EMPLOYMENT AND ECONOMIC DEVELOPMENT

Office of Broadband Development

Annual Report
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Introduction and 2020 Annual Highlights

The Office of Broadband Development (Office or OBD) is located in the Minnesota Department of Employment and Economic Development (DEED). The Office was created by statute in 2013 and just completed its seventh year of work on its mission to improve access to broadband service that meets the state's speed goals, serving the needs of anchor institutions, and expanding the skills and knowledge needed to use these services. Responsibilities of the OBD are outlined in statute at Minn. Stat. § 116J.39. Border-to-border high speed Internet access is the goal throughout Minnesota. The Broadband Office connects communities, policy makers, providers, regional support organizations, and state and federal programs with each other and the resources they need to improve broadband access and use in Minnesota.

The need for ubiquitous broadband access was never more apparent than in 2020 – due to the COVID-19 pandemic. Access to telehealth services, remote learning, and telework all require access to high-speed, reliable Internet service.

2020 milestones for the Office included: collaborating with the Minnesota Department of Education and the K-12 Connect Forward Work Group in response to broadband needs related to the COVID-19 pandemic; continuing work with our broadband mapping vendor to ensure the state accurately measures progress towards the state's broadband speed goals; continuing work on digital inclusion and equity activities; and contributing to the national discussion on broadband availability.

Specific highlights for 2020 include:

- Launched a $20 million grant round and evaluated 64 applications for the Border to Border Broadband Infrastructure grant program. Grant awards to be announced in January 2021.
- Certified 29 Telecommuter Forward! communities.
- Updated broadband availability maps in April and October.
- Provided broadband availability analysis to over 245 constituents.
- Hosted a webinar for tribes in Minnesota and Wisconsin discussing the FCC's 2.5 GHz Educational Broadband Initiative for Tribal Nations, in partnership with the Blandin Foundation and the MICA Group.
- Minnesota's broadband program was highlighted in a Pew Charitable Trusts report, "How States Are Expanding Broadband Access".[1] The Pew Charitable Trusts examined state broadband programs nationwide and highlighted promising practices in nine states.
- Minnesota broadband policy was highlighted in a 2020 National Governors Association report, "Governor Strategies to Expand Affordable Broadband Access".[2]

[1] https://www.pewtrusts.org/en/research-and-analysis/reports/2020/02/how-states-are-expanding-broadband-access
[2] https://www.nga.org/wp-content/uploads/2020/11/Broadband_White_Paper_Final.pdf

- Participated in state and national meetings or conferences to continue to promote the broadband resources available from state and federal sources, and to highlight Minnesota's work to advance broadband service in the state.
- Worked with broadband providers and the Minnesota Department of Transportation and Department of Natural Resources to address the permitting process for broadband construction.
- Assisted in planning the virtual Blandin Conference, *Broadband 2020 – Connected We Stand.*
- Met virtually with local groups to provide technical assistance on broadband issues, including the state grant program.
- Engaged Minnesota Congressional staff and federal agencies in work to maximize impacts of federal broadband programs in Minnesota.
- Provided administrative support to the Governor's Task Force on Broadband.
- Supported policy makers on broadband discussions throughout the 2020 legislative sessions.
- Updated the broadband availability by township map to continue to engage township supervisors in the discussion of how to improve broadband availability for their residents.
- Updated the broadband availability by school district map to document the homework gap in Minnesota.

Broadband Programs

OBD administers two specific programs that support infrastructure development: the Minnesota Border-to-Border Broadband Development Grant program and the Telecommuter Forward! Communities Certification program.

Border to Border Broadband Development Grant Program

2020 Grant Program Update

OBD received and evaluated 64 applications for the $20 million in broadband grant funding appropriated during the 2019 legislative session. Grant awards were not yet announced as of the drafting of this report; however, awards will be announced by the end of January 2021.

Projects Awarded with 2014 – 2020 Appropriations

Year	Applications Received	Applications Awarded	% of Applications Funded	Amount Requested	Amount Awarded	Number of Locations Served
2014	40	16	40%	$44,215,644	$18,670,337	6,333
2015	44	15	34%	$29,063,436	$11,008,366	4,098
2016	57	40	70%	$54,228,825	$29,040,896	16,708
2017	70	39	56%	$50,348,055	$26,475,556	12,202
2019	80	30	37%	$67,809,312	$23,270,933	10,938
2020	64	TBD	TBD	$42,038,096	TBD	TBD

Telecommuter Forward! Community Certification Program

OBD launched the Telecommuter Forward! Community Certification program in December 2019 and certified 29 communities in 2020. Telecommuter Forward! certification recognizes communities that meet criteria for promoting telecommuting opportunities in partnership with broadband providers, economic development professionals, and OBD.

Any political subdivision (city, township, or county) in Minnesota that supports and commits to promote the availability of telecommuting options is eligible for the Telecommuter Forward! Community Certification and may apply through the Office of Broadband Development. The political subdivision must demonstrate compliance with the statutory requirements under Minn. Stat. 116J.9923. The Office of Broadband Development has created a model resolution that satisfies the minimum statutory requirements to assist communities in this effort.

Monitor and Measure

Minnesota Broadband Mapping Program

The OBD engaged in its sixth year of independently mapping broadband access and speeds across Minnesota in 2020. This work continues to be performed through a contract with Connected Nation, a non-profit organization that has considerable experience working with Minnesota broadband providers. The requirement to conduct these mapping activities was codified into law (Minn. Stat. § 116J.397). It must be noted that funding for mapping activities comes from the administrative allowance of the Border to Border Grant program per Minn. Stat. § 116J.396 at subd. 2(3).

The state broadband speed goals are articulated at Minn. Stat. §237.012. They call for achieving border-to-border access by all homes and businesses in the state to a service that offers speeds of at least 25 Mbps download by 3 Mbps upload by the year 2022. A second goal to be achieved by the year 2026 seeks to have broadband service offering 100 Mbps download and 20 Mbps upload from at least one provider available to all homes and businesses.

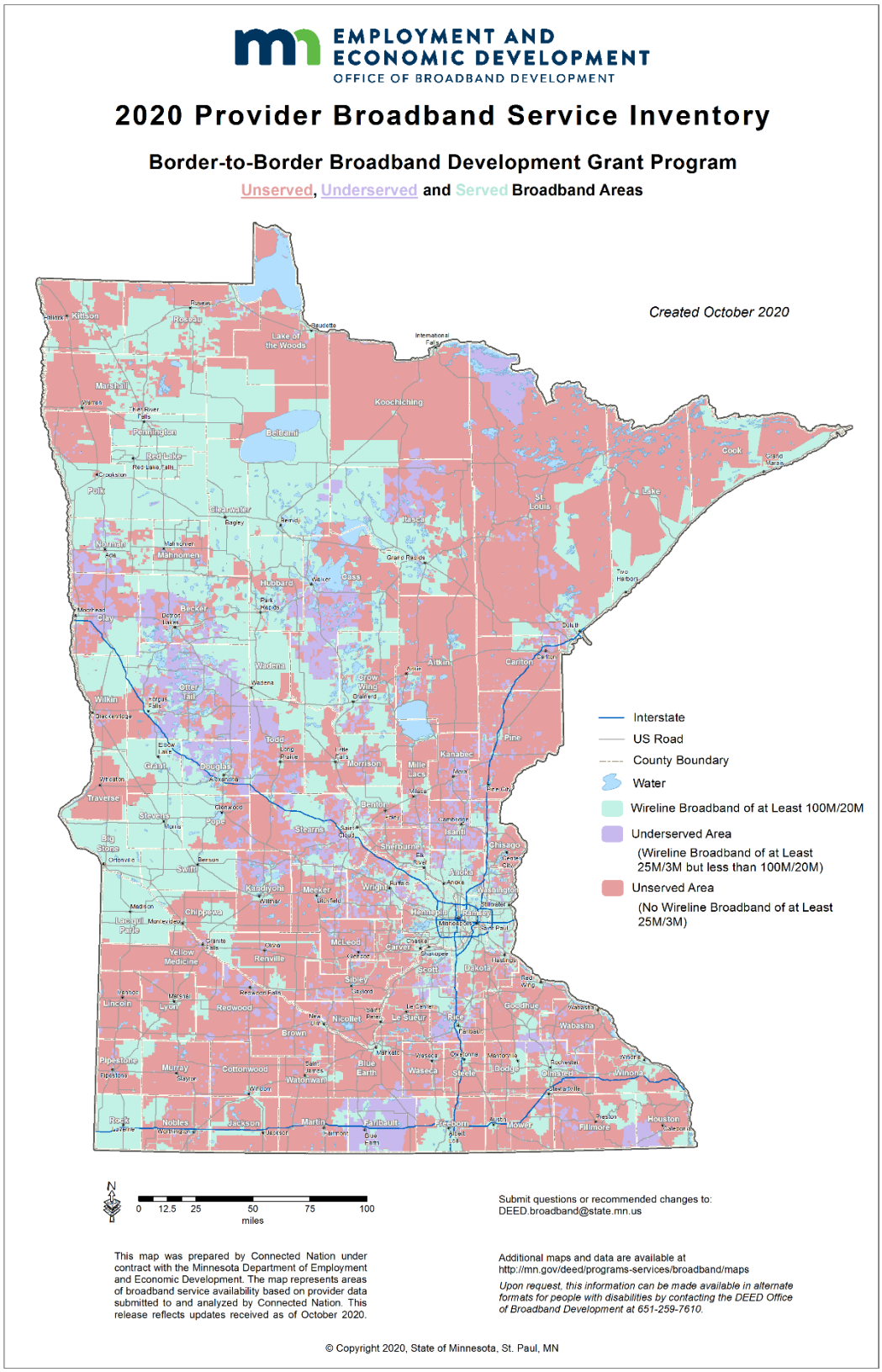
The most recent round of data collection shows that progress is being made toward these goals.

Table 1 – Wireline Broadband Availability

	2015	2016	2017	2018	2019	2020
Statewide 25/3 % of HH: # of HH without:	85.83% covered 296,000 HH w/o	87.53% covered 260,000 HH w/o	88.11% covered 248,000 HH w/o	91.13% covered 185,000 HH w/o	92.79% covered 150,000 HH w/o	92.47% covered 157,000 HH w/o
Non-metro 25/3 % of HH: # of HH without:	68.08% covered 286,000 HH w/o	72.03% covered 251,000 HH w/o	73.45% covered 238,000 HH w/o	80.07% covered 179,000 HH w/o	83.92% covered 144,000 HH w/o	83.10% covered 152,000 HH w/o
Statewide 100/20 % of HH: # of HH without:	39.14% covered 1,270,000 HH w/o	68.53% covered 657,000 HH w/o	70.04% covered 625,000 HH w/o	74.11% covered 540,000 HH w/o	86.10% covered 290,000 HH w/o	87.75% covered 256,000 HH w/o
Non-metro 100/20 % of HH: # of HH without:	40.68% covered 532,000 HH w/o	49.33% covered 455,000 HH w/o	52.88% covered 423,000 HH w/o	60.05% covered 358,000 HH w/o	68.74% covered 280,000 HH w/o	72.53% covered 246,000 HH w/o

The following is an update of the detailed coverage map of broadband across the state:

Figure 1 – 2020 Map of Broadband Availability in Minnesota



The 2020 Broadband Service Inventory map reflects the statutory goal of 25 Mbps download by 3 Mbps upload and 100 Mbps download by 20 Mbps upload. This map is also used for preliminary screening for the Border-to-Border Broadband Grant program. As state-funded grant projects are completed, they are reflected on this map (projects in Benton, Big Stone, Fillmore, Mille Lacs, Rock, Roseau, Swift and Winona Counties are large enough areas to be evident on the map).

Township Heat Map

The township heat map was initially created in 2016 and has been updated with each subsequent data collection process. This configuration provides a clearer view of where the actual areas of unserved territory are located within each county.

Figure 2 – 2020 Township Heat Map of % HH Served at State Border to Border Broadband Speed Goal for 2022

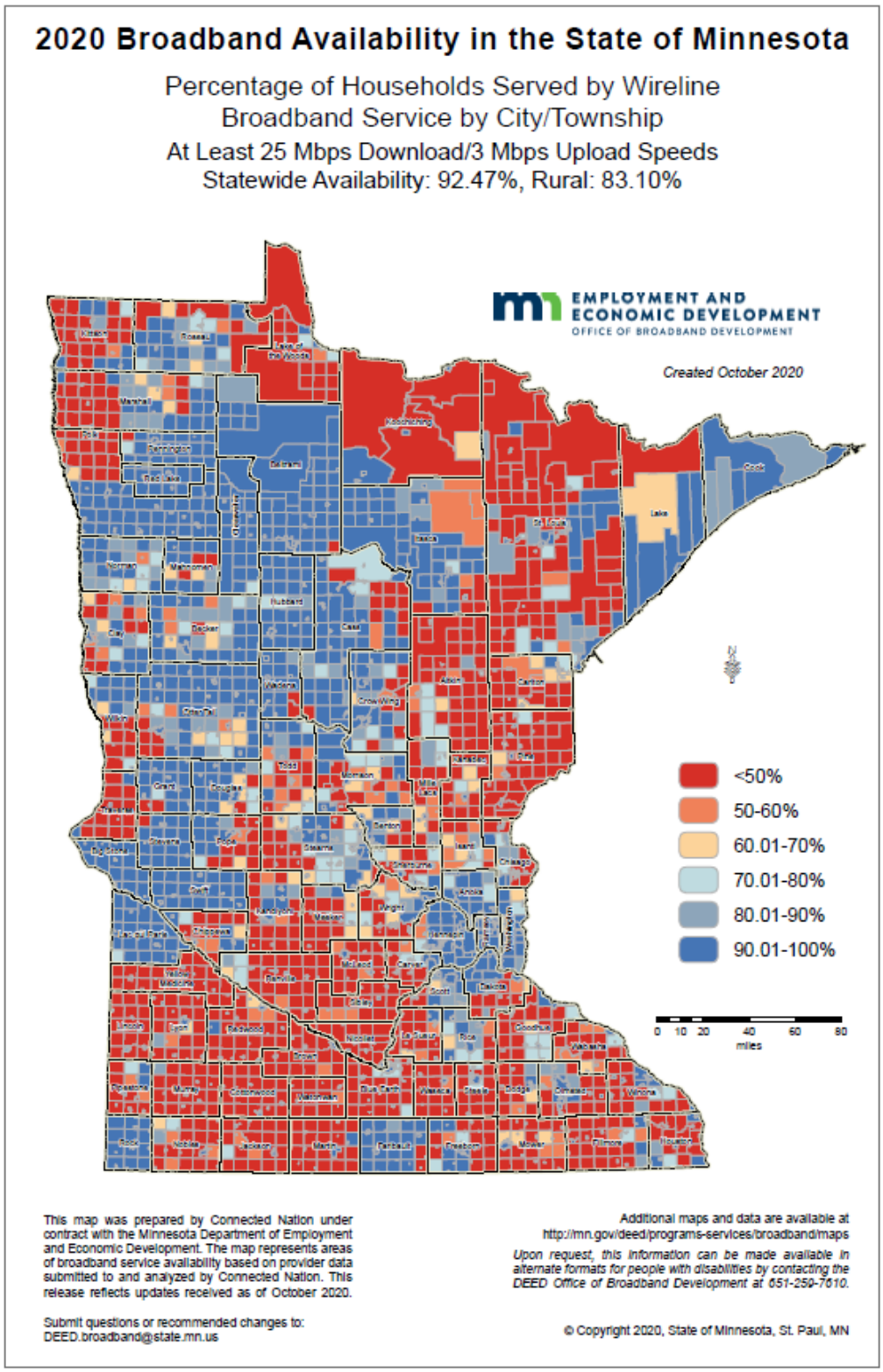
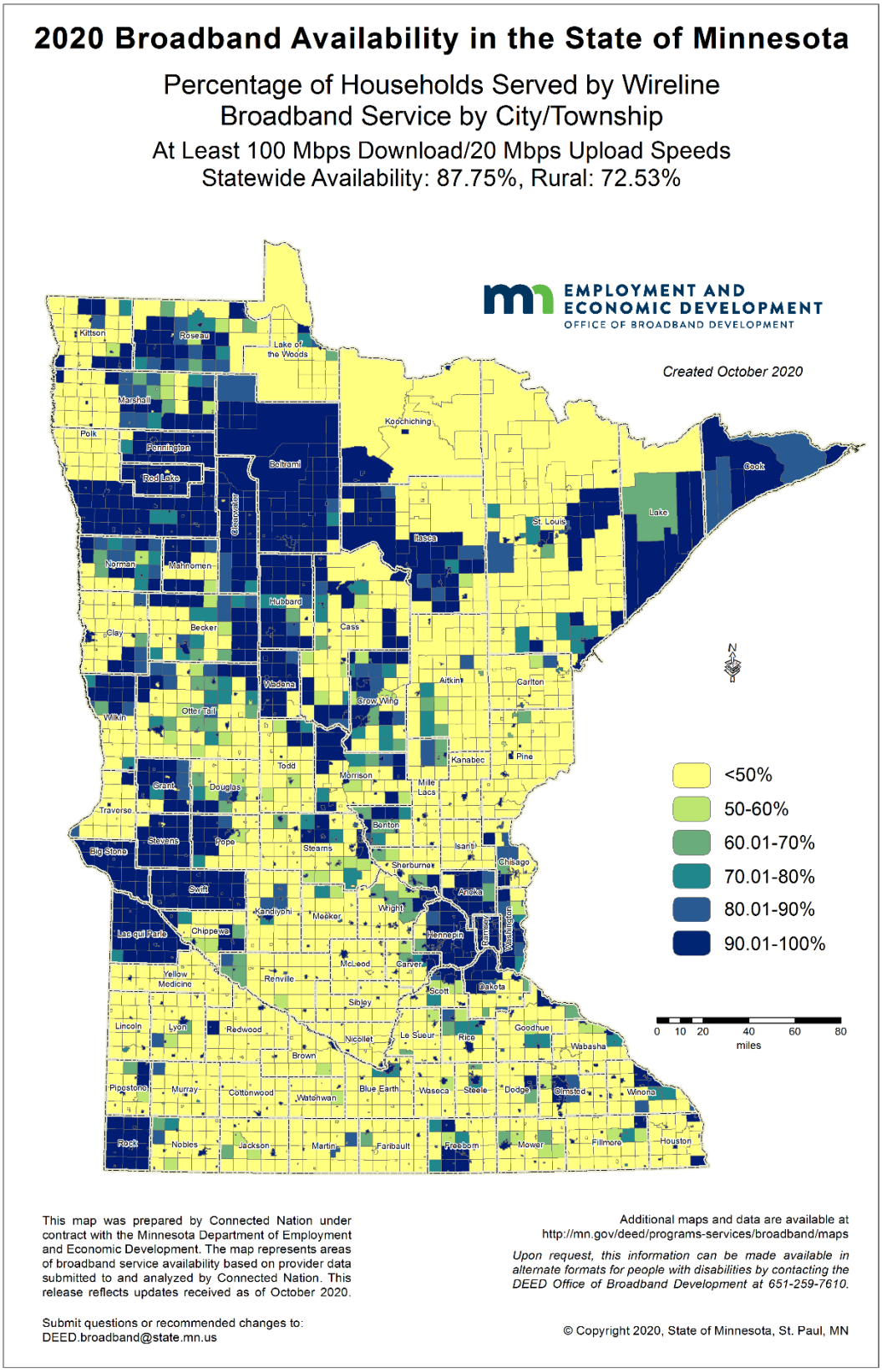


Figure 3 – Township Heat Map of % HH Served at State Border to Border Broadband Speed Goal for 2026



As of 2020, 87.75 percent of households and businesses had access to service that meets or exceeds the state's speed goal for 2026, which is 100 Mbps download by 20 Mbps upload from at least one provider. When looking at just non-metro areas, that number drops to 72.53 percent. While the broadband grant program has largely focused on achieving the 2022 goal, investments can only be funded under state law if they are scalable to deliver speeds at 100 Mbps download by 100 Mbps upload. The Office will continue to track this data and produce both a county and township level map of this information in 2021.

Next Steps and Recommendations – Mapping

The mapping program was codified into law in 2016 via Minn. Stat. § 116J.397 and will continue on an annual basis as long as funding is available. The Office negotiated a new two year contract with the provider for 2017-18, and subsequent one year extensions for 2019, 2020 and 2021. The Office continues to work with the contractor, providers and citizens to produce the most accurate and detailed maps possible. Maps are used by all stakeholders, policymakers, constituents and providers and improvements are constantly being considered.

The Federal Communications Commission also maintains a map of broadband coverage based on provider submitted data, however, concerns have been raised with the accuracy of that map. In March 2020, Congress passed the Broadband DATA Act (with funding to implement the Act included in the COVID Relief Bill passed in late 2020), which will improve the FCC's mapping data. The federal government also allocated $7.5 million to the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce in 2018 to assist in creating a more accurate map of broadband availability. Minnesota was one of eight initial states that collaborated with NTIA to create a pilot version of the map, a geographic information system platform that allows for the visualization of federal, state, and commercially available data sets. The map will be made available exclusively to state and federal partners, as it includes non-public data that may be business sensitive or have licensing restrictions. Several other states are also considering or in the process of establishing their own state broadband maps. The Office has been consulted by several federal entities and other states regarding the process used to create Minnesota's broadband maps.

Connectivity for Community Anchor Institutions

A core part of the mission of the Office of Broadband Development is to measure and report on the status of connectivity for community anchor institutions, including K-12 schools, libraries, higher education institutions, healthcare facilities, public safety sites, town halls and government facilities. The importance of measuring and analyzing community institution connectivity levels is twofold. First, high speed broadband is important for anchor organizations to deliver next generation services in rural areas. Additionally, these institutions act as anchor tenants in areas where networks may otherwise be financially difficult to sustain without them.

K-12 Connectivity Update

The COVID-19 pandemic brought into stark relief the need for high speed internet access and digital equity for students and teachers as distance learning became necessary.

In 2020, the Office continued to lead the K-12 Connect Forward work group. Launched in 2016, the Minnesota K-12 Connect Forward Initiative is a joint partnership between the Minnesota Department of Education (MDE), the Department of Employment and Economic Development (DEED), the national non-profit Connected Nation (which assumed data analysis and reporting responsibilities from EducationSuperhighway in 2020), and representatives from the Minnesota Education Technology Network, Minnesota School Board Administrators, Minnesota School Superintendents, Minnesota Rural Education Association and the Minnesota Association of Charter Schools. Together, this group is working to address the need for all students and teachers in Minnesota to have access to scalable infrastructure, high-speed, affordable bandwidth, and ubiquitous access for distance learning. The group meets monthly to share information and ideas to assist in making progress towards achieving the goals. The work group also continues to encourage the Legislature to fully fund the Telecom Equity Aid (TEA) fund, which helps overcome the geographic disparity in pricing that exists in providing broadband access to districts across the state.

Minnesota's K-12 Connect Forward Initiative was included as a case study in the State Educational Technology Directors Association's (SETDA's) recent white paper "Broadband Imperative III" at page 19: https://www.setda.org/wp-content/uploads/2019/11/SETDA_Broadband-Imperative-III_110519.pdf

In December 2020, MDE released a "Digital Inclusion Toolkit"[1].

> This toolkit provides information and resources to support schools, districts, public libraries, and community organizations in achieving digital equity among the students and families they serve. The toolkit addresses a broad scope of access barriers that students and families commonly face including but not limited to affordability of adequate internet service, availability of enough devices for everyone in a household, digital literacy, and English language skills.[2]

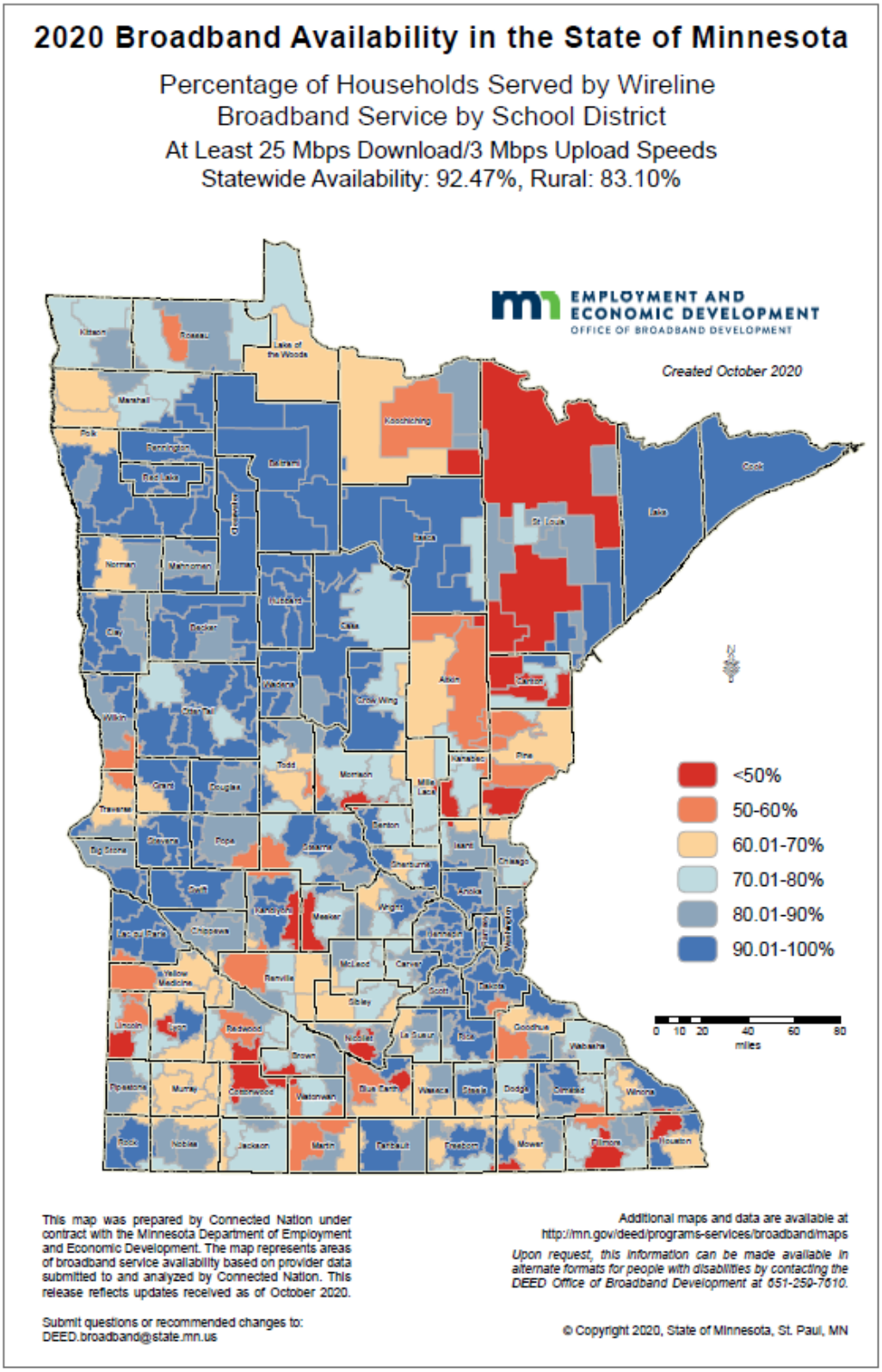
The Office has continued its work with the non-profit Connected Nation to document K-12 public and charter school connectivity using federal E-Rate filings with follow-up to education consortia and individual school districts. The interactive broadband map on OBD's website shows the location of all K-12 public and private schools in Minnesota and links back to connectivity data for the public schools.

Significant progress has been made to increase the number of schools with fiber broadband connections, ensuring they can scale service to meet increasing demand often at a lower cost per megabit. Only a handful of districts remain that lack fiber access to one or more buildings and Connected Nation's resources are offered in these situations.

Separate from connectivity at school facilities, and recognized as critically important, is the issue of students' home broadband access, often referred to as the homework gap. Students need broadband availability at home for distance learning due to COVID-19 restrictions, and more permanently, to complete assignments, make full use of 1:1 device initiatives, or to successfully implement an E-learning day as authorized by Minn. Stat. § 120A.414 passed in 2017. To assist school officials, the Office took the broadband availability data collected as part of the mapping effort and created the below map showing household availability at the school district level.

[1] https://education.mn.gov/mde/dse/tech/
[2] https://education.mn.gov/mde/dse/tech/ at page 2.

Figure 4 – Heat Map of Percentage of HH Served at the 2022 State Goal by School District



Other Community Anchor Institutions

Library Update

The Minnesota Department of Education captures connectivity data of libraries and reports that back out in an annual report. In its July 2020 report, Minnesota Public Library Report, 2019 Key Statistics, the data show that libraries provided 6,732 internet computers—5,663 desktops and over 1,000 mobile devices—for public use. Ninety-nine percent of public libraries offered wireless internet service. Library customers went online during 10.5 million computer and wireless sessions. Like K-12 schools, Minnesota libraries are eligible for federal E-rate program dollars to off-set a percentage of their out-of-pocket costs for connectivity. Also like K-12 schools, the state provides equity aid to further defray the remaining costs of these connections. State library representatives report that current state funding levels are adequate to meet their needs in this area, but they are reviewing eligible expenditures.

Public Safety

The Office continues to work with the Department of Public Safety's Office of Emergency Communication Networks to complete the picture of public safety broadband needs and use across the state. There are 102 Public Safety Answering Points or PSAPs in Minnesota that each maintain two separate diverse connections to provide emergency fail-over capabilities during a provider network outage.

While connectivity of PSAPs is determined at the state level, connectivity for the many police and fire stations across Minnesota are made at the local level. The interactive broadband map maintained by the Office, which can be found here: Minnesota Map, includes the locations of all such facilities by activating the "Anchor Institutions" layer on the map. Work remains to be done to devise a reliable means of gathering robust connectivity data for these anchor institutions.

Additionally, construction of the nationwide first responder network, known as FirstNet, is underway. The federal government awarded the FirstNet contract to AT&T in 2017. Minnesota's participation is coordinated by the Minnesota Department of Public Safety's Emergency Communication Networks division. The purpose of FirstNet is to build, operate, and maintain a high speed, nationwide wireless broadband network dedicated to public safety and operable across the country.

Rural Healthcare

The COVID-19 pandemic amplified the need for broadband connectivity, as health care providers transitioned to telemedicine in response to the stay-at-home order. With the onset of the COVID-19 pandemic, the Minnesota Department of Health (MDH) designed a brief survey to learn more about the changes Minnesota's health care providers were facing at work as they respond to the pandemic. The *COVID Health Provider Survey*[1] focused on a handful of COVID-specific topics, including the use of telemedicine, and related topics.

[1] https://www.health.state.mn.us/data/workforce/covidsurvey/docs/surveyresults.pdf

In terms of telemedicine, the results of the MDH survey indicated:

- More than half of all providers reported that at least some of the care they provided was remote—either via telephone, email, or dedicated telemedicine equipment (or all three). Again, this varied greatly by profession, with mental health providers most likely to be providing care via telemedicine or telephone.

- More than 85 percent of all respondents who were using telemedicine said they thought they would continue to provide at least some care via telemedicine after the pandemic ended.

According to an NTCA report, "Anticipating Economic Returns of Rural Telehealth", the measurable benefits of rural telehealth relate to cost savings for transportation, lost wages, hospital costs, and increased revenues to local labs and pharmacies. The report identified the following national average estimates of cost savings[1]:

- Travel expense savings: $5,718 per medical facility, annually;
- Lost wages savings: $3,431 per medical facility, annually;
- Hospital cost savings: $20,841 per medical facility, annually;
- Increased local revenues for lab work: from $9,204 to $39,882 per type of procedure, per medical facility, annually; and
- Increased local pharmacy revenues: from $2,319 to $6,239 per medical facility annually, depending on the specific drug prescribed.

The need for connectivity of healthcare institutions grew with the adoption of electronic health record (EHR) systems and other health information technology. E-Health is needed to exchange patient information to support coordinated care. Minnesota's health community has achieved considerable e-Health progress since the e-Health initiative was established in 2004. When the e-Health Initiative was established in Minnesota, approximately 17% of clinics and 9% of hospitals in the state had adopted EHRs. Now 100% of Minnesota Hospitals and 99% of clinics are using EHRs, and numbers are growing for health providers from other settings. The ability to share patient records can greatly assist in proper diagnosis and treatment, whether a patient is in-network or out-of-network. More recently, e-Health has been identified as one method to assist in the opioid crisis by increasing the rate of electronic prescribing of controlled substances (EPCS).

The federal government, as one of its Universal Service programs, has funding to assist rural health care providers address their connectivity needs. The Rural Health Care Program, or RHC, receives funding and is administered by the Universal Service Administrative Company (USAC). Broadband services and network equipment can receive up to a 65 percent discount for eligible applicants.

As with public safety anchors, the Office includes the locations of hospitals on the interactive broadband map and continues to work on locating a reliable data source to map connectivity levels to individual healthcare facilities.

[1] www.ntca.org/sites/default/files/documents/2017-12/SRC_whitepaper_anticipatingeconomicreturns.pdf

Next Steps and Recommendations – Other Community Anchor Institutions

In awarding Border to Border Broadband grants, DEED requests that applicants provide information on whether community anchor institutions would be served as part of the grant funded area. Additional points were awarded if that was the case. DEED staff has also found a number of incidences when an anchor institution was not part of the project, but because the project brought fiber closer to the location, it became affordable to extend fiber to the anchor institution not included in the grant project area.[1]

Where data sources can be found and validated, the Office will work to incorporate connectivity type and speeds on the interactive broadband map.

Coordinating Broadband Infrastructure Development with MNDOT

Under Minn. Stat. § 116J.391, the Office is to collaborate with the Minnesota Department of Transportation (MNDOT) and private entities to encourage and coordinate "Dig Once" efforts. The Office met several times with MNDOT to make progress in this area and MNDOT posts notice of its regional meetings to discuss upcoming road construction projects and invites broadband providers and utilities. Discussions have been held regarding the placement of conduit in rights-of-way but has run into barriers with lack of funding to deploy, track and manage the conduit.

In late 2017, the Office convened meetings of broadband providers with MNDOT and Minnesota Department of Natural Resources (MNDNR) personnel responsible for issuing right-of-way and crossing permits. Productive discussions were held on how both sides can best manage the process to ensure applications are issued and received in a timely manner. In 2020, the Office continued to monitor this process and worked with both MNDOT and MNDNR when broadband providers believed the issuance of their permits was unreasonably delayed.

In 2020 OBD participated in Connected and Automated Vehicle (CAV) meetings coordinated by MNDOT. OBD involvement is related to planning for the broadband infrastructure necessary to support this technology. Connected vehicles use technology to either communicate with each other, connect with traffic signals, signs, and other road items, or obtain data from a cloud. This information exchange will help with safety and improve traffic flow. Automated vehicles will use technology to steer, accelerate, and brake with little to no human input. Some vehicles still require a human to monitor the roadway, while other vehicles require no human intervention. This work will continue in 2021.

[1] The Big Lake police department was connected to fiber that was placed as part of the Palmer Big Lake industrial park grant project and the Big Fork Valley Hospital was able to gain access to fiber at an affordable price as a result of the 2016 Paul Bunyan Communications grant project.

Broadband and Tribal Outreach

With the grant program again being funded in 2020, the Office was able to reach out to tribal representatives to inform them of the availability of grant funding for broadband infrastructure. Outreach also included hosting a webinar for tribes in Minnesota and Wisconsin on the FCC's 2.5 GHz Educational Broadband Initiative for Tribal Nations, in partnership with the Blandin Foundation and the MICA Group.

DEED actively encouraged MIAC to refer a candidate to the Governor's Office for appointment to the broadband task force. A tribal representative was named to the task force in 2020.

The Office is also working with DEED's tribal liaison to ensure that broadband in tribal areas is accurately reflected on Minnesota's broadband service inventory maps.

Monitoring the Future – Technology Scan of Current and Emerging Technologies

The OBD monitors broadband technology advancements to determine when new innovations in delivering broadband services are market-tested to the point of being considered as viable options in a broadband infrastructure investment portfolio. The advancements being monitored range from 5G to satellite, to new fixed wireless configurations to ultra-fast fiber deployments. The Office will continue to track and study these and other emerging options for their use in closing Minnesota's connectivity gaps. At this time, we can report:

- OBD will track the beta deployments of low-earth orbit (LEO) satellite service in Minnesota.
- The Office continues to monitor the advancements in fixed wireless technology.
- Another type of fixed wireless deployment, using spectrum white spaces, with Microsoft as a partner has gained traction in states adjacent to Minnesota. The Office will monitor the results from these trials.
- Regarding traditional geosynchronous (GEO) satellite technology, the Office continues to hear customer dissatisfaction expressed with the pricing, data caps and latency associated with satellite broadband service, including the higher speed services that have recently become available.
- 5G appears to be a service that will be offered in urban areas where the fiber necessary for the backhaul from these dense cell sites is available. 5G will not likely be deployed in rural areas in the foreseeable future due to the short distance that the wireless portion can travel before needing a fiber connection.

Next Steps and Recommendations – Technology

As noted above, OBD will continue to track technologies available, and attempt to collect specific performance data where we have the ability.

Federal and Other State Broadband Policy

At the federal level, both Congress and the Executive Branch have been active on broadband. OBD frequently works with federal level counterparts including the independent FCC (and its universal service program administrator, the Universal Service Administrative Company or USAC), the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce, the Rural Utilities Service of the U.S. Department of Agriculture, as well as the offices of Minnesota's federal delegation.

Specific federal activities OBD monitors or actively participates include:

CAF II

The Connect America Fund II (CAF II) is a program within the federal Universal Service Fund that is used to help pay for communications services, including broadband, in high cost, rural areas of the country provided by price cap companies (generally the large telephone companies, which in Minnesota includes CenturyLink, Frontier, Windstream and Consolidated Holdings.) Providers must deploy service of at least 10 Mbps download and 1 Mbps upload to count the location as served. The Border to Border Broadband Infrastructure grant program has taken these investments into consideration when determining eligible applications, and as such will continue to monitor construction of these CAF II projects to confirm that consumers receive the service that CAF II recipient companies committed to provide when challenging applications to the state grant program.

Table 2 – Connect America Fund II – Price Cap Carriers Offer of Support

Company Name	# Locations to be Served by 2020	Annual Funding Received
CenturyLink	114,739	$54 million
Consolidated Holdings	4,266	$2.5 million
Frontier	46,910	$27.5 million
Windstream	4,440	$1.5 million

The Office's interactive map contains a layer showing the census blocks that are eligible for CAF II funding. The four carriers, under program requirements, were to have completed CAF II installations by the end of 2020. Locations served are reported to USAC. The Office is monitoring that information as it is made public and including a data layer containing this information on the interactive map as USAC releases the data. The broadband mapping program should also more generally capture the information as reported by these companies in their mapping submissions.

ACAM

The Alternative Connect America Cost Model is a revised method of providing high cost subsidies to smaller telephone companies, often referred to as "rate of return" carriers. These companies received their revised subsidy offer from the FCC in late 2016 with the option to accept it or retain the old high cost formula for a period of time. The funds allotted for this program were oversubscribed after a majority chose the new funding model. The ACAM program requirements are for the providers to deploy service at speeds of 25 Mbps download and 3M Mbps upload to a majority of eligible locations, with provisions for service to also be deployed at 10 Mbps download and 1 Mbps upload or 4 Mbps download and 1 Mbps upload for a minority of locations. The end date for this program is 2026. The FCC is considering a proposal to extend the term of the ACAM program and increase the deployment speeds.

Table 3 – ACAM for Rate of Return Companies

Company Name	Locations to be Served by 2026		Annual Funding Received (2017-2026)
	At Least 25/3	Total Locations	
Arvig	21,578	33,455	$22,466,968
Christensen Communications Co.	117	420	$630,898
Hanson Communications	1,280	2,466	$2,707,453
Interstate Telecommunications Coop.	166	779	$1,036,877
Larson Utilities	262	1,160	$1,483,539
Mabel Coop. Tel. Co.	192	518	$660,042
Northern Tel. Co./Wilderness Valley Tel. Co.	33	231	$344,871
NU Telecom	4,831	7,913	$7,648,208
Park Region Mutual Tel. Co.	2,841	4,351	$3,255,069
Rural Communications Holding Co. (BEVCOMM)	3,320	6,035	$5,542,366
Rothsay Telephone Co.	24	335	$467,044
TDS	7,524	10,788	$5,314,611
VNC Enterprises (Dunnell Telephone Co.)	36	302	$274,969
Wikstrom Telephone Co.	1037	6,587	$7,068,281

As with CAF II, the Border to Border Broadband Development Grant program has taken into account the federal funding that areas of the state receive through ACAM and the interactive broadband map contains a layer showing these areas. The broadband mapping program will also capture the investments made with ACAM as these companies submit updated mapping and data information. For example, the map prepared from data

submitted in early 2018 shows that Norman County has gone from largely unserved (pink) to mainly underserved (purple) due to ACAM investments.

ACAM II

Established by the 2018 Rate-of-Return Reform Order, the Alternative Connect America Cost Model (ACAM) II provides funding to rate-of-return carriers that voluntarily elected to transition to a new cost model for calculating High Cost support in exchange for meeting defined broadband build-out obligations. Carriers that elected this option receive predictable monthly payments based on support of up to $200 for each funded location over the program's 10-year support term (2017-2026). Participating carriers must meet annual deployment milestones starting in year four, 2022.

Table 4 – ACAM II for Rate of Return Companies

Company	# Locations to be Served by 2029	Annual Amount
Ace Telephone Association	2,625	$297,283
Albany Mutual Telephone Association	2,376	$174,183
Alliance Communications Cooperative, Inc.	667	$51,874
Benton Cooperative Telephone Company	3,724	$259,215
Consolidated Telephone Company	7,965	$516,285
City of Barnesville Municipal Telephone	545	$10,327
Emily Cooperative Telephone Company	1758	$77,442
Federated Telephone Cooperative	2,122	$339,287
Farmers Mutual Tel	1,094	$169,362
Gardonville Cooperative Telephone Association	3,090	$211,974
Garden Valley Telephone Company	10,737	$1,361,026
Halstad Telephone Company	707	$109,830
Harmony Telephone Company	583	$57,846
Johnson Telephone Company	3,063	$236,331
Kasson & Mantorville Telephone Company	1,574	$155,809
Lonsdale Telephone Company	710	$46,681
Lismore Cooperative Telephone Company	382	$57,697

Company	# Locations to be Served by 2029	Annual Amount
Manchester-Hartland Telephone Company	79	$12,074
New Ulm Telecom, Inc.	834	$18,152
Paul Bunyan Rural Telephone Cooperative	13,727	$1,150,140
Polar Communication Mutual Aid Corporation	182	$26,192
Runestone Telephone Association	3,627	$442,921
Spring Grove Communications	531	$77,768
Tri-Co Technologies, LLC	678	$9,983
Upsala Cooperative Telephone Association	1,157	$120,771
Woodstock Telephone Company	1,067	$141,671
Winnebago Cooperative Telephone Association	688	$78,248
West Central Telephone Association	3,712	$421,016

CAF II Auction

The Connect America Fund Phase II (Phase II) is part of the FCC's reform and modernization of its universal service support programs. In 2018, the FCC conducted an auction (Auction 903) to allocate Phase II support to certain eligible areas across the United States. 103 bidders won $1.49 billion over 10 years to provide fixed broadband and voice services to over 700,000 locations in 45 states.

Table 5– CAF II Auction Companies

Company Name	# Locations to be Served	Annual Amount
Broadband Corp	128	$42,812
Consolidated Telephone Company	358	$93,493
Farmers Mutual Telephone Company	163	$34,899
Federated Telephone Cooperative	808	$143,104
Fond du Lac Reservation Business Committee	13	$5,501

Company Name	# Locations to be Served	Annual Amount
Garden Valley Telephone Company	95	$88,035
Halstad Telephone Company	7	$1,964
Interstate Telecommunications Cooperative, Inc.	209	$55,233
Jaguar Communication, Inc.	672	$51,059
Johnson Telephone Company	47	$8,127
LTD Broadband LLC	840	$110,444
Midcontinent Communications	7,410	$2,797,728
Paul Bunyan Rural Telephone Cooperative	315	$131,354
Roseau Electric Cooperative, Inc.	326	$208,177
West Central Telephone Association	532	$61,193
Wikstrom Telephone Company	56	$53,256

Rural Digital Opportunity Fund (RDOF) Phase I Auction (Auction 904)[1]

On January 30, 2020, the Federal Communications Commission (FCC) adopted the Rural Digital Opportunity Fund (RDOF) Report and Order, which established the framework for a $20.4 billion fund utilizing universal service funds to bring high speed fixed broadband service to rural homes and small businesses. The FCC made eligible for the RDOF auction census blocks where no provider is offering, or has committed to offering, either via the CAF II auction, the USDA ReConnect program, or state-specific programs, service of at least 25/3 Mbps (based on Form 477 data).

The FCC established a two-stage application process for Auction 904. The following detail is from the FCC's *Auction 904: Rural Digital Opportunity Fund Fact Sheet*[2]:

[1] https://www.fcc.gov/auction/904
[2] https://www.fcc.gov/auction/904/factsheet#technology

Step 1: Short-Form Application — Entities seeking to participate in the auction had to establish baseline financial and technical capabilities in order to be found eligible to bid. There were two pathways for establishing eligibility:

- Demonstrate two years of experience providing a voice, broadband, and/or electric distribution or transmission service and submit one year of audited financials (if an applicant with at least two years of experience is not audited in the ordinary course of business, it can instead submit one year of audited financials within 180 days after being announced as a winning bidder but has to submit one year of unaudited financials with its short-form application), or submit three years of audited financials with the short-form application and a letter of interest from an eligible bank willing to issue a letter of credit for a specified amount
- Entities were also required to provide high-level technical information to demonstrate they have the technical qualifications to meet the applicable performance tier and latency requirements.
- Entities can wait until after they were announced as winning bidders to obtain eligible telecommunication carrier designations from the relevant states or the Commission, if applicable.

Step 2: Long-Form Application (due by January 29, 2021) — Winning bidders or their designees must:

- Provide in their long-form applications additional information about qualifications, funding, and the network that they intend to use to meet their obligations.
- Within a specified number of days, submit a letter from an eligible bank committing to issue a letter of credit; upon notification that the entity is ready to be authorized, must obtain a letter of credit from an eligible bank that remains open and covers disbursements until compliance with certain service milestones is complete and verified
- Within 180 days of being announced as winning bidders, certify they are eligible telecommunications carriers in any areas for which they seek support and submit relevant documentation.
- Once a long form application is approved, the long-form applicant will be authorized to begin receiving support.

Any entity that filed a short-form application or any long-form applicant is subject to a forfeiture in the event it defaults prior to becoming authorized to receive support. Defaults include, but are not limited to, failing to meet submission deadlines, defaulting on a bid, or otherwise being disqualified for any reason.

On December 7, 2020, the FCC released the RDOF Phase I auction results.[1] There were 180 winning bidders, with the 10-year support amount totaling $9.2 billion to deploy high-speed broadband to over 5.2 million locations in 49 states and one territory. As a state, Minnesota is slated to receive the 4th largest support amount. The table below shows that 22 bidders will be receiving approximately $408 million over 10 years to serve 142,841 locations.

[1] https://www.fcc.gov/document/auction-904-winning-bidders

Table 6 - RDOF Phase I Auction: Winning Bidders - Minnesota Summary

Winning Bidder	# of Locations to be Served	Annual Amount
AMG Technology Investment Group Minnesota LLC	1,408	$373,631
Arrowhead Electric Cooperative, Inc.	4,879	$1,846,227
CenturyLink, Inc.	3,265	$1,564,609
Consolidated Communications, Inc.	12	$1,112
Consortium of AEG and Heron	1,150	$670,942
Farmers Mutual Telephone Company	332	$75,982
Federated Telephone Cooperative	248	$53,739
Fond du Lac Communications Inc.	728	$104,612
Gardonville Cooperative Telephone	24	$6,390
Great Plains Consortium	402	$8,170
Halstad Telephone Company	603	$311,805
LTD Broadband LLC	102,005	$31,187,793
Midcontinent Communications	6,058	$445,380
Minnesota Connections c/o Consolidated Tel Company	979	$204,027
Paul Bunyan Rural Telephone Coop	5,088	$1,630,789
Roseau Electric Cooperative, Inc.	266	$122,849
Savage Communications	4,541	$609,047
Space Exploration Technologies Corp.	7,529	$842,480
Wikstrom Telephone Company	228	$98,363
Windstream Services LLC	2,899	$654,896
Winnebago Cooperative Telecom	178	$2,054
Wisper-CABO 904 Consortium	19	$167

While the bidding phase of Auction 904 has ended, there are additional steps that winning bidders must complete before their awards are finalized. When FCC staff have determined that a winning bidder's long-form application is complete and the long-form applicant is financially and technically qualified, and the letter(s) of credit and accompanying opinion letter(s) have been received and approved, the FCC will issue a public notice announcing the authorization of support for the winning bid(s) and directing USAC to begin disbursing support.

During 2021, OBD will track the winning bidders' progress in achieving Eligible Telecommunications Carrier (ETC) designation and completing required filings with the FCC. The Office looks forward to the construction that will occur with RDOF Phase I auction funding and will capture the RDOF deployments on the interactive map.

USDA Community Connect Grants

The USDA also offers a Community Connect grant program to construct broadband services in rural areas lacking service of at least 10Mbps download and 1Mbps upload. A portion of the funding is used to provision free broadband access at critical community facilities. The Fond du Lac Band of Superior Chippewa had benefitted from this grant program in 2015 and 2017.

In November 2018, Consolidated Telephone Company received a $2.1 million grant to construct a fiber-to-the-home broadband system to bring high-speed internet service to 250 households, eight businesses and a community center in Todd County. Because of this project, the community center, located within Moran Township Town Hall, will be able to provide free public access to two computer terminals and a public Wi-Fi network. Additionally, this project will ensure previously underserved residents and businesses better access to improved economic, healthcare, and education e-Connectivity services. Project construction began in the spring of 2019.

In October 2019, the USDA announced an award of $1,953,464 to Mille Lacs Energy Cooperative (MLEC) to construct a fiber-to-the-premises network to 235 establishments in portions of Rice River Township and Spaulding Township in Aitkin County, Minnesota. This includes tribal land and facilities of the Mille Lacs Band of Ojibwe. Mille Lacs Energy Cooperative, located in Aitkin, Aitkin County, Minnesota, will construct a broadband network to support service at levels up to 1 Gbps for each subscriber.

USDA ReConnect

The USDA's Broadband ReConnect Program offers federal financing and funding options in the form of loans, grants, and loan/grant combinations to facilitate broadband deployment in areas of rural America that don't currently have sufficient access to broadband, defined by the law as 10 Mbps (megabits per second) downstream and 1 Mbps upstream.

In January 2020, the USDA announced an award of $2.7 million ReConnect Program loan and a $2.7 million ReConnect Program grant to Harmony Telephone Company to construct a fiber-to-the-premises (FTTP) network to connect 577 households, a health care center and a critical community facility spread over 143 square miles in several counties bordering southern Minnesota and northern Iowa.

In January 2020, the USDA announced an award of $5.2 million ReConnect Program grant to Consolidated Telephone Company (CTC) to construct a fiber-to-the-premises (FTTP) network of up to one gigabit of symmetrical high-speed internet to nearly 700 homes and public facilities in portions of Cherry and Great Scott townships in Minnesota. CTC will leverage existing middle-mile infrastructure, in partnership with Northeast

Service Cooperative, and require only an additional 157.1 miles of new FTTP construction. The funded service area includes 667 households, two educational facilities and two critical community facilities in St. Louis County.

In October 2020, the USDA announced an award of $3 million to Consolidated Telephone Company (CTC) to construct a fiber-to-the-premises network, which will connect 819 people, 34 businesses and 25 farms to high-speed broadband internet in Morrison County, Minnesota.

E-Rate

The FCC issued two significant orders in 2014 reforming the E-Rate program to include broadband and additional support for broadband (including wireless) capacity. In 2019, the FCC permanently extended the Category 2 budget approach. Through its work with EducationSuperHighway and ConnectedNation as noted above, the Office has been monitoring and advising school districts on the implications of these FCC orders and notifying districts that are not taking full advantage of this federal resource.

In September 2020, the FCC announced the opening of a second funding year E-Rate 2020 filing window to allow schools to request additional E-Rate funding specifically to address urgent on-campus bandwidth needs resulting from the heightened reliance on remote learning during the COVID-19 pandemic.

Earlier in 2020, the FCC extended key E-Rate service implementation and filing deadlines and waived the program's gift rules to enable service providers to offer, and E-Rate program participants to solicit and accept, improved connections or additional equipment for remote learning during the coronavirus outbreak.

Emergency COVID Relief Act of 2020

On December 27, 2020, the President signed the Consolidated Appropriations Act, 2021 (Act)[1]. The Act contains $7 billion in funding for federal programs related to broadband access. As this is recently enacted legislation, the programmatic rules and processes have not been fully released. OBD will monitor the development of these programs in 2021. The following is a brief summary of the broadband internet access related funding and provisions in the Act:

- $3.2 billion Emergency Broadband Benefit program (FCC program) that will provide $50 per month for broadband for low-income families, to help them afford broadband service and an internet-connected device.
- $1.9 billion for "rip and replace" efforts to remove Huawei and ZTE equipment from U.S. networks.
- $1 billion in grants for Tribal broadband programs –via NTIA grant program.
- $300 million for rural broadband deployment –via NTIA grant program.
- $285 million that will in part fund a pilot program to help with broadband issues for communities around historically Black colleges and universities –via NTIA grant program.
- $250 million for the Federal Communications Commission's telehealth program.
- $65 million to improve broadband mapping (FCC mapping).

[1] https://rules.house.gov/sites/democrats.rules.house.gov/files/BILLS-116HR133SA-RCP-116-68.pdf

- An extension of one year (until December 31, 2021) for states to utilize CARES Act Coronavirus Relief Funds.

State Policies across the United States

In addition to monitoring federal activities in order to better align state policy, OBD also monitors activities in other states to identify emerging models and determine best practices. Independent broadband mapping continues to occur in states active in the broadband policy arena, even after federal funding for mapping ended.

Many states also award broadband grants: Alabama, Arkansas, California, Colorado, Georgia, Idaho, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Missouri, Nebraska, New Mexico, New York, North Carolina, Pennsylvania, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin and Wyoming.

Next Steps and Recommendations – Federal and State Broadband Policies

The Office will continue to monitor activities at the federal level and make recommendations on options for aligning state broadband investment policy to achieve maximum benefits for Minnesotans.

Economic Impact of Broadband

In addition to the examples from the Border to Border Broadband Infrastructure grant projects, which positively impact individual households and businesses as they are connected, national studies and reports show the benefits of and/or need for high speed broadband access.

- In January 2021, the Minnesota Chamber of Commerce identified maintaining and enhancing infrastructure, including broadband connectivity, in its legislative priorities--urging policy makers to support measures that encourage economic recovery and growth. [1]
- Internet-driven transactions account for almost 50% of the U.S. gross domestic product or $9.6 trillion annually. These transactions are estimated to grow to over 65% by 2022 to $14 trillion annually.[2]
- According to the USDA, digital technologies could create approximately $47–$65 billion annually in additional gross benefit for the U.S. economy. USDA estimates that rural broadband connectivity is the driver of more than one-third of that economic benefit or $18-$23 billion per year.[3]

[1] https://www.mnchamber.com/blog/top-4-legislative-priorities-2021
[2] https://www.frs.org/sites/default/files/documents/2018-03/A-Cyber-Economy_The-Transactional-Value-of-the-Internet-in-Rural-America.pdf
[3] https://www.usda.gov/sites/default/files/documents/case-for-rural-broadband.pdf

- Fiber optic connections can add $5,437 to the price of a $175,000 home.[1] And a study done by the University of Wisconsin – Whitewater found that the availability of internet service can add $11,815 to the value of a $439,000 vacation home in Door County, WI.[2]

- Rural areas need widely available and adopted broadband to attract millennials.[3]

- The Internet Innovation Alliance finds that the average American household can save $12,019 every year by being online. The Alliance further found that while the number of "on-demand" workers was 3.8 million in 2016, it is expected to be 9.2 million workers in four years. Not all sharing economy workers are full time, averaging annual income of $3,588 which covers approximately 6.26% of household spending.[4]

- Rural communications providers contributed more than 77,000 jobs in the United States and supported more than $10 billion in economic activity across a wide range of industries, according to a 2019 Purdue University study.[5]

Next Steps and Recommendations – Economic Impact of Broadband

The Office plans to document the economic impact in a more formalized process for the grant funded projects as they complete to measure economic gains.

Conclusion

This year, rural communities continued to see the deployment of broadband services from the Border to Border Broadband Development Grant Program funding appropriated through 2020, as well as from federal programs. Despite these programs, and as documented in the mapping efforts by the Office, there remain locations in Minnesota that are unserved by broadband. A state grant program continues to be necessary to help make the business case for providers to go into these unserved areas, so that broadband access across all of Minnesota at the legislated speed goals can be achieved. The Office will also work with the Governor, the Legislature, the Task Force and other stakeholders in 2021 to ensure that progress toward state goals is facilitated.

[1] http://realtormag.realtor.org/daily-news/2015/07/02/study-speedy-internet-boosts-home-values
[2] https://www.wra.org/WREM/Oct16/Broadband/
[3] https://www.dailyyonder.com/comes-broadband-millennials-vote-feet/2018/04/11/24960/
[4] https://internetinnovation.org/wp-content/uploads/MultiplierEffectBroadbandWhitepaper.pdf
[5] https://pcrd.purdue.edu/wp-content/uploads/2020/09/007-Job-Creation-From-Rural-Broadband-Companies-3.pdf