

**Draft  
Annual  
Report**

July 9, 2018

**2018**

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This document contains the Task Force's 2018 Annual Report with recommendations for policy makers and stakeholders to consider in the 2019 legislative session.

**Governor's Task  
Force on Broadband**

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## 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 2018 and makes policy recommendations to the Governor and Legislature. This report is also the last report to Governor Dayton, and so we take this opportunity to reflect on our past achievements and look forward to issues that the next governor and future legislatures might consider when developing policy to expand access to and increase adoption of broadband.

Over the last seven 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 March 2018, 90.77 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). As of October 2017, 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.

While these goals are both aspirational and attainable, they are not immutable. As technologies evolve and policies change, along with shifts in demographic and consumer trends, the state's broadband speed goals may also change. This report looks ahead to potential changes in technology and state and federal policy—changes that a future governor and Legislature might consider when addressing broadband policy. The report also reflects on the past achievements of this Task Force and makes broadband policy recommendations.

## Introduction

This report is our final report to Governor Dayton; it is our final opportunity as a Task Force on Broadband to share our findings and recommendations for how to expand access to and adoption of broadband throughout Minnesota. We take this opportunity to not only share our perspective on these items but to reflect on our past achievements as a Task Force and the progress the state has made on achieving its broadband speed goals. We will also take this opportunity to look forward to technology changes and policy issues that the next governor and future legislature might consider when developing policies to expand broadband throughout Minnesota.

- Overview of the economic impact of broadband
  - *Illustrative:* McKinsey global study on the economic impact of the Internet that found that increases in Internet access strongly correlate with increases in real per capita GDP. Studies that have given specific attention to rural areas have noted a positive relationship between rural broadband access and adoption and greater economic growth (Stenberg, et al., 2009), attraction of new firms (Kim & Orazem, 2017), higher household incomes (Whitacre, Gallardo, & Stover, 2014), small business growth (Shideler & Badasyan, 2012), increase in annual sales and value added (Canzian, Poy, & Schuller, 2015), and growth in annual payroll and number of business establishments (Kandilov & Renkow, 2010). Broadband = Access to Opportunity
- Overview of Minnesota's historical and existing gaps in broadband access, adoption and affordability. (Where are we at today, what improvements have we seen?); MN/US comparisons; MN rural/urban comparisons)

Historical Estimate of 25 Mbps Download and 3 Mbps Upload Broadband Service Availability in the State of Minnesota

| Date          | Wireline (%) | Fixed, Non-Mobile (%) |
|---------------|--------------|-----------------------|
| April 2011    | 69.64        | 69.64                 |
| April 2012    | 70.56        | 70.56                 |
| April 2013    | 82.03        | 82.96                 |
| April 2014    | 84.10        | 85.27                 |
| February 2015 | 85.83        | 88.29                 |
| July 2016     | 87.72        | 89.98                 |
| April 2017    | 87.94        | 93.06                 |
| March 2018    | 90.77        | 95.59                 |

Source: *Connected Nation, Mar. 2018.*

## History of Minnesota's response to expand broadband access statewide

In 2010, prior to the establishment of this Task Force, broadband goals were included in statute as a recommendation from the legislatively created *Ultra High Speed Broadband Task Force* that existed from mid 2008 until the end of 2009. Those goals included a speed goal: that all households and businesses should have access to broadband service of at least 10Mbps download and 5Mbps upload by 2015; as well as the following comparative goals:

### Subd. 2. State broadband leadership position.

It is a goal of the state that by 2022 and thereafter, the state be in:

- (1) the top five states of the United States for broadband speed universally accessible to residents and businesses;
- (2) the top five states for broadband access; and
- (3) the top 15 when compared to countries globally for broadband penetration.

The Minnesota Legislature revisited the broadband speed goal in 2016, and at the recommendation of this Task Force, established the following new goals:

### Subdivision 1. Universal access and high-speed goal.

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.

### *Creation of the 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.<sup>1</sup> Creation of the OBD was a recommendation of this Task Force in its 2012 Annual Report.<sup>2</sup> 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. 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.<sup>3,4</sup>

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,

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<sup>1</sup> Minnesota Session Laws, 2013 regular session, chapter 85 at Article 3, sections 13, 14, and 26.

<sup>2</sup> 2012 Annual Report and Broadband Plan at p. 33.

<sup>3</sup> 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](https://mn.gov/deed/assets/broadband-dev-report_tcm1045-132774.pdf).

<sup>4</sup> 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).

including cost, community support, the number of households and community institutions impacted by the project, and demonstrated need for economic development, among others.<sup>5</sup>

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. More information on the accomplishments of the OBD can be found in its most recent report at [Office of Broadband Development Annual Report](#)

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 full funding, on an on-going basis is so important—and that is why we are including it as a recommendation.

#### **Recommendations**

Provide the Office of Broadband Development with full funding, on an on-going basis.

#### *Creation and Funding of the 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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<sup>5</sup> Minnesota Session Laws, 2014 regular session, chapter 312 at Article 3, sections 3.

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)<sup>6</sup>:

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.

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.<sup>7</sup> 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.<sup>8</sup>

The Border-to-Border Broadband Development Grant Program was funded for four consecutive years, with grants distributed from appropriations in 2014, 2015, 2016, and 2017. Altogether, the Office of Broadband Development received 211 grant applications, awarded 110 projects totaling \$85,195,193 and leveraging \$110,620,686 in matching dollars. A combined 33,852 households, 5,189 businesses and 300 community anchor institutions have or are in the process of receiving service from these projects.

Unfortunately, while there was bi-partisan support for the grant program in 2018, funding was included in a 990 page omnibus policy and budget bill that was vetoed.

#### **Status on state broadband goals**

- 2022
- 2026

#### **Economic Impact of Broadband Investments in Minnesota**

Minnesota is seen by others as an exemplary model of a State-led broadband expansion initiative. At least 18 states are formally looking at the "Minnesota Model," including establishing a Broadband Task Force, statutory speed goals, an Office of Broadband Development and the state-funded Border to Border broadband grants program.

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<sup>6</sup> In some cases, applicants commit more than 50 percent of the total cost of the project to further leverage state funds.

<sup>7</sup> 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](https://mn.gov/deed/assets/grant-challenge-process-2016_tcm1045-257998.pdf).

<sup>8</sup> An informal coalition of over 20 organizations representing a diverse range of statewide and community interest groups, particularly in rural areas, came before the Task Force to provide specific feedback about the impact of this challenge process on rural communities. Their letter to the Task Force can be found in Appendix B.

In Minnesota, the Office of Broadband Development was made part of the Department of Employment and Economic Development, a decision which has highlighted broadband's role in the state's economic vitality and prosperity. Another part of the "Minnesota Model" is broad recognition that broadband expansion requires Public Private Partnerships. Private providers have the technical expertise to expand broadband but often can't make the business case necessary to invest in upgrades or expansions in areas with low population density. Public providers can invest in riskier projects or projects with slower return on investment.

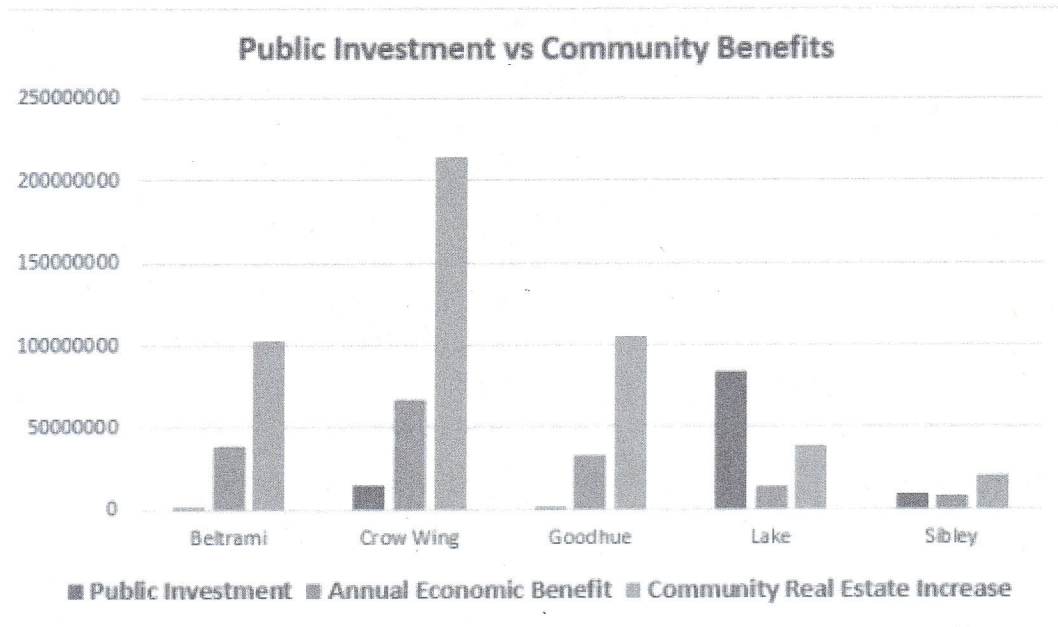
Last year, the Blandin Foundation looked at five rural communities to track the economic impact of public investment in better broadband. Using third party data (Census), established economic formulas and interviews with local residents, the study found that community members benefitted from better broadband.

The study looked at five counties: Beltrami, Crow Wing, Goodhue, Lake and Sibley.

County data showed that while a community might reap immediate economic benefits, there is a lag in the time it will be reported. The most recent data available was from 2015-2016; only one community had enough broadband coverage in 2015 to legitimize that data. But that county (Beltrami) did see benefits.

Beltrami's population increased 3.7 percent where other similar counties saw a decrease in population. The median income was \$44,757 where similar counties had a median income of \$40,7000. It's a trend of one, but the results are impressive.

Community economic impact was evident through the lens of an economic development formula. Using numbers from an earlier study by Ohio State University Swank Program, Roberto Gallardo at Purdue Extension determined that a rural home without broadband misses out on \$1,850 in economic benefits per year. FTTH Council released a study showing access to fiber-delivered Internet boosts home values by up to 3.1 percent. The study uses those numbers – multiplied by the number of households with broadband to get community-wide economic benefits and compares that to public investment, which includes grants, loans and other public or community funding. (See chart below.)



In three of the study's counties the annual economic benefit accrued from broadband was larger than the public investment made, and in Sibley County the amount of investment is only slightly larger than the amount of calculated economic benefits. In Lake County the benefit is projected to surpass the investment in six years in part because they had received a larger investment. In each of the communities, residents and community leaders were happy with their decision to invest.

In sum, economic developers and community leaders in communities with good broadband can focus on implementing innovative, tech-based economic development strategies. This gives them a distinct advantage over their counterparts in unserved counties where local teams must instead prioritize pursuing broadband deployment and struggle with limited bandwidth and unhappy residents and businesses.

**Issues on the horizon: How changes in technology and policy impact access to broadband**

Technology

Before we touch on a few alternative broadband delivery options, we want to provide a brief update on the traditional delivery options – what is happening with Fiber technology and updates to cable's DOCSIS protocol

*Fiber Technology*

Fiber optics was first used as a telecommunication medium in the late 1970s. The first live telephone traffic over this technology was sent in 1977 in Long Beach, California at a speed of 6 Mbps. The technology leverages transmitters on one end that translate an electrical signal into an optical signal, and receivers on the other end that converts this signal back to an electrical signal. In between these are bundles of fiber optic cable that stretch for many 40-60 miles. These bundles can be attached to amplifiers that enable signals to travel great distances.

Most of today's fiber optic infrastructure can handle speeds of at least 10 Gbps. Infrastructures that interconnect and aggregate traffic can handle speeds up to 400 Gbps. The increase in speed is achieved via upgrades to the transmitters, receivers, or amplifiers along the fiber routes.

Fiber technology continues to evolve. Laboratory environments have shown new technologies capabilities of reaching speeds of 250 Tbps. While we are still years away from this technology being deployment-ready, fiber continues to have a long-term future delivering voice, video, and data.

### *DOCSIS*

DOCSIS is the cable industry standard for enabling high-bandwidth data delivery over cable systems. This standard has allowed cable providers to add voice and data as service offerings to their video customers using their hybrid fiber-coax (HFC) infrastructures. In its 10 plus years of experience, DOCSIS has evolved from providing theoretical maximum speeds (up/down) of 40Mbps/10Mbps to 10Gbps/10Gbps with the latest (3.1 Full Duplex) version of the standard defined in late 2017.

In the future, cable providers will have the opportunity to invest in their networks to enable 3.1 Full Duplex support and be able to deliver faster speeds to their customers.

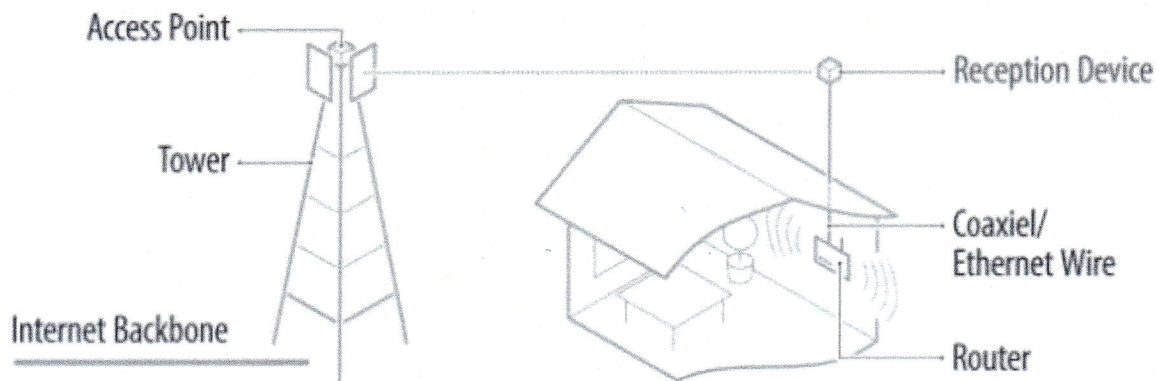
### *Alternative Broadband Options*

While many urban areas have access to at least one traditional broadband carrier, many rural areas are left with a slow speed option or no option at all. As of July 2016, 22% of rural Minnesotans did not have access to a broadband service that meets our current goals of 25Mbps up/3Mbps down.

The density of these rural areas makes providing this service via traditional funding models nearly impossible to justify without some subsidies to help defray costs. To fill this gap, we examined 4 areas that also play a role in serving rural areas. We discuss some of the benefits and challenges below.

### Fixed Wireless

Fixed wireless enables two fixed locations to communicate with each other. Instead of a physical connection like you would have with a copper or fiber connection from a traditional broadband provider, service is delivered over airwaves between the two locations.



Simplified fixed wireless

© creative commons BROADBANDNOW

### Fixed Wireless<sup>9</sup>

Compared to traditional broadband offerings of DSL and cable, fixed wireless is usually quick to install and has a much lower last mile installation charge (~\$70 vs. ~\$1500 for traditional infrastructure) Service speeds are comparable to traditional offerings. Even though it is delivered over the air, the latency for fixed wireless is generally low.

Some of the challenges with fixed wireless include a line of sight requirement between two endpoints, the lack of available spectrum to reduce the risk of interference, and a perceived security concern since the technology is wireless.

There are many debates on how fixed wireless could eliminate the need for fiber or vice versa. The Task Force heard from four fixed wireless providers serving parts of MN, North Dakota, South Dakota and Wisconsin They see the technologies as being essential to each other. First, most towers are connected to upstream networks via a fiber build to the tower (see Fixed Wireless diagram). Second, instead of having the high costs of trenching miles of fiber into every end location, fixed wireless can be used to extend existing fiber buildouts. In other words, fiber supports fixed wireless, and fixed wireless extends the reach of fiber.

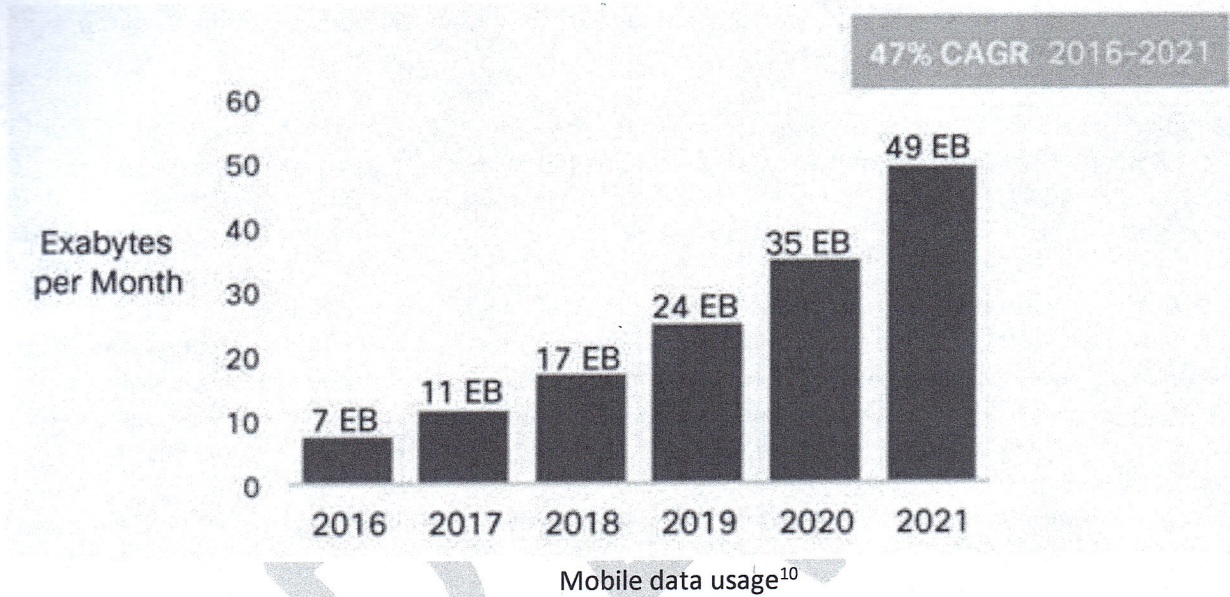
The providers also see the current competitive landscape as being a positive for the market. There are 74 fixed wireless providers in Minnesota today. The town of Warren, MN (population 1,547) is served by two fixed wireless and two wired providers. Here the competitive landscape helps with down costs for consumers providing more bandwidth for similar cost or a cheaper cost for similar bandwidth vs. some Twin Cities' zip codes.

### 5G

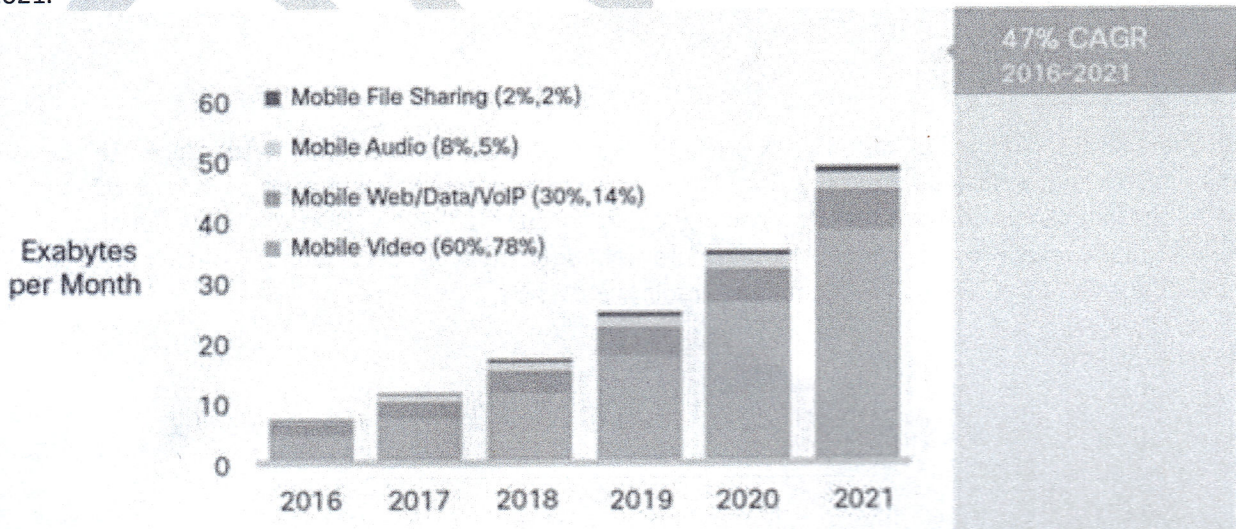
<sup>9</sup> <https://broadbandnow.com/Fixed-Wireless#note-1>

Previous generations of mobile wireless were geared toward delivering voice and data to mobile handsets. They were designed to leverage the original cellular network architecture where cell towers served geographic areas of several miles.

Today, mobile data usage is growing dramatically. Cisco predicts that in just five years, mobile data traffic is expected to grow at a CAGR of 47%. The growth in traffic is due to the boom in mobile video as well as the growth in Internet of Things (IoT) devices.



Consumption of mobile data by younger generations continues to grow. The increase in usage of video chats, Snapchat and Netflix, is leading to the prediction of over 75% of all mobile traffic being video by 2021.



<sup>10</sup> [https://www.cisco.com/c/dam/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.doc/jcr\\_content/renditions/mobile-white-paper-c11-520862\\_8.jpg](https://www.cisco.com/c/dam/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.doc/jcr_content/renditions/mobile-white-paper-c11-520862_8.jpg)

## Types of mobile data used<sup>11</sup>

Connected devices are also seeing a significant growth surge. Gartner predicts that by the end of 2017 there are expected to be 8.4 billion devices connected to the Internet. By 2020 this number will approach 21 billion. Vehicles, watches, packages, medical devices, and drones are just a few of the devices that will need to connect to the network to sending and receiving data.

Today's mobile networks are not capable of dealing with this increase in traffic or connections. Soon, 5G networks will deploy which will provide additional capacity for mobile devices and handle all of the additional IoT devices that will be seeking connections.

In addition to increased density, 5G networks also have the capability of utilizing many additional spectrum ranges. Lower ranges of the spectrum can be used to cover greater distances while higher ranges enable more bandwidth. This will enable 5G also to increase coverage and bandwidth for fixed wireless offerings.

These networks will not be started from scratch, but instead, leverage the existing mobile network. Small cells will be used to increase density. Current networks include 300K+ cells to provide coverage across the US. Each cell covers an area of roughly 1-2 miles. The small cells used in 5G cover a much smaller area - typical coverage under a mile. The smaller coverage area requires many more small cells spread out to provide coverage across the US. Accomplishing this means millions of small devices installed on lamp posts, buildings and across neighborhoods.

Fiber has a significant role to play in 5G as many of these small cells need to interconnect with fiber. The fiber provides high speed and capacity connections to the small cells, meaning that the 5G networks of tomorrow will be some of the "most wired" wireless networks ever deployed.

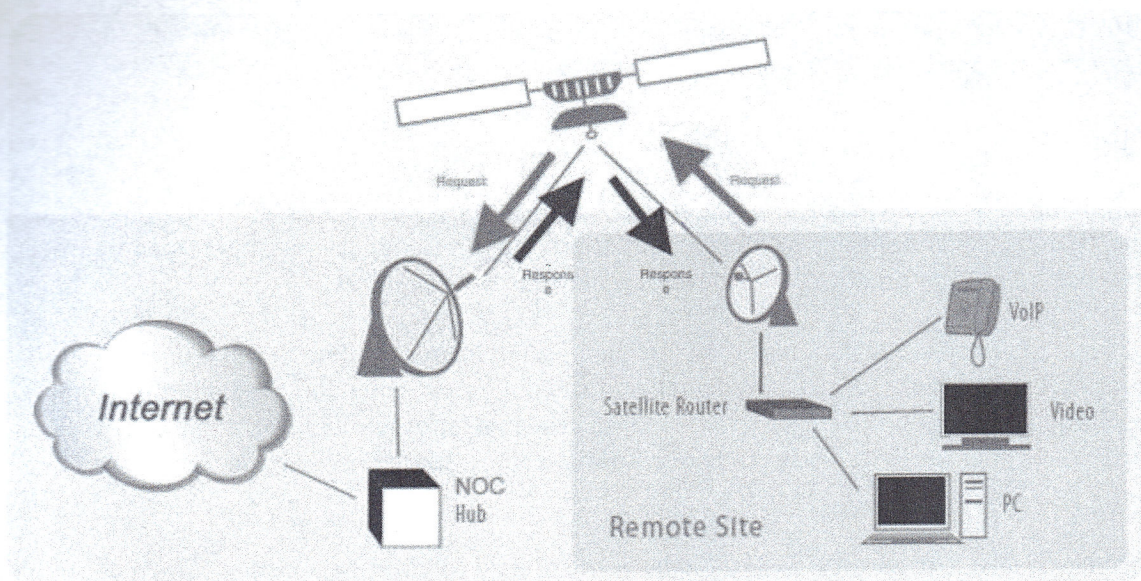
The American Consumer Institute recently released a report confirming the economic and consumer benefit of 5G networks. The study shows an expected benefit of \$533B to US GDP over seven years and \$1.2T in long-run consumer benefit.

### Satellite-based Broadband

Six years after the launch of Sputnik 1, NASA launched a satellite that was able to orbit the Earth above the equator and remain in a fixed position. The concept of a geosynchronous orbit paved the way for satellites that can be adapted for television and communications delivery. Over the years, satellite delivery has evolved to provide an option for Internet connectivity for users who are outside the coverage area of traditional broadband and wireless providers.

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<sup>11</sup> [https://www.cisco.com/c/dam/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.doc/jcr\\_content/renditions/mobile-white-paper-c11-520862\\_24.jpg](https://www.cisco.com/c/dam/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.doc/jcr_content/renditions/mobile-white-paper-c11-520862_24.jpg)



### Satellite Internet<sup>12</sup>

The satellite acts as a connection pathway between the remote site (home or business) and the NOC (service provider location). In this case, the connection is 22K miles “up to” and “down from” the satellite.

Internet delivery via satellite is available just about everywhere with over 1.7M US subscribers. Satellites launched in 2016-17 now enable speeds of 25 Mbps down/3 Mbps up which enable most applications to function like they would on broadband from cable or DSL.

There are some challenges with satellite internet. All traffic needs to travel nearly 100K miles (2 trips up to and 2 down from the satellite). The distance introduces a high amount of latency which can impact applications like voice-over-IP, video conferencing and gaming. The FCC is working with providers on a next-generation satellite offering which may be able to minimize this impact by leveraging non-geostationary satellites at lower orbits.

Another challenge can be the data limits imposed by the providers. Some traditional broadband and fixed wireless providers also impose data limits, but the limits the satellite providers impose are usually lower. Previously, these limits were hard caps that you could either not exceed or exceed with significant overage charges. Today, there is no cost to exceed the cap, but the satellite providers will reduce your speeds down to < 3 Mbps.

The size of the limits ranges from 10-150GBs. This may seem like an adequate amount of data, but iGR Research<sup>13</sup> reported last year that the average monthly broadband usage per household is 190GBs

<sup>12</sup> [http://www.groundcontrol.com/How\\_Does\\_Satellite\\_Internet\\_Work.htm](http://www.groundcontrol.com/How_Does_Satellite_Internet_Work.htm)

<sup>13</sup> <http://www.telecompetitor.com/igr-average-monthly-broadband-usage-is-190-gigabytes-monthly-per-household/>

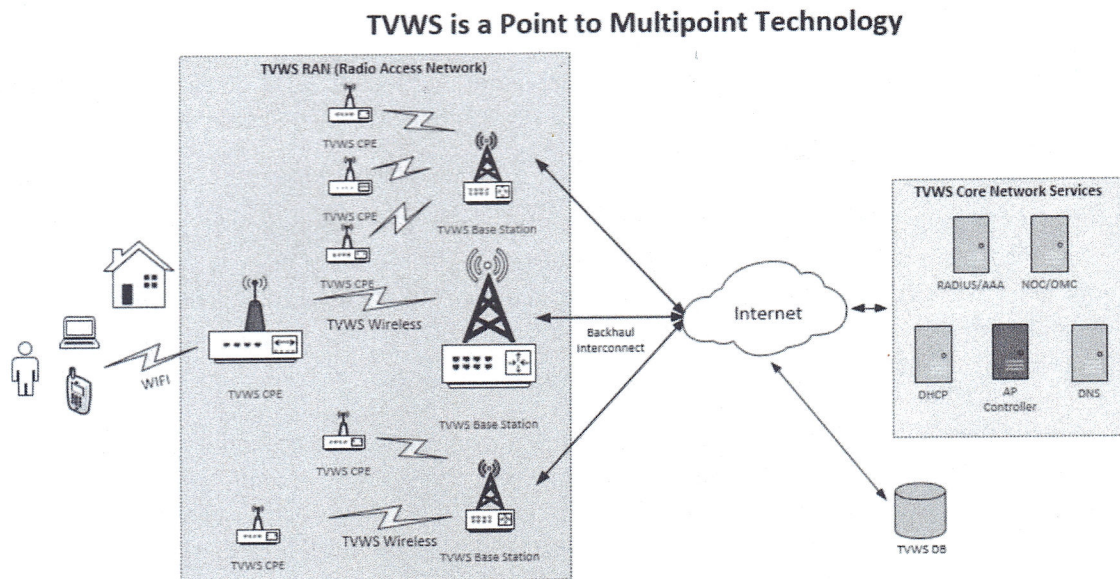
while both AT&T<sup>14</sup> and Comcast<sup>15</sup> claim that their monthly average home internet users consume at least 100 GBs of data per month. This shows that while today's satellite internet offerings can fill the coverage gap, they still may not meet the needs of the average household.

### TV Whitespace

Telecommunication broadcasters are required to obtain a license which enables them to broadcast at a specific frequency over a specific distance. A buffer around this frequency is also reserved to prevent interference from other broadcaster or devices using nearby frequencies.

Before June 2009, television stations broadcast their signals in analog across a wide range of frequencies. Once stations switched to digital broadcast, they were able to squeeze more channels into smaller frequency ranges, thus making large ranges available for other uses. Since then, network operators have been looking at ways to take advantage of this space between the ranges or "whitespace." This is TV White Space (or TVWS)

One promising idea is to use of TVWS is to deliver broadband services. Base stations could be set up at points with high-capacity connectivity. These base stations would then broadcast to multiple, individual locations. Advantages of using the TVWS include coverage at longer distances, better penetration at the individual location, and installation/CPE costs similar to fixed wireless solutions.



<sup>14</sup> <https://www.att.com/esupport/article.html#!/dsl-high-speed/KM1010099>

<sup>15</sup> <https://www.xfinity.com/support/internet/data-usage-average-network-usage/>

## TV Whitespace Overview<sup>16</sup>

Currently, TVWS is in a pilot stage in the US and other countries. There are permitting and equipment manufacturing issues to resolve for this technology to deliver at large scale. One project in the works is Microsoft's Airband Initiative. The project has launched a number pilots across 24 countries and this year announced a plan to deliver 12 TVWS projects to 12 states in 12 months with a long-term goal of connection 2 million rural Americans to TVWS by 2022.

### Security of Alternative Broadband Options

Since many of the previous alternatives to broadband are "wireless," some people wonder if this makes it easier for hackers to listen in on the signals and potentially steal data. The fact the signal is transmitted over the air adds little to how insecure the signal is. Experts agree that no matter how the signal is transmitted, the infrastructure must receive the proper security patches and that encryption of the data is the real key to prevent exposing sensitive data via wireless or wired networks.

### *Emerging Technologies*

In previous Task Force reports, we have reported on many additional ways that MN residents are taking advantage of broadband services than just email, Facebook, and Netflix. We have discussed the growth of the freelance employment, the advantage of telecommuting options for full-time employees, the increased use of broadband in education and libraries systems and the applications requiring broadband in the field of telemedicine. In this report, we touch on new technologies and their reliance on broadband.

### Precision Ag

The need for broadband in agriculture has continued to climb. According to Alpha Brown by the end of 2017, there were over 250,000 farmers using Internet of Things (IoT) sensors to monitor portions of their business. The growth possibilities include up to 1.1 million farms with a \$4 billion market size.

Today, some sensors monitor cows that are about to give birth, report on dairy cows biological measurements, and measure moisture and pest presence in fruit orchards. In addition to the sensors, drones are being used to monitor field moisture to more accurately direct irrigation and to ensure chemicals are only applied where needed. Even the equipment used by farmers continues to be enhanced with sensors. The Task Force visited CNH in Benson, MN to learn about the increased use of near real-time sensors in the equipment they manufacture.

All of these sensors are using and generating significant amounts of data. They need to have reliable broadband connectivity to enable MN farmers to take advantage of their production-enhancing promises.

### Blockchain

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<sup>16</sup> Microsoft Presentation to September Broadband Task Force Meeting - [https://mn.gov/deed/assets/microsoft-airband\\_tcm1045-313541.pdf](https://mn.gov/deed/assets/microsoft-airband_tcm1045-313541.pdf)

Another technology that the Task Force reviewed in 2018 was Blockchain. This technology is an encrypted, decentralized ledgering system that provides decentralized, immutable ownership. The technology can be used to enable smart contracts, asset transfers or payments (i.e., Bitcoin). It has the potential to reduce the cost of verification.

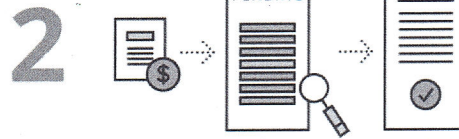
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**Figure 2. Blockchain: How it works**

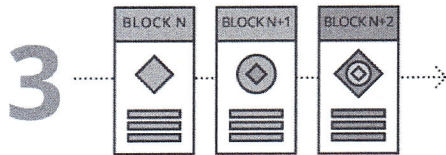
Blockchain allows for the secure management of a shared ledger, where transactions are verified and stored on a network without a governing central authority. Blockchains can come in different configurations, ranging from public, open-source networks to private blockchains that require explicit permission to read or write. Computer science and advanced mathematics (in the form of cryptographic hash functions) are what make blockchains tick, not just enabling transactions but also protecting a blockchain's integrity and anonymity.



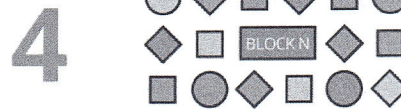
**1 TRANSACTION** Two parties exchange data; this could represent money, contracts, deeds, medical records, customer details, or any other asset that can be described in digital form.



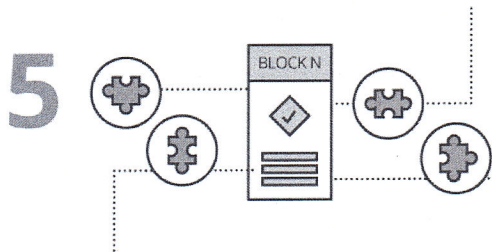
**2 VERIFICATION** Depending on the network's parameters, the transaction is either verified instantly or transcribed into a secured record and placed in a queue of pending transactions. In this case, nodes—the computers or servers in the network—determine if the transactions are valid based on a set of rules the network has agreed on.



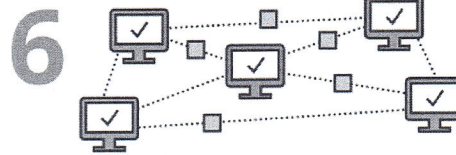
**3 STRUCTURE** Each block is identified by a hash, a 256-bit number, created using an algorithm agreed upon by the network. A block contains a header, a reference to the previous block's hash, and a group of transactions. The sequence of linked hashes creates a secure, interdependent chain.



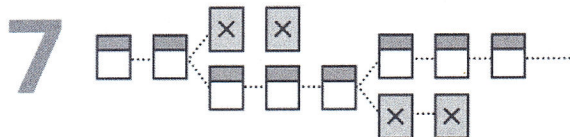
**4 VALIDATION** Blocks must first be validated to be added to the blockchain. The most accepted form of validation for open-source blockchains is proof of work—the solution to a mathematical puzzle derived from the block's header.



**5 BLOCKCHAIN MINING** Miners try to "solve" the block by making incremental changes to one variable until the solution satisfies a network-wide target. This is called "proof of work" because correct answers cannot be falsified; potential solutions must prove that the appropriate level of computing power was drained in solving.



**6 THE CHAIN** When a block is validated, the miners that solved the puzzle are rewarded and the block is distributed through the network. Each node adds the block to the majority chain, the network's immutable and auditable blockchain.



**7 BUILT-IN DEFENSE** If a malicious miner tries to submit an altered block to the chain, the hash function of that block, and all following blocks, would change. The other nodes would detect these changes and reject the block from the majority chain, preventing corruption.

Source: Deloitte Tech Trends 2016, *Blockchain: Democratized Trust*.

Deloitte University Press | [dupress.deloitte.com](http://dupress.deloitte.com)

**An Overview of Blockchain**

Walmart and IBM are partnering on a way to use Blockchain to track products from farm to consumer to help combat food fraud. Maersk is also partnering with IBM to leverage Blockchain to create tamper-resistant digital shipping paperwork to aid shipping supply chains. Governments are also looking to solve problems with Blockchain. The country of Georgia using it to secure and record land transfers, Estonia is using it to create a digital identity of its citizens, and at least six different state and local agencies in Illinois are using the benefits of blockchain to provide a thoughtful and light touch to government integration. While this technology itself is not a high user of broadband resources, high-quality broadband connectivity will be necessary for companies, residents and the government entities in MN to take part in the advances made with this technology.

### *Cyber Security*

It seems like every day there is another news article about stolen data, ransomware taking over systems and encrypting data or identity theft occurring. To provide some context, Verizon published their annual Data Breach Investigation Report<sup>17</sup> reviewing 53,000+ global security incidents resulting in 2,200+ data breaches. While the report has many interesting statistics, there are two that we want to highlight. The first is Thea the Public-Sector systems had the were third for the number of breaches in 2017. The second was that while compromises typically take just minutes to occur once an attacker has found an opening, most take months to discover.

We mention these to highlight the importance of the work going on within MNIT. MN CISO Aaron Call & MN CIO Brig. Gen. Johanna Clyborne presented to the Task Force about some of the initiatives they are taking with updating the security policies and security training to begin to ensure systems are being developed from the beginning to be as secure as possible and to educate state employees about what to do to combat the many attempts at social engineering or what to do if they see suspicious activity. Both of these steps help to improve the security posture of the State's systems and data.

#### **Recommendations**

No one broadband delivery solution will serve the needs of all Minnesota residents. As the report has shown, there are still many parts of the state that cannot receive even the minimum speeds required to count as connected. Once connected, ongoing investments in the infrastructure will continue to be needed to ensure Minnesota's residents can take advantage of newer technology offerings.

The Task Force also supports MNIT's multi-year strategic plan to secure Minnesota's IT environments.

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<sup>17</sup> [https://www.verizonenterprise.com/resources/reports/rp\\_DBIR\\_2018\\_Report\\_execsummary\\_en\\_xg.pdf](https://www.verizonenterprise.com/resources/reports/rp_DBIR_2018_Report_execsummary_en_xg.pdf)

### *Federal policy: Future challenges and opportunities*

Developments at the Federal Communications Commission (“FCC”) continue to impact broadband deployment and adoption in Minnesota.<sup>18</sup> Federal investment in telecommunications has evolved significantly over recent years. Programs aimed at improving broadband access for rural health care, education and public safety bring substantial funds into the state. This section highlights how federal efforts impact Minnesotans.

The Connect America Fund (“CAF”) provides substantial funding directly to telecommunications carriers who serve high cost rural communities. The FCC will conduct a reverse auction in July and August 2018 to award \$1.98B over a ten-year period.<sup>19</sup> The funding is available in areas where the carrier declined CAF support in 2015 and there is no broadband available of at least 10/1 Mbps.<sup>20</sup> Several Minnesota carriers were declared eligible to participate in the auction.<sup>21</sup>

Public safety networks depend on access to robust telecommunications services.<sup>22</sup> Congress created the FirstNet program to deliver secure, dedicated wireless network services to public safety providers. Minnesota finalized its contract with FirstNet in May 2018.<sup>23</sup> Minnesota law enforcement, fire, emergency medical personnel and sovereign nations may now sign up.<sup>24</sup> “FirstNet offers priority, preemption and reliability during emergencies like the Interstate 35 bridge collapse or the recent refinery explosion in Superior, Wisconsin,” said Emergency Communication Networks Director Dana Wahlberg. “Duluth responders provided mutual aid to the refinery explosion and experienced congestion on the wireless network during the incident.”<sup>25</sup>

Rural health care facilities in Minnesota benefit from federal support to reduce the high cost of accessing broadband in sparsely populated areas. Critical functions in hospitals, clinics, labs and medical provider offices are intricately reliant upon reliable, high speed broadband. The FCC recently expanded the cap from \$400M to \$571M in recognition of increasing demand for support. FCC Chairman Ajit Pai stated, “Telemedicine is vital in many communities that may not otherwise have access to high-quality health care, and the Federal Communications Commission has an important role in promoting it.”<sup>26</sup>

Minnesota students and educators incorporate technology into learning done in the classroom and at home. “Innovative digital learning technologies and the growing importance of the Internet in connecting students, teachers and consumers to jobs, life-long learning and information, are creating

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<sup>18</sup> Danna Mackenzie, Director of the Office of Broadband Development, was recently appointed by FCC Chairman Pai to serve on the full Broadband Deployment Advisory Committee. <https://docs.fcc.gov/public/attachments/DA-17-476A1.pdf>.

<sup>19</sup> <https://www.fcc.gov/auction/903>.

<sup>20</sup> A map of eligible areas is available on the FCC website. <https://www.fcc.gov/maps/caf2-auction-final-areas/>.

<sup>21</sup> <https://docs.fcc.gov/public/attachments/DA-18-658A2.pdf>.

<sup>22</sup> <https://firstnet.gov/about>.

<sup>23</sup> <https://dps.mn.gov/divisions/ecn/programs/wireless-broadband/Pages/default.aspx>.

<sup>24</sup> The Task Force heard from a panel including FirstNet Board Member Hennepin County Sherriff Richard Stanek, AT&T FirstNet Coordinator Corey Draack and Melinda Miller from the Emergency Communications Network division of the Minnesota Department of Public Safety at its April 2018 meeting. [https://mn.gov/deed/assets/first-net\\_tcm1045-334395.pdf](https://mn.gov/deed/assets/first-net_tcm1045-334395.pdf); [https://mn.gov/deed/assets/mndps-first-net\\_tcm1045-334394.pdf](https://mn.gov/deed/assets/mndps-first-net_tcm1045-334394.pdf).

<sup>25</sup> <https://dps.mn.gov/divisions/ooc/news-releases/Pages/dedicated-broadband-minnesota-responders-now-available.aspx>.

<sup>26</sup> <https://docs.fcc.gov/public/attachments/DOC-351633A1.pdf>.

increasing demand for bandwidth in schools and libraries.”<sup>27</sup> The E-Rate program provides a substantial discount to broadband services offered in rural areas of the state.<sup>28</sup> The Task Force heard from EducationSuperHighway in May about the progress the E-Rate program has generated for educational institutions in Minnesota.<sup>29</sup> According to their presentation, “Only a handful of districts remain that are not meeting fiber and bandwidth metrics.”<sup>30</sup>

#### *State policy: Future challenges and opportunities*

Minnesota has established itself as a national leader and model for broadband infrastructure development. Minnesota’s legislatively created broadband goals, development office, mapping and grant program are frequently referenced as “the Minnesota Model” by other state and federal policy makers looking to assure the needs of their citizens in the ever-burgeoning connected world. Minnesota’s leadership is characterized by a statutory framework key components of which include (1) realistic, forward-looking internet speed goals, (2) an Office of Broadband Development within the Department of Economic Development charged with numerous broadband oversight responsibilities, (3) broadband deployment mapping capabilities to accurately plan, monitor and track broadband infrastructure, and (4) the Border-to Border Broadband Development Grant Program to provide matching funds for broadband infrastructure deployment in unserved and underserved areas.

#### Minnesota Statute Section 237.012’s Internet Speed Goals

A review and understanding of the history of Minnesota’s legislatively created internet speed goals is included here as background for the Task Force’s state policy recommendations. Minnesota’s first broadband speed goal was enacted in 2010. This legislation, codified at Minn. Stat. § 237.012 (2010), provided that “It is a state goal that as soon as possible, but no later than 2015, all state residents and businesses have access to high-speed broadband that provides minimum download speeds of ten to 20 megabits per second and minimum upload speeds of five to ten megabits per second.” *Id.* (emphasis added). The legislation also adopted as a goal that Minnesota undertake a broadband leadership position, and specifically that Minnesota be in the top 5 states for internet speed, the top 5 states for internet access, and in the top 15 when compared to countries globally for broadband penetration. *Id.*

With the growth of internet use, advancement of broadband technologies, and expiration of the state broadband goals established to be accomplished by 2015, the 2016 Minnesota Legislature following the recommendations of the 2015 Task Force on Broadband enacted updated broadband goals for the State of Minnesota. The 2016 legislation updated Minnesota Statutes section 237.012 setting (1) a speed goal to be met by 2022, (2) a speed goal to be met by 2026, and (3) a goal for the state’s continued position of broadband leadership:

#### **237.012 BROADBAND GOALS.**

Subdivision 1. **Universal access and high-speed goal.** It is a state goal that:

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<sup>27</sup> <https://www.fcc.gov/general/universal-service-program-schools-and-libraries-e-rate>.

<sup>28</sup> <https://www.fcc.gov/general/universal-service-program-schools-and-libraries-e-rate>.

<sup>29</sup> [https://mn.gov/deed/assets/10-may-2018-esh\\_tcm1045-339814.pdf](https://mn.gov/deed/assets/10-may-2018-esh_tcm1045-339814.pdf).

<sup>30</sup> *Id.*

(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**.

Subd. 2. **State broadband leadership position.** It is a goal of the state that by 2022 and thereafter, the state be in:

- (1) the top five states of the United States for broadband speed universally accessible to residents and businesses;
- (2) the top five states for broadband access; and
- (3) the top 15 when compared to countries globally for broadband penetration.

Minn. Stat. § 237.012 (2017) (enacted in 2016) (emphasis added).

These are the broadband goals set for the state by the Minnesota Legislature, and which form the basis for the Task Force's recommendations in this report and in earlier years.

#### Border-to-Border Broadband Development Grant Program

Created by the Minnesota Legislature in 2014, the Minnesota Border-to-Border Broadband Development Program funds the expansion of broadband service to areas of Minnesota that are unserved or underserved. An **underserved area** is an area "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." Minn. Stat. § 116J.394(h). An **unserved area** is an area of Minnesota in which households or businesses lack access to wire-line broadband service with transmission speeds of at least of at least 25 Mbps download and 3 Mbps upload. Minn. Stat. § 116J.394(i) (2017); see Minn. Stat. § 116J.39. subd. 1(b) (2017).

The Border-to-Border Broadband Development Grant Program can pay up to 50 percent of the broadband development costs for a qualifying project, including the acquisition and installation of middle-mile and last-mile infrastructure that support broadband service scalable to speeds of at least 100 megabits per second download and 100 megabits per second upload.

Last mile infrastructure is broadband infrastructure that serves as the final leg connecting the broadband service provider's network to the end-use customer's on-premise telecommunications equipment. Middle mile infrastructure is broadband infrastructure that links a broadband service provider's core network infrastructure to last-mile infrastructure.

Construction of broadband infrastructure may include any of the following: project planning; obtaining construction permits; construction of facilities, including construction of both "middle mile" and "last mile" infrastructure; equipment; and installation and testing of the broadband service.

The grant program is designed to foster collaboration between public and private organization and the leveraging of public funds. Eligible organizations include:

1. Incorporated businesses or a partnerships;
2. Political subdivisions;
3. Indian tribes;
4. Minnesota nonprofit organizations organized under chapter 317A;
5. Minnesota cooperative associations organized under chapter 308A or 308B; and
6. Minnesota limited liability corporations organized under chapter 322B for the purpose of expanding broadband access.

While the program is set up to provide dollar-for-dollar matching funds to grant recipients, it is not uncommon for grant recipients to commit more than 50 percent of the total project cost thereby further leveraging state dollars.

During the first two years of the Border-to-Border Broadband Development Grant Program, the Legislature allocated nearly \$31 million to the program, leveraging \$41 million in private investments and serving more than 9,000 households and more than 900 businesses. Grant applications have consistently exceeded available grant funds. For example, in 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. Since its inception, the grant program has received \$85 million in funding in turn leveraging \$110 million in matching local and/or private investments, making service available to more than 34,000 households, 5,200 businesses and 300 community institutions across Minnesota.

#### We're Not There Yet – Meeting the Goals

The Task Force has consistently recommended continued funding of the Border-to-Border Broadband Development Grant Program in order to assure that Minnesota meets the broadband goals established by the legislature. The continued exponential growth of demand for broadband bandwidth is a reality, one which our legislature has recognized by law as necessary for Minnesota citizens and businesses to be connected and remain competitive in a 21<sup>st</sup> century global economy.

The most recent data available to the Task Force indicates good progress towards meeting Minnesota's broadband goals, but that there remain significant areas in the state where broadband availability is lacking, either unserved or underserved using statutory definitions. 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. Application of the Minnesota Statutes section 116J.394 definitions of "unserved" and "underserved" reveals that 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).

The numbers of "unserved" and "underserved" in rural Minnesota are greater. 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).

**Historical Estimate of Wireline Broadband Service Availability Statewide and in Rural Areas of Minnesota**

| Date   | 25 Mbps/3 Mbps |        | 100 Mbps/20 Mbps |        |
|--------|----------------|--------|------------------|--------|
|        | Statewide      | Rural  | Statewide        | Rural  |
| Feb-15 | 85.83%         | 68.08% | 39.14%           | 40.68% |
| Jul-16 | 87.72%         | 72.24% | 68.45%           | 48.93% |
| Oct-16 | 87.53%         | 72.03% | 68.53%           | 49.33% |
| Apr-17 | 87.94%         | 73.07% | 69.86%           | 52.46% |
| Oct-17 | 88.11%         | 73.45% | 70.07%           | 52.88% |

As can be seen in the table above, there remains work to be done in order to meet the Minnesota broadband goal that by “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 the 2026 goal of “download speeds of at least 100 megabits per second and upload speeds of at least 20 megabits per second.” Minn. Stat. § 237.012, subd. 1 (2017).

For the reasons stated in its 2017 annual report, the Task Force continues to recommend on-going biennial funding of the Border-to-Border Broadband Development Grant Program at \$71.48 million per biennia until the state achieves its broadband speed goals. This number is based on current numbers of Minnesota unserved households and factors in anticipated federal funding under the Federal Communication Commission’s Connect America Fund (CAF II). Reliable funding of the program will provide a level of certainty that assist and accelerate planning for the technology, collaboration and long-term investments needed to reach Minnesota’s broadband goals.

<< Note: Could also include details of how \$71.48 million number reached found on page 17 of 2017 report, but left out as may be too much detail here >>

<< Note: Include in Appendix: (1) Flyer put out by 70 organizations supporting the program; (2) Letter from Hector resident describing lack of broadband >>

<< Note: Insert new 2018 maps here or in appendix >>

State General Obligation Bonding for Fiber Optic Cable Infrastructure

Article XI, Section 5 of the Minnesota Constitution permits the issuance of general obligation bonds for specified purposes, stating in part:

**Sec. 5. Public debt and works of internal improvement; purposes.** Public debt may be contracted and works of internal improvements carried on for the following purposes:

(a) to acquire and to better public land and buildings and other public improvements of a capital nature and to provide money to be appropriated or loaned to any agency or political subdivision of the state for such purposes if the law authorizing the debt is adopted by the vote of at least three-fifths of the members of each house of the legislature....

Minn. Const. Article XI, § 5.

State general obligation bonding has not been used for fiber optic cable deployment. A 1994 legal opinion letter providing guidance to the Minnesota Department of Finance [footnote] concluded the installation of fiber optic cable would not meet the Section 5 constitutional restrictions of “the acquisition of land or buildings or clearly comprise (1) the betterment of ‘land’ or (2) the acquisition and betterment of ‘other public improvements.’” *Id.* The 1994 opinion concluded that fiber optic cable, at least as of 1994, was personal property and that the Section 5 “other public improvements of a capital nature” clause “most likely refers to additions to real estate, not personal property.” *Id.* The letter indicated that unless there was “no doubt” as to the appropriateness of using general obligations for this purpose, a test case would be required before an unqualified opinion could be issued approving bonding for installation of fiber optic cable. *Id.*

The Office of Broadband is seeing that some counties bonding for the county’s portion of grants under the Border-to-Border Broadband Development Grant Program. County bonding for fiber optic cable installation does is not hampered by Article XI, Section 5 restrictions as far back as 1872 it has been “well settled that the public debt and internal improvement provisions of the constitution apply only to the state, and not its political subdivisions.” *Lifteau v. Metropolitan Sports Facilities Comm’n.*, 270 N.W.2d 749, 756 (1978).

During the 2018, legislative session, at least two bills were introduced that would have expressly provided state general obligation bonding for use in the deployment or maintenance of fiber optic infrastructure. See SF3964/HF4376 (Fiber Network Extension from Willow River to Pine City and from Cromwell to Aitkin); SF1602/HF1092 (Minneapolis Veterans Home, Historic Trust Bridge). The proposed Willow River fiber network extension bill expressly anticipated the Article XI, section 5 issue with the following proposed legislative finding:

Subd. 3. General eligibility; state general obligation bond funds. Article XI, section 5, clause (a), of the Minnesota Constitution requires that state general obligation bonds be issued to finance only the acquisition or betterment of public land, buildings, and other public improvements of a capital nature. The legislature has determined that many fiber optic infrastructure projects will constitute betterments and capital improvements within the meaning of the Minnesota Constitution and capital expenditures under generally accepted accounting principles, and will be financed more efficiently and economically under this section than by direct appropriations for specific projects.

SF3964/HF4376 (Introduced 4/12/2018).

In the 21<sup>st</sup> century world of the Internet-of-things, the Task Force agrees with the characterization of fiber optic cable installation falling within the constitutional ambit of “the acquisition or betterment of public land, buildings, and other public improvements of a capital nature.” The advent of driverless

vehicles is also leading to deployment of accompanying highway technologies and “dig once” initiatives for installation of utilities. As such, general obligation bonding may now also be permissible “to establish and maintain highways.” Minn. Const. Article XI, Section 5(e). While not bound by the legislature’s characterization of bonds governed by the Minnesota Constitution, the courts will uphold bonding legislation when “the label matches the substance of the transaction.” Schowalter v. State, 822 N.W.2d 292, 301 (Minn. 2012).

#### Mapping of Broadband Service Areas in Minnesota

Of the 27 statutory obligations assigned to the Minnesota Office of Broadband Development, measuring and mapping broadband infrastructure deployment in the state is one of the most important. Accurate, timely mapping based on best available data has been a key, well recognized feature of Minnesota model for development of broadband infrastructure in the state. “Minnesota’s maps are better than any other state” is often heard from experts and broadband policymakers.

National level bills have been introduced to try and improve the data on cellular and broadband coverage available at the national level. See H.R.4810 MAPPING NOW Act of 2018; H.R.4798 – Inventory of Assets for Communications Facilities Act of 2018. Presently there is no regulation on data reporting by broadband providers, and self-reporting results in less than optimal data. Minnesota is fortunate to be in a better position on mapping than most others.

The budget set by the legislature for the Border-to-Border Broadband Development Grant Program has included a 3 percent budget allocation for broadband mapping. The Task Force believes this is a critical element and should remain a part of future funding for the program.

#### Potential Successor to the Governor’s Task Force on Broadband

- Should there be another Task Force on Broadband?
- If so, what would it look like?

This may be the biggest item to cover in the Task Force’s 2018 report. The report will likely want to cover what the Task Force has accomplished over 8 years. There appears to be overlap between this subject and the work of the Economic Impact subcommittee as legislators will likely be asking what has been the return on investment in broadband. This section can be drafted following discussion at our July 10, 2018 meeting.

## **Recommendations**

1. Ongoing biennial funding of the Border-to-Border Broadband Development Grant Program at \$71.48 million per biennia until the state achieves its broadband speed goals.
2. Continue to include a 3 percent budget allocation in the Border-to-Border Broadband Development Grant Program for broadband mapping.
3. Include state general obligation bonding as an additional financing tool to facilitate fiber optic cable deployment and achieve the state's broadband speed goals.
4. Continue a Minnesota Broadband Task Force.

## **Conclusion**

### **Summary of Recommendations**

1. Provide the Office of Broadband Development with full funding, on an on-going basis.
2. No one broadband delivery solution will serve the needs of all Minnesota residents. As the report has shown, there are still many parts of the state that cannot receive even the minimum speeds required to count as connected. Once connected, ongoing investments in the infrastructure will continue to be needed to ensure Minnesota's residents can take advantage of newer technology offerings.
3. The Task Force also supports MNIT's multi-year strategic plan to secure Minnesota's IT environments.
4. Ongoing biennial funding of the Border-to-Border Broadband Development Grant Program at \$71.48 million per biennia until the state achieves its broadband speed goals.
5. Continue to include a 3 percent budget allocation in the Border-to-Border Broadband Development Grant Program for broadband mapping.
6. Include state general obligation bonding as an additional financing tool to facilitate fiber optic cable deployment and achieve the state's broadband speed goals.
7. Continue a Minnesota Broadband Task Force.