

**m** **EMPLOYMENT AND  
ECONOMIC DEVELOPMENT**

March 23, 2018

Chris Steller  
Legislative Reference Library  
645 State Office Bldg.  
100 Rev. Dr. MLK Jr. Blvd.  
St. Paul, MN 55155

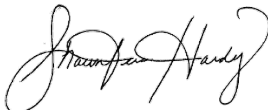
Dear Chris Steller:

As required by Minn. Stat. 116J.39 Subd. 5, please find enclosed the Minnesota Office of Broadband Development 2017 Annual Report to the Minnesota Legislature, for calendar year 2017.

This report summarizes the activities of the office for the past year and offers some recommendations for future action as requested in statute.

Please do not hesitate to contact me if you have any questions or concerns about this report.

Regards,



Shawntera Hardy  
Commissioner

CC: Office of Governor Mark Dayton

# OFFICE OF BROADBAND DEVELOPMENT

ANNUAL REPORT  
MARCH 23, 2018

---

Total cost of salaries, printing, and supplies in  
developing/preparing this report is \$ 4,918.05  
(reported as required by Minn. Stat. 3.197)

# Contents

Introduction and 2017 Annual Highlights .....	3
Broadband Infrastructure Availability .....	4
Border-to-Border Development Grant Program .....	4
Minnesota Border-to-Border Broadband Development Program by the Numbers .....	4
Projects Awarded with 2017 Appropriation.....	5
Monitor and Measure – Minnesota Broadband Mapping Program.....	9
Mapping Program Update .....	9
Wireline Broadband Availability .....	10
Connectivity for Community Anchor Institutions .....	15
K-12 Connectivity Update.....	15
Other Community Anchor Institutions .....	19
Coordinating Broadband Infrastructure Development with MNDOT .....	20
Broadband and Tribal Outreach .....	21
Broadband and Electric Coops.....	21
Monitoring the Future – Technology Scan of Current and Emerging Technologies.....	21
Federal and Other State Broadband Policy .....	22
CAF II .....	22
Connect America Fund II – Price Cap Carriers Offer of Support.....	23
ACAM .....	23
Connect America Fund II – ACAM for Rate of Return Companies.....	23
Lifeline Reform .....	24
E-Rate Reform.....	24
Federal Legislation.....	25
USAC .....	25
BDAC.....	25
State Policies across the United States .....	25
Economic Impact of Broadband.....	25
Conclusion.....	26

## Introduction and 2017 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 fourth 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](#)

2017 milestones for the office included: announcing grant awards in January and November totaling \$55.5 million; closing out 30 projects from the first two rounds of the grant program (leaving only 1 project still in progress); completing the first comprehensive view of K-12 district broadband connectivity; negotiating a new vendor contract for mapping broadband availability in the state; continuing work on digital inclusion and equity activities; and contributing to the national discussion on broadband availability.

Specific highlights for 2017 include:

- Reviewed 70 applications submitted in the Border-to-Border Broadband infrastructure grant program and recommended 39 projects for awards totaling over \$26 million.
- Wrote and executed 40 grant contracts with Round 3 recipients.
- Updated broadband availability maps in April and October.
- Participated in 36 state meetings or conferences and 14 national events 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.
- Convened discussions with providers and state agencies to review current and future permitting needs in support of timely broadband deployments.
- Assisted in planning and executing the national digital inclusion conference, *NetInclusion*, in St Paul in May & the Blandin Conference, *Border to Border Broadband: Bridging the Gaps—Expanding the Impact*.
- Participated on the FCC's Broadband Deployment Advisory Commission (BDAC) through appointment by the FCC Chair to a BDAC work group.
- Hosted four informational webinars on the Minnesota broadband grant program.
- Conducted 23 site visits to review Border to Border grant projects in process.
- Met with 16 local groups to provide technical assistance on broadband issues, including the state grant program.
- Provided broadband availability analysis to 117 constituents.
- Worked with a provider on a pilot program to encourage participation in the federal Lifeline program on tribal lands.
- Continued our lead work with a multi-agency work group and the non-profit EducationSuperhighway to document and provide support in closing the K12 broadband connectivity gaps.
- Engaged with Minnesota Congressional staff and federal agencies on maximizing impacts of federal broadband programs in Minnesota.
- Provided support for 12 meetings of the Governor's Task Force on Broadband,
- Supported policy makers on broadband discussions throughout the legislative session.
- Continued the discussion with electric coops and how they might engage in the broadband discussion.
- Developed a new tool, a broadband availability by township map, to engage township supervisors in the discussion of how to improve broadband availability for their residents.

## Broadband Infrastructure Availability

OBD activities that support infrastructure development include the administration of the Minnesota Border-to-Border Broadband Development Grant program, monitoring and measuring consumer broadband availability, analyzing community anchor connectivity, and coordinating with federal programs to achieve maximum benefits for Minnesotans.

### Border-to-Border Development Grant Program

#### 2017 Grant Program Update

Four rounds of funding have been awarded to date, including \$20 million from the 2017 legislative appropriation.

#### Minnesota Border-to-Border Broadband Development Program by the Numbers

	2014	2015	2016	2017	Four Year Totals
Program Funding	\$20,000,000	\$10,588,000	\$35,000,000	\$20,000,000	\$85,588,000
Awards Made	\$18,670,337	\$11,008,366	\$29,040,894	\$26,475,556	\$85,195,153
Matching Dollars	\$23,107,806	\$18,233,661	\$34,247,588	\$34,247,588	\$110,620,686
<b>APPLICATIONS:</b>					
Applications:	40	44	57	70	211
Challenges Rec'd	33	47	44	49	173
<b>AWARDS:</b>					
Awards Made:	16	15	40	39	110
Households Served	6,100	3,222	14,557	9,973	33,852
Businesses Served	150	786	2,084	2,169	5,189
Institutions Served	83	90	67	60	300

Projects Awarded with 2017 Appropriation

2017 Awarded Projects	Grant Award
Acentek - Rushford Village/Rural Rushford Fiber Build	\$2,011,628
Advantenon - Rural Grant, Stevens and Wilkin Counties, MN	\$316,554
Albany - Two Rivers Area	\$616,743
Arvig - Pelican Rapids rural non-ACAM	\$633,642
Benton - Rice Ramey	\$765,015
BEVCOMM - Delavan SE Rural Project	\$220,350
BEVCOMM - Freeborn Southwest Rural Final	\$122,460
BEVCOMM - Granada Rural Final	\$202,410
Carlton County w/ Frontier - Phase I: Cromwell/Kettle River	\$569,058
CenturyLink - Fish Lake Township FTTH Project	\$1,833,724
CenturyLink - Fredenberg Township FTTH Project	\$1,809,312
Farmers - City of Watson and SW Lac Qui Parle County FTTP	\$760,501
Fond du Lac - Brookston Project	\$258,265
Garden Valley - Bejou	\$1,304,421
Gardonville - Douglas County: Country Estates FTTH Project	\$101,624
Gardonville - Douglas County: Pospisil Drive FTTH Project	\$54,155
Hanson - Minnewaska Area FTTP	\$4,996,791
Jaguar - Sand Creek Township Area Broadband Project	\$192,405
KMTelecom - Rural Kasson Fiber Build	\$606,108
Mediacom - Fountain 2018 Broadband Build	\$202,125
Mediacom - Medina 2018 Broadband Build	\$62,219
Midco - Annandale East	\$537,050
Midco - Wanamingo	\$768,600

MVTC - Milroy Broadband Project	\$742,365
NuTel - Hanska A&D FTTP	\$324,894
NuTel - White Rock Rural East FTTP	\$411,704
Otter Tail - Red Oak Drive	\$173,683
Palmer - Duelm Hwy 95	\$162,814
Palmer - Sherburne County Road 3	\$110,661
Paul Bunyan - North Central Fiber	\$802,620
SCI - Dell Grove Township Broadband Expansion	\$118,248
SCI - Shamrock Township Broadband Expansion	\$148,503
Sjoberg's - NW MN Rural Broadband	\$307,088
WCTA - Northern Todd County	\$902,695
WCTA - Wadena Rural Phase III	\$874,581
Wikstrom - Wikel NW MN Broadband	\$1,307,785
Winthrop - Cornish Township FTTP Project	\$365,895
Woodstock - Balaton FTTP	\$413,009
Woodstock - Pipestone County Wireless	\$363,851

A map showing the locations of the projects awarded in November 2017 is on the following page.

Office of Broadband Development Annual Report 2017





## Progress on Projects Awarded with 2014, 2015 and 2016 Appropriations

2014 and 2015: All projects have been constructed and closed out, with the exception of one 2015 project.

2016: Awards were announced in January 2017. Three projects have been completely constructed and closed out. The remaining 41 projects are in process and all are scheduled to complete no later than June 2019.

Stories on how these grant projects are benefiting residents in rural Minnesota are being relayed to the office: A Microsoft teleworker near Brainerd has gigabit access, reducing his travel by a third—which saves about \$2000/week and keeps the resident in town. Farmers in Sibley County are using fixed wireless solutions with fiber backhaul to support precision agriculture. KQAD Radio Station in Rock County saw their broadband bills go from \$2000 per month with a wireless connection to \$85 a month with fiber. Woodruff Marketing in Goodhue County does 90 percent of their business online with a fiber connection—the company has grown from one person in 2004 to 17 in 2017. Veldkamp Farms in Jasper uses fiber connections for surveillance and real-time automation of livestock care, reducing costs, improving productivity and enhancing communications with banks and buyers. Because the Big Lake police department was in proximity to a grant project, the provider was able to extend fiber to the police station, exponentially decreasing the time it took to upload body camera video to the cloud and transmitting documents to the county attorney.

## 2017 Broadband Projects to Note

The Border-to-Border grant program is technology and provider agnostic. For this reason there is the opportunity to fund different models and study them to see what works best for Minnesota customers and providers in the unique conditions found across the state. The Office has again funded programs in the 2017 round of awards that are worth noting and following:

***Advantenon Rural Grant, Stevens and Wilkins Counties:*** While the grant program has funded fixed wireless providers in the past, this will be the first project from a fixed wireless-only provider for last mile service. The office will be able to monitor subscriber take rates, the ability to serve all customers requesting service, customer satisfaction, and how the technology performs.

***Carlton County with Frontier:*** A project that pairs Frontier’s CAF II funding with a state grant to build service to speeds of at least 25Mbps download and 3Mbps upload. The project areas in Carlton County are so rural that Frontier indicated even with CAF II funding it may not have constructed service to these customers but for the state grant. Service levels will achieve the state’s 2022 broadband speed goal but not the 2026 goal.

***CenturyLink Fish Lake Township Project:*** Similar to last year’s project in Sunrise Township, this project will combine CenturyLink’s CAF II funding, bonding by the township, and the state grant to construct fiber to the home, easily surpassing the 2026 broadband speed goal. In this year’s application, CenturyLink is the applicant, not the township.

***Garden Valley Bejou and Fond du Lac Reservation Brookston Projects:*** Both projects will deploy gigabit speeds to tribal areas which have historically lagged behind in broadband availability.

***Mediacom Fountain and Midco Wanamingo:*** Examples of unserved towns (with only very low speed DSL service available) where the grant funding made it financially feasible for the cable company to enter the market and offer service at speeds that will easily exceed the 2026 broadband speed goal.

### ***Minnesota Valley Telephone Company's Milroy and West Central Telephone Association's Northern Todd***

**County Projects:** Both projects will deploy gigabit service exceeding the 2026 broadband speed goals to unserved areas that also include a significant number of low income households. Monitoring the take rates in this project will enable the office to analyze the impact of income on broadband subscription.

**Palmer Sherburne County 3:** This project in Sherburne County will make use of empty conduit the county placed during a recent county road reconstruction project, thus putting into practice the concept of "Dig Once."

**SCI Dell Grove Township:** A project in Pine County, by a new cable partner, that will deploy broadband service at speeds exceeding the 2026 goal to one of Minnesota's least served counties and one which has not previously had a grant application. This project will provide broadband service to the Audubon School of the North Woods, a non-profit environmental learning center.

### **Next Steps and Recommendations – Border to Border Grant Program**

Four years of implementing this grant has allowed policymakers to fine-tune the program so that it is directed toward reaching unserved and underserved areas of the state with quality broadband access while taking into consideration the needs and concerns of providers, communities and consumers.

Demand for the program, demonstrated through the number of applications submitted and additional new partners each year (9 in 2017), shows that interest in the program exceeds the resources available. The grant program has been funded year-to-year and is not part of the base funding for the Office of Broadband Development. Therefore, unless there is an additional appropriation in the 2018 session, the program will not be offered in 2018. Given the progress made towards the state statutory border to border broadband goals using these grant funds as incentive for private investment, it is the recommendation of this office that the legislature continue to fund this program.

## **Monitor and Measure – Minnesota Broadband Mapping Program**

### **Mapping Program Update**

2017 marked the third year of independent mapping of broadband access and speeds in Minnesota. This work continues to be performed through a new 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 the mapping activities comes from the administrative allowance of the Border-to-Border Broadband 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 available to all homes and business broadband service offering 100 Mbps download and 20 Mbps upload from at least one provider.

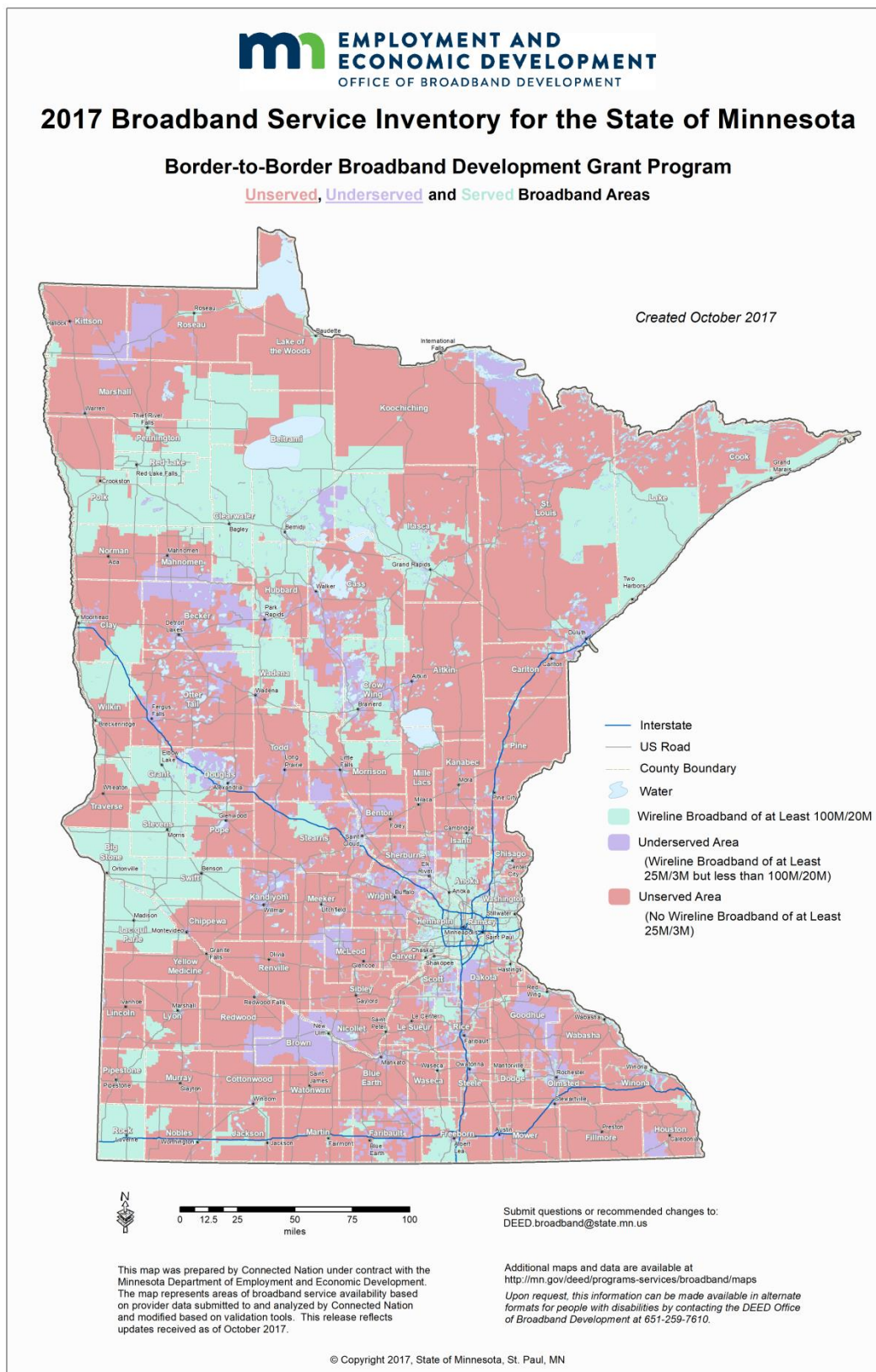
The most recent round of data collection shows that progress is being made towards these goals.

### Wireline Broadband Availability

	2015	2016	2017
Statewide 25/3 % of HH:	85.83% covered	87.53% covered	88.11% covered
# of HH without:	296,000 HH w/o	260,000 HH w/o	248,000 HH w/o
Non-metro 25/3 % of HH:	68.08% covered	72.03% covered	73.45% covered
# of HH without:	286,000 HH w/o	251,000 HH w/o	238,000 HH w/o
Statewide 100/20 % of HH:	39.14% covered	68.53% covered	70.04% covered
# of HH without:	1,270,000 HH w/o	657,000 HH w/o	625,000 HH w/o
Non-metro 100/20 % of HH:	40.68% covered	49.33% covered	52.88% covered
# of HH without:	532,000 HH w/o	455,000 HH w/o	423,000 HH w/o

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

Figure 2 - 2017 Map of Broadband Availability in Minnesota



The 2017 Broadband Service Inventory map reflects the statutory goal speeds of 25Mbps download by 3Mbps upload and 100Mbps download by 20Mbps upload. This map would also be used for preliminary screening for the Border-to-Border Broadband Grant program. Some of the state grant funded projects are beginning to be reflected on this map as construction completes (the Rock County and Big Stone County projects are large enough areas to be evident on the map). Additional state grant and federally funded CAF II projects will be reflected in the next mapping round, due to be published in April 2018.

### Township Heat Map

The township heat map was initially created in 2016 and has been updated in the 2017 data collection process. This configuration provides a clearer view of where the actual areas of unserved territory are located within each county.

Figure 3 - 2017 Township heat map of percentage Households served by broadband at state 2022 speed goal

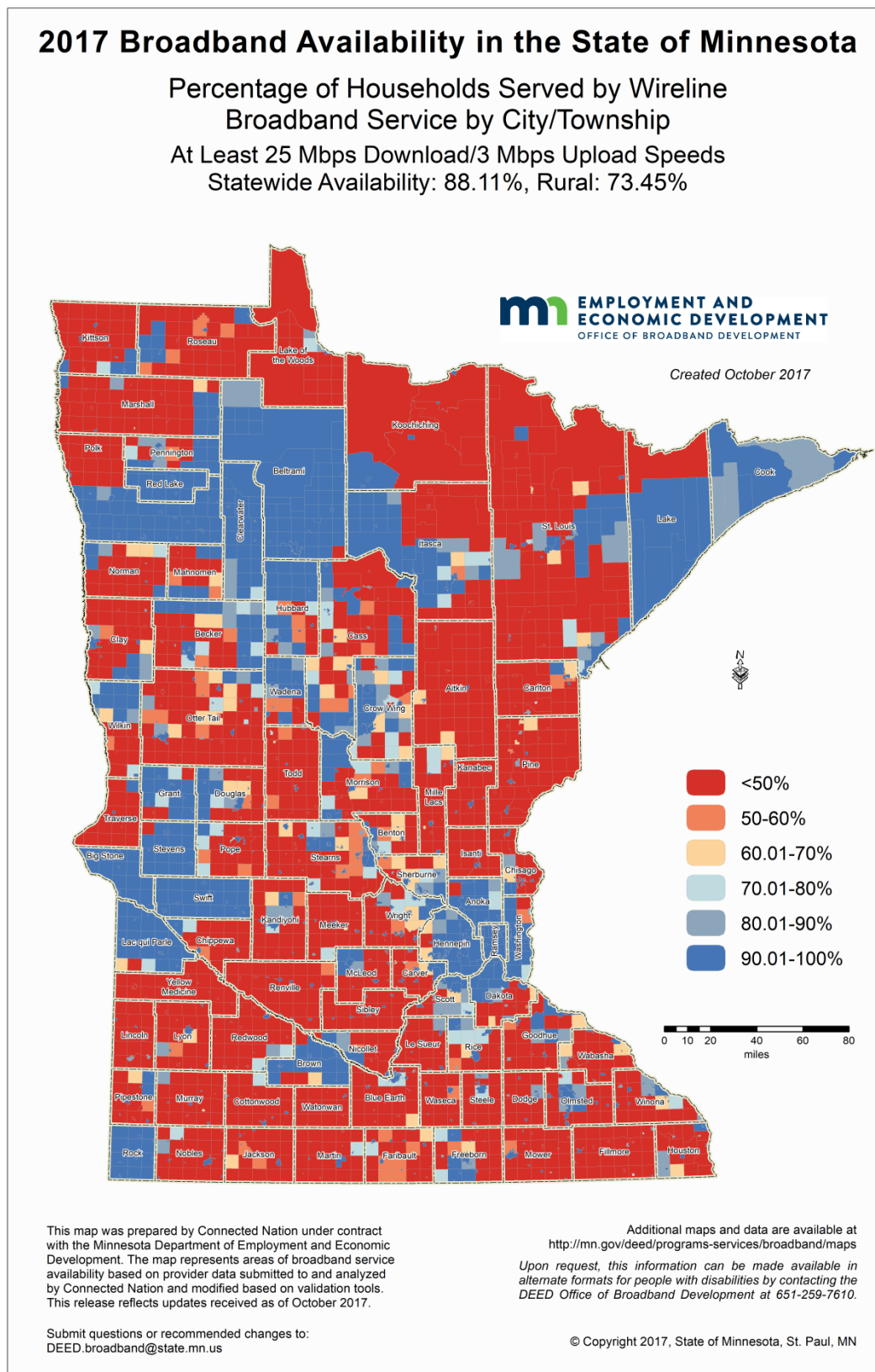
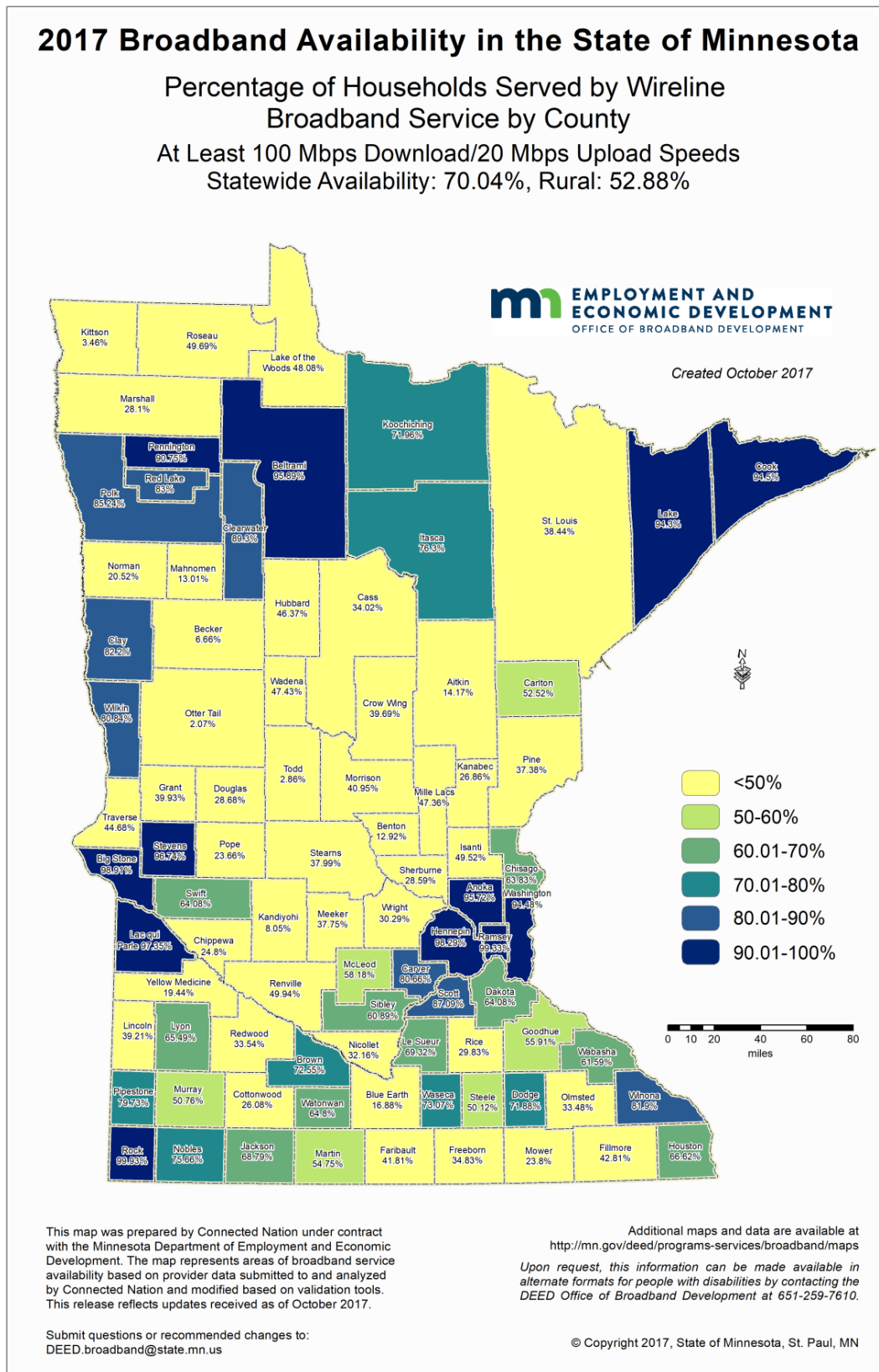




Figure 4 - County Heat Map of % HH Served at State Border to Border Broadband Speed Goal for 2026



As of 2017, 70.04% of households and businesses had access to service that meets or exceeds the state's speed goal for 2026, which is 100Mbps download by 20Mbps upload from at least one provider. When looking at just non-metro areas, that number drops to 52.88%. While the broadband grant program is largely focused on achieving the 2022 goal, investments made during current grant rounds are required to be scalable to deliver speeds at the 2026 goal. The office will continue to track this data and produce both a county and township level map of this information in 2018.

## Next Steps and Recommendations – Mapping

The mapping program was codified into law in 2016 via Minn. Stat. § [116J.397](#) and will therefore be continued on an annual basis as long as funding is provided. The office negotiated a new contract with the provider in 2017 and continues to work with the contractor, providers and citizens to produce the most accurate and detailed maps. The maps are used by all stakeholders, including the office, policymakers, constituents and providers; and different ways to show the data or add layers are constantly being considered. Wherever address level data is available, the maps are measurably more accurate than when that information is not available.

## Connectivity for Community Anchor Institutions

Another 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 other government facilities. The importance of measuring and analyzing community institution connectivity levels is twofold. Not only is high speed broadband particularly important for these organizations to function and deliver next generation services in rural areas, but they also act as anchor tenants in areas where networks may otherwise be financially difficult to sustain without them.

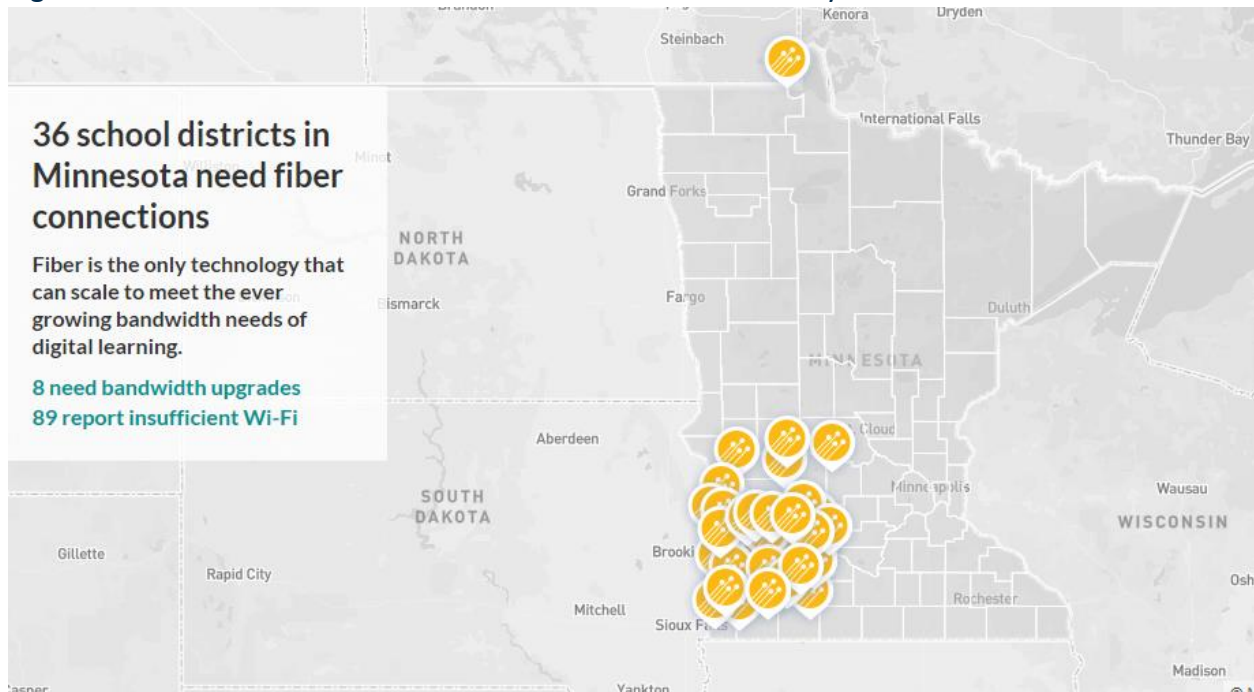
## K-12 Connectivity Update

Over the past year, the office has continued its work with the non-profit, EducationSuperhighway (ESH), to document K-12 public 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 schools in Minnesota and now links back to the connectivity data for the public schools. This fall, ESH began a concerted effort to review and acquire comparable data for Minnesota's charter schools.

Significant progress was found in the number of schools having fiber as their broadband connection, ensuring the ability to scale service to meet the increasing demand and in many cases access a lower cost per megabit for their connections. One area of the state, southwestern Minnesota, still relies to a large extent on fixed wireless to connect individual school buildings. A handful of other districts lack fiber access to one or more buildings. EducationSuperhighway's resources to identify solutions and assist in the E-Rate process are offered in these situations. The map below shows school districts without fiber connectivity.



Figure 5 - Minnesota School Districts Without Fiber Connectivity<sup>1</sup>



The office has also led the formation, with participation by the Governor’s Office, the Minnesota Department of Education, K-12 education consortia, the Minnesota School Boards Association and the Minnesota Superintendents Association along with ESH, of a work group to examine K-12 connectivity gaps and potential policy and program solutions.

In 2017, the work group encouraged legislation ([SF2237/HF2449](#)) that would have implemented a ten percent state contribution to attain an additional ten percent federal E-Rate match for special construction for fiber, but the effort was unsuccessful.

The work group also continues to encourage the Legislature to fully fund the Telecom Equity Aid fund, which helps overcome the geographic disparity in pricing that exists in providing broadband access to districts across the state.

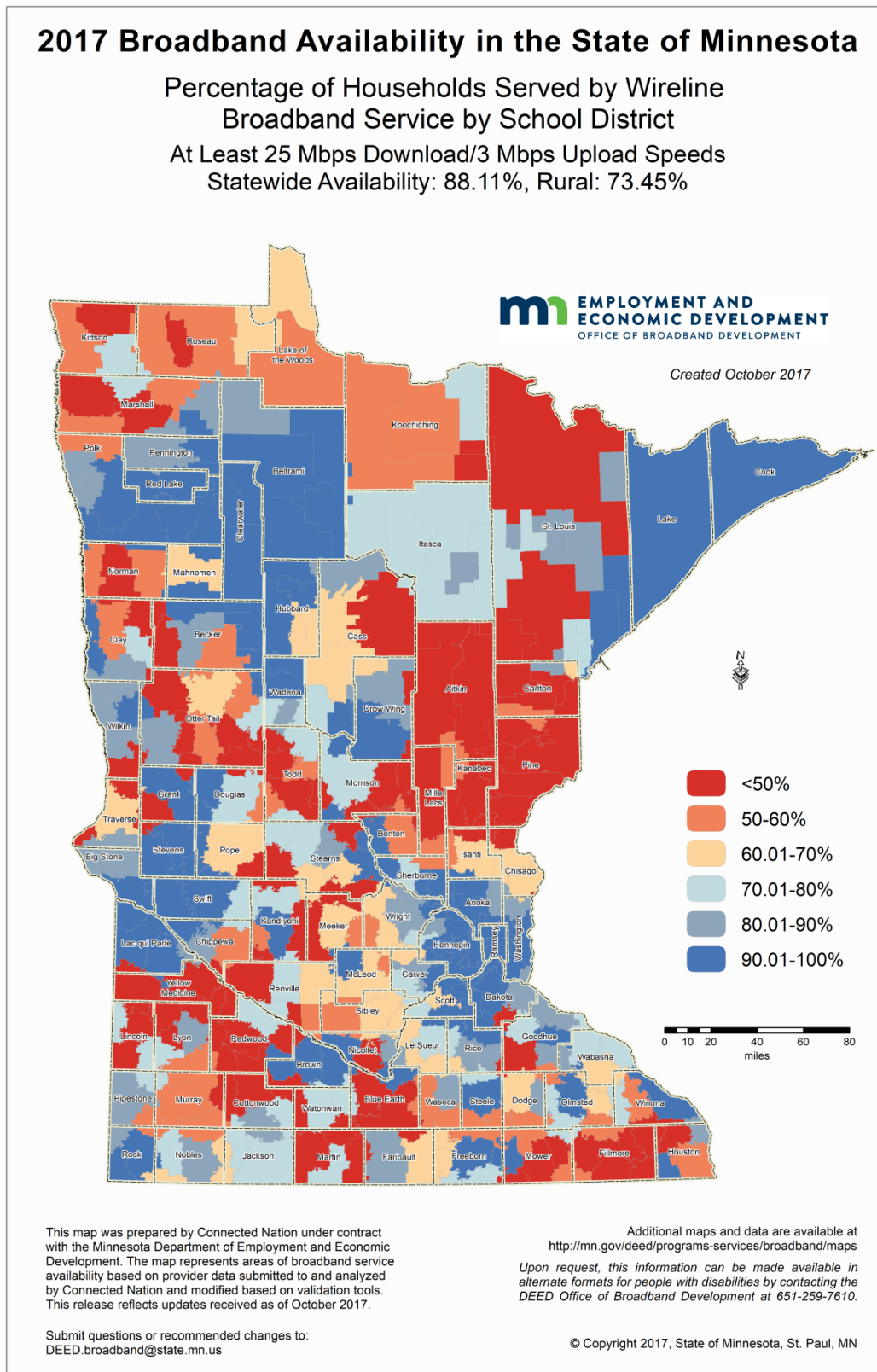
Monitoring K-12 connectivity levels will be an ongoing project. One K-12 school consortium in Minnesota has seen demand for bandwidth grow 40 to 50 percent per year, for the past several years. Once a school district has completed a 1:1 device initiative, and with all students and staff now generally having their own personal devices connecting, demand growth may decline to 25 to 40 percent per year—until the next high-use bandwidth application comes online.

---

<sup>1</sup> Adrian, ACGC, Canby, Cedar Mountain, Comfrey, Edgerton, Ellsworth, Fulda, Hendricks, Heron Lake-Okabena, Hills-Beaver Creek, Ivanhoe, Jackson County Central, Kerkhoven-Murdock-Sunburg, Lac qui Parle, Lake Benton, Luverne, Lynd, MACCRAY, Marshall, Milroy Elementary, Mountain Lake, Murray County Central, Pipestone, R-T-R, Red Rock Central, Redwood Area, Round Lake-Brewster, Sleepy Eye, Springfield, Tracy, Wabassa, Warroad, Westbrook-Walnut Grove, Windom and Worthington.

Separate from connectivity at school facilities is the issue of students having broadband service at home to complete assignments, make full use of 1:1 device initiatives, or to successfully implement an E-learning day as authorized in by Minn. Stat. §120A.414 passed in 2017. To assist school officials in understanding where their district stands in terms of broadband availability at the household level, 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.

Figure 6 - Heat Map of Percentage of HH Served at 2022 State Goal by School District



## Next Steps and Recommendations – K-12 Broadband

The K-12 Connect Forward steering group will continue to work with EducationSuperHighway to refine our understanding of the gaps and to recommend policy that would target these areas in need. The current effort to ensure that all districts are aware of, and making use of, federal E-Rate funding will also continue. The Office recommends the State continue to monitor K-12 connectivity, the associated costs, and to evaluate methods for increasing available speeds and lowering per megabit costs to districts.

## 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 [Minnesota Public Library Services, 2016](#), 260 library branches, or 73 percent, have fiber connectivity. About 95 branches are without fiber based service. Most public library locations have internet speeds above 20Mbps, with the greatest number of locations having service between 50 and 100Mbps as determined by self-conducted speed testing. 98% of public library locations offer free access to wireless internet service. 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.

### Public Safety

Focusing on Public Safety Answering Points or PSAPs, there are 104 PSAPs in Minnesota that each maintain two separate diverse connections to provide emergency fail-over capabilities during a provider network outage. Fifty-four PSAPs are connected using fiber for one of two diverse routes. The second diverse route is a T-1 copper facility. The 50 remaining PSAPs have T-1 connections for both diverse routes. The Department of Public Safety will be working with MN-IT to provision more fiber connectivity to PSAPs, especially in the Twin Cities metro area and southern Minnesota. The move to fiber lines will provide more available bandwidth and in most cases lower the per megabit cost of these connections.

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. 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.

### Rural Healthcare

The need for connectivity of healthcare institutions grew with the adoption of electronic health record 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. Currently, 100% of hospitals, 98 percent of clinics, 97 percent of local health departments, 97 percent of clinical labs and 69 percent of nursing homes had adopted electronic health record systems. E-prescribing is available to 97 percent of pharmacies, 89 percent of hospitals and 88 percent of clinics. In terms of information exchange, 69 percent of clinics are exchanging with unaffiliated hospitals and clinics, 72 percent of hospitals are exchanging with unaffiliated hospitals and clinics, and 56 percent of hospitals

are sending alerts to primary care practitioners. The ability to share patient records can greatly assist in proper diagnosis and treatment, whether the 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).<sup>2</sup>

In addition to using broadband connectivity to share health records, there are many examples of how telemedicine assists in rural healthcare. At the Essentia Health Sandstone-Pine Medical Center, neurologists in the Twin Cities are called upon to remotely diagnose patients suffering from strokes to secure the necessary, immediate treatment to minimize the effects of the stroke. Rural health facilities with one doctor or physician's assistant on duty can summon experts from regional medical facilities to assist with diagnosis and treatment. Patients needing treatment for wound care can travel to their local medical facility for remote office visits.

The federal government, as one of its Universal Service programs, does have funding available to assist rural health care providers to address their connectivity needs. The Rural Health Care Program, or RHC, receives funding of \$400 million annually 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. Since 2013, Minnesota health facilities have received over \$4.5 million in funding through RHC.

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

### Next Steps and Recommendations—Other Community Anchor Institutions

In the past, in awarding Border to Border Broadband grants, DEED has requested applicants to provide information on whether community anchor institutions would be served as part of the grant funded area. Additional points are awarded if that is the case. Should the Border to Border Broadband Infrastructure grant program again be funded in 2018, DEED would continue to recognize applications that would support connectivity to anchor institutions.

Where data sources can be found and validated, the office will work to incorporate connectivity type and speeds on the interactive broadband map. In the coming year, we will try to determine whether, at a minimum, library connectivity data collected by the Minnesota Department of Education can be added.

Initial analysis suggests that eligible rural healthcare facilities in Minnesota may be underutilizing federal Universal Service Fund Rural Healthcare Connect funding in comparison to neighboring states and national averages. Work will be done in 2018 to complete this analysis and look for ways to support eligible facilities in accessing these dollars.

## Coordinating Broadband Infrastructure Development with MNDOT

Recognizing the increased demand on MNDOT for permits to place facilities in highway rights of way due to investments related to the grant program, CAF II, and ACAM, the Office convened a group representing providers, MNDOT, and Business First Stop (including the DNR). Following several meetings where information was exchanged regarding the process and reasons for permitting delays, solutions were identified to resolve

---

<sup>2</sup> <http://www.health.state.mn.us/e-health/advcommittee/docs/ehealthac-prelimrecs-response.pdf>

issues and streamline the process. Discussions and information sharing are planned to continue as another construction season approaches.

Under Minn. Stat. §116J.391, the office is to collaborate with the Department of Transportation (MNDOT) and private entities to encourage and coordinate “Dig Once” efforts. The office has met several times with MNDOT to make progress in this area. MNDOT does post 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 the 2017 grant round, the office did award a grant to a private provider who will be deploying fiber in conduit laid by the county during a recent road construction project, so that will be a successful “Dig Once” initiative.

## Broadband and Tribal Outreach

The office engaged in tribal outreach for both broadband infrastructure and adoption. As noted in the highlights section, OBD worked with a provider offering fiber to the home broadband service on the Red Lake Indian Reservation to engage tribal leaders and use paper and social media to inform enrolled members of the federal discount of \$34.25 that can be used towards the monthly broadband subscription costs.

For broadband infrastructure outreach, the office used email to contact all IT and tribal leaders of each of the eleven tribes in Minnesota to inform them of the Border to Border Broadband Infrastructure grant program and to invite them to participate in one of the webinars on the program. The office talked by phone with representatives of three tribes regarding the program. The office also met with tribal liaisons from two agencies, MNDOT and Commerce. A concrete result of that outreach is that two of the Border to Border Broadband Infrastructure grant projects awarded will be used to deploy fiber to the home in tribal areas on the White Earth and Fond du Lac reservations.

## Broadband and Electric Coops

In some Midwestern states, electric coops are stepping up to provide broadband service in rural areas in conjunction with their deployment of smart grid. The office has seen some interest by Minnesota’s electric coops but not as great as in other states, perhaps because much of the rural area in Minnesota is dotted with service from rural independent telephone companies. In early 2017, a Border to Border Broadband Grant was awarded to Mille Lacs Energy Coop (MLEC) which is working to deploy broadband service to an area in Aitkin County in a partnership with Consolidated Telecommunications Company (CTC), a telephone coop. Arrowhead Electric (also in partnership with CTC) received an American Recovery and Reinvestment Act (ARRA) stimulus grant/load to deploy broadband service in Cook County and that system has been built out. Cooperative Light and Power, also on the North Shore, continues to provide fixed wireless service to areas in St. Louis County. The office continues to make its resources available to encourage electric cooperative participation in the deployment of broadband service.

## 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:

- In the 2017 grant awards, we will closely track deployment, costs, speeds achieved, take rates and customer satisfaction with two fixed wireless projects that will be deployed, one in Pipestone County and the other in portions of Grant, Stevens and Wilkins Counties.
- A second fixed wireless deployment, using white spaces, is gaining traction with the Microsoft announcement of trials it has scheduled. A few of our neighboring states will be hosting trials, and the office will work to secure a trial in Minnesota.
- Satellite has been an emerging technology for broadband access. Previous versions of satellite broadband have faced challenges meeting some customer expectations around technical capabilities, pricing and data caps. There is another generation of satellite technology scheduled to come to market in early 2018, and the office will monitor acceptance and capabilities of the new service.
- For 5G service, the standards are yet to be developed and finalized. 5G appears to be a service that will be offered in urban areas but not likely to be deployed in rural areas due to the short distance 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, all three branches of government have been active on broadband policy. 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, the Offices of U.S. Senator Amy Klobuchar and U.S. Senator Al Franken, as well as Minnesota’s congressional staff.

Specific federal activities OBD monitors or actively participates include:

### CAF II

The Connect America Fund 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. The Border to Border Broadband Infrastructure grant program takes 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.

CAF II recipients in Minnesota and the annual amount of funding and locations that they have committed to provide service of at least 10Mbps download and 1Mbps upload by 2020 are shown in the table below.



#### 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, are to have reached at least 40 percent of the eligible locations by the end of 2017. Locations served will be reported to USAC. Our office will monitor that information to the extent we are able with the information that is made public. The broadband mapping program should also 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 Minnesota's 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. Minnesota's small carriers are active nationally to advocate that the ACAM program be fully funded. The requirements of the ACAM program require the providers to deploy service at speeds of 25Mbps download/3Mbps upload to a majority of the eligible locations, with provisions for service to also be deployed at 10/1 or 4/1 for a minority of locations. The end date for this program is 2026.

#### Connect America Fund II – 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	20,993	33,455	\$21,559,568
Christensen Communications Co.	83	420	\$536,263
Hanson Communications	1,179	2,466	\$2,572,081



Company Name	Locations to be Served by 2026		Annual Funding Received (2017-2026)
	At Least 25/3	Total Locations	
Interstate Telecommunications Coop.	155	779	\$994,999
Larson Utilities	243	1,160	\$1,423,622
Mabel Coop. Tel. Co.	186	518	\$633,384
Northern Tel. Co./Wilderness Valley Tel. Co.	33	231	\$330,942
NU Telecom	3,414	7,913	\$6,118,567
Park Region Mutual Tel. Co.	2,735	4,351	\$3,092,315
Rural Communications Holding Co. (BEVCOMM)	2,784	6,035	\$4,433,893
Rothsay Telephone Co.	24	335	\$448,181
TDS	7,362	10,788	\$5,099,964
VNC Enterprises (Dunnell Telephone Co.)	36	302	\$274,969
Wikstrom Telephone Co.	997	6,587	\$6,782,806

As with CAF II, the Border to Border state grant program takes into consideration 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 should also capture the investments made with ACAM as these companies submit updated mapping and data information.

### Lifeline Reform

The FCC issued a decision in 2016 on reforms to its Lifeline program, which supports the purchase of telephone and broadband service by low income households. In that 2016 decision, broadband became a supported service, eligible for a monthly subsidy of \$9.25 and low income residents of tribal areas eligible for a subsidy of \$34.25. The FCC is again contemplating changes to the program, and the office will continue to monitor those changes before making additional decisions on how to promote the program for broadband adoption in Minnesota.

### E-Rate Reform

The FCC issued two significant orders in 2014 reforming the E-Rate program to include broader and additional support for broadband (including wireless) capacity. Through its work with EducationSuperHighway noted

above, the office has been monitoring and advising school districts on the status of meeting the goals established in those FCC orders and when districts are not taking advantage of this federal resource.

## Federal Legislation

Several pieces of legislation impacting broadband were introduced in 2017 but have failed to be passed into law to date. It is also anticipated that the Trump administration will be including broadband in the infrastructure package that is currently being discussed. The office will continue to monitor and make appropriate communications to the congressional delegation as opportunities arise.

## USAC

The office has been actively communicating with USAC regarding the four Universal Service programs that they administer. The office was specifically asked to provide feedback on the National Verifier that will be used to confirm eligibility for the Lifeline program and the HUBB (High cost Universal Broadband) portal and resulting public map that will report out the progress of broadband providers in meeting their commitments to deploy broadband service with CAF II, ACAM, rural broadband experiment, and high cost loop support.

## BDAC

The office has been actively participating on the Broadband Deployment and Advisory Committee (BDAC) Working Group on the Removal of State and Local Regulatory Barriers. BDAC and working group members were appointed by the FCC. The Working Group recommendations will be reviewed by the full BDAC in early 2018 and final recommendations referred to the FCC by the BDAC.

## 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.

Several states also award broadband grants: California, Colorado, Maine, Massachusetts, Nebraska, New Mexico, New York, North Carolina, Vermont, Virginia, West Virginia, and Wisconsin. The office has provided information on Minnesota's Border to Border broadband grant program to several additional states looking to craft a legislative program (Missouri, Virginia, Ohio, Kansas, Georgia, Rhode Island, and Tennessee).

## 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. The office is also a convener of state broadband office leaders and this group is used as a mechanism to share what is going on in states with an active broadband office.

## Economic Impact of Broadband

In addition to the examples from the Border to Border Broadband 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.

- The Minnesota Chamber of Commerce identified broadband infrastructure as a component necessary for businesses to compete and succeed and noted Minnesota needs to do more to build out broadband infrastructure in the state.<sup>3</sup>
- The economic gain to households greatly exceeds the costs of providing broadband service according to research by Roberto Gallardo at Purdue University.<sup>4</sup>
- The rural telecommunications industry has a positive impact on gross domestic product as reported by the Hudson Institute.<sup>5</sup>
- 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.<sup>6</sup>
- The Pew Research Center surveys found that the inability to find work or advance in one’s career is the greatest impediment for those lacking broadband access. The lack of broadband access also impacts the job search related skills of creating a resume, contact an employer via email, fill out a job application and find lists of available jobs in their area.<sup>7</sup>

## Next Steps on the Economic Impact of Broadband

The office is working on documenting economic impact in a more formalized process for the grant funded projects as they complete to measure economic gains. We hope to present the initial results of that work in the next annual report.

## Conclusion

2017 was a year of opportunities for continuing the expansion of advanced communications into rural areas. These opportunities came from implementing the Border to Border Grant Program as well as working with providers and communities to navigate through potential deployment barriers. The Office of Broadband Development at the Department of Employment and Economic Development believes the work it has performed and the results that have been tracked provide the legislature with a comprehensive view of the status of broadband in Minnesota. As evidenced by the information provided, additional investment is required to make progress towards the state’s 2022 and 2026 broadband speed goals and to increase adoption in specific population groups. Advances in the deployment and adoption of broadband will continue into 2018 and beyond. The office will work to assist in that growth and monitoring in the coming year.

---

<sup>3</sup> <http://www.mnchamber.com/benchmarks2018> at page 14.

<sup>4</sup> <http://www.dailyyonder.com/broadband-economic-benefits-invest-broadband-infrastructure-adoption/2017/08/07/20695/>

<sup>5</sup> <https://s3.amazonaws.com/media.hudson.org/files/publications/20160419KuttnerTheEconomicImpactofRuralBroadband.pdf>

<sup>6</sup> <https://internetinnovation.org/wp-content/uploads/MultiplierEffectBroadbandWhitepaper.pdf>

<sup>7</sup> <http://www.pewresearch.org/fact-tank/2015/12/28/lack-of-broadband-can-be-a-key-obstacle-especially-for-job-seekers/>