January 3, 2018

Annual Report

2017

This document contains the Task Force's 2017 Annual Report with recommendations for policy makers and stakeholders to consider in the 2018 legislative session.

Governor's Task Force on Broadband

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Dear Governor Dayton,

Thanks to your leadership and that of the Legislature, the issue of statewide broadband availability has received growing attention over the years since you established your first Task Force on Broadband in 2011. And because of your leadership and the Legislature's commitment to this issue, we can report progress is being made toward connecting every Minnesotan with broadband. Today, more than 88 percent of Minnesota households have access to broadband at the state speed goals of 25 megabits per second (Mbps) download and 3 Mbps upload.

This Task Force on Broadband has presented you and the Legislature with a report of our work and policy recommendations to consider. Although this report is our final report to you and this Legislature that can produce measurable bipartisan legislative action on the critical issue of broadband, the content and many of the recommendations contained in past reports are just as relevant and important now as they were when the reports were written.

Of paramount importance, and a focus of this year's report, is Minnesota's Border-to-Border Broadband Development Grant Program and the Office of Broadband Development. The grant program, in its first four years, leveraged $110 million in matching local and/or private investments, making service available to more than 34,000 households and 5,200 businesses across Minnesota.

With 26.55 percent of households in rural Minnesota lacking access to broadband at the state speed goals of 25 Mbps download and 3 Mbps upload, demand for this program continues to outpace its funding. The Office of Broadband Development received 70 grant applications, with requests totaling more than $50 million, all competing for $20 million in funding allocated to the grant program in 2017.

Administration of the grant program would not be possible without the Office of Broadband Development. The Office of Broadband Development does not only administer the grant program, it is also responsible for carrying out 27 statutory obligations, including those related to measuring and mapping broadband, broadband adoption and use, and providing support to this Task Force.

Due to the importance of the Border-to-Border Broadband Development Grant Program and the Office of Broadband Development, this report focuses on those two aspects—and provides recommendations related to them. On-going, biennial funding of the grant program is critical for helping communities and broadband providers make the long-term, strategic investments necessary to connect more Minnesotans with broadband. Likewise, fully funding the Office of Broadband Development is critical to the administration of the grant program, and to carrying out the office's statutory obligations.

Expanding access to broadband has not and should not become a partisan issue; all Minnesotans, regardless of political affiliation, need access to broadband. We are confident that with broad, bipartisan leadership from you and the Legislature, Minnesota will continue to make great strides in expanding broadband access throughout the state.

Sincerely,

Margaret Anderson Kelliher

Margaret Anderson Kelliher
Chair, Governor's Task Force on Broadband

Members of the Governor's Task Force on Broadband

Margaret Anderson Kelliher (Chair), Minnesota High Tech Association

Hannah Buckland, Leech Lake Tribal College

Denise Dittrich, Minnesota School Boards Association

Kevin Hansen, Thomson Reuters

Shannon Heim, Moss & Barnett

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Steve Lewsader, Communications Workers of America

Neela Mollgaard, Red Wing Ignite

Donald Niles, City of Wadena

Jody Reisch, Rock County

Daniel Richter, MVTV Wireless

Andrew Schriner, CenturyLink

Richard Sjoberg, Sjoberg's Cable

Paul Weirtz, AT&T

Executive Summary
In 2011, Minnesota Governor Mark Dayton signed Executive Order 11-27 (**Executive Order 11-27**) establishing his first Governor's Task Force on Broadband. The current Task Force is the second under Governor Dayton, and was appointed in 2015. Fifteen members, representing a variety of backgrounds, serve on the Task Force which is charged with developing, implementing, and promoting state policy, planning and initiatives to achieve state broadband needs and goals.

This report highlights the work of the Task Force in 2017 and makes policy recommendations to the Governor and Legislature. This report is also the last report to Governor Dayton and this Legislature. Over the last six years, the Task Force on Broadband has studied issues related to broadband affordability, adoption, and accessibility, and has made recommendations to remove barriers to broadband deployment and modernize Minnesota's telecommunications regulatory framework.

The Task Force has also consistently recommended funding Minnesota's Border-to-Border Broadband Development Grant Program. This program has leveraged state and private investment to provide broadband service to thousands of households and businesses across Minnesota, connecting unserved and underserved areas of the state.

Following the recommendations of the 2015 Task Force on Broadband, the Legislature updated Minnesota's broadband speed goals in 2016. The updated speed goals, which reflect the growing demand for broadband Internet and the Federal Communication Commission's updated definition of broadband, are found in Minn. Stat. §237.012:

> It is a state goal that (1) no later than 2022, all Minnesota businesses and homes have access to high-speed broadband that provides minimum download speeds of at least 25 megabits per second and minimum upload speeds of at least three megabits per second; and (2) no later than 2026, all Minnesota businesses and homes have access to at least one provider of broadband with download speeds of at least 100 megabits per second and upload speeds of at least 20 megabits per second.

As reported by Connected Nation in October 2017, 88.11 percent of Minnesota households have wireline broadband access available at a speed of at least 25 megabits per second (Mbps) download and 3 Mbps upload (25 Mbps/3 Mbps), while 73.45 percent of rural Minnesota households have a wired broadband connection that meets these speeds. Nearly 70 percent (70.04 percent) of Minnesota households have wireline speeds of 100 Mbps/20 Mbps. In rural areas of Minnesota, 52.88 percent of households have access to these speeds. As Minnesota strives to meet its updated broadband speed goals, much work remains.

This report contains two recommendations to the Governor and the Legislature:

- Provide $71.48 million in on-going biennial funding for the Border-to-Border Broadband Development Grant Program, until the state achieves its broadband speed goals.[1]

- Provide the Office of Broadband Development with $500,000 on-going biennial funding and maintain the existing partnership with the Minnesota Department of Commerce, until the state achieves its broadband speed goals.[2]

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[1] More details on this recommendation can be found on pages 17 and 18.

Continued, on-going funding for the grant program is important because it helps mitigate the cost and risk for providers and the communities with which they may partner. This, in turn, provides communities and broadband providers with certainty, so they can make the informed, strategic investments necessary to expand broadband into the most difficult to reach areas of Minnesota.

Providing the grant program with $71.48 million in on-going, biennial (or $35,741,000 in annual) funding over the next four years will provide broadband Internet at speeds of 25 Mbps/3 Mbps to the 252,000 households that currently lack such service—and help Minnesota achieve its statutory broadband speed goal of connecting all Minnesotans with broadband Internet at speeds of 25 Mbps/3 Mbps by 2022.

In addition to administering the state's Border-to-Border Broadband Development Grant Program, the Office of Broadband Development is tasked with a number of other responsibilities, each of which plays an important role in helping the state achieve its broadband speed goals. That's why funding the Office of Broadband Development, on an on-going basis, and maintaining its partnership with the Department of Commerce is so important.

The report begins with a brief historical overview of the Governor's Task Force on Broadband, followed by discussion of the state's Border-to-Border Broadband Development Grant Program and the Office of Broadband Development.

Introduction
Throughout the course of 2017, the Governor's Task Force on Broadband heard from a number of stakeholders, experts and those impacted by broadband or the lack thereof. Broadband is more important today than ever before, and will play an increasingly important role in the lives of Minnesotans in the years and decades to come. With the advent of telemedicine, the promise of driverless and connected vehicles, and the future of next-generation wireless technology, devices that depend on a broadband connection are changing the ways we interact with each other and our (built) environment.

Transportation systems, emergency communications systems and emergency response systems, for example, are rapidly becoming more dependent upon telecommunications infrastructure. Continued funding to deploy broadband infrastructure is key to assuring the viability of these systems as a matter of public safety and to drive economic growth and stability.

New technologies in the area of transportation are swiftly emerging with numerous tests and trial deployments occurring in the United States. These new technologies include various forms of vehicle-to-vehicle communications, self-driving autonomous vehicles, and smart highway systems to control traffic and directly interact with vehicles.[3] "[N]early every major car manufacturer has set a deadline of producing autonomous cars by 2021, with China's Baidu aiming for 2019 and Tesla aiming for the end of 2017."[4]

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[2] More details on this recommendation can be found on page 21.
[3] See "Federal Automated Vehicles Policy – Accelerating the Next Revolution in Roadway Safety," at 9-10, National Highway Traffic Safety Administration (Sept. 2016) (found at: http://www.safetyresearch.net/Library/Federal_Automated_Vehicles_Policy.pdf).
[4] "Autonomous Vehicles – A Policy Preparation Guide," at 2, National League of Cities Center for City Solutions (2017) (found at: http://www.nlc.org/sites/default/files/2017-04/NLC%20AV%20Policy%20Prep%20Guide.pdf).

Emergency communications and response systems are rapidly evolving to meet the critical needs of public safety and obtain the advantages of better and more secure technologies. Next Generation 911, for example, will include features such as text to 911; 911 video; vehicle sensor data transmission to 911; and interoperability of emergency networks. The decision announced on October 4, 2017 that Minnesota will participate in the FirstNet plan to deliver secure, dedicated wireless network services to Minnesota's public safety providers is a positive example of support of these new technologies.[5]

Broadband has also become a cornerstone utility in healthcare. Every-day and every-minute functions in hospitals, clinics, labs and medical provider offices are intricately reliant upon reliable, high speed broadband. Life-changing examples of broadband's importance to modern healthcare delivery include:

- Ambulances use broadband to send cardiac tracings from the ambulance to the hospital in advance of arrival;
- Stroke patients receive time-critical evaluations in rural emergency rooms from metro sub-specialists using CT scans sent via broadband;
- Electronic medical records are shared instantly with any health care entity;
- Patients use broadband to communicate with health care providers;
- Telemedicine uses broadband to enable visits to the home;
- Broadband allows doctors to more quickly and accurately research symptoms and identify treatment options; and
- Broadband helps connect scarce medical specialty and training providers across the state.

The deployment of broadband technologies continues to exponentially expand in health care as in other areas. Broadband technologies are being used in combatting the current opioid crisis. Essentia Health in Duluth, for example, is using broadband to supplement in-person patient visits with remote teleconference visits with clinical pharmacists in tapering opioid dosing. Telemedicine and remote prescribing to combat the opioid crisis will continue to expand as a result of the recent declaration of the opioid crisis as a national emergency.[6]

Leveraging the benefits of these technologies, however, requires a robust connection to the Internet. And while many Minnesotans already have a broadband connection, 12.06 percent of Minnesota households (252,000 households) lack access to broadband at the state's speed goals of at least 25 megabits per second (Mbps) download and 3 Mbps upload (25 Mbps/3 Mbps). Without access to broadband, these households have limited or no access to telemedicine (a service that is particularly important for residents of rural Minnesota), online curriculum for school or training, or online job search tools and job applications. Businesses without access to broadband lack a crucial connection necessary to compete in a global, 21st Century economy.

The benefits of broadband are not new, and have in fact been discussed in previous reports by the Governor's Task Force on Broadband. We encourage readers to consult past reports for more

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[5] "Minnesota to Transform Communications for Public Safety: Governor Dayton Approves Buildout Plan for First Responder Network," (Oct. 4, 2017) (found at: www.firstnet.gov/news/minnesota-transform-communications-public-safety).

[6] L. Schmitz Mazur, R. Marcus & M. Jackson, "The Opioid Crisis: Declaring a National Emergency and the Effect on Remote Prescribing through Telemedicine," (Oct. 20, 2017) (found at www.ofdigitalinterest.com/2017/10/the-opioid-crisis-declaring-a-national-emergency-and-the-effect-on-remote-prescribing-through-telemedicine/).

details on the associated benefits of broadband.[7] The intent here is to highlight Minnesota's Border-to-Border Broadband Development Grant Program, along with the recommendations of the Task Force. Appendix B contains letters from various stakeholders, including a letter from a group of 24 organizations representing many rural interests that expresses support for on-going funding of the grant program and the Office of Broadband Development, but raises some concerns, including with the current challenge process.

Overview of Governor's Task Force on Broadband
In 2011, Minnesota Governor Mark Dayton signed Executive Order 11-27 (**Executive Order 11-27**) establishing his first Governor's Task Force on Broadband. Fifteen members, representing a variety of backgrounds, serve on the Task Force which is charged with developing, implementing, and promoting state policy, planning and initiatives to achieve state broadband needs and goals. This Task Force—Governor Dayton's second—was appointed in 2015 and will serve through 2018.

Throughout each year, the Task Force hears presentations from various stakeholders interested in broadband, tours facilities and organizations that use broadband, and assembles the annual report to the Legislature and Governor Dayton. In 2013 the Task Force recognized the importance of having an office to help promote the expansion and adoption of broadband throughout Minnesota, and a dedicated fund to match private investment in broadband, successfully advocating for the creation of the Office of Broadband Development and establishment and funding of the Border-to-Border Broadband Development Grant Program.

These represent two key advocacy successes of the Governor's Task Force on Broadband. The Task Force has also helped advocate for funding for Telecommunications Access Equity Aid, E-Rate and Regional Library Telecommunications Aid, one-to-one devices in the classroom, the establishment of a cybersecurity legislative commission, along with other policy and funding recommendations. These recommendations, and more, are contained in past reports.

This report is our final report to this Legislature and Governor that can produce measurable bipartisan legislative action on the critical issue of broadband.

Overview of Border-to-Border Broadband Development Grant Program
The Border-to-Border Broadband Development Grant Program, created by the Legislature in 2014 and initially funded at $20 million, provides funding to build the state's broadband infrastructure and promote broadband access in unserved and underserved areas of the state, where "unserved" and "underserved" are defined in Minn. Stat. §116J.394(h) and Minn. Stat. §116J.394(i), respectively:

> (h) "Underserved areas" means areas of Minnesota in which households or businesses lack access to wire-line broadband service at speeds of at least 100 megabits per second download and at least 20 megabits per second upload.
> (i) "Unserved areas" means areas of Minnesota in which households or businesses lack access to wire-line broadband service, as defined in section 116J.39.

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[7] For past reports from the Governor's Task Force on Broadband, visit https://mn.gov/deed/programs-services/broadband/task-force/.

The grants provide up to a dollar-for-dollar match on funds, not to exceed $5 million for any one project, and are distributed to qualified entities, including a(n)[8]:

1. Incorporated business or a partnership;
2. Political subdivision;
3. Indian tribe;
4. Minnesota nonprofit organization organized under chapter 317A;
5. Minnesota cooperative association organized under chapter 308A or 308B; and
6. Minnesota limited liability corporation organized under chapter 322B for the purpose of expanding broadband access.

The Border-to-Border Broadband Development Grant Program has now been funded for four consecutive years, with grants distributed during 2015 (two rounds), 2016, and 2017. The Office of Broadband Development reviewed 70 grant applications, with requests totaling more than $50 million, all competing for $20 million in funding allocated to the grant program in 2017. In November 2017, the office announced $26.47 million in funding for 39 projects across the state (approximately $6 million of which was carried over from the previous grant years), which will bring broadband service to 9,973 households, 2,169 businesses and 60 community institutions across Minnesota.

In addition to updating the state's broadband speed goals and the state's definitions of unserved and underserved with respect to broadband availability, the 2016 Legislature added a formal challenge process to the grant program.[9] This process allows an existing broadband provider to challenge an application if the proposed broadband deployment overlaps on the existing provider's territory or if the proposed area is one that an existing provider plans to build to within 18 months of the award announcement.

The State Speed Goals and the Grant Program
In 2016, the Legislature updated Minnesota's broadband speed goals (Minn. Stat. §237.012):

> It is a state goal that (1) no later than 2022, all Minnesota businesses and homes have access to high-speed broadband that provides minimum download speeds of at least 25 megabits per second and minimum upload speeds of at least three megabits per second; and (2) no later than 2026, all Minnesota businesses and homes have access to at least one provider of broadband with download speeds of at least 100 megabits per second and upload speeds of at least 20 megabits per second.

The Border-to-Border Broadband Development Grant Program provides matching funds to an eligible applicant that agrees to provide broadband service to unserved areas (i.e. areas that do not have access to wireline speeds of 25 Mbps/3 Mbps) and underserved areas (i.e. areas that do not have access to wireline speeds of 100 Mbps/20 Mbps) of the state. The grant program is helping connect unserved and underserved areas of the state, but more work remains to help close the broadband availability gap.

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[8] In some cases, applicants commit more than 50 percent of the total cost of the project to further leverage state funds.
[9] The Office of Broadband Development provides a summary of the challenge process and procedures: https://mn.gov/deed/assets/grant-challenge-process-2016_tcm1045-257998.pdf.

Historical Estimate of Wireline Broadband Service Availability in the State of Minnesota

Date	10 Mbps/5 Mbps	25Mbps/3 Mbps	100 Mbps/20 Mbps	1 Gbps/1 Gbps
February 2015	86.46%	85.83%	39.14%	4.33%
July 2016	87.54%	87.72%	68.45%	14.00%
October 2016	87.38%	87.53%	68.53%	14.28%
April 2017	87.02%	87.94%	69.86%	16.93%
October 2017	87.24%	88.11%	70.07%	17.10%

Statewide, 88.11 percent of households have access to broadband at speeds of 25 Mbps/3 Mbps, while 70.07 percent of households have access to broadband at speeds of 100 Mbps/20 Mbps, as reported by Connected Nation in October 2017. In other words, 11.89 percent of Minnesota households are unserved (down from 12.64 percent in October 2016), while 29.93 percent of Minnesota households are underserved (down from 30.14 percent in October 2016).

Historical Estimate of Wireline Broadband Service Availability in Rural Areas of Minnesota

Date	10 Mbps/5 Mbps	25Mbps/3 Mbps	100 Mbps/20 Mbps	1 Gbps/1 Gbps
February 2015	69.55%	68.08%	40.68%	5.81%
July 2016	71.86%	72.24%	48.93%	11.39%
October 2016	71.69%	72.03%	49.33%	12.03%
April 2017	70.99%	73.07%	52.46%	14.24%
October 2017	71.43%	73.45%	52.88%	14.62%

Examining households in rural Minnesota yields a different picture.[10] A smaller share of households in rural Minnesota—73.45 percent—have access to broadband at speeds of 25 Mbps/3Mbps, while 52.88 percent of rural Minnesota households have access to broadband at speeds of 100 Mbps/20 Mbps, as reported by Connected Nation in October 2017. Within Minnesota, 26.55 percent of rural households are unserved (down from 27.97 percent in October 2016), and 47.12 percent of rural households are underserved (down from 50.67 percent in October 2016).

Despite the challenges that continue to face Minnesota, particularly rural Minnesota, the state continues to make progress toward connecting households with broadband. Since 2014, and including the $20 million allocated in 2017, the grant program has received $85 million in funding, which has leveraged $110 million in matching local and/or private investments, making service available to nearly 34,000 households and 5,200 businesses, along with 300 community institutions.

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[10] The Office of Broadband Development uses the National Telecommunications & Information Administration's definition of "rural area." A rural area is "any area, as confirmed by the latest decennial census of the Bureau of the Census, which is not located within: (i) a city, town, or incorporated area that has a population of greater than 20,000 inhabitants; or (ii) an urbanized area contiguous and adjacent to a city or town that has a population of greater than 50,000 inhabitants. For purposes of the definition of rural area, an urbanized area means a densely populated territory as defined in the latest decennial census of the U.S. Census Bureau." (Federal Register, Vol. 74, No. 129, Wednesday, July 8, 2009, page 5, https://www.ntia.doc.gov/files/ntia/publications/fr_broadbandmappingnofa_090708.pdf).

The maps on the following four pages illustrate[11]:

1. Which areas of the state are unserved, underserved and served;
2. The percentage of households served by wireline broadband service by county at speeds of 25 Mbps/3 Mbps;
3. The percentage of households served by wireline broadband service by county at speeds of 100 Mbps/20 Mbps;
4. The percentage of households served by wireline broadband service by township at speeds of 25 Mbps/3 Mbps; and
5. The percentage of households served by wireline broadband service by school district at speeds of 25 Mbps/3 Mbps.
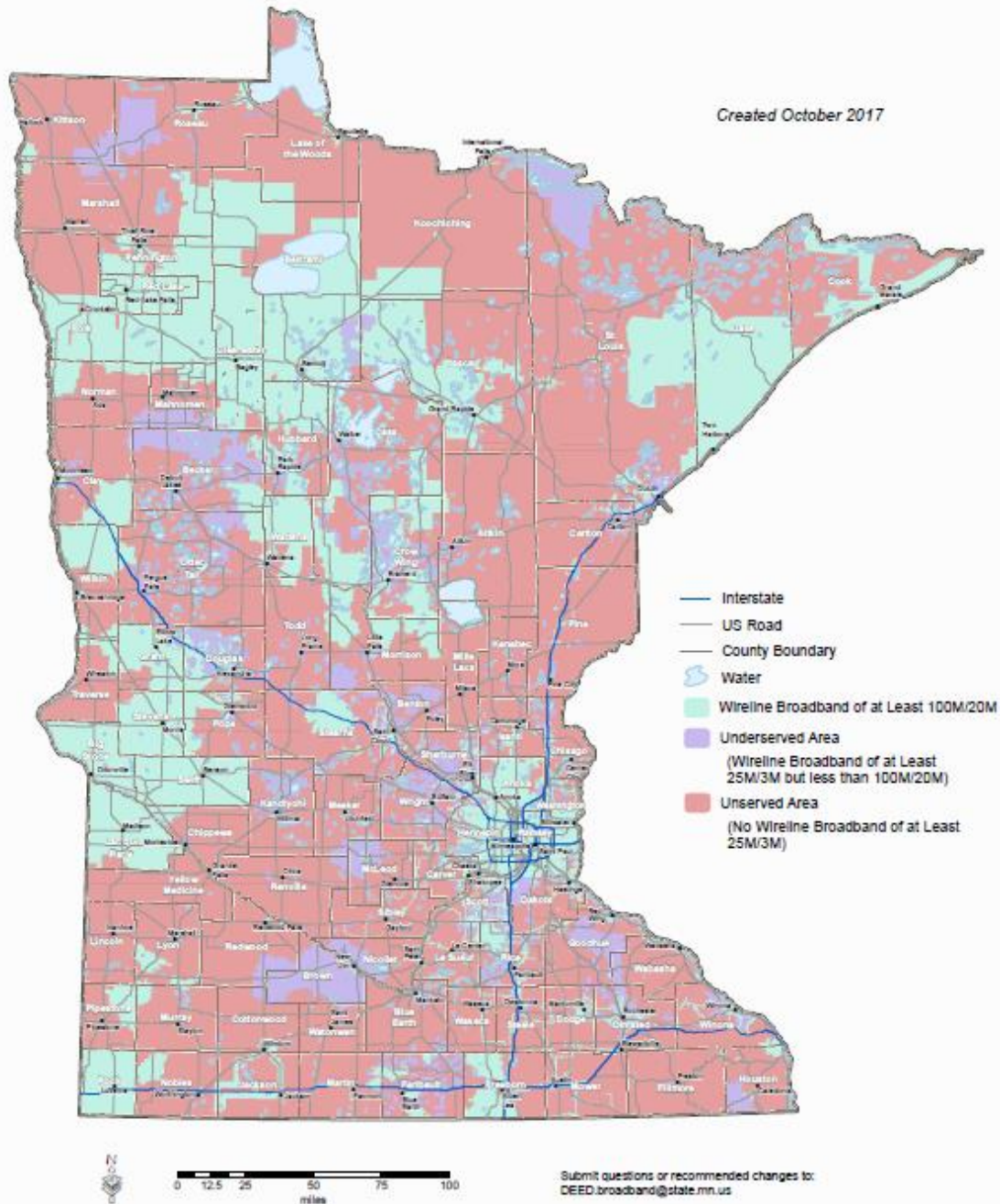
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[11] Additional maps can be found at: https://mn.gov/deed/programs-services/broadband/maps/general-maps.jsp.

2017 Broadband Service Inventory for the State of Minnesota

Border-to-Border Broadband Development Grant Program

Unserved, Underserved and Served Broadband Areas

Created October 2017

Legend:

— Interstate
— US Road
— County Boundary
Water
Wireline Broadband of at Least 100M/20M
Underserved Area
(Wireline Broadband of at Least 25M/3M but less than 100M/20M)
Unserved Area
(No Wireline Broadband of at Least 25M/3M)

N

0   12.5   25   50   75   100
miles

Submit questions or recommended changes to:
DEED.broadband@state.mn.us

Additional maps and data are available at
http://mn.gov/deed/programs-services/broadband/maps
Upon request, this information can be made available in alternate
formats for people with disabilities by contacting the DEED Office
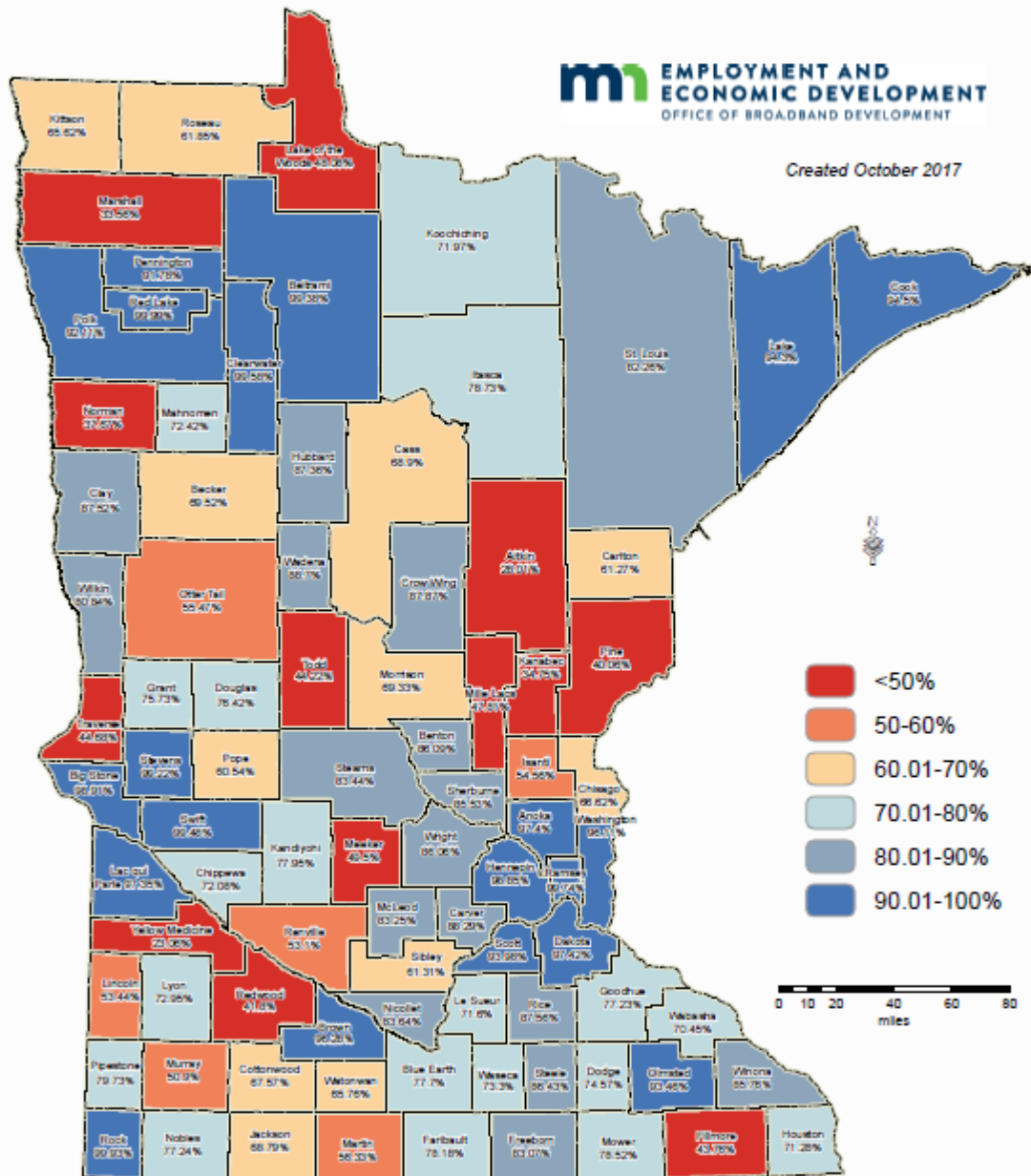of Broadband Development at 651-259-7610.

This map was prepared by Connected Nation under contract with the
Minnesota Department of Employment and Economic Development.
The map represents areas of broadband service availability based
on provider data submitted to and analyzed by Connected Nation
and modified based on validation tools. This release reflects
updates received as of October 2017.

County Map

Percentage of Households Served by Wireline Broadband Service of at Least 25 Mbps Download/3 Mbps Upload Speeds
Statewide Availability: 88.11%, Rural: 73.45%

County Map

Percentage of Households Served by Wireline Broadband Service
of at Least 100 Mbps Download/20 Mbps Upload Speeds
Statewide Availability: 70.04%, Rural: 52.88%

EMPLOYMENT AND
ECONOMIC DEVELOPMENT
OFFICE OF BROADBAND DEVELOPMENT

Created October 2017

Kittson 3.46%
Roseau 49.69%
Lake of the Woods 46.06%
Marshall 28.1%
Pennington 63.76%
Red Lake 64%
Polk 65.24%
Koochiching 71.08%
Beltrami 94.20%
St. Louis 38.44%
Cook 94.5%
Clearwater 69.5%
Norman 20.52%
Mahnomen 13.01%
Hubbard 46.37%
Cass 34.02%
Itasca 78.9%
Lake 86.4%
Becker 6.88%
Clay 82.2%
Wadena 47.43%
Crow Wing 39.69%
Aitkin 14.17%
Carlton 52.52%
Wilkin 57.94%
Otter Tail 2.07%
Kanabec 26.86%
Pine 37.38%
Grant 39.93%
Douglas 28.88%
Todd 2.86%
Morrison 40.95%
Mille Lacs 47.36%
Traverse 44.88%
Pope 23.66%
Stearns 37.99%
Benton 12.92%
Isanti 49.52%
Stevens 64.48%
Big Stone 56.61%
Sherburne 28.59%
Chisago 63.83%
Swift 64.08%
Kandiyohi 8.05%
Meeker 37.75%
Wright 30.29%
Anoka 84.12%
Washington 84.46%
Lac qui Parle 57.35%
Chippewa 24.8%
Hennepin 95.53%
Ramsey 95.03%
Yellow Medicine 19.44%
Renville 49.94%
McLeod 56.18%
Carver 80.66%
Scott 87.59%
Dakota 64.08%
Sibley 60.89%
Lincoln 39.21%
Lyon 55.49%
Redwood 33.54%
Nicollet 32.16%
Le Sueur 69.32%
Rice 29.83%
Goodhue 55.91%
Wabasha 61.50%
Brown 13.66%
Pipestone 70.73%
Murray 50.76%
Cottonwood 26.06%
Watonwan 54.6%
Blue Earth 16.88%
Waseca 57.07%
Steele 50.12%
Dodge 71.66%
Olmsted 33.48%
Winona 81.4%
Rock 69.09%
Nobles 75.56%
Jackson 68.79%
Martin 54.75%
Faribault 41.81%
Freeborn 34.83%
Mower 23.8%
Fillmore 42.81%
Houston 66.52%

N

Legend
- <50%
- 50-60%
- 60.01-70%
- 70.01-80%
- 80.01-90%
- 90.01-100%

0 10 20   40   60   80
miles

This map was prepared by Connected Nation under contract
with the Minnesota Department of Employment and Economic
Development. The map represents areas of broadband service
availability based on provider data submitted to and analyzed
by Connected Nation and modified based on validation tools.
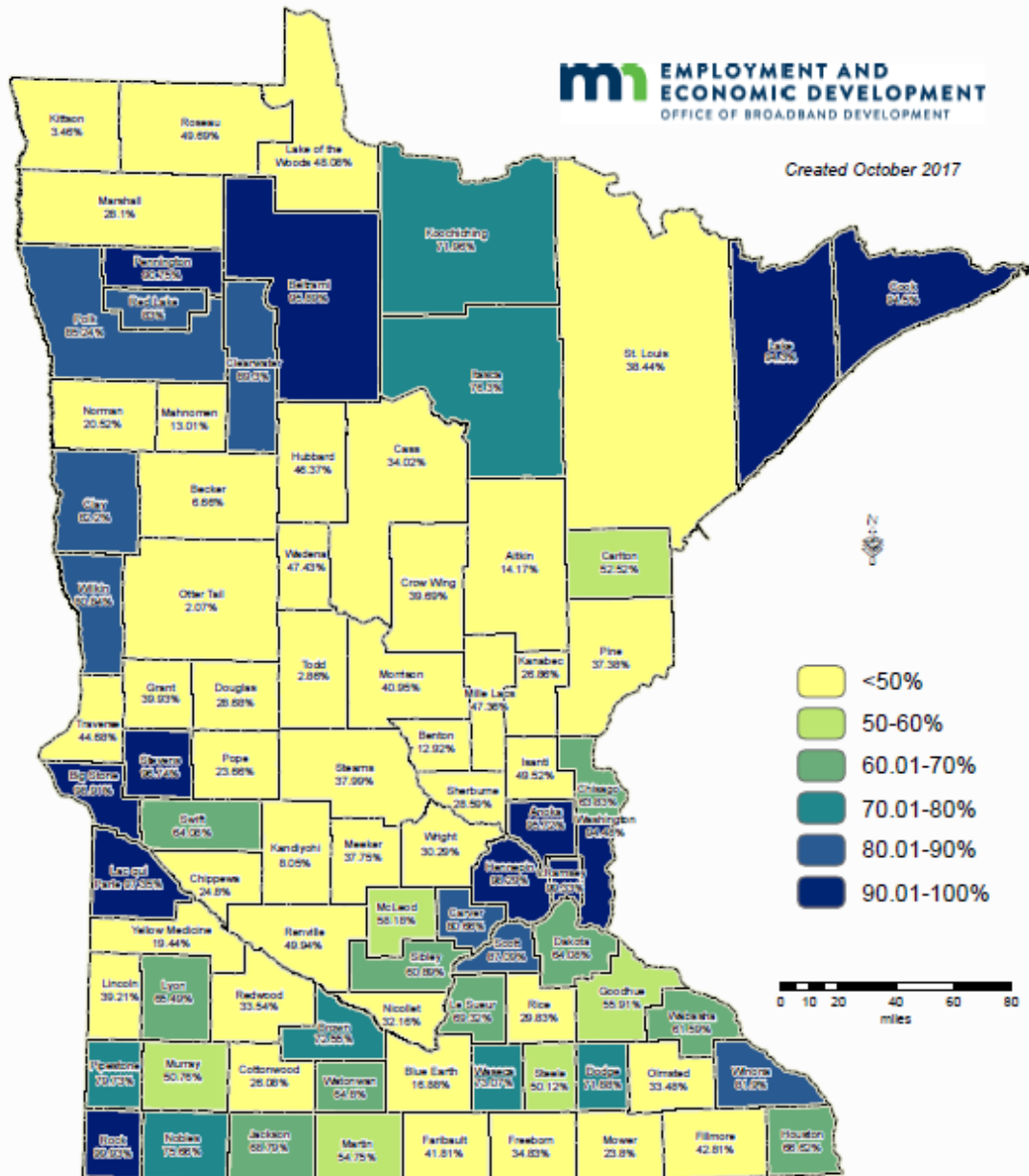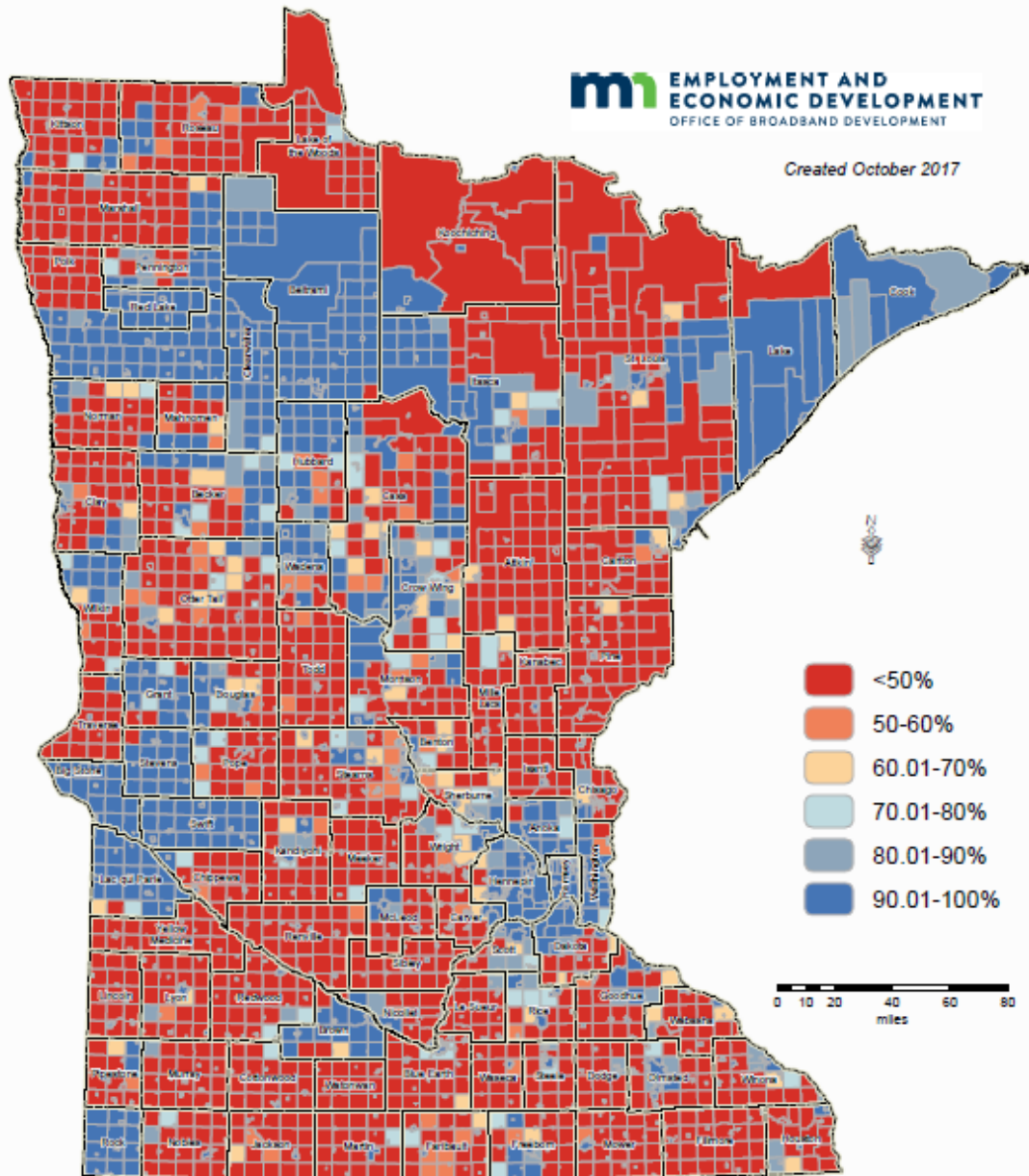This release reflects updates received as of October 2017.

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Additional maps and data are available at
http://mn.gov/deed/programs-services/broadband/maps

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City/Township Map

Percentage of Households Served by Wireline Broadband Service
of at Least 25 Mbps Download/3 Mbps Upload Speeds
Statewide Availability: 88.11%, Rural: 73.45%

EMPLOYMENT AND ECONOMIC DEVELOPMENT
OFFICE OF BROADBAND DEVELOPMENT

Created October 2017

Legend:
- <50%
- 50-60%
- 60.01-70%
- 70.01-80%
- 80.01-90%
- 90.01-100%

0 10 20 40 60 80 miles

This map was prepared by Connected Nation under contract with the Minnesota Department of Employment and Economic Development. The map represents areas of broadband service availability based on provider data submitted to and analyzed by Connected Nation and modified based on validation tools. This release reflects updates received as of October 2017.

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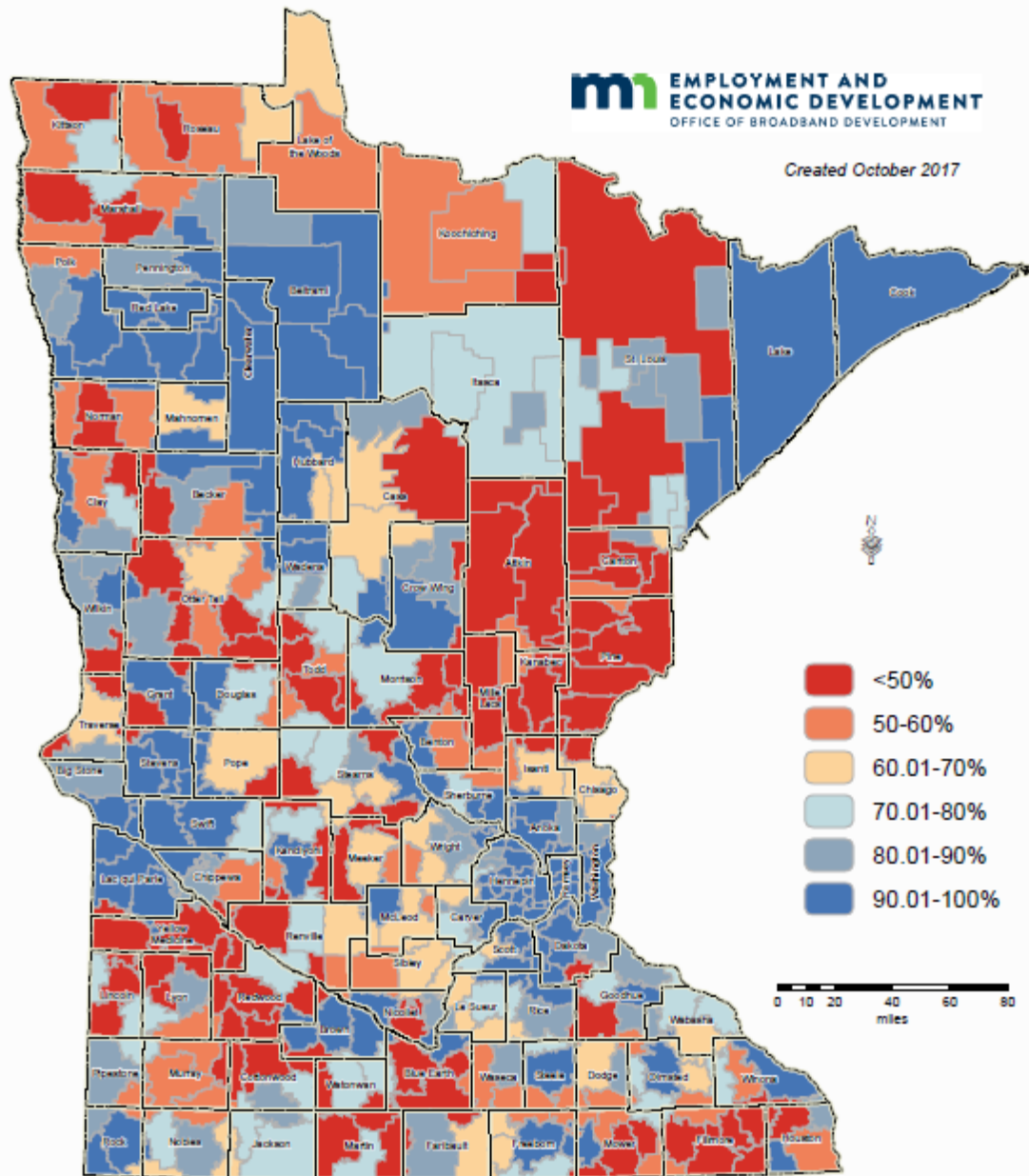http://mn.gov/deed/programs-services/broadband/maps

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School District Map

Percentage of Households Served by Wireline Broadband Service
of at Least 25 Mbps Download/3 Mbps Upload Speeds
Statewide Availability: 88.11%, Rural: 73.45%

EMPLOYMENT AND
ECONOMIC DEVELOPMENT
OFFICE OF BROADBAND DEVELOPMENT

Created October 2017

Legend:
- <50%
- 50-60%
- 60.01-70%
- 70.01-80%
- 80.01-90%
- 90.01-100%

0 10 20 40 60 80
miles

Impact of the Grant Program on Minnesota's Communities
The Border-to-Border Broadband Development Grant Program is the state's primary mechanism to help connect unserved or underserved areas of the state with broadband. These areas of the state tend to be more rural (and less densely populated) than other areas, while also having terrain that is more difficult to navigate. This, in turn, drives up the cost for broadband providers to connect households in these areas.

Minnesota's Border-to-Border Broadband Development Grant Program helps mitigate the cost and risk for providers and the communities with which they may partner. That is why continued, on-going funding for the grant program is so important—to provide communities and broadband providers with certainty, so they can make the informed, strategic investments necessary to expand broadband into the most difficult to reach areas of Minnesota.

Communities that partner with providers, and who have received grants through the Border-to-Border Broadband Development Grant Program, largely appreciate the program and recognize that without it, they might not have wireline broadband available. From Alvarado to Westbrook, stories of the importance of a broadband connection echo across the state.

In Aitkin County, Mille Lacs Energy Cooperative (MLEC) partnered with Consolidated Telephone Company (CTC) to bring fiber optic service to a significantly underserved area in Aitkin County. MLEC expects that the benefits of providing connectivity will improve the lives of those in the area through increased access for education, workforce development and lead to increased time seasonal residents spend in the region, resulting in increased spending locally on goods and services.

The City of Westbrook (Cottonwood County), population 740, is the smallest city in Minnesota with a full hospital. To help their hospital get the faster speeds and better reliability it needed to stay competitive, the city partnered with Woodstock Communications to build a fiber-to-the-home network that will serve the entire community.

In Itasca County, Harris Township partnered with cable provider Mediacom to bring broadband infrastructure to unserved households, businesses and anchor institutions. Now, students in the served area will be able to do their online homework with iPads issued by their local schools. Without internet access at home, students in the unserved households were falling behind.

BEAMCO and Wikstrom Telephone partnered to build a Fiber-to-the-Home network for farms and businesses in rural Alvarado (Marshall County). This project will connect BEAMCO's rural engineering and manufacturing facility and many nearby farmers and residents. The new network will provide the necessary infrastructure to keep the BEAMCO facility in operation and address the education and business needs of area farms, including, for example, process monitoring of agricultural operations.

Other highlights from the Border-to-Border Broadband Development Grant Program include the following projects.[12]

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[12] For a more complete list of projects funded by the Border-to-Border Broadband Development Grant Program visit: https://mn.gov/deed/programs-services/broadband/grant-program/.

Highlights of 2017 Projects Funded by the Border-to-Border Broadband Development Grant Program

Fond du Lac Band of Lake Superior Chippewa - Brookston Project
This last mile project will serve up to 108 unserved homes, 8 unserved businesses, and 1 community anchor institution in a project area in the Fond du Lac Indian Reservation in northeastern Minnesota. This area also includes the town of Brookston. A funding partnership with the State of Minnesota and the Fond du Lac Band of Lake Superior Chippewa will improve broadband service levels up to 1 Gbps down and 1 Gbps up, exceeding the 2026 state speed goals. It will also add needed additional network redundancy for the Fond du Lac Reservation. The fiber-to-the-home network will open up many opportunities such as telemedicine, Home Health Care, and improved and secure electronic health records; and online education and improved business development and more. The total eligible project cost is $538,052, with a $279,787 local match.

Wikstrom Telephone - Wiktel NW MN Broadband
This project will serve rural sparsely populated areas in Kittson, Marshall, and Roseau counties in far northwestern Minnesota, passing 300 unserved homes and 31 unserved business locations. In a funding partnership with the State of Minnesota, Wikstrom will improve broadband service levels to 1 Gbps down and up, exceeding the 2026 state speed goal, on a fiber optic network, and in some locations will extend the service from routes built via the 2016 Border to Border State Grant program. The total eligible project cost is $2,906,189, with a $1,598,404 local match.

CenturyLink - Fish Lake Township FTTH Project
This last mile, fiber-to-the-home project will serve 919 unserved households, 7 unserved businesses, and one unserved community anchor institution in Fish Lake Township in rural Chisago County. In a funding partnership leveraging federal (CAF II), state grant and local township funding, CenturyLink will improve broadband service levels to 1 Gbps down and 1 Gbps up, exceeding the 2026 state speed goal. Consumers will be able to work from home, have better access to education and healthcare, and businesses will be better able to compete locally and globally. The total eligible project cost is $4,584,310, with a $2,750,586 local match.

Albany Mutual Telephone Association - Two Rivers Area
This last mile project will extend the existing Albany Fiber-to-the-Home network to serve 121 unserved households and home-based businesses in an area northeast of Albany in Stearns County. In a funding partnership with the State of Minnesota, Albany Mutual Telephone Association will improve broadband service levels to exceed the 2022 state goal of 25 Mbps download and 3 Mbps upload. The all-optical network will provide more opportunity for the creation of new businesses, educational advances and access to healthcare services including wearable technology and home monitoring devices. The total eligible project cost is $1,233,486, with a $616,743 local match.

Mediacom Minnesota LLC - Fountain 2018 Broadband Build
In a funding partnership with the State of Minnesota, Mediacom will leverage its existing hybrid fiber and coaxial network in the City of Fountain in Fillmore County in southeastern Minnesota, to increase and extend advanced broadband to 161 unserved households and 20 unserved businesses, exceeding the 2022 state speed goal of 25 Mbps down and 3 Mbps up. The project will unlock opportunities for distance learning, telemedicine, and telecommuting and other increased business development. The total eligible project cost is $421,094, with a $218,969 local match.

Winthrop Telephone Company - Cornish Township FTTP Project
This last mile project will serve 58 unserved households and 2 unserved businesses in Cornish Township located in Sibley County in south central Minnesota. In a funding partnership with the State of Minnesota, Winthrop Telephone Company, Inc. will improve broadband service levels to 1 Gbps down and 1 Gbps up, exceeding the 2026 state speed goal. The 60 locations are primarily agricultural-related sites, which given the size and technical sophistication of these operations, need advanced broadband to remain vital and competitive. The total eligible project cost is $813,100, with a $447,205 local match.

Deployment of broadband in unserved or underserved areas of the state faces significant challenges without the state's Border-to-Border Broadband Development Grant Program. The projects noted above are a sample of projects funded by the state's grant program. The success of the program is remarkable; yet, there is still the need for more funding to help deploy broadband to those areas of the state that are most difficult and expensive to reach.

The Task Force does not, however, recommend funding the grant program with a blank check. Instead, it recommends on-going biennial funding at $71.48 million per biennia until the state achieves its broadband speed goals. This is a measured, responsible approach that provides fiscal constraint and guideposts for the Legislature, while providing providers and communities with the certainty they need to make advanced, long-term investment plans.

Minnesota's rural carriers are receiving $85 million per year for the next five years from the second phase of the Federal Communication Commission's (FCC's) Connect America (CAF II) fund.[13] Available since 2016, CAF II funding subsidizes the costs of the largest telephone providers, known as price cap carriers, to deploy broadband in areas that are expensive to serve. In addition to receiving funding via CAF II, Minnesota's rural carriers will also be receiving funding from the FCC's Alternative-Connect America Cost Model (A-CAM), which subsidizes the costs of the smallest broadband providers, known as rate-of-return carriers. Minnesota providers will receive $54.3 million per year for the next 10 years as part of A-CAM.

Based on the most recent data, there are 252,000 unserved households in Minnesota. The average cost of connecting households in projects financed with funding from the Border-to-Border Broadband Grant Development Grant Program is $5,527. Using those average costs as a guide, the total cost of connecting the remaining 252,000 households is $1,392,804,000; the cost to the state, however, via the Border-to-Border Broadband Grant Development Grant Program is $696 million (50%). There are four years remaining for the state to achieve its speed goals by 2022, at a cost to the state of $174 million annually.

This cost is reduced, however, by the FCC's CAF II and A-CAM funding. Minnesota telecommunications carriers will be receiving $85 million per year via CAF II and $54.3 million per year via A-CAM. Together, these programs will help reduce Minnesota's cost burden by $139.3 million per year. Covering the remaining cost of connecting all Minnesotans with broadband by 2022 will require an investment by the state of $34.7 million per year for the next four years. Accounting for the standard 3 percent administrative costs, the Task Force recommends providing the Border-to-Border Broadband Grant Development Grant Program with $71.48 million in on-going biennial funding, until the state achieves its broadband speed goals.

> **Recommendation**
> Provide $71.48 million in on-going biennial funding for the Border-to-Border Broadband Development Grant Program, until the state achieves its broadband speed goals.

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[13] The FCC's CAF II program requires broadband providers to meet a minimum speed standard of 10 Mbps/1 Mbps.

Calculation of Recommended Funding Level for the Grant Program

252,000 (unserved households)
x $5,527 (average cost of connection)

$1,392,804,000 (total cost of connecting unserved households)
x 50% (state's share of total cost)

$696,402,000 (state's total cost to connect unserved households)
÷ 4 (number of years remaining to achieve state broadband speed goals)

$174,100,500 (state's annual cost to connect unserved households)
− $85,000,000 (annual CAF II funding)
− $54,300,000 (annual A-CAM funding)

$34,700,000 (state's remaining annual cost of connecting unserved households)
x 1.03 (accounting for standard 3 percent administrative costs)

$35,741,000 (annual contribution from grant program to connect unserved households)
x 2 (years in a biennium)

$71,482,000 (Task Force's biennial recommendation)

Minnesota IT Service's Strategic Plan for Security
The Internet enables the transfer and storage of information, and with it the potential for unauthorized access of such information. Minnesota businesses and the state's enterprise system continue to face cybersecurity threats. Then-Minnesota State Chief Information Officer, Chris Buse, shared with the Task Force the current state of threats facing information technology systems, and provided an overview of Minnesota IT Service's multi-year strategic plan to protect state systems from such threats.

2017 Threats to Systems

• Exploits to Internet of Things devices	• More attacks against control systems
• Cybercrime as a service	• Increase in attacks against open source software
• Massive denial of service attacks	• Increase in phishing campaigns
• Increase in cyber espionage	
• Increase in attacks against elections	• Ransomware

In response to these threats, and to prepare for future threats, Minnesota IT Services developed a multi-year strategic plan. Below are highlights of that plan.

Minnesota IT Service's Multi-year Strategic Plan
1. Build secure systems- Improve security of state systems by improving security engineering in building systems, securing data centers where the systems run, and the networks they run on.
2. Improve Situational Awareness—Develop risk management and training programs to enhance security awareness.

3. Minimize Operational Risk—Improve monitoring and vulnerability management methods to better handle denial of service and other types of attacks. Build and test disaster recovery plans.
4. Foster strategic relationships—Leverage relationships to gain better threat intelligence and create a strong talent pipeline.

The deployment of broadband throughout Minnesota is critical for connecting every Minnesotan with the educational and economic opportunities of the 21st Century. Protecting the personal data of Minnesotans is also critical for providing access to such opportunities. Without proper protection and mitigation efforts, access to personal information can be compromised. Minnesota IT Service's strategic plan and cybersecurity funding requests are aimed at protecting the personal data of Minnesotans and mitigating against unauthorized attempts to access that information.

> Chris Buse, former Minnesota State CISO, now deputy legislative auditor for the Office of the Legislative Auditor's financial audit division—"When you look at all of the major breaches that are in the news today and the fact that almost everybody's data recently got hacked with the latest Equifax breach, we're almost at a point now today where we don't even need to talk about whether cybersecurity is a real risk. It's pretty clear now that we operate in a threat-laden world."

Overview of Office of Broadband Development
The Office of Broadband Development (OBD), located within the Department of Employment and Economic Development (DEED), was established during the 2013 Legislative Session.[14] OBD plays an important role in developing Minnesota's broadband infrastructure, including working with partners on mapping broadband availability to more effectively direct state investment.[15] OBD also assists the Governor's Task Force on Broadband, the Governor's Broadband Subcabinet, and oversees the state's Border-to-Border Broadband Development Grant Program. [16]

In administering the Border-to-Border grant program, the Office of Broadband Development considers a number of criteria, as defined in statute, in evaluating and awarding the grants to eligible entities, including cost, community support, the number of households and community institutions impacted by the project, and demonstrated need for economic development, among others. [17]

In addition to administering the state's Border-to-Border Broadband Development Grant Program, the Office of Broadband Development is tasked with a number of other responsibilities. These responsibilities are assigned in state statute, and include serving as the central broadband planning body for the state of Minnesota; monitoring broadband development efforts of other states and nations in areas such as business, education, public safety, and health; driving job creation, promoting innovation, and expanding markets for Minnesota businesses.

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[14] Minnesota Session Laws, 2013 regular session, chapter 85 at Article 3, sections 13, 14, and 26.
[15] Danna Mackenzie, Executive Director, Office of Broadband Development, received the 2017 Community Broadband Hero of the Year from the National Association of Telecommunications Officers and Advisors (NATOA).
[16] More information about the Office of Broadband Development can be found in its annual report: https://mn.gov/deed/assets/broadband-dev-report_tcm1045-132774.pdf.
[17] Minnesota Session Laws, 2014 regular session, chapter 312 at Article 3, sections 3.

The Office of Broadband Development has 27 statutory obligations, spread across Statute 116J.39 (see Appendix A for a complete list of obligations). The Office's responsibilities are broken into eight broad categories: broadband access, measuring broadband, adoption and use, Broadband Task Force, resource center/information clearinghouse, outreach and engagement, policy, and planning.

Current Office Activities and Responsibilities[18]

Broadband Access
- B2B grant administration
- Community anchor institutions
- Deployment facilitation (permitting/ROW, dig once, etc.)

Measuring Broadband
- Mapping program

Adoption and Use
- Adoption and use survey
- Data inclusion efforts

Broadband Task Force
- Administrative and logistical support

Resource Center/Information Clearinghouse
- Coordination of OBD information resources

Outreach and Engagement
- Coordination of outreach and engagement
- Policy
- State policy development and consultation
- Federal policy analysis

Planning
- State broadband planning
- Local planning, advancement and support

As part of its work to serve the on-going and growing needs of Minnesota's education systems, OBD (in coordination with the Governor's Office) has established a partnership with the nonprofit EducationSuperHighway (ESH) called the K-12 Connect Forward Initiative. The goals of the partnership include: compiling better data about K-12 connectivity levels; developing an accurate picture of costs; using information on costs, provider pricing, and available state and federal subsidies to identify opportunities to improve connectivity; facilitating ESH's work with individual school districts towards achieving the federal standard of at least 100 kbps per student to all schools and meeting bandwidth demands for the future; working towards ubiquitous Wi-Fi on school campuses; and maximizing the impact of state and federal funding for school districts.

A Minnesota work group, with representation from various sectors of the K-12 community, meets monthly to guide the partnership.[19] The group helps facilitate outreach between ESH and school

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[18] Provided by OBD. A complete list of OBD's statutory obligations is included in Appendix A.

districts identified as not fully using federal subsidies. ESH maintains information on its website to enable school districts and providers to see connectivity information (www.compareandconnectk12.org/), and that information is linked to OBD's interactive map. While Internet access costs have been known to vary widely between districts, the data compiled by ESH documents and makes transparent that disparity.

The work group, like the Task Force, has for several years supported increasing Telecommunications/Internet Equity Aid (TEA) to fully fund the gap left after federal E-Rate program funding is applied. Full funding would address the disparity faced by districts in higher cost areas, as noted in the article "Inequity in Funding Internet Services in our Schools."[20] Unfortunately, the bills to increase TEA funding stalled in the 2017 session (see HF881/SF936). A separate effort, with language developed by the work group with assistance from ESH, intended to increase school district's ability to maximize federal funding opportunities by providing a ten percent state match for special construction charges (see HF2449/SF2237), also failed.

Currently, $500,000 per biennium from the state's General Fund supports OBD's operations and administration, which include: two full-time employees; office space, utilities, computers, advertising, printing, supplies; expenses for holding meetings of the Governor's Task Force on Broadband; outreach; and staff research and development. The Minnesota Department of Commerce provides one full-time employee, as an analyst and general support to the program. Finally, as specified in statute, up to three percent of the grant appropriation is available for grant administration, mapping, data acquisition, and analysis.

Maintaining the volume and quality of work provided by OBD requires sufficient funding from the Legislature. While OBD has received sufficient funding from one legislative session to the next, the uncertainty of biennial funding hinders long-term planning and could impair continued successful implementation of the Border-to-Border Broadband Development Grant Program. The success of the Border-to-Border Broadband Development Grant Program is in large part tied to the success of OBD. That's why providing OBD with on-going biennial funding is so important—and that is why we are including it as a recommendation.

Recommendation
Provide the Office of Broadband Development with $500,000 on-going biennial funding and maintain the existing partnership with the Minnesota Department of Commerce, until the state achieves its broadband speed goals.

Conclusion
We urge continued funding, on an on-going biennial basis, of Minnesota's Border-to-Border Broadband Development Grant Program. The grant program, in its first four years, has leveraged $110 million in local and/or private investments, making service available to more than 34,000 households and 5,200

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[19] For more information on the K-12 Connect Forward Initiative and the work group, see https://mn.gov/deed/programs-services/broadband/connect-forward/.
[20] https://www.mnasa.org/cms/lib/MN07001305/Centricity/Domain/152/MASA%20Newsletter%20F17.pdf at page 10.

businesses across the Minnesota. We know that broadband plays a critical role to help educate our children, care for our chronically ill and expand access to markets for our businesses.

Limited access to broadband will continue to be a challenge facing many Minnesotans, but the state continues to make progress toward connecting every Minnesotan with broadband service. Statewide, 88.11 percent of households have access to broadband at speeds of 25 Mbps/3 Mbps. In rural areas of Minnesota, however, 73.45 percent of households have access to those speeds—that is a difference of 14.66 percentage points. The disparity is even larger when considering the state's long-term speed goal of 100 Mbps/20 Mbps by 2026. Here, 70.07 percent of Minnesota households have access to broadband at speeds of 100 Mbps/20 Mbps, while 52.88 percent of rural Minnesota households have access to such speeds—a difference of 17.19 percentage points.

Achieving our state broadband speeds goals and reducing the broadband availability gap requires a commitment from the State Legislature and the Governor to provide sustained funding to the Border-to-Border Broadband Development Grant Program.

The success of the grant program, however, depends in large part on the Office of Broadband Development and its ability to effectively administer the program and carry out its other statutory responsibilities. Without sufficient on-going funding, the Office of Broadband Development will struggle to achieve those outcomes.

These two areas—the Border-to-Border Broadband Development Grant Program and the Office of Broadband Development—are the focus of the recommendations of this Task Force:

- Provide $71.48 million in on-going biennial funding for the Border-to-Border Broadband Development Grant Program, until the state achieves its broadband speed goals.

- Provide the Office of Broadband Development with $500,000 on-going biennial funding and maintain the existing partnership with the Minnesota Department of Commerce, until the state achieves its broadband speed goals.

The issues of broadband and funding for the grant program and the Office of Broadband Development has received various levels of political support or opposition throughout the years. The Task Force has tried to stay out of those political debates and advocate for policies that most effectively expand access to broadband throughout Minnesota. This year is no different. Access to broadband is important regardless of political stripe. That is why we urge continued, bipartisan leadership on helping expand broadband throughout Minnesota.

Appendix A: Office of Broadband Development Statutory Charges

Office of Broadband Development Statutory Charges/KPI	Source
All state residents and businesses have access to high-speed broadband that provides minimum download speeds of 25 megabits per second (Mbps) and minimum upload speeds of 3 Mbps by 2022; and 100 Mbps download and 20 Mbps upload by 2026.	Statute 237.012
The top five states of the United States for broadband speed universally accessible to residents and businesses	Statute 237.012
The top five states for broadband access	Statute 237.012
Rank among top 15 when compared to countries globally for broadband adoption	Statute 237.012
Encourage, foster, develop, and improve broadband within the state	Statute 116J.39
Drive job creation, promote innovation, and expand markets for Minnesota businesses	Statute 116J.39
Serve the on-going and growing needs of Minnesota's education systems, health care system, public safety system, industries and businesses, governmental operations, and citizens	Statute 116J.39
Improve accessibility for underserved communities and populations	Statute 116J.39
Serve as the central broadband planning body for the state of Minnesota	Statute 116J.39
Coordinate with state, regional, local, and private entities to develop, to the maximum extent practicable, a uniform statewide broadband access and usage policy	Statute 116J.39
Develop, recommend, and implement a statewide plan to encourage cost-effective broadband access, and to make recommendations for increased usage, particularly in rural and other underserved areas	Statute 116J.39
Coordinate efforts, in consultation and cooperation with the commissioner of commerce, local units of government, and private entities, to meet the state's broadband goals in section 237.012	Statute 116J.39
Develop, coordinate, and implement the state's broadband infrastructure development program under section 116J.391	Statute 116J.39
Provide consultation services to local units of government or other project sponsors in connection with the planning, acquisition, improvement, construction, or development of any broadband deployment project	Statute 116J.39
Encourage public-private partnerships to increase deployment and adoption of broadband services and applications, including recommending funding options and possible incentives to encourage investment in broadband expansion	Statute 116J.39
Monitor the broadband development efforts of other states and nations in areas such as business, education, public safety, and health	Statute 116J.39

Consult with the commissioner of Commerce to monitor broadband-related activities at the federal level, including regulatory and policy changes and the potential impact on broadband deployment and sustainability in the state	Statute 116J.39
Serve as an information clearinghouse for federal programs providing financial assistance to institutions located in rural areas seeking to obtain access to high-speed broadband service, and use this information as an outreach tool to make institutions located in rural areas that are unserved or underserved with respect to broadband service aware of the existence of federal assistance	Statute 116J.39
Provide logistical and administrative support for the Governor's Broadband Task Force	Statute 116J.39
Provide an annual report	Statute 116J.39
Coordinate an on-going collaborative effort of stakeholders to evaluate and address security, vulnerability, and redundancy issues in order to ensure the reliability of broadband networks	Statute 116J.39
Perform an analysis of current availability and use of broadband, including average broadband speeds, within the state	Statute 116J.39
Analysis of actual speeds and unmet need for schools, libraries, hospitals, and public safety facilities	Statute 116J.39
Analysis of incumbent broadband infrastructure within the state and its ability to spur economic development	Statute 116J.39
Analysis of the degree to which new, additional, or improved broadband infrastructure would spur economic development in the state	Statute 116J.39
Encourage and coordinate "dig once" efforts for the planning, relocation, installation, or improvement of broadband conduit within the right-of-way in conjunction with any current or planned construction, including, but not limited to, trunk highways and bridges	Statute 116.J.391
Develop a strategy to facilitate the timely and efficient deployment of broadband conduit or other broadband facilities on state-owned lands and buildings	Statute 116.J.391
The office shall encourage and assist local units of government to adopt and implement policies similar to those under paragraphs (a) and (b) for construction or other improvements to county state-aid highways, municipal state-aid roads, and any other rights-of-way under the local unit of government's jurisdiction, and to other lands or buildings owned by the local unit of government.	Statute 116.J.391
Administer the Border-to-Border Broadband Development Grant Program	Statute 116J.395
Contract for the collection of broadband deployment data from providers and the creation of maps showing the availability of broadband service. Household and business broadband use surveys.	Statute 116.J.396

Appendix B: Letter from Coalition Representing Many Rural Interests

September 28, 2017

Margaret Anderson Kelliher, Chair
Honorable Members
Governor's Broadband Task Force
St. Paul, MN

Dear Chair Anderson Kelliher and members of the Governor's Broadband Task Force,

The organizations signed on to this document represent a broad coalition of statewide and community interest groups, particularly in rural areas. Our organizations represent people and organizations that live and work in rural Minnesota. They know access to quality broadband services has never been so important. The vitality of our communities is directly affected by access to affordable high-quality broadband services.

This letter offers recommendations and comments from rural communities for your consideration as you develop and adopt your recommendations to the Governor and Legislature.

Our recommendations are:

1. **Fund the Border-to-Border Broadband Grant Program:** The grant program is essential to reaching the state broadband goals and allowing providers to extend and improve networks in the hardest to reach places in Minnesota. This program was not funded for fiscal year 2019, but there remain significant portions of Minnesota, especially low-density rural areas, that lack broadband service. The amount requested by all applicants continues to exceed the money available in the fund, showing the providers' continued interest in participating in this program.

   We are further concerned that some policy makers may seek ways to diminish state investment in broadband, believing lesser technologies are adequate for rural residents and businesses. We continue to support the current requirement that funded projects must meet the scalability requirements and work

towards the 2026 state goal. We recommend the task force emphasize that state investment in broadband should continue to fund future-resilient technology that meets the current scalability standards.

2. **Provide multi-year funding for the Grant Program**: Providers have found it challenging to complete the complex task of blending engineering, finance, partnership agreements and community support into a competitive application in the time allowed by the single-year funding model. Stable biennial funding, incorporated into DEED's base funding, would give confidence to providers and communities alike to continue to plan and build partnerships and prepare effective project proposals.

3. **Modify the Challenge Process**: The challenge process remains an obstacle to delivering the best network possible to communities. The Challenge Process is overprotective of incumbent providers and discourages non-incumbent providers from participating in the program over concerns their efforts will be undermined. The process does not require the incumbent to install the same or better service as proposed by the applicant, rather it allows a challenger to improve service – not to 2026 speed goals – but just enough to prevent a grant, to the detriment of the community. If a provider is not meeting a community's needs, they should not be allowed to place undue burdens on access to state grants.

4. **Remove or Increase the $5 million cap on projects**: The $5 million grant cap per project may limit applications for project that propose to cover larger areas, including entire counties. Larger projects may allow for more cost-efficient network planning and construction.

5. **Increase the match offered by the Grant Program**: The 50% maximum grant level is increasingly insufficient to attract providers due to the high costs and project risks of building networks in Minnesota's hardest-to-serve rural areas. OBD should be allowed to implement a sliding scale system in which the grant amount could be more than 50% based on deployment factors such as population density, terrain, the capabilities of the network proposed, and the expected consumer benefit.

6. **Emphasize the importance of the Office of Broadband Development**: DEED's Office of Broadband Development (OBD) provides a critical link between communities and providers, documenting successful infrastructure project design and management. They are critical to implementation of the Grant Program and mapping activities. We fully recognize that 2018 is not a budget year and that the office is funded through next year. We believe the task force should emphasize the office should be maintained in the future and enhanced to include a role in promoting the adoption and use of broadband so that the highest possible value is gained from broadband infrastructure investments.

Thank you for your work on behalf of the citizens of Minnesota and for your consideration of this input.

Sincerely,

Laura Ziegler
League of Minnesota Cities (LMC)

Emily Murray
Association of Minnesota Counties (AMC)

Steve Fenske
Minnesota Association of Townships (MAT)

Dan Dorman
Greater Minnesota Partnership (GMNP)

Bradley Peterson
Coalition of Greater Minnesota Cities (CGMC)

Nancy Vyskocil
Northwest Minnesota Foundation (NWMF)

Jack Kegel
Minnesota Municipal Utilities Association (MMUA)

Brad Lundell
Schools for Equity in Education (SEE)

Donn Winckler
Mid-Minnesota Development Commission (MMDC)

Janet Keough
Cloquet Valley Internet Initiative (CVII)

Mary Minnick-Daniels
East Central Regional Arts Council (ECRAC)

Vince Robinson
Minnesota Association of Professional County Economic Developers (MAPCED) and Lincoln County Enterprise Development Corp. (LCEDC)

Jay Trusty
Southwest Regional Development Commission (SRDC)

Gary Johnson and Dawn Hegland
Upper Minnesota Valley Regional Development Commission (UMVRDC)

Dan Pecarina
Hiawatha Broadband Communications (HBC)

Steve Gottwalt
Minnesota Rural Health Association (MRHA)

Cheryal Lee Hills
Region Five Development Commission

Christopher Mitchell
Institute for Local Self Reliance (ILSR)

Matt Varilek
Initiative Foundation

Glenn Kluis
Murray County

Appendix C: 2017 Meeting Details, Presentations and Other Correspondence

January 26, 2017—DEED—James J. Hill Conference Room
- Meeting Agenda
- Meeting Minutes

February 21, 2017—Harold E. Stassen Office Building
- Meeting Agenda
- Meeting Minutes
- Minnesota Telephone Assistance Plan (TAP) & Federal Lifeline Program Overview
  - Tracy Smetana and Mike McCarthy from the Minnesota Public Utilities Commission

March 22, 2017—DEED – James J. Hill Conference Room
- Meeting Agenda
- Meeting Minutes
- Broadband Needs for Transportation
  - Frank Douma and Adeel Lari, Humphrey School of Public Affairs, University of Minnesota
- Emergency Communication Networks
  - Jackie Mines, Director, Emergency Communication Networks
- New Frontiers in Autonomous and Connected Vehicle Policy
  - Bill Kohler, Dykema
- Preparing for Connected and Automated Vehicles in Minnesota
  - Ray Starr, Assistant State Traffic Engineer; Office of Traffic, Safety and Technology, MNDOT

April 19, 2017—DEED – James J. Hill Conference Room
- Meeting Agenda
- Meeting Minutes
- Consolidated Telecommunications Company Presentation
  - Kristi Westbrock, COO, Consolidated Telecommunications Co.
- The Economic Impact of Rural Broadband
  - Dusty Johnson, Vantage Point Solutions
- Cost Modeling Overview
  - Mike Wilson, CostQuest
- Feasibility Studies for Broadband
  - Mark Mrla, Finley Engineering

May 11, 2017—St. Paul Neighborhood Network
- Meeting Agenda
- Meeting Minutes
- Community Technology Empowerment Project (CTEP) Handout
- Community Technology Empowerment Project (CTEP) Summary

June 28, 2017—Herreid Board Meeting Room – Rock County Courthouse
- Meeting Agenda
- Meeting Minutes
- Alliance Overview of Rock County Project

July 19, 2017—Essentia Health Sandstone-Pine Medical Center
- Meeting Agenda
- Meeting Minutes
- Telecare Services
  - Rebecca Sienko, Manager
- Success of Telestroke
  - Sandra Hanson, MD, Stroke Neurologist
- Promoting Economic Development in East Central Minnesota
  - Nancy Hoffman, Chisago County HRA/EDA
  - Robert Musgrove, Pine County Economic Development
  - Doyle Jehlsing, Kanabec EDA
- Essentia Health Telehealth Update
  - Maureen Ideker, RN, System Director of Telehealth
- The Value of Broadband at Essentia Health
  - Dennis Smith, System IT Director
  - Steve Altendorf, Manager Networks

August 16, 2017—Minnesota Senate Office Building –Room 2308
- Meeting Agenda
- Meeting Minutes
- Bug Tussel Wireless
  - Steve Schneider, Bug Tussel Wireless
- Advantenon Broadband Wireless Internet
  - Paul Hess, Advantenon
- InvisiMax Fixed Wireless ISP
  - Dave Giles, Invisimax
- MVTV Wireless
  - Tim Johnson, MVTV Wireless

September 28, 2017—Minnesota Senate Office Building –Room 2308
- Meeting Agenda
- Meeting Minutes
- Microsoft Airband Initiative
  - Sid Roberts Microsoft Affordable Access Initiative Team
- The 5G Wireless Future: Apps, Devices, Networks, Spectrum
  - Bret Swanson Entropy Economics

October 12, 2017—Minnesota Senate Office Building –Room 2308
- Meeting Agenda
- Meeting Minutes
- MNIT- Securing Minnesota: A Plan to Fill the Gaps
  - Chris Buse, Former Assistant Commissioner for Information Security and CISO, MNIT

November 2, 2017—Minnesota Senate Office Building –Room 2308
- Meeting Agenda
- Meeting Minutes

December 7, 2017—Minnesota Senate Office Building –Room 2308
- Meeting Agenda

Good day,

My intention was to be present with you today and speak with you directly. Unfortunately, my plans with work this week had changed, taking me out of town. Listed here are my thoughts on the new Alliance Communications fiber optic network here in Rock County, MN.

Last October, 2016, I was one of the first customers connected to the Alliance Communication fiber optic network in Rock County, MN. Since then, I have had great improvement in Internet connectivity. Previously, Rural Rock County had little to offer in broadband Internet services. Internet services that were available could not deliver the greater through-put and speeds required to operate in today's world of technology.

With the new fiber optic connection provided by Alliance Communications, I am now able to conduct work in the evenings and weekends, which I was unable to do previously. I am the Network Administrator for Pipestone Veterinary / Pipestone System. At my work, I use South Dakota Network for all of my data connectivity, linking six separate locations through out the Midwest. Alliance Communications makes it very easy to connect to my remote systems as they are a member company of SDN. At any moment, I can see my work systems from my home with out any delay or effort.

I have also enjoyed the phone, video and Internet services for personal use. The HD TV stations, ability to stream NETFLIX and music services are of great value. As more and more residents work from home, the Alliance system is a sure fit. for Rock County residents.

As we enjoy the new TV stations From Alliance Communications, there is one other area I would like to focus on. S/W MN (Rock County) has been and currently is in a 100% MN news coverage black out. The rural residents of Rock County have only one choice for local news coverage, that being primarily of Sioux Falls, SD. Residents of Luverne are able to receive many Minneapolis TV Stations. I know for a fact, that there are multiple sources, some delivered via fiber optic, Minnesota local TV stations are near areas in S/W

MN. Jackson, MN being one location. It is fair to say that most Rock County residents know more of South Dakota news, then in what is happening in Minnesota. Specifically, St. Paul. I know there are FCC regulations that govern the ability of delivery of programming. However, with SDN's network presence in MN, there could be alternate, legal methods to receive the MN programming to Rock County residents.

Thank you for your time.

Sincerely,

Bill Rolfs, Rock County Resident

Before fiber broadband:

We ran a load balancing router to combine a satellite Internet connection with cellular data connection to achieve a fairly stable 25 GB download speed; upload around 10GB. Latency on the satellite link ranged 600 to 800ms so it took some time to get a link moving.

If the weather was poor we were on cellular alone and if the weather was extreme even cellular data was hit and miss.

These were both metered data connections so when we passed 70 GB downloaded/uploaded data there were overage charges.

Our Internet data costs averaged around $400 per month with some months exceeding $800.

After fiber broadband:

We still use a load balancing router with cellular data as a backup. In the months we have been on Alliance broadband the backup has never been required. Fiber broadband download speed is consistently 70GB; upload around 30GB. Latency is always under 5ms; pretty much instantaneous.

Weather is now a non-factor.

Data download/upload are not metered (unlimited) so there are no overage charges.

Our Internet data costs are now fixed at under $180 per month and if we weren't so stubborn about having a "backup", $80 per month.

We also have no need for Satellite TV or a legacy telephone lines. All of that is on fiber broadband now as well.

Summary:

The reduction in the cost for Internet data and phone along with the increased reliability of the broadband connection means a lot to a rural home based business. The fiber broadband connection puts a rural business on equal ground with city businesses.

If you look at the numbers above it is obvious the huge expense reduction that has accrued due to the broadband connection.

Dwight Bremer
BTM

SANFⒺRD

ROCK COUNTY BROADBAND ACCESS COMMENTARY

BY

RICHARD J. MORGAN, MD

Broadband access has been a life changer for the majority of us Sanford Luverne physicians.

There are 9 physicians in our group and 6 of us live outside the city limits. We recently hired a fulltime OB/GYN physician who starts work here this fall. She intends to live "in the country" as well. Thus nearly all of our Luverne physicians will be linked up to our county's new broadband service after September 1st.

I've lived outside the city limits since 1991. Until broadband was installed I never had reliable internet service. I first had dial-up, then transitioned through 3 different microwave-sourced providers in an attempt to get reliable service. None could meet my needs and I finally cancelled the contract with my last provider and had no internet service at my home for the 4 months preceding broadband installation. I was unable to do any clinic work from home.

For the last 11 years our patients' charts have been computerized. We no longer maintain any paper charts. Our new reliable broadband service means that I am able to access my patients' electronic medical records from my home at any time of day. This is especially important for dealing with patient or hospital calls after hours when I am "on call." As you know, medical care has become extremely complex. As a physician attempting to make important medical decisions in the middle of the night, access to complete patient records is irreplaceable.

Another great benefit for us physicians is that we are able to update the patient charts from our home. On average every Minnesota family physician spends 2-2 ½ hrs after each clinic day simply updating patient charts. Allowing us to work from home gives us more flexibility in the quest for that elusive work/family balance.

As for completing daily charting, several of us physicians are not the best typists. (!) Instead we use voice recognition software to enter patient information. This program requires a high degree of connectivity to be functional and most of all accurate. Our new broadband handles this extremely well.

If the past is any prediction of the future, it is going to be more and more difficult to recruit new physicians to our rural community. Having an excellent broadband service is going to be a huge selling feature in promoting our county as the new "millennial" doctors come out of training.

I am very grateful for the work and efforts that our elected leaders have put into making this dream a reality. I believe that this project will pay for itself many times over.

Chair Margaret Anderson Kelliher
Minnesota Broadband Task Force
Saint Paul, Minnesota

August 16, 2017

Chair Kelliher and Task Force:

Thank you for your interest in our shared vision of ubiquitous broadband access for all Minnesotans. Minnesota has achieved measurable progress in recent years through private and public investment, meaningful cross-sector partnership, and, not least, our nation-leading Border-to-Border Broadband competitive matching grant fund – which in its first three funding rounds has extended the reach of broadband to over 25,000 homes and businesses, as well as hundreds of community anchor institutions. Of course, much work remains. We must stay focused on viable solutions to bridging Minnesota's broadband access gap – a gap that adversely impacts approximately 20 percent of Greater Minnesota and the homes, businesses, and community anchors therein.

To this end, I write to offer public comment regarding your August 16 meeting agenda discussion on non-terrestrial internet service, and in response to isolated but persistent misperceptions about how Minnesota can meet its current state speed goals to extend basic broadband connectivity to all homes and businesses by 2022 and world-class broadband access by 2026.

Specifically, I call attention to the shortcomings of non-terrestrial internet service generally and, in particular, to the inability of satellite-based service to meet Minnesota's broadband speed goals due to limitations with bandwidth, latency, weather-induced interruption, cost and data caps, etc. Although we should welcome investment in expanded internet service and choice, we must not confuse short-term, make-shift options with sustainable, long-term solutions. Quite simply, Greater Minnesota residents and businesses deserve no less.

Following dozens of listening sessions across the state involving hundreds of Minnesotans from all walks of life, input from respected national industry experts, and countless stories from frustrated Minnesotans looking for more reliable broadband connectivity, this much is clear to me: non-terrestrial internet service generally and satellite service in particular, while a welcome alternative where no other choices exist, are not viable long-term solutions for extending the reach of reliable, affordable broadband service. These alternatives will not reliably and affordably support home-based business, enable distance learning or telehealth applications, or empower Minnesotans to take full part in 21st century communication, culture, and commerce.

Please join me and others in pushing back against misperceptions and baseless rhetoric undermining Minnesota's commitment to reliable, affordable broadband access and those suggesting that satellite-based internet service, in particular, is the solution for residents and businesses in Greater Minnesota lacking access to the level of service they need to compete and thrive.

Best,

Matt Schmit

Ms. Kelliher and to whom it may concern,

My name is Tim Larson and I am a resident of rural Staples Minnesota in northern Todd County, we actually only live 3 miles from town. My wife and I have worked in the Information Technology industry for over 20 years and about 4 years ago we made a decision to move our family to a rural small town in Minnesota to be able to raise our boys within a community that is built on small town values and a good work ethic. Certain values that only growing up on a farm in small town setting can teach. When we made this move high speed internet was the major determining factor as to if we could move or not. I work for Microsoft and am a home office worker so I required high speed internet at home where ever we live. Also our youngest son has Juvenile Idiopathies Arthritis and we wanted to be able to communicate effectively with his doctors located in the Minneapolis/St Paul area. Aside from those two critically important reasons we needed good internet for school work and learning, to keep in touch (video and voice call) grandparents and other relations, for TV and entertainment, leverage all the newest technology in our home from internet connected garage doors, security and surveillance systems, to digital assistance like the Amazon Echo for music and news, and lastly with two young boys we had to have the ability for them to play video games and talk /interact with the their friends both local and away.

So with all that being said prior to building our home I did a great deal of research and testing different internet connections and technology both available and in development. I gathered information about wired and wireless solutions, spoke with local telecoms, and private wireless vendors alike and after many months came down to only one viable and not economically efficient solution. We had to go with two T1 connections from the local telco company, for a total of 3mb internet speeds (both upload and download) and after negotiations I found the lowest cost possible but still pay $400 a month just for internet.

Now the why copper T1's for internet versus wireless or satellite:

All wireless plans (Verizon, ATT, etc.) were limited to 25GB a month of data downloaded and several did not have a solution that would allow my whole home to be connected, meaning that I had to use my cell phone connected to a computer to access the internet on a PC. Along with that the highest plan you could get was 25GB per month for around $125-$150 a month then the overage charges started to kick in at a per MB rate and the costs would go through the roof. Beside those after testing T-Mobile, Verizon, Sprint and ATT the only vendor with good enough signal was ATT and that was 2-3 out of 4 bars.

Satellite was the same issue as wireless, no matter if I looked at a business plan or a home plan there were high upfront costs and high monthly costs with a limit on the amount of data that could be downloaded a month (usually 25GB or less) then there were very high fees after that. On top of the limited data and the high costs the latency (delay) in the data travelling from the earth to the satellite and back to the earth then across the internet was such that voice, video and Virtual Private Network services (VPN) would not function at a usable level. This automatically removed this solution for any form of work from home and trying to communicate with Doctors or relatives via video and voice. Satellite technology works for data that is <u>not</u> affected by latency (i.e. backhauling data from oil rigs and devices in the remote field locations) but it not to a point where it can support live voice and video for solutions needed in the home for communications like telemedicine, or live online learning let alone the occasional video call to family.

The other factor besides speed and latency for the wireless and satellite options was the amount of monthly data download. This may seem trivial but it is very easy to go over 25GB a month when watching TV and video on the internet or gaming. A prime example is that I have two boys and they play videos games. When they buy a new game and have to download it from the internet that is usually between 30GB-60GB of data to get it installed and then more as they play it. This one game alone would consume 1-2months of data allowed from a wireless or satellite vendor, and that is doing nothing else on the internet for the other 30 days of the month. That is not a solution that will work for modern day families.

Please note that there are two very key metrics in internet connections; speed and latency. For my situation 2 T1's provides 3mb of internet speeds (which is barley sufficient for me to work from home but does suffice as long as we are not doing other things on the internet) but the latency is so low that I can easily make voice and video calls for work. These is a perfect example of satellite will not work not even with faster upload and download speeds.

Having moved to this rural setting and working in technology I have become very passionate about rural high speed internet access. My family and I see if first hand every day, in kids in school that do not have access at home, and have to be driven into town in the evenings to use internet at the library. We have neighbors who home school their kids and only have a cell phone to access the internet, because in our area there is no other options other than satellite and it is not an affordable or viable solution for many types of communications.

I could go on all day long on how the lack of home broadband internet negatively affects the lives of rural Minnesotans and hinders their ability to get educated and find good paying jobs. But I will leave it at this, I am always willing to speak to anyone about these issues and my vast experience in trying to find viable options for our area residence.

Please take this information into consideration when discussing funding rural broadband initiatives, or thinking that a satellite providers if offering a solutions that is affordable and works in our situations.

Thank you for your time and attention.

Tim Larson

State Broadband Task Force:

I am a resident who resides within the Leech Lake Band of Ojibwe Indian Reservation. It appears that the state broadband guidelines may forego me and my neighbors again. I am a constituent who access to broadband via satellite. Although the Gen 5 internet that I have most recently acquired for a rate of $69.00 per month is touted as high speed, it is not what I need to satisfy myself. This rate is the introductory rate and I am sure as time passes it too will be beyond the rate that most people who reside in the boundaries of the Leech Lake Band of Ojibwe Reservation may afford.

Issues I have already experienced the first month with this service:

1. It stalls out and I must reboot the receiver.
2. I get a lot of buffering
3. If it rains, I have zero access to internet at all

I genuinely ask you to consider to move forward with fixed wireless and/or fiber optics to all citizens in Minnesota. It is only fair to include the most rural areas in your scope of future broadband to all.

Sally Fineday

Dear Ms. Kelliher,

The Minnesota Broadband Task Force will be discussing the merits of wireless internet including satellite systems this week. I wanted to give you some first hand experience with satellite internet. Here is a letter to the Duluth News Tribune that I submitted this spring and it was ultimately published, shortly after the MN Broadband Day at the Capital.

While current satellite internet systems can deliver up to 25Mbps down, as I point out here, they are very expensive, with cost increasing as data plans are exceeded with a necessity to purchase additional data to get through the month.

Once people have access to fast internet, they find more and more ways to use it, with multiple family members or home based businesses all trying to use the internet at once from multiple devices. And the internet of things, such as home monitoring systems, also tap internet data. Data plan- based systems are generally much more expensive than comparable non-data plan offerings. This includes mobile wireless and satellite systems.

We currently have wireless internet from a set of towers established by our electric cooperative. The speed is up to 7Mbps down, with no data caps, and the cost is $60 per month. The electric coop says that the technology they have and the spectrum they use does not allow them to increase the speed beyond 7Mbps. While fairly reliable (although they are currently having difficulties with their service provider and the system is very erratic (off and on), the speed provided is quickly becoming frustrating. And the distance of service from each tower is 1.5 miles, so this system cannot cover all the residents in my township, approximately half of them cannot get service. We are located at the very margin of Century Links CAF map and they have told us that they may not be able to reach us by the end of the CAF2 program. There are still many rural areas in Minnesota that are caught between very slow vs very expensive internet access.

I urge you and the Task Force to listen to wireless and satellite subscribers, not just to the providers. And include subscribers from the hilly and conifer forested parts of Minnesota, not just the open agricultural areas, as wireless behaves quite differently "up north" than it does in southern Minnesota.

The only update I suggest from my letter to the DNT is that, previous to the MN Broadband Day, Exede offered at 150Gb plan. At about the same time, when Hughesnet began offering 25Mbps, Exede dropped it's highest data plan to 50Gb. Now, probably owing to pressure from subscribers, Exede is back to offering a 150Gb plan. At the time of my letter to the DNT, Exede only offered a 50Gb plan (in response apparently to its competition).

Thanks for your consideration,
Janet Keough
North Star Township