahoma's broadband service providers and key Content Delivery Networks ("CDN") such as Netflix, Google, and Amazon. By pooling broadband service provider's traffic, OneNet incentivizes CDNs to collocate their respective data within the state of Oklahoma. This saves operating expenses across the board while better utilizing existing network infrastructure.

Office of Management and Enterprise Services

The Office of Management and Enterprise Services Information Services Department (OMES) is a unified state IT resource, promoting collaboration, innovation and operational excellence. They provide shared services to state agencies. Shared services include the oversight of technology investments and the establishments of state standards to further reduce costs, increase the value of IT, and contribute to the development of a more effective government for Oklahoma citizens. As such, OMES has acquired fiber assets to provide services to state agencies throughout the state.

Oklahoma Turnpike Authority

The Oklahoma Turnpike Authority (OTA) is an instrumentality of the State of Oklahoma and a body corporate and politic created by statute in 1947. OTA is authorized to construct, maintain, repair and operate turnpike projects at locations authorized by the legislature of the State of Oklahoma

and approved by the State Department of Transportation. OTA receives revenues from turnpike tolls and a percentage of the turnpike concession sales.

The Oklahoma Turnpike Authority is similar to a public utility, providing a needed, basic service at a fee that yields a return to its investors. Much the same as ODOT, OTA has fiber assets that have been acquired through partnerships with telecommunications companies in exchange for accessing OTA rights-of-way.

Oklahoma Department of Transportation

The mission of the Oklahoma Department of Transportation (ODOT) is to provide a safe, economical and effective transportation network for the people, commerce and communities of Oklahoma. By establishing public-private partnerships, ODOT has acquired fiber optic assets or the rights of use thereof, in exchange for telecommunications companies utilizing state or federal rights of way to install infrastructure. As well, ODOT owns a vast array of telecommunications towers which provide services to ODOT facilities located throughout Oklahoma.
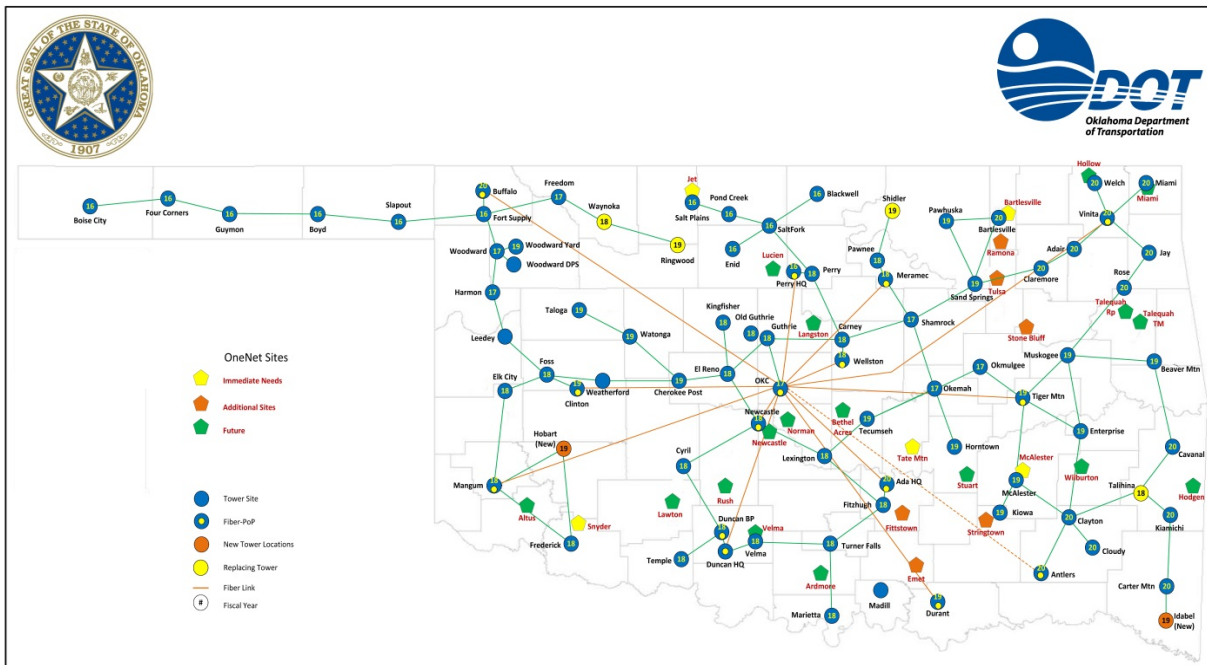
Tribal Lands

Tribal areas and communities continue to lag behind other areas and segments of American society with respect to broadband and telecommunications services. High poverty rates and low-income levels on tribal land, along with the fact that many tribal communities are located in remote rural areas, are major factors that may explain why tribal areas have comparatively poor levels of broadband access, and why providers may lack an economic incentive to serve those specific areas.

The FCC and the Department of Commerce have begun to collect and compile data on tribal broadband deployment. According to December 2017 FCC deployment data, 32% of Americans living on tribal lands lacked access to terrestrial fixed broadband at speeds of 25 Mbps download/3 Mbps upload. This is an improvement over 2014 data (42.8% without broadband) and 2013 data (62.9%). The table below shows the Oklahoma Tribal Jurisdictions with access to fixed terrestrial broadband service with respect to tribal lands, rural areas, urban areas, and the United States as a whole:

Percentage of Americans with Access to Fixed Terrestrial Broadband at Minimum Speed of 25 Mbps/3 Mbps

	2013	2014	2015	2016	2017
All U.S.	83.6%	89.4%	89.9%	91.9%	94.0%
Urban	92.3%	96.4%	96.7%	97.7%	98.5%
Rural	47.6%	60.4%	61.5%	67.8%	75.7%
Tribal	37.1%	57.2%	57.8%	63.1%	68.0%

Oklahoma Tribes and the Oklahoma Community Anchor Network

The construction of the Oklahoma Community Anchor Network can provide solutions for Oklahoma tribes that remain unserved or underserved. The 1,100 mile fiber infrastructure passes through 17 tribal jurisdictions and serves as a middle-mile conduit for last-mile providers to expand into these areas.

Oklahoma Tribal Jurisdictions
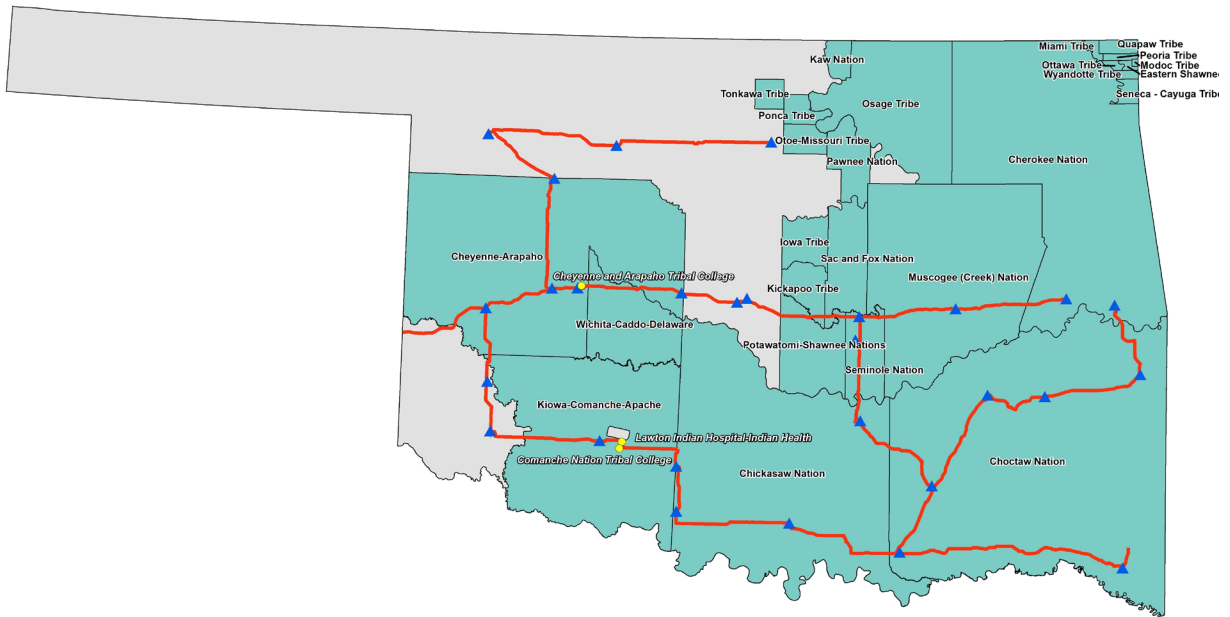
Map Produced by
Center of Spatial Analysis
University of Oklahoma

Oklahoma Broadband Roadmap

A state broadband organizational structure is critical in order to propel Oklahoma forward in efforts to expand broadband coverage and analyze how to better utilize existing network infrastructure. This structure will allow the state to accurately identify areas of focus as well as provide the necessary coordination across state agencies to utilize assets in an efficient and effective manner.

The Secretary of Digital Transformation and Administration took the first step in organizational structure by establishing the role of State Broadband Coordinator. In cooperation with the Chancellor of Higher Education, this role was assumed in July 2019 and is coordinated through OneNet.

Expansion of this role to include the creation of a State Broadband office will ensure successful and sustainable broadband deployment throughout Oklahoma.

State Broadband Office

The Oklahoma State Broadband Office will operate under the leadership of the State Broadband Coordinator. The State Broadband Office will provide oversight and coordination for the following:

- Update and maintain the state broadband plan
- Streamline current procedures and approval processes by state agencies for accessing state fiber assets.
- Manage a state agency task force to coordinate broadband infrastructure projects
- Develop and oversee the Oklahoma State Broadband Advisory Council to be comprised of representatives from the telecommunications industry, state agencies, tribal governments, municipalities, and other stakeholders as deemed necessary.
- Coordinate and update mapping of broadband coverage and analyze data on broadband availability and capacity
- Provide coordination between service providers and public and private entities to facilitate partnerships that enhance broadband expansion
- Provide technical assistance to communities and organizations on broadband initiatives
- Research and coordinate opportunities to fund projects in unserved and underserved communities
- Make recommendations to establish grant funding to be appropriated by the state for broadband expansion

- Establish online presence for Oklahoma State Broadband. Details to be included on this website are:
  a) Updated broadband mapping detail
  b) Oklahoma State Broadband Plan
  c) Programs, proposals and incentives for broadband expansion
  d) Updates to the status of broadband expansion throughout the state
  e) Opportunities to partner with the state on potential broadband projects

Broadband Programs, Proposals and Incentives

A key component to a successful broadband roadmap for Oklahoma is the development and implementation of viable programs proposals, and incentives to enhance the expansion of broadband coverage. The proposals and incentives listed in this plan will be evaluated and expanded upon by the Oklahoma State Broadband Advisory Council. Incentives and proposals include but are not limited to the following:

Broadband Mapping: The future of connectivity requires that a comprehensive, statewide map of broadband deployment be created to reflect an accurate picture of where broadband is currently available and where it is unavailable. In order to effectively expand affordable broadband options to unserved or underserved communities, it is critical that the Oklahoma broadband map reflect the most current data. Creating and maintaining a broadband map will provide critical benefits. Coverage maps will:

Broadband Mapping

- Improve understanding of unserved/served areas, resulting in better cost estimates, deployment time and progress;
- Enable more effective targeting of funds in current and future government programs; and
- Speed rural Oklahoma's access to broadband benefits including eCommerce, eLearning and telehealth.

A strategy to update Oklahoma's broadband map and refresh the data that was collected and validated by the Oklahoma Broadband Initiative is being developed. This project will ensure that there is an accurate baseline established to effectively expand affordable broadband to the unserved or underserved areas of Oklahoma.

The state of Oklahoma is closely monitoring the FCC's effort establishing the Digital Opportunity Data Collection[1]. The FCC has recognized the need for a more accurate mapping resource and Oklahoma plans to mirror these efforts. As more and more funding programs become available

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[1] https://docs.fcc.gov/public/attachments/DOC-358433A1.pdf

mapping existing broadband services becomes essential. The FCC issued a notice of proposed rulemaking to improve existing mapping resources. Oklahoma's broadband map will incorporate these efforts.

Dig Once Policy: One of the most formidable barriers to expanding broadband, particularly in rural areas is the cost of deploying fiber-optic cable. Data from the U.S. Department of Transportation's Intelligent Transportation Systems Joint Program Office indicates the average cost of deploying fiber-optic cable is about $27,000 per mile.

According to the Federal Highway Administration, "90 percent of the cost of deploying broadband is when the work requires significant excavation of the roadway."

Oftentimes, this expense is the primary obstacle in the deployment of fiber-optic cable in more isolated areas, as well as those with lower population densities or unfavorable terrain, contributing to the service gap between urban and rural residents. As a result, state and local governments have benefited by implementing cost-saving measures to incentivize rural broadband deployment.

Local and state governments can facilitate the expansion of broadband in communities by adopting a dig once policy. This policy would require public and private excavators to coordinate with local government on the installation of extra fiber or conduit whenever ground will be broken in the public right-of-way (PROW). Dig once policies were identified as a best practice for local governments by the Broadband Opportunity Council as a means of enhancing competition in the broadband market. Establishing a dig once policy in Oklahoma will have many benefits including but not limited to the following:

- Protection of newly and recently paved roads and sidewalks
- Enhancement of the uniformity of construction
- Efficient, non-duplicative placement of infrastructure in the PROW
- Reduction in overall costs of all underground work in the PROW, both utility and telecommunications-related, for public and private parties
- Facilitation of private communications network deployment by reducing construction costs

In addition, dig once policies offer opportunities for municipalities to monetize extra conduit or fiber. Municipalities can lease conduit to providers who want to pull cable to deliver internet service to the local community. Municipalities can pull their own fiber and contract with an

internet service provider to offer local services. With extra fiber, municipalities also have the option to lease dark fiber to providers wanting to provide local services.

Broadband Ready Designations: The purpose of broadband ready designations for communities and sites is to show that a local unit of government has taken steps to reduce obstacles to broadband infrastructure investment. A local government that has created a plan to meet outlined requirements will be eligible to apply for a Broadband Ready Community or Broadband Ready Community Site designation. Guidelines for establishing a Broadband Ready Community will be:

- The appointment of a single point of contact for all matters related to broadband development projects
- A requirement that all permit applications are approved or denied within 10 business days after they are filed
- Assurance that all inspections related to a broadband project will be completed in a timely and expeditious manner

These procedures must also prohibit the community from:

- Imposing a fee to review an application or to issue a permit on a broadband project
- Imposing a seasonal moratorium on the issuance of permits for a project
- Discriminating among communications service providers

The Broadband Ready Community designation information and application will be posted on the Oklahoma broadband website.

Analysis of State Assets for Broadband: The state broadband coordinator will lead in efforts to conduct an analysis of state assets that might be used to expand broadband availability in unserved and underserved areas throughout Oklahoma. Leveraging the state's resources and relationships, this assessment will be designed to identify potential target areas for broadband expansion, essential requirements and recommendations for potential implementation.

As well, a collaborative task force comprised of state agency stakeholders has been developed to participate in regular meetings. Participants include representatives of Oklahoma State Regents for Higher Education, OneNet, Department of Transportation, Oklahoma Turnpike Authority, Oklahoma Department of Management and Enterprise Services, and Oklahoma Department of Commerce. This group meets under the leadership of the Oklahoma state broadband

coordinator. The broadband task force will develop a comprehensive inventory of state broadband assets to be housed at the Oklahoma State Broadband Office. This inventory will include the following:

a) State fiber contracts (interagency agreements as well as agreements with private telecommunications providers)
b) State fiber maps
c) Comprehensive list of state fiber infrastructure to include agency ownership, total fiber strands, usage, and assignments
d) Communications towers and communications huts
e) Analysis of cost to maintain fiber infrastructure to include repairs and relocation of fiber

Right-of-Way

Broadband on State Rights-of-Way: Rights-of-way management has arisen as a key issue in broadband deployment at the federal, state and local levels. The steps required for broadband construction can have real consequences in the decision to deploy broadband service to a community.

According to a broadband forum conducted by NTIA in 2002, participants and commenters cited rights-of-way issues as having a major impact on broadband deployment. These issues generally fell into the following four categories:

1) Timeliness of processes
2) Fees
3) Information collection
4) Remediation and maintenance

To ensure that there are no unwarranted obstacles to the initiatives in this broadband plan for the expansion of broadband coverage, Oklahoma will develop a strategy to streamline the permitting process to access rights-of-way. This strategy will address the length of time it takes to secure required approvals as well as the compensation that is requested for accessing rights-of-way. As well, special considerations will be granted to applicants that are participating in one or more of the initiatives outlined in the Oklahoma State Broadband Plan. The permitting process will be posted on the Oklahoma broadband website.

State Grant Funding: Appropriate $5M in state grant funding for the expansion of broadband infrastructure in rural Oklahoma.   Applicants will be encouraged to submit proposals that correlate with the 117 Opportunity Zones that have been designated in Oklahoma or other regions that have been identified by the state broadband coordinator. Funds will be awarded through a competitive grant application process and will not exceed $500K per award. Communities that are designated as Broadband Ready Communities will be given special consideration.

State Grants

Investments in Unserved Areas: According to the Federal Communications Commission's 2019 Broadband Deployment Report, "over 26% of Americans in rural areas and 32% of Americans in Tribal lands lack coverage from fixed terrestrial 25 Mbps/3 Mbps broadband, as compared to only 1.7% of Americans in urban areas." Expanding broadband access in unserved areas is challenging, because in areas with a less dense customer base, costs often outweigh the return on investment for construction. The objective of this proposal will be to identify and recommend investment options which can be implemented by governments and providers to deliver service to these areas. Broadband infrastructure investment recommendations must provide a sustainable and positive return on investment in order for providers to expand into these areas.

Unserved Areas

A broadband planning team will work with local governments and provider partners on a plan to address unserved or underserved areas. Recommended strategies or policies must either lower broadband investment costs or provide financial assistance to broadband users in unserved or underserved areas to deliver access to high-speed internet and enable communities to become economically self-sustaining. Strategies could include programs such as grants, tax credits, matching funds to leverage federal funds, or one-time funds contributed by the state. The broadband planning team will work in conjunction with stakeholders and providers to identify optimal strategies. The team will evaluate all potential opportunities to promote increased broadband infrastructure investment throughout rural Oklahoma.

State Broadband Plan: In addition to implementing the initiatives highlighted in this plan, Oklahoma will continue to refine and update the Oklahoma Broadband Plan to highlight state priorities such as access to quality health care, enhanced educational capabilities, economic development and growth of small business, and basic quality of life issues that require high-speed internet access. State and local policies work hand in hand to advance broadband access throughout communities large and small. Efficient broadband deployment also depends on well-informed leadership at all levels.

Broadband Plan

Stakeholders, lawmakers and community leaders will work together to review policy and implement initiatives that further the Broadband Plan and move the state forward to equal access for all citizens.

Conclusion

Access to reliable and high-speed internet should not be a privilege in the 21st century and should not depend on where you live. Defining areas with lack of service and/or speed will help target efforts in expanding the critical service to the areas that need it most.

The benefits of broadband are easily felt. Expanding broadband to all corners of Oklahoma is vital to economic development - from critical education tools to capacity-building for current and future businesses. Broadband also provides access to telemedicine, especially important to rural areas that may not have access to a hospital and emergency services support.

Our state policymakers, private sector and community leaders will continue to work together address the broadband gaps that remain in our state. Ongoing collaboration among policymakers, state agencies, the private sector, educational institutions and community leaders is essential if we are to see continued progress in this initiative. The Oklahoma State Broadband Plan can be a conduit for pursing that joint purpose.