

Minnesota Governor's Task Force on Broadband

2022 Annual Report

This document contains the Task Force's recommendations for policy makers and stakeholder partners to review and position for adoption in the 2023 legislative session.

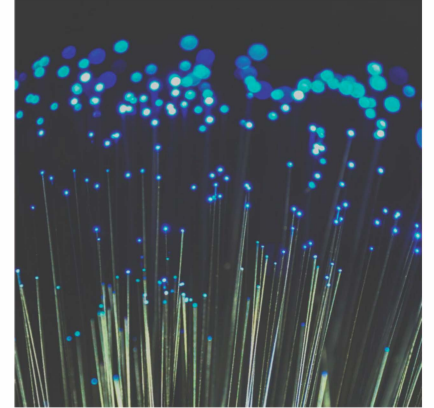


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Introduction

The Governor's Task Force is composed of 15 appointed members from across the state*, representing multiple sectors. Meeting monthly, they review the current state of broadband deployment, access, adoption, and affordability relative to the Minnesota statutory goals to serve 100% of Minnesota families and businesses.

This annual report is required under the Governor's Executive Order (EO19-10) that continues the work of the Task Force, which is to continuously evaluate the State's progress toward achieving the goals stipulated in the [Minnesota broadband statute, section 237.012](#). This report includes an inventory and assessment of the areas required by the statute. Additionally, the Task Force makes recommendations to the Governor, and the legislature, that if adopted, would improve the likelihood of achieving the state's broadband goals.

* See member name list in appendix

Executive Summary

While the disruption the pandemic caused has lessened over this past year, the dramatic negative impacts on our systems of education, health, government, and commerce are still being felt in every corner of our state. Education, health, government, and commerce leaders have been challenged to be increasingly more creative and innovative in their approaches to keep vital services to students, families, and communities working. However, despite some progress, the lack of sufficient high-speed broadband internet for every Minnesotan remains one of the biggest of these challenges.

Improvements in our state broadband mapping data and related resources has revealed that we have more households and businesses without access to broadband than understood last year* (>198,000 with no service or insufficient service @ 25/3 and >291,000 @ 100/20). As the new FCC “fabric map” updates coverage through the challenge process, it is expected this number will reveal further deficits in coverage. With over 80% of the unserved and underserved areas being in Greater MN, reaching all Minnesotans in some of the hardest areas to serve will be more costly. We must budget accordingly knowing that the cost per household will require greater investment (full details later in the report).

Clearly the billions of dollars of federal money being allocated to close broadband coverage gaps will dramatically improve Minnesota’s ability to serve every Minnesotan, however our estimates indicate that the legislature will still need to dedicate resources from reserves to fully meet the need. The recommendations in this report will outline what is needed from legislative leadership & agencies.

Recap of Statutory Goals

ALL households and businesses in Minnesota are to have access to speeds of at least 25/3Mbps by 2022 & 100/20Mbps by 2026. (The links show PDF maps of the wireline covered and uncovered areas.)

- [Wireline service of at least 25 Mbps download and 3Mbps upload \(2022 goal\)](#)
- [Wireline service of at least 100 Mbps download and 20Mbps upload \(2026 goal\)](#)

Additionally, the comparative goals are:

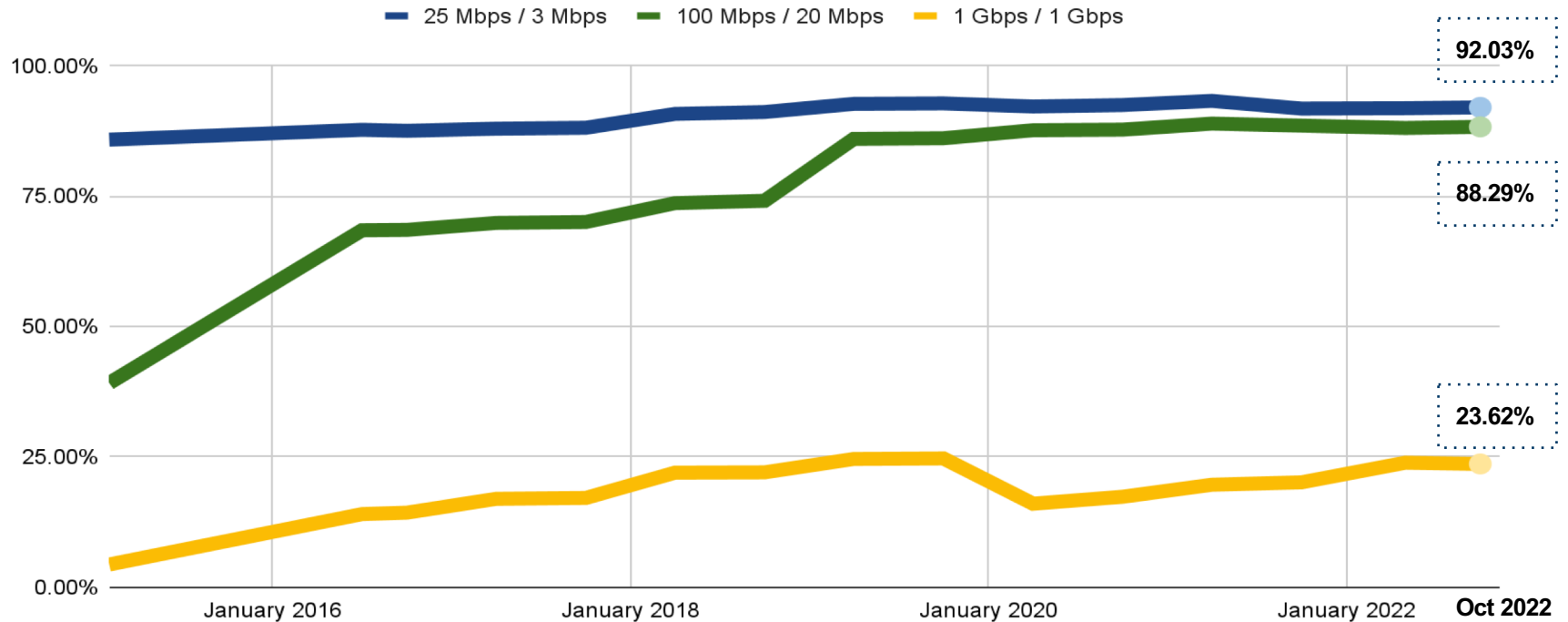
By 2022 and thereafter, the state be in -

1. the top five states of the United States for broadband speed universally accessible to residents and businesses, and
2. the top five states for broadband access & adoption, and
3. the top 15 when compared to countries globally for broadband penetration



Historical Estimate of Broadband Service Availability in the State of Minnesota

% of service availability



Statutory Comparative Goals Score

The scores as of 2022 related to our comparative goals are:

- 1. Goal - be in the top five states of the United States for broadband speed universally accessible (available) to residents and businesses**
 - According to the US News Annual Infrastructure Ranking, Minnesota is in 15th position - 26th in Gigabit
- 2. Goal - be in the top five states for broadband access & adoption (# of households subscribed)**
 - Depending on the source data referenced, Minnesota is ranked between 19th and 26th
- 3. Goal - be in the top 15 when compared to countries globally for broadband penetration and speed**
 - Multiple reports indicate the US is still way behind other industrialized countries in adoption, ranking anywhere from 20th to 37th. Additionally, while speeds have improved (some reports as high as 6th overall), Americans pay considerably more for faster service, and as a result, high-speed internet is inequitably distributed given many can't afford to purchase the best services



Key Challenges - Funding

While new federal funding is substantial, there is still a gap in funding to reach every Minnesotan with broadband.

Broadband implementation in unserved/underserved areas continues to be more costly & experiences delays due to multiple factors:

- 1.1 The increased costs of materials, and delays due to the pandemic have created supply chain issues -
 - Contractor availability is restricted due to labor shortages, increasing project loads, and
 - Equipment backorders disrupt planning & installations, and
 - Installation costs are appreciably higher for the hardest to reach unserved/underserved as the distance and difficulty of installation increases (e.g. ledge rock underground, etc.) and state grant money only covers 50%
- 1.2 Permitting in MN costs more now, and increases the delays during broadband implementation
 - Prevailing wage requirements tied to federal funding also increase installation costs
- 1.3 The projected overall cost of reaching 100% of MN households is also higher now due to the new definition of households (it has increased the number of total identified locations yet to be served over last year), and many rural locations aren't ReConnect eligible
- 1.4 Recent denial of Rural Digital Opportunity Fund (RDOF) applications reduced current Federal build out dollars in key MN rural unserved/underserved areas (note: these areas are now eligible to be served by others using federal & state funding)



NOTE: the numbered Challenges roughly align with the corresponding numbered Recommendations in that section.

Key Challenges - Mapping

The Infrastructure Investment & Jobs Act (IIJA) tied new Broadband Equity, Access & Deployment (BEAD) Act funding to new location based maps yet to be finalized through the challenge process.

Previous census block maps were problematic, but the new FCC address based “fabric” maps are still not fully accurate:

- 2.1 Uncertainty of the results of new FCC mapping efforts creates uncertainty in MN broadband programs, and the corresponding amount of grant funding that will be available for appropriation by the MN legislature to broadband programs
- 2.2 The FCC challenge process to produce more accurate maps is time intensive, and access to quality data sets isn't always readily available to effectively support the challenge process
- 2.3 Counties and townships need more resources to support the effort to improve and update mapping (e.g. challenge process, working with providers, etc.)
- 2.4 Delays in the improvement of FCC fabric maps slows implementation, and isn't expected until March 2023 at the earliest, which may delay BEAD funding allocations to MN as a result (NTIA will make decisions by June 2023)
- 2.5 Map inaccuracies can block future investments in areas that still lack service that reliably meets the state goals



Key Challenges - Affordability

While programs exist to reduce broadband costs for families, it is still prohibitively expensive for many at the speeds needed today.

Affordability for many is a substantial barrier to wired broadband:

3.1 While there are available approaches to improve affordability like the federal Affordable Connectivity Program (ACP) -

- Information about them is not always readily available to community leaders (and the public) so they can consider and assertively promote them as options
- Applying for them can take too much time to complete all of the requirements needed to qualify for the program
- Some aspects of the process are too complicated, and/or additional support is needed to complete the documentation
- Some communities & families most in need of these programs don't trust government programs or know how to engage them
- Folks in multiple dwelling units in Greater MN often pay as much or more for broadband as they do for rent

3.2 Not all providers assertively promote their affordability programs (some offer special pricing for low-income households, but the most in need often aren't aware of them)

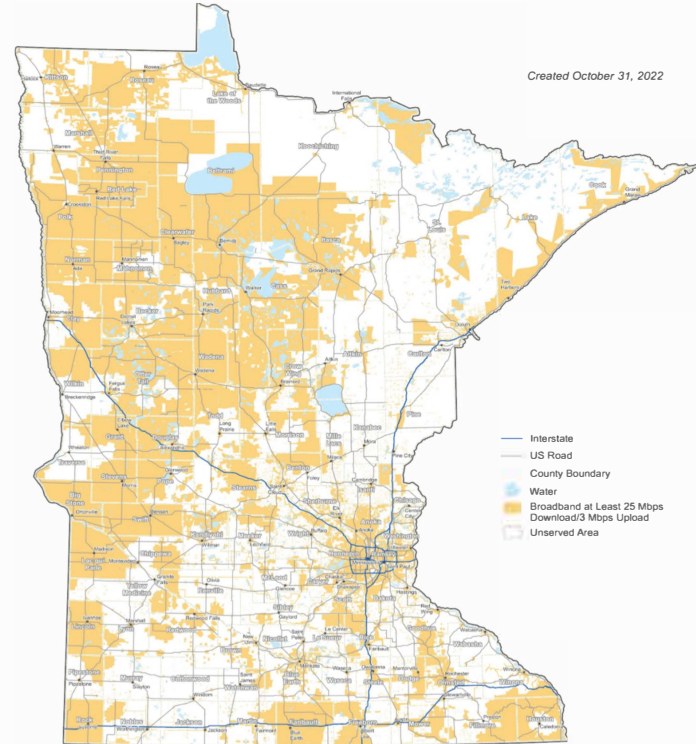
3.3 Small schools, usually rural, pay a disproportionate rate per student (as much as \$80) for broadband and network services due to the way their aid programs are funded by the state

3.4 Many families still can't afford to equip all in their household with enough devices to meet educational or remote work needs, nor afford to keep them updated and current to support online activities

3.5 Smaller communities in Greater MN need more talent to aid counties, cities, and townships in creating community awareness

2022 Provider Broadband Service Inventory

Wireline Broadband Service at Advertised Speeds of at Least
25 Mbps Downstream and 3 Mbps Upstream



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

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. This release reflects updates received as of October 2022

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

Key Challenges - Adoption

Providers and the state invest millions in infrastructure to reach many families, and a high percentage of them don't subscribe to high-speed services for a variety of reasons.

4.1 Adoption of wired broadband is often lower than desired due to -

- Some community members lack of trust in government or corporations, or have concerns about security and online fraud so don't take advantage of available internet services, which increases costs for those who do subscribe
- Not feeling that being online is relevant to their life (not knowing how it could positively impact them or their family)
- Language barriers persist for non English speakers - (English not first language and info about access and technical support is typically in English)
- Insufficient understanding/familiarity with hardware and software - technical background, ability to manage router for WiFi in the home, ability to understand operating system vs applications, etc.
- Insufficient promotion of the many practical needs/uses for broadband (e.g. telehealth, job seeking, services to home, etc.)

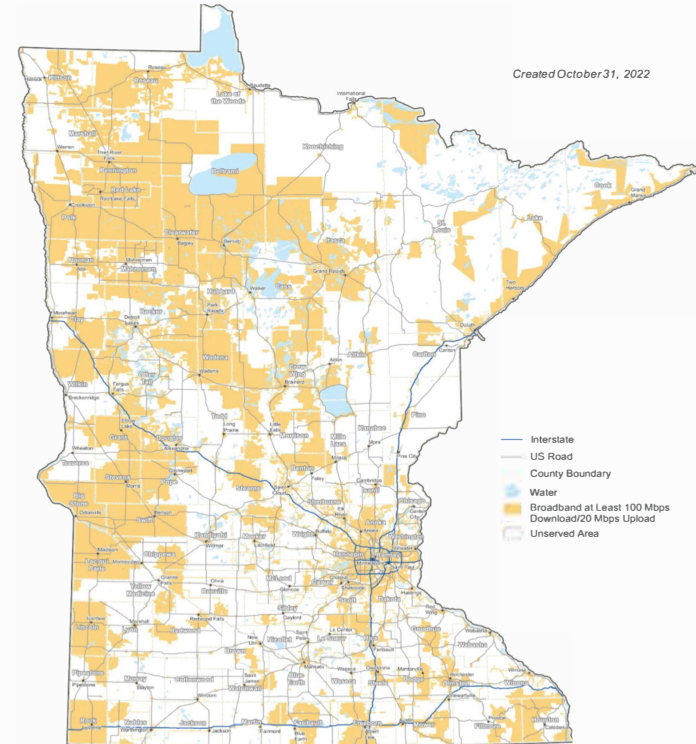
4.2 Not knowing about options for providers in their area (current OBD map tells what providers are available at an address, but can be tough to use it, or know it's accurate)

4.3 Smaller communities in Greater MN need more talent to aid counties, cities, and townships in creating community awareness

4.4 Not having/knowing about adaptive devices (screen readers, captioning, adaptive mice, etc.) if they have a temporary or permanent challenge for people with disabilities

2022 Provider Broadband Service Inventory

Wireline Broadband Service at Advertised Speeds of at Least
100 Mbps Downstream and 20 Mbps Upstream



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

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. This release reflects updates received as of October 2022.

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Key Challenges - Usage & Navigation

Digital Skills regarding usage & navigation are lacking:

- 5.1 For many users, especially those for whom English is a second language, the advancing sophistication of home technology (e.g. Wi-Fi networks, streaming, etc.), has increased the difficulty of getting & staying connected
- 5.2 Given the experience of customers now varies depending on many factors inside and up to the home, customers need more technical assistance getting and staying connected, and these needs often go unmet
- 5.3 “Digital Navigation” services are new, and not yet widespread. There is no statewide plan for digital navigation services to support all citizens in getting and staying connected. (See NDIA report in the appendix)

Coordination of Broadband Equity, Access & Deployment (BEAD) Act federal funding opportunities for infrastructure build outs:

- 5.4 Many counties, cities, & townships need help to coordinate the use of remaining ARP dollars for broadband with neighboring counties, cities, & townships to maximize the opportunity to reach more unserved populations
- 5.5 The OBD needs help with developing its Digital Equity Plan that will support improvement in usage and navigation



Recommendations



Each year the Task Force makes recommendations to the Governor and legislature to consider enacting, through enhancements to existing policy or new policy that aligns with Minnesota statutory broadband goals.

The chart at the end of the recommendations section shows progress toward previous recommendations.

NOTE: the numbered Challenges in previous sections roughly align with the corresponding Recommendations in the following sections.

Recommendations - Funding Goals



[1.1, 1.3, & 1.4] Establish a base Annual Investment that is tied to the “gap funding” needed to reach 100% of unserved/underserved (inclusive of all expected Federal funds - **see details on the following page**)

[1.1, 1.3, & 1.4] Amend/update the current Broadband statute to expand flexibility for the Office of Broadband (OBD) to allow for larger state investments needed to support reaching the hardest to reach users (e.g. increase the dollar cap to \$8 million or remove it, reduce the 50% match)

[1.1, 1.3, & 1.4] Utilize federal funds to increase staff in the Office of Broadband (OBD) in anticipation of additional workload -

- Provide the OBD the opportunity to look at larger projects to “catch up” for two lost years of construction on broadband expansion due to pandemic and funding delays
- Continue to focus on using the reference speed of 100/20 (already at the 2026 goal) as most all providers are currently building to that as a minimum
- Ensure that there are community and provider voices contributing to the planning process that will shape the amount and approach to utilizing the new Federal dollars coming into the state
- Organize an opportunity for the legislature to review and study the overall anticipated costs to reach all Minnesotans (clarify that Federal funding alone will not be enough to fulfill the goal of reaching every Minnesotan)

[1.2] Address delays in permitting ASAP to help MN meet their goals on connectivity and help mitigate the ever increasing costs

Summary of Federal and State Funding

NOTES:

* Average cost per household to install gets higher every year due to material and labor pressures, and the increased difficulty of reaching more remote locations. These figures are based on state matching at 50%, but it may need to be as much as 75%.

** The spreadsheet shows a summary of multiple possible sources of funding and anticipated costs to serve every Minnesotan with at least 100/20 speeds by 2026.

Estimated Cost to Achieve 2026 Goal of 100/20 Service			
# of Unserved households (w/o 100/20 speeds)-Oct. 2022		291,000	291,000
Ave. Cost per Connection *		\$ 9,500	\$ 9,500
Total Cost		\$ 2,764,500,000	\$ 2,764,500,000
State's share of cost - 50% or 75% of grant projects		50%	75%
State's total cost to connect unserved households		\$ 1,382,250,000	\$ 2,073,375,000
Divided by number of years to achieve 2026 goal		4.0	4.0
State's gross ANNUAL cost to connect unserved households		\$ 345,562,500	\$ 518,343,750
VARIOUS FEDERAL FUNDING SOURCES			
ARPA CFP (2021 & 2022)	\$ 130,700,000		
ReConnect Round 3	\$ 59,000,000		
RDOF	\$ 81,000,000		
NTIA Tribal Awards (Bois Forte, Lower Souix, Leech Lake)	\$ 38,800,000		
NTIA BEAD Guaranteed	\$ 100,000,000		
NTIA BEAD Competitive (Estimate-based unserved) **	\$ 550,000,000		
Federal Direct Appropriations	\$ 8,800,000		
Total Federal Funds	\$ 968,300,000		
Potential Federal Funding Per Year (~4 years)		\$ 242,075,000	\$ 242,075,000
State's NET annual cost for unserved households		\$ 103,487,500	\$ 276,268,750
Admin Cost factor (3%)		\$ 3,104,625	\$ 8,288,063
Amount of Biennial Funding Needed to Fill the Gap		\$ 213,184,250	\$ 569,113,625
2 x Biennial Funding to Cover 4 Years		\$ 426,368,500	\$ 1,138,227,250

Recommendations - Mapping Goals



[2.1, 2.2] Provide funding to support engagement, in partnership with the Office of Broadband Development (OBD), with communities, counties, townships or regions, so they are prepared to participate and have the capacity to respond to the challenge process with the FCC updates to the fabric map

[2.3, 2.4] Organize an immediate direct response to the FCC to extend the initial deadline for submitting challenges to the new fabric map to give providers, agencies, anchor institutions, and the general public time to properly assess deficiencies and have the time to submit their responses to the FCC

[2.3] Ensure OBD has sufficient funding to provide guidance, processes, and support to communities, counties, townships or regions who need their help evaluating and gathering the data they need to submit their challenges to the FCC for updates to the fabric map

[2.5] Maintain funding support for OBD's mapping contractors

Recommendations - Affordability Goals



- [3.1, 3.2, 3.4] Direct Office of Broadband Development (OBD) to -
- Invest resources and time to prepare materials, or augment existing materials (e.g. online and print, from providers, etc.) that increase awareness of affordability programs
 - Prepare and deliver posts about places to get free/low-cost equipment, provider programs and the Affordable Connectivity Program (ACP) options (Facebook, Instagram, TikTok, etc.)

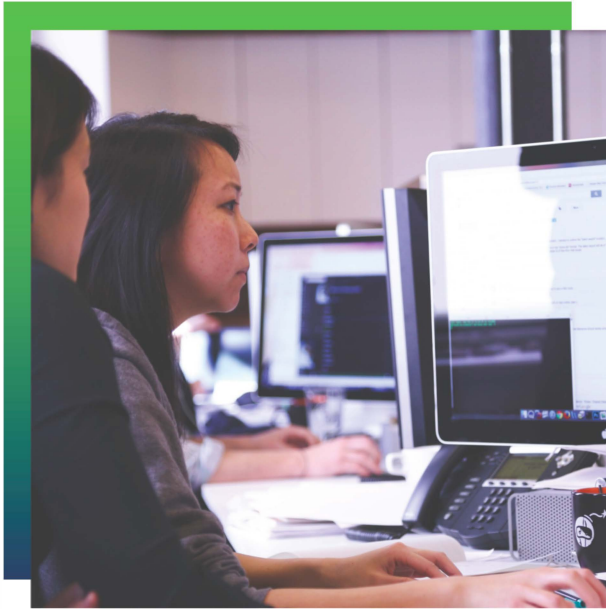
[3.3] Fully fund the Telecommunications Access Equity Aid (TEA) program (by raising the funding cap to at least \$9 million) in order to allow school districts to equitably procure internet and network bandwidth needed to fully support digital learning. This aid program benefits school districts by making access to broadband more affordable by fully funding the eligible costs of the federal E-rate program -

- Create new positions & fill vacant positions at MN Dept. of Education (MDE) to support schools to arrange, coordinate, and implement systems to assure that every school/library has affordable broadband connections/subscriptions that are roughly equivalent from place to place around the state

[3.2] Encourage the OBD to collaborate with broadband provider industry associations to more assertively promote the ACP program with their customers

[3.5] Fund American Connection Corp (ACC) fellows (\$225,000) to work in rural communities to help bridge the gaps, assist with grant applications, reporting, & help with outreach & engagement efforts

Recommendations - Adoption Goals



[4.1] Create and curate a library of instructional videos to aid usage and increase adoption (e.g. many folks without high-speed internet use cellphones to access information, and video watching is a common activity). Videos available in multiple languages that teach digital navigation skills would help people find internet providers in their area, tell them about the ACP, explain basics and show them how to find more help. (YouTube is good for this)

- Fund the creation of the above resources (including consolidation and organization of these resources)
- Consider how IT classes could be formalized through the state education system - introduce the remote curriculum as a key part of the approach

(the following two are intentionally included from the previous slide)

[4.2, 4.3] Create new positions & fill vacant positions at MN Dept. of Education (MDE) to support schools to arrange, coordinate, and implement systems to assure that every school/library has affordable broadband connections/subscriptions that are roughly equivalent from place to place around the state

[4.2, 4.3] Fund American Connection Corp (ACC) fellows (\$225,000) to work in rural communities to help bridge the gaps, assist with grant applications, reporting, or help with outreach & engagement efforts

[4.4] Increase the availability of digital marketing materials (in various languages and formats for ADA) that can be distributed to each county to fill in with the relevant info for their county.

Recommendations - Usage & Navigation



[5.1, 5.2] Increase digital navigation supports to help address ongoing user challenges. (By connecting with a person individually, they can find out what their barriers are and address them with information and personal connection).

Promote, support, expand programs like those below -

- [Literacy Minnesota](#)
- [Digital Training](#)
- [Basic Computer Training](#)

[5.3] Support the OBD's finalization of their Digital Equity Plan and the development of a digital navigation approach that is closely connected to trusted community based organizations (e.g. libraries, social service nonprofits, schools, etc.)

(the following is intentionally included from the previous slide)

[5.4, 5.5] Fund American Connection Corp (ACC) fellows (\$225,000) to work in rural communities to help bridge the gaps, assist with grant applications, reporting, or help with outreach & community engagement efforts

Economic Impact of Broadband

Universal, ubiquitous high speed internet (broadband) is proven to be a key foundation for every single business and household in the state of Minnesota.

We've learned after our experience during COVID, even the smallest restaurant, local merchant, and household relies on a high speed internet connection to function in daily life.

Our economy, and the tax revenue it produces at all levels of government in Minnesota is heavily reliant and impacted by access, affordability, and adoption of broadband for every Minnesotan.

"It's going to get pretty chaotic." says Michael Powell, CEO of the Internet and Television Assn. "We need to insure that the needs of the Unserved are addressed first - are the highest priority, and it's up to regulators in each state working with providers to make sure that happens." "It just makes economic sense."

Watch CEO of NCTA, Michael Powell's guidance [here](#)

"It's essential we get federal infrastructure dollars to the communities that need them most. The challenge is however, the places most in need are also those with the least staffing capacity to organize, prepare, and apply for these dollars. In many rural places, the same person in charge of administering all COVID relief applications for businesses is also the same person charged with bringing broadband to their county. Investing in rural capacity-building is a key factor to investing in broadband."

- Benya Kraus Beacom, ED, **Lead for MN**

Economic Impact of Broadband

The Internet & Television Assn issued a report in July 2022 with these findings:

\$1.3+
trillion
additional
contribution
to GDP

Broadband networks have added over \$1.3 trillion to US GDP between 2010 and 2020. These networks allow more businesses to reach consumers, and facilitate the creation of entire industries that wouldn't exist without ubiquitous connectivity.

10.9%
of GDP growth
since 2010 is due
to broadband
adoption

In addition to powering everyday business, fixed broadband has also facilitated the growth of services like e-commerce, connecting start-up shops with markets all over the country and world. As more stores are able to reach more consumers, everybody wins and the economy grows.

174.2
Mbps
average
download
speed in 2020

Average download speeds have risen from 10 Mbps in 2010 to 174.2 Mbps in 2020. That's because America's internet leaders build new networks with the future in mind, so that whatever new technology emerges, the bandwidth to power them is available.

Inter/Intra Agency Cooperation/Coordination

The DEED Office of Broadband Development (OBD) staff lead and manage key aspects of the state's broadband program:

- Conducts and administers the Border-to-Border grant program
- Coordinates and oversees the mapping program that is now undergoing major revisions through the FCC's address based "fabric maps" that will determine allocations to MN via the BEAD
- Now planning and managing the Digital Equity program that is an essential part of releasing BEAD infrastructure funding
- Works directly with NTIA to insure effective design & implementation of the BEAD program
- Coordinates and guides the work of the Governor's Task Force on Broadband
- Advises DEED senior leaders and the legislature on policy and funding issues as they arise (e.g. application for 22

Inter/Intra Agency Cooperation/Coordination

OBD staff has worked hard through many changes in the past year to manage leadership transition, many new federal programs, and a growing body of needs from the provider sector as the impacts of COVID and supply chain disruptions have increased the need to stay closely connected with all parties working to meet the needs of Minnesota students, families, commerce, and anchor institutions across the state.

The substantial mandates built into new BEAD program funding will require an even greater level of coordination and collaboration across the state to insure funds are wisely invested in meeting the needs of communities yet unserved and underserved.

The Low Density Pilot Program is a new innovative approach. The Legislature appropriated \$30M, and projects can be funded up to a cap of \$10M (instead of the traditional Border-to-Border's \$5M cap). 75% of eligible costs can be reimbursed instead of the traditional Border-to-Border program's 50%. The Pilot program was launched 12/19/22 in hopes of reaching some of the most difficult to serve Minnesotans.

In the 2022 Legislative Session, the OBD was directed to create a new program, the [Broadband Line Extension Connection Program](#). The purpose of the program is to award grants for the extension of existing broadband infrastructure to unserved locations. An unserved location is a location that does not have a wired broadband service of at least 25 Mbps download and 3 Mbps upload. This program launched in November of 2022.

Household Wireline Broadband Availability



154,000
more households
in MN have access
to 25/3 Mbps
broadband than in
2015



198,000
households in MN
without access to
internet speeds of
25/3 Mbps in 2022

6.2%
increase of
available 25/3 Mbps
broadband service
in MN between
2015-2022



8%
of households in
MN are without
access to internet
speeds of 25/3
Mbps in 2022



Household Wireline Broadband Availability



**1.22
Million**
more households
in MN have access
to 100/20 Mbps
broadband than in
2015



291,000
households in MN
are without access
to internet speeds
of 100/20 Mbps in
2022

49%
increase of
available 100/20
Mbps broadband
service in MN
between 2015-2022



11.71%
of households in
MN are without
access to internet
speeds of 100/20
Mbps in 2022



Household Wireline Broadband Availability

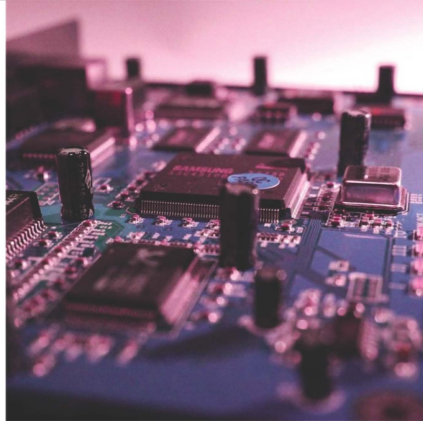


479,000
more households
in MN have access
to 1/1 Gbps
broadband than in
2015



1.9
million
households in MN
are without access
to internet speeds
of 1/1 Gbps in 2022

19%
increase of
available 1/1 Gbps
broadband service
in MN between
2015-2022



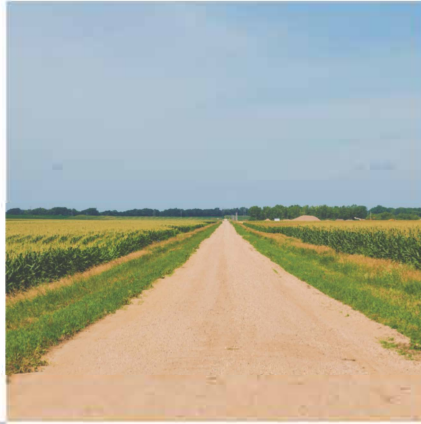
76%
of households in
MN are without
access to internet
speeds of 1/1 Gbps
in 2022



Household Wireline Broadband Availability: Rural

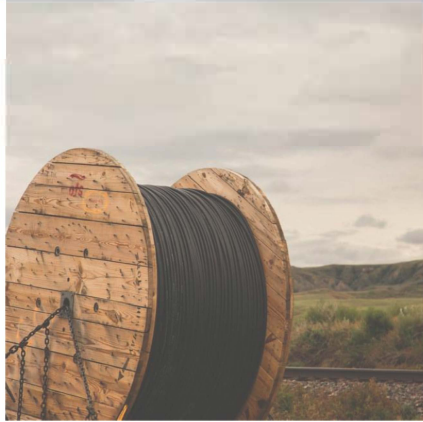


**1 out of 3
rural
households**
in MN do not have
access to 100/20
Mbps internet
speeds



180,000
households in rural
MN are without
access to internet
speeds of 25/3
Mbps in 2022

2.50x
rural households
are over twice as
likely to not have
access to 25/3
Mbps internet
speeds when
compared to the
state average



**28% slower
growth**
the availability of
100/20 Mbps
internet in rural MN
grew at a slower
rate than the state
average



Appendix

- **Task Force Members**
- **Technology Updates**
 - Advances in technologies used to deploy services
 - Types of technologies in use for high-speed internet
- **Maps Showing Broadband Coverage**
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- **Reference Material**
- **Summary of Past Recommendations Progress**
- **Glossary**
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Task Force Members

Member Name	Title	Organization
Teddy Bekele	SVP & Chief Technology Officer	Land O'Lakes Technology
Yvonne Cariveau	CEO / President	Internet Connections
Nolan Cauthen	Broadband Technician	Lumen
Steve Fenske	General Counsel	Minnesota Association of Townships
Steve Giorgi	Former Executive Director	Range Association of Municipalities & Schools (retired)
Jason Holliday	Director of Planning	Fond du Lac Band of Lake Superior Chippewa
Marc Johnson	Executive Director	East Central MN Educational Cable Cooperative
Bernadine Joselyn	Director Public Policy and Engagement	Blandin Foundation (resigned 9/22)
Barbara Dröher Kline	Coordinator/Organizer	Le Sueur County Broadband Initiative
Brian Krambeer	President/CEO	MiEnergy
Micah Myers	IT Director	City of St. Cloud
Theresa Sunde	Senior Manager, Government Relations	Mediacom
Phil Stalboeger	VP of Public Affairs	MTM
James Weikum	Executive Director	Arrowhead Library System
Paul Weirtz	President	AT&T Minnesota

Technology Updates

Advances in technologies used to deploy services

Every existing technology in use today continues to improve and advance, from the equipment customers use (the end point) to the hardware and software providers deploy on their networks. Providers are being creative, seeking ways to improve services to existing customers, and expand services to those most in need.

Types of technologies in use for high-speed internet

Cable

Cable broadband internet services are most commonly provided over hybrid fiber coaxial (HFC) networks. An HFC network is comprised of a fiber portion which connects a regional hub to an optical node in a neighborhood. The coaxial portion then connects the neighborhood optical node to each home receiving cable broadband internet service. The Data Over Cable Service Interface Specification (DOCSIS™ technology) is the international telecommunications standard, and optional features could allow 10 Gbs download and 2 Gbs upload.

DSL

DSL technology is an asymmetrical service delivering internet by using existing copper telephone lines for the “last mile”. Since the foundation of this technology is the legacy telephone infrastructure covering the continental United States, it is the most widely available wired technology to connect homes, especially in rural areas.

High speeds meeting the statutory speed goals are only available to customers very close to a DSLAM (phone company network device) with speed degrading quickly after approximately 1-2 miles from this device.

Types of technologies in use for high-speed internet

Fiber Optic

Fiber-optic technology delivers high-speed internet using light through transparent glass fibers to transmit data from fiber broadband. The download and upload speed for fiber depends on the electronics attached to the fiber and ranges widely from 250 Mbps to 5 Gbps, far exceeding the needs of the typical user. The speed experienced by the user depends on a multitude of factors including transmitters, receivers and amplifiers used in route to connect the “last mile” as well as the in-home connection a user chooses (e.g. Wi-Fi, direct to modem, etc.).

Wireless Technologies

There are increasingly more hi-speed wireless options available to users today, including 4G/5G mobile devices ('hotspots), Fixed Wireless systems (tower to home) and satellite. While fiber to the home is often considered the 'gold standard', fixed and mobile wireless can offer attractive solutions particularly in areas where there are very low density populations or where physical barriers make fiber difficult to deploy.

Satellite Technologies

Traditional satellite options (Dish, Direct, Hughes, Viasat, etc.) offer users varying speeds (typically less than 25/3). Of the many existing technologies, one receiving more attention recently is the fast expansion of Low Earth Orbit (LEO) satellite networks by companies like Starlink, OneWeb, Telesat and Amazon. The LEO satellite networks may offer lower-latency (delay) and 200-300Gb+ speeds as they grow, and perhaps most importantly, the ability to reach very difficult remote (often rural) locations that are currently unserved. These systems, like all systems, have their challenges and users are discovering some of those now during beta testing (like Starlink is doing with select clients). As more satellites are deployed, coverage, speed, and reliability have improved. Whether they will be affordable and sustainable for a typical underserved or unserved user is not yet clear.

Maps Showing Broadband Coverage

Broadband Service Inventory for the State of Minnesota

- [Infrastructure Grants Map](#) - displays areas unserved by wireline broadband at 25Mbps download/3Mbps upload and underserved at 100Mbps download/20Mbps upload
- [Infrastructure Grants Map with Populated Census Blocks](#)
- [Unserved/Underserved/Served areas by Tribal Nations](#)
- [Wireline service of at least 25Mbps download and 3Mbps upload \(2022 goal\)](#)
- [Wireline service of at least 100Mbps download and 20Mbps upload \(2026 goal\)](#)
- [Fixed, non-mobile broadband service of at least 10Mbps download and 5Mbps upload \(final results for 2015 goal\)](#)
- [Fixed, non-mobile broadband service at state speed goals](#)

Percentage of Households Served by Wireline Broadband Service in Minnesota (Based on 2020 Census Housing Units.

Previously, counts were based on 2010 [Occupied Households](#) Source: Connected Nation, October 2022)

- [With speeds of at least 25Mbps download and 3Mbps upload - 2022 goal](#)
- [With speeds of at least 25Mbps download and 3Mbps upload - 2022 goal \(Township map\)](#)
- [With speeds of at least 25Mbps download and 3Mbps upload - 2022 goal \(School district map\)](#)
- [With speeds of at least 100Mbps download and 20Mbps upload - 2026 goal](#)
- [With speeds of at least 100Mbps download and 20Mbps upload - 2026 goal \(Township map\)](#)
- [With speeds of at least 100Mbps download and 20Mbps upload - 2026 goal \(School district map\)](#)
- [With speeds of at least 10Mbps download and 5Mbps upload \(final wireline results for 2015 state broadband goal\)](#)

Interactive Broadband Map of Minnesota

- [Minnesota Map](#) - Tools and layers to examine broadband availability at your address, town, township, county, etc.

Other Maps

- [NEW FCC November 2022 FCC “Fabric” Map Tool \(key to the Challenge Process\)](#)
 - a. [Guidance for Using the New FCC Map Tool](#)
- [FCC RDOF I Winning Bid Areas](#)
- [Digital Equity Scores by State \(access/affordability\) NDIA](#)

Reference Material & Reports

- [CONTRIBUTION OF FIXED BROADBAND TO THE ECONOMIC GROWTH OF THE UNITED STATES](#)
- [Blandin Broadband Blog](#)
- [Fiber Broadband Assn Launches Tech Training Program](#)
- [Fiber Minnesota Creates Statewide Network Through Merger](#)
- [Institute of Self Reliance Muni Network report](#)
- [Supply Chain Issues not Effecting Everyone the Same](#) (BBB, Aug. 2021)
- [Interactive maps by census block showing by % of wireline households](#) (NDIA, Dec. 2018)
- [Limiting Broadband investment to “Rural Only” discriminates](#) (NDIA, June 2020)
- [2022 Policy Priorities Outline](#) (NDIA, Oct. 2022)
- [Indiana Connectivity Program \(Website\)](#)
- [2021 Broadband Deployment Report](#) (FCC, Jan. 2021)
- [Broadband Now Data](#) (Comparison Report 2021)
- [The Benefits and Costs of Broadband Expansion](#) (Brookings, Nov. 2021)
- [Minnesota State ARP info](#)
- [Minnesota State Broadband Statute](#)
- [March 30th, 2021 DEED Roundtable in the Arrowhead](#)
- [Minnesota OBD Map Database](#)
- [Minnesota State ARP Recovery Fund info](#)
- [Land O’Lakes Plays Key Role in Securing \\$65B in Funding for Broadband](#) (TCB, Dec. 2021)
- [Congress Tells FCC to Fix Broadband Maps](#) (Benton, March 2020)
- [Home Connectivity Study Report](#) (Consortium for School Networking, Spring 2021)
- [UNESCO Country by Country broadband penetration](#)
- [2019 American Community Survey - devices/broadband](#) (US Census Bureau)

Summary of Progress on Past Recommendations

[Link to Table Showing Examples of 2015-2020 Recommendations and their Status](#)

2020 - Excerpt	
<p>Continue to fund the Border-to-Border (B2B) grant program at a biennial amount of \$120 million from the base budget each year and ensure that all future expenditures must be on service that meets or exceeds the 2026 speed goal of 100 Mbps download and 20 Mbps upload.</p>	<p>The legislature allocated \$70 million from the Federal ARP Capital Projects Fund to the Border-to-Border grant program. Because these were federal funds, they could not be utilized until guidance for accessing the funds was issued by Treasury, and application made to release the funds. Consequently, no grant applications could be approved or funded in 2021, and depending on program application approvals from Treasury in 2022, may further delay B2B grants being approved/funded</p>
<p>The Task Force recommends the Office of Broadband Development (OBD) receive an appropriation of \$700,000 per biennium from the base budget. That figure is OBD's estimate of funding needed to maintain current operations.</p>	<p>The Office of Broadband Development received an appropriation to maintain current operations</p>
<p>Create an OBD operating annual fund of \$1.5 million to promote broadband adoption and use and redress digital inequity.</p>	<p>No action was taken on this recommendation</p>
<p>Given the condensed construction season in Minnesota, it is critical that permits are issued promptly. The state should convene a working group comprised of all state agencies relating to broadband construction permitting to streamline the process, both in time to issue the permits as well as the permit application process.</p>	<p>No action was taken on this recommendation</p>
<p>There needs to be more oversight of railroad facilities by the Office of Pipeline Safety. Railroads need to be required to locate their own facilities and need to be encouraged to issue permits promptly.</p>	<p>No action was taken on this recommendation</p>

Glossary

DEFINITIONS

- **Unserved area:** any area of Minnesota in which households or businesses lack access to wire-line broadband service at speeds that meet the FCC threshold of 25 megabits per second download and 3 megabits per second upload.
- **Underserved area:** an area of Minnesota in which households or businesses do receive service at or above the FCC threshold (25/3) but lack access to wire-line broadband service at speeds 100 megabits per second download and 20 megabits per second upload.
- **High-speed Internet:** broadband, or high-speed internet (typically equal to or greater than 25 megabits per second download and 3 megabits per second upload), commonly refers to access that is always on and faster than services less than 25/3 speeds, and may be provided by DSL, cable, satellite, wireless or fiber-optic technology.