



GOVERNOR'S TASK FORCE ON
BROADBAND ACCESS



REPORT TO GOVERNOR TONY EVERS
AND WISCONSIN STATE LEGISLATURE





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EXECUTIVE SUMMARY

In Wisconsin, broadband plays a key role in economic, public, and social sectors, including in education, healthcare, agriculture, manufacturing, industry, energy, public safety, tourism, and more. Whether it is a farmer leveraging precision agriculture, a student accessing learning opportunities online, a jobseeker applying for work, or a family member or friend staying connected, broadband brings endless potential and an essential ability for participation in modern society. Broadband bridges communities, both rural and urban. The COVID-19 pandemic heightened the need for broadband services for students to learn from home, workers to telecommute, and Wisconsinites to receive medical care from home.

In its [2021 Broadband Deployment Report](#), the Federal Communications Commission (FCC) currently estimates that 6.8% of the population in Wisconsin (or 394,000 people) lack access to at least one fixed, terrestrial broadband service with a speed of 25 megabits per second download and 3 megabits per second upload (or, 25/3 Mbps) or better, compared to the national average of 4.4%. Of those 394,000 people, 385,000 are in rural areas, which accounts for 21.8% of rural residents in Wisconsin, compared to the national rural average of 17.2%. Unfortunately, due to the reporting mechanism used by the FCC, it is estimated that these numbers are greater in reality. According to estimates in a study performed by BroadbandNow, the number of people lacking internet access in Wisconsin is close to double the number estimated by the FCC. In its 2021 study, BroadbandNow estimated that 670,592 Wisconsinites lack access to a fixed 25/3 Mbps service.¹

Our use of broadband connections continues to expand, and supporting the technologies that have the capacity to scale and expand bandwidth would be prudent. According to FCC data, 17.7% of the state had access to 1 gigabit per second (Gbps) speeds.² To ensure Wisconsin's ability to compete in an ever-expanding technology-rich economic, educational, and healthcare environment, building out an infrastructure that can ensure this access is a shared responsibility between the public and private sectors. Our rural and urban communities equally deserve quality access, and this needs to be expressed and reflected in how the barriers to quality broadband connections are overcome.

In terms of broadband infrastructure itself, certain areas in the state – predominately rural areas – need investment and support given obstacles to broadband expansion such as lack of population density, distance, and in some cases difficult terrain. When focusing on infrastructure issues, federal, state, and local public funding allows for long-term returns on investment. Roads, sewers, and buildings are examples of these long-term uses. Broadband falls into this category, especially when focused on technologies that persist for 50 years or longer. Public capital can be leveraged by local governments to help create public/private partnerships that meet the goals of rural communities for high-quality, high-speed, and affordable broadband.

Beyond the support for investment in constructing broadband infrastructure itself, digital equity issues must be addressed in tandem. Access, Affordability, and Adoption are the three key measures indicative of whether Wisconsinites are connected.

It is recommended that goals set by the Governor's Task Force on Broadband Access be reviewed annually, with a report to the Legislature to offer updates on the state's progress.

¹ "BroadbandNow Estimates Availability for all 50 States: Confirms that More than 42 Million Americans Do Not Have Access to Broadband" | [BroadbandNow.com](https://www.broadbandnow.com)
² FCC Form 477 Data, December 2019

SPEED GOALS AND TIMELINE



Ensure base level broadband service to all Wisconsinites with measurable goals:

- By 2025, all homes and businesses within the state have access to high-speed broadband that provides a download speed of at least 25 Mbps and an upload speed of at least 3 Mbps.
- By 2028, all homes and businesses within the state have access to 50 Mbps and an upload speed of at least 10 Mbps.
- By 2031, all homes and businesses within the state have access to 100 Mbps and an upload speed of at least 50 Mbps.

Point toward the future use of broadband infrastructure by measuring access to 1 Gbps download speed:

- By 2025, 50% of all homes and businesses within the state have access to high-speed broadband that provides a download speed of 1 Gbps.
- By 2030, 90% of all homes and businesses within the state have access to high-speed broadband that provides a download speed of 1 Gbps.

Additionally, the following top recommendations will offer enhancements to the process of addressing the issue:

- Explore hybrid models of broadband infrastructure development and ownership. Create a shared-risk mechanism for public/private partnerships that make use of publicly owned infrastructure to reach underserved locations by private internet service providers.
- Increase construction and permitting coordination.
- Increase Broadband Expansion Grant Program funding.
- Collect internet access data from all ISPs at a household and business level of granularity.
- Increase broadband consumer protections and pricing transparency.
- Establish a State Internet Assistance Program.
- Establish a statewide Digital Equity Fund operated by a nonprofit or similar organization with a mission to fund, strengthen, and support digital inclusion activities and ideas that lead to all Wisconsin residents having the information capacity needed to fully participate in society.
- Develop and fund a statewide Digital Navigator program to assist underconnected people and solve a wide range of adoption issues. Digital navigators should be embedded in organizations with strong and trusting relationships to the target populations, with the organizational capacity and cultural competency to make an impact.
- Assess broadband adoption and lack of adoption among households not adopting internet based on means, needs, connectivity, and prioritization.
- Align, coordinate, and maximize present and future federal funding.
- Increased funding for broadband administration.
- Establish and support a coalition of willing, engaged broadband leaders to connect communities with providers, local and regional partners, planning and technical assistance opportunities, funding opportunities, and resources.
- Create planning and implementation grants for regions and communities.



TASK FORCE MEMBERS

The Task Force was chaired by Brittany Beyer, executive director for Grow North Regional Economic Development Corporation, and consisted of members who represent a balance of interests, perspectives, and areas of expertise.

The Governor's Task Force on Broadband Access members:

Brittany Beyer, executive director, Grow North Regional Economic Development Corporation

Marta Bechtol, executive director, Educational Communications Board

Tom Boron, IT director, Washburn County

Chad Young, CEO/general manager, Norvado

Jean Pauk, government affairs manager, TDS Telecommunications

Celeste Flynn, director of government affairs, Charter Communications

Kurt Kiefer, assistant state superintendent, Wisconsin Department of Public Instruction

Theron Rutyna, IT director, Red Cliff Band of Lake Superior Chippewa

Brett Schuppner, general manager, Reedsburg Utility Commission

Jose Martinez, vice president, UMOs

Chris Meyer, director of virtual care and telehealth, Marshfield Clinic Health System

Scott VanderSanden, president - AT&T Plains States, AT&T

Chris Her-Xiong, executive director/principal, Hmong American Peace Academy

Emily Dittmar, legislative director, Wisconsin Educational Media and Technology Association

Andrew Faust, senior GIS analyst, North Central Wisconsin Regional Planning Commission

Robert Earl Baker III, founder, RenderTech

Lori Collins, president/CEO, SonicNet Inc.

Gail Huycke, community development specialist, UW-Extension Center for Community and Economic Development

Shannon Clark, CEO & general manager, Richland Electric Cooperative

Salvador L. Carranza, founder, Latino Education Council of Dane County

Thomas J. Shaitel, consultant and senior advisor, KS Energy Services LLC

State Representative **Beth Meyers** (D-Bayfield)

State Representative **Jeffrey Mursau** (R-Crivitz)

State Senator **Howard Marklein** (R-Spring Green)

State Senator **Patty Schachtner** (D-Somerset) replaced by State Senator **Brad Pfaff** (D-Onalaska)

LETTER FROM PSC CHAIR, REBECCA CAMERON VALCQ

Less than a decade ago, broadband internet was seen as a luxury used for streaming entertainment, downloading music and books, or playing video games with people half a world away. Over time, broadband has become essential in business, healthcare, and education and allowed us to grow economies, create efficiencies, and improve lives. Many of the things we do in our daily lives thanks to broadband are easy to take for granted because they have become ubiquitous and synonymous with participation in modern society. Broadband is now as critical a service as electricity, heat and running water. However, for those without broadband or the skills to use broadband effectively and safely, there is a risk of being left behind.

The Wisconsin Broadband Office (WBO) works to make high-performance broadband more accessible, resilient, competitive, and affordable in Wisconsin. Since 2009, the WBO has been collecting and mapping broadband coverage information for improved planning purposes. As part of the Public Service Commission of Wisconsin, the WBO serves as the leader and coordinator of broadband goals, data, and strategies across the state. Our vision is that all Wisconsinites have the information technology capacity needed to fully participate in society. We also administer Wisconsin's Broadband Expansion Grant Program.

The Broadband Expansion Grant Program provides public funding to expand broadband infrastructure to underserved and unserved areas of the state and makes the expansion financially viable for eligible entities. Profit and not-for-profit organizations, telecommunications utilities, and those organizations and utilities in partnership with municipalities and counties are eligible to apply for grants.

Since Governor Evers took office in 2019, nearly \$60 million has been awarded for expanding broadband in the state. In January of this year, Governor Evers declared 2021 to be the "Year of Broadband" and shortly thereafter announced the inclusion of \$200 million in his state budget proposal allocated to broadband access expansion and addressing internet affordability for low-income families. This funding is critical to ensure a consistent, robust source of funds necessary to strategically address our state's unique broadband challenges and goals. In May 2021, Governor Evers directed \$100 million in funding from the federal American Rescue Plan Act for broadband grants, making it the single largest broadband investment in state history. The "Year of Broadband," indeed! But our work does not stop here.

While the expansion grants are extremely successful and an incredibly important tool to get people connected, we recognize that it will take more than grants to ensure all Wisconsinites have affordable access and are able to adopt and experience the benefits of broadband. That is where the Governor's Task Force on Broadband Access and this report comes in. The Task Force members have done the hard work of listening, studying, and recommending ways that we can foster the creativity, collaboration, and innovation necessary to get Wisconsin residents and businesses connected to broadband.

I want to thank each of the Task Force members for their service to our state and their dedication to such an important issue with far-reaching impacts. Their work represents a major stride toward connecting all and puts us on a path to move our state forward by breaking down barriers to broadband access. Lack of broadband is a complex, yet solvable, problem. By continually working the problem from all angles - including Access, Affordability, and Adoption - we strive in the direction of a vision in which all Wisconsinites have the information technology capacity needed to fully participate in society, in which Wisconsin and its people reach their full potential.

Sincerely,



Rebecca Cameron Valcq

Chairperson

Public Service Commission of Wisconsin

LETTER FROM TASK FORCE CHAIR, BRITTANY BEYER

To Governor Evers, members of the State of Wisconsin's legislative bodies, and the public reading this report:

Please accept this first report of the activities of the State of Wisconsin's Task Force on Broadband Access. In the report you will find an explanation of the process and a detailed picture of the current state of broadband access, along with our recommendations to the Governor and the Legislature. We urge you to address this issue with the seriousness that the Governor took in naming 2021 the "Year of Broadband."

Broadband emerged during the rapidly changing landscape of 2020 as one of the clear-cut issues to solve for personal, community, and economic prosperity in the coming decades.

It was with great forethought that the Governor and those who formed this committee created a direct link to the Blue Ribbon Commission on Rural Prosperity, formed in Governor Evers' State of the State address in January of 2020. I served in a dual role as a commissioner on that committee along with holding the chair position for this Task Force. I believe the report submitted by the Blue Ribbon Commission on Rural Prosperity in December of 2020 can add additional, complementary context to this Task Force's work and recommendations.

Although there is a tie to our rural communities, access to broadband presents challenges in almost every corner of our state. You will read this framed in terms of Access, Affordability, and Adoption challenges, with recommendations that seek to improve the condition of this essential service in the state from each of those angles. The Task Force members all stressed the importance of prudence in the use of public dollars even as the issue calls for a large investment, asking that recommendations include levels of accountability that could be evaluated and clearly measure success in closing the gaps.

In thought leader Carol Sanford's most recent book, she states that when one sets out to develop a new process, such as a report and recommendations on improving broadband access throughout the state, the activity demands two things of us:

- "We must start from recognition of the places where we are lacking capability, rather than always leaning on the capabilities we already have.
- We must be willing, even enthusiastic, about taking on challenges and rising to them in ways that will inevitably require us to grow."³

I thank all the Task Force members and the staff members of the PSC for taking this approach during our work on the Governor's Task Force on Broadband, setting the groundwork for future Task Force on Broadband work.

On behalf of the members of the Task Force, we thank you for your actions as leaders in solving this issue for the State of Wisconsin.

Sincerely,



Brittany Beyer

Chair, Governor's Task Force on Broadband

³ Sanford, Carol. "The Regenerative Life: Transform Any Organization Our Society, and your Destiny," Nicholas Brealey Publishing, Boston, London 2020, p28



ACKNOWLEDGMENTS

We would like to acknowledge several individuals for their participation and effort in making this Task Force a success.

All our guest speakers, including:

- Kendra Karp**, director, New Mexico Office of Broadband
- Russ Elliott**, director, Washington State Broadband Office
- Scott Hoffman**, chief executive officer, WIN Technology
- Bill Esbeck**, executive director, Wisconsin State Telecommunications Association
- Angela Siefer**, executive director, National Digital Inclusion Alliance
- Curtis Dean**, co-founder, Community Broadband Action Network

UW-Madison, Division of Extension, staff, including **Jessica Beckendorf**, community development educator and senior outreach specialist, and **Annie Jones**, organizational development and Tribal Nations specialist, for their help with facilitation, exploration, and coordination of Task Force meetings.

Wisconsin Broadband Office and other Public Service Commission of Wisconsin staff for their work on this report including **Kristy Nieto**, **Tara Kiley**, **Alyssa Kenney**, **Jaron McCallum**, **Colter Sikora**, **Milena Bernardinello**, **Dennis Klaila**, **Jason Kuhn**, **Cath Kittle**, **Billy Mauldin** and **Kathy Endres**.



TASK FORCE PROCESS AND METHODOLOGY

The Governor's Task Force on Broadband Access (Task Force)⁴ was established by Governor Tony Evers in Executive Order #80 on July 14, 2020. The Task Force's charge was:

“Advise the Governor and Wisconsin State Legislature on broadband actions and policy, including strategies for successfully expanding high speed internet access to every residence, business, and institution in the state; initiatives for digital inclusion; and pathways to unlocking and optimizing the benefits of statewide, affordable access to broadband for all communities in Wisconsin.”⁵

The facilitated Task Force process began in August of 2020 and concluded in May of 2021. In a typical year, this process would likely have looked different. It is clear that 2020 was not a typical year, but the challenges the Task Force faced throughout this process were appropriate for the topic of broadband access: the Task Force developed this report within a completely virtual collaborative process. While there are some challenges to all virtual processes, they are more cost-effective while allowing for wider participation across geographies. One challenge, for example, was the fact that there were no informal opportunities for relationship development among Task Force members, such as what may happen during meeting breaks when in person. Additionally, a virtual process illustrates the importance of good broadband connectivity, and at times some Task Force members experienced connectivity issues.

This was a multi-pronged approach involving collaboration on visioning and sense-making, a nominal group process to somewhat anonymously collect stakeholder ideas, a Qualtrics survey, guest speakers, and a variety of subcommittees. After data was collected from the visioning session, the nominal group process, and a survey of Task Force members, the information was used to establish and inform the work of the subcommittees. Task Force members met on a bimonthly schedule until February of 2021, when the schedule accelerated to each Task Force member attending one meeting per month with the full Task Force and one subcommittee per month. Each Task Force member served on a subcommittee. Additional notes from the process are available in appendix IV.

Core to this process was an appreciation for the complexity of the issue at hand. Efforts were made to ensure that different points of view, sometimes conflicting, were represented. Some focus areas included the following:

- Making intentional efforts to involve multiple sectors and diverse stakeholders.
- Featuring guest speakers representing broadband efforts from other states, providers, Wisconsin's Public Service Commission (PSC), and other key experts in broadband expansion and digital equity. When guest speakers were featured on the agenda, Task Force members were asked to take group shared notes and listen for information related to the purpose of their subcommittee.

⁴ The recommendations and methodology provided in this Report are of the Governor's Task Force on Broadband Access only and do not reflect legal or fiscal opinions or representations of the Public Service Commission of Wisconsin.

⁵ Governor Tony Evers' Executive Order 80. [EO080-BroadbandTaskForce.pdf \(wi.gov\)](#). The full text of the Executive Order is also provided as Appendix 1 to this report.

- Employing a variety of process, digital, and analog tools for maximum engagement in a completely distributed, virtual setting:
 - Process tools from well-known frameworks like Art of Hosting, Liberating Structures, GameStorming, Doblin’s 10 Types of Innovation, Nominal Group Process, and more.
 - Use of the online collaboration space “Miro” during Task Force meetings.
 - A mailing of Post-it notes with instructions and a self-addressed stamped envelope to send ideas back to the facilitator to be grouped and shared at the next meeting.
 - Creation of a document with screenshots and text from the Miro “sticky notes” for anyone having trouble accessing or using the collaboration space.
 - Use of live shared note taking in a meeting.
 - Employing the use of a Qualtrics survey to provide another outlet for input, to check on alignment, and to assess how the collaboration tools were working for Task Force members.
- Consistently looping back to information previously gathered, where appropriate.
- Adapting and pivoting when issues arose with the use of focused workgroups: Immediate Solutions, Defining Terms, and Equity and Inclusion. The Immediate Solutions workgroup was short-term, the Defining Terms workgroup was a “pop-up” workgroup that emerged during a discussion at a full Task Force meeting, and the Equity and Inclusion workgroup was a longer-term committee.

The subcommittee meetings were designed to maximize bridging between topics and perspectives, broken into the following topic areas:

- **Data and Mapping** – responsible for investigating solutions to improve the granularity, accuracy, and timeliness of the broadband data that is needed to strategically improve broadband access, affordability, and adoption.
- **Policy and Legislative** – responsible for investigating ways Wisconsin can improve broadband access, affordability, and adoption through laws, including identifying policy barriers and reviewing other states’ broadband policy frameworks.⁶
- **Active Network Building and Community Alignment** – responsible for investigating ways Wisconsin can support the significant number of local communities seeking to expand broadband access, affordability, and adoption and at times lacking the human, financial, or technical resources needed to pursue a project or a plan.
- **Funding** – responsible for investigating the extent to which cost or need for additional investment is a barrier to broadband access, affordability, and adoption, and identifying solutions and recommendations to invest, leverage, and maximize funding in pursuit of expansion.

During meetings, Task Force members and subcommittee moderators (PSC staff) would join at the same time, receive instructions or notes, and then move into breakout rooms. During the final half-hour of these sessions, the subcommittee leaders and the PSC staff moderators would return to the main room and share conversations, inviting other subcommittees to discuss and make connections on any shared topics or issues that came up in their respective discussions. The details related to broader recommendations were identified and shaped using this approach. Subcommittees were asked to answer the following questions about each recommendation:

1. What about the recommendation makes it “future-proof”?
2. How is the recommendation equitable and/or how does it contribute to an equitable solution?

⁶ See Pew Charitable Trusts’ State Broadband Policy Explorer for a 50-state guide to statutes on broadband programs, competition and regulation, definitions, funding and financing, and infrastructure access. [State Broadband Policy Explorer | The Pew Charitable Trusts \(pewtrusts.org\)](#)



DEFINITIONS

A subgroup of Task Force members assembled to agree on key definitions for the Task Force. The subgroup considered a wide range of terms and brought recommendations back to the full Task Force for consideration and discussion.

The subgroup looked at items such as what is meant by “100% connectivity,” “quality of service,” and “scalability.” Here are a few definitions key to the group’s work:

Broadband: Technologies that provide high-speed internet access and other advanced telecommunications services to end users. Broadband is currently defined by the Federal Communications Commission (FCC) as 25 Mbps download and 3 Mbps upload speeds (25/3 Mbps⁷).

Latency: A measure of the time delay required for information to travel across a network.

Scalable: A broadband network has the ability to increase parameters relating to the size of the network while maintaining the quality of its broadband service.

Future-Proof: The ability to continue to be of value into the distant future; that the item does not become obsolete.

⁷ This abbreviated naming convention, download speed/upload speed in megabits per second (Mbps), will be used in several instances throughout this report.

GOALS

Previously, in his 2019–21 Executive Budget, Governor Evers proposed an accessibility goal for the State of Wisconsin that by 2025, all homes and businesses within the state have access to high-speed broadband that provides a minimum download speed of 25/3 Mbps.⁸ This was the first time that a governor had established an accessibility goal for the state. Following the Governor’s lead to make broadband a top priority, the PSC Broadband Office (WBO) developed granular, ambitious goals. In its 2021 update to the State Broadband Plan, the PSC established a series of four goals to meet its mission of making “high performance broadband more accessible, resilient, competitive and affordable in Wisconsin”:

- **Resilient:** Every Wisconsin community will have access to at least 1 Gbps symmetrical broadband service to anchor institutions such as schools, hospitals, government buildings, business parks, and enterprise centers by 2024.
- **Accessible:** 97% of Wisconsin homes and businesses will have access to at least one internet service with minimum speeds of 25/3 Mbps by 2025.
- **Affordable:** 75% of households with income below 200% of the federal poverty level have access to fixed, home internet service at a cost of less than \$25 per month by 2025.
- **High Performance:** 75% of Wisconsin homes and businesses will have access to at least one internet service with a minimum speed 100/20 Mbps service with preference on symmetrical service, no usage limits, and latency low enough to run interactive video applications by 2025.”⁹

The Task Force supported these goals and additionally chose to think about proposing goals along a longer timeline to help policymakers chart progress. In its discussions, the members too recognized that speeds up to 25/3 Mbps did not satisfy the needs of a household or businesses during the height of the pandemic. Many heard the comments of Wisconsinites who found that amount of service with multiple users streaming, doing video conferences and the like during the past year’s massive shifts.

The demands of bandwidth will also only continue to rise, and there needs to be additional focus placed on expanding the base level of service upwards at a speed that recognizes some communities are only now accessing service at that level discussed.

Members also agreed on the importance of long-term, aspirational goals. In keeping with its emphasis on future-proof solutions, the Task Force discussed the importance of striving toward high speeds and discussed recommendations to include benchmarks such as 100/20 Mbps, 100/100 Mbps, and 1 Gbps symmetrical service goals. At the same time the Task Force was discussing these aspirational speed goals, the FCC’s Rural Digital Opportunity Fund (RDOF) reverse auction winners were announced. Many of the RDOF winning bids in Wisconsin were at speeds of up to 1 Gbps. This made the Task Force more confident in concentrating their efforts on the higher goal of speeds up to 1 Gbps. Higher upload speeds in particular were discussed within the context of today’s society of citizens working, engaging in telehealth, and learning from home. The intent of aspirational goals is to incentivize long-term solutions for Wisconsinites.

⁸ 2019–21 Executive Budget. <https://doa.wi.gov/budget/SBO/2019-21%20Executive%20Budget%20Complete%20Document.pdf#page=440>

⁹ Wisconsin State Broadband Plan, Public Service Commission of Wisconsin, Broadband Office. [WisconsinBroadbandPlan2021.pdf](#). This plan is also provided in Appendix 2.

The FCC's most recent 2019 data shows that 17.7% of the state has access to service speeds up to 1 Gbps. The Task Force discussed whether there should be a difference in speed goals between urban and rural settings. The Task Force - while it recognizes and appreciates the differing circumstances, economics, and constraints across rural and urban geographies - firmly believed speed goals should not differ. For example, while it may be more costly to strive for 100/50 Mbps in a sparsely populated rural area, those living in those locations should have access to those speeds as well. There should be an understanding of that significance and the potential public support that is necessary to address these challenges. This may include paying attention to middle-mile and backhaul opportunities to make this possible.

17.7% has access to service speeds **OF THE STATE** up to 1 Gbps

By approaching the issue in this way, it puts in place goals that can then be measured to ensure those points are being met. These steps allowed prudent use of public dollars with measures in place to evaluate progress. It was important to offer goals that were aspirational and yet pragmatic.

The Task Force approached the issue with two layers for recommendations. The first addresses baseline access, building off the Governor's own assertion:

- By 2025, all homes and businesses within the state have access to broadband that provides a download speed of at least 25 Mbps and an upload speed of at least 3 Mbps.
- By 2028 all homes and businesses within the state have access to 50 Mbps and an upload speed of at least 10 Mbps.
- By 2031, all homes and businesses within the state have access to 100 Mbps and an upload speed of at least 50 Mbps.

Recognizing the long-term expansion of speeds in the sector, the Task Force recommends aspirational goals that clarify:

- By 2025, 50% of all homes and businesses within the state have access to high-speed broadband that provides a download speed of 1 Gbps.
- By 2030, 90% of all homes and businesses within the state have access to high-speed broadband that provides a download speed of 1 Gbps.

The Task Force chose to not address upload speeds at the aspirational level. Offering symmetrical service at such speeds seems unnecessary for most common applications but stresses the importance that download and upload speeds must support real-time, interactive applications.

Beyond speed, the Task Force supported these aspirational goals:

“All Wisconsinites should have broadband sufficient to successfully participate in society, including but not limited to, health, economic, and educational opportunities.”



CURRENT STATE OF BROADBAND ACCESS

According to the PSC WBO, “[m]any thousands of Wisconsin residents do not have access to the minimum speed of 25 megabits per second download and 3 megabits per second upload (25/3 Mbps) [. . .] and throughout the state residents have issues with the speed, quality and performance of their internet” and “[t]he current available data on broadband is insufficient.”¹⁰

In the [2021 Broadband Deployment Report](#), the FCC currently estimates that 6.8% of the population in Wisconsin (or 394,000 people) lack access to at least one fixed, terrestrial broadband service with a speed of 25/3 Mbps or better, compared to the national average of 4.4%. Of those 394,000 people, 385,000 are in rural areas, which accounts for 21.8% of rural residents in Wisconsin lacking access, compared to the national rural average of 17.2%. In addition, these estimates are likely underreported due to the FCC’s coverage data reporting mechanism, which was used for these estimates.

The table below shows FCC coverage data for Wisconsin compared to the 2021 national averages.

	Wisconsin	United States
Percentage lacking fixed 25/3 Mbps service	6.8%	4.4%
Persons lacking fixed 25/3 Mbps service	394,000	14,520,000
Rural percentage lacking fixed 25/3 Mbps service	21.8%	17.2%
Rural persons lacking fixed 25/3 Mbps service	385,000	11,261,000

Over time, the FCC’s broadband deployment reports have shown improvements in Wisconsin. For example, in 2016, 744,002, or 13%, of Wisconsinites lacked access to fixed 25/3 Mbps service. In 2021, 394,000, or 6.8%, of Wisconsinites lack access to fixed 25/3 Mbps service.¹¹

6.8%

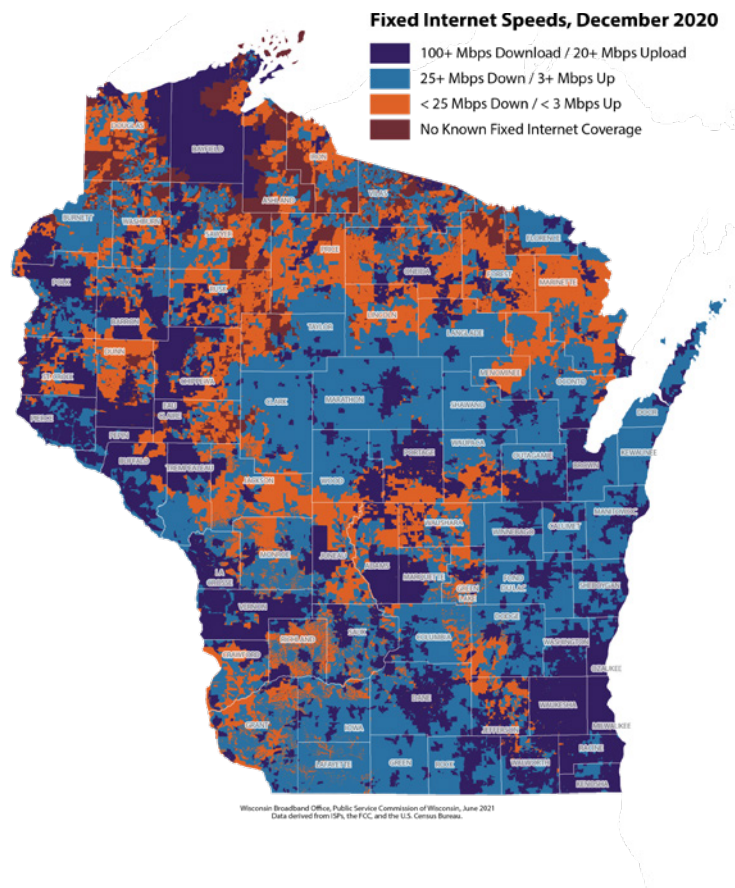
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lack access to at least one broadband service

¹⁰ Wisconsin State Broadband Plan, Public Service Commission of Wisconsin, State Broadband Office. [WisconsinBroadbandPlan2021.pdf](#). This plan is also provided as Appendix 2. ¹¹ Broadband Progress Reports of the Federal Communications Commission. [Broadband Progress Reports | Federal Communications Commission \(fcc.gov\)](#)

Some states' broadband access data comes from required reporting by internet service providers (ISPs) to the FCC in the FCC Form 477. There is no Wisconsin state law requiring ISPs to disclose specific coverage data to the state. Other access data are derived from crowd-sourced surveys, privately owned data sets, and other studies, each with their limitations. Under FCC Form 477 requirements, providers must indicate the maximum advertised service speed available to at least one premises in a census block. If one premises in a census block has access to 25/3 service, all inhabitants of that block in the dataset are represented to have access to that service. Thus, the FCC acknowledges its data overstates access to broadband service. Due to this limitation, in 2019, the FCC issued an order to begin the process of requiring ISPs to submit more granular, location-based data. Progress is underway, but the specific future date when the FCC's new program will be implemented and the new data will be available has not been identified.

According to estimates in a study performed by BroadbandNow, the number of people lacking internet access in Wisconsin is slightly less than double the number estimated by the FCC. In its 2021 study, BroadbandNow estimated that 670,592 Wisconsinites lacked access to a fixed 25/3 Mbps service.¹²



670,592 lack access to a fixed 25/3 Mbps service
WISCONSINITES

The COVID-19 pandemic sharply elevated the already critical need to expand broadband to all Wisconsinites lacking access to reliable and affordable access. Beginning in March of 2020, school, work, healthcare, commerce, and participation in society went virtual seemingly overnight. Governor Evers recognized that lack of broadband access was not acceptable for Wisconsinites and to that

end, allocated over \$5 million in CARES Act Relief Funds to the Wisconsin Broadband Office. The funds were issued in grants to providers who built critical infrastructure by the end of 2020.

Governor Evers went on to declare 2021 the Year of Broadband, and in his 2021–23 Executive Budget, proposed 10 different measures¹³ to ensure essential broadband access, affordability, and basic customer protections. In the spring of 2021, Wisconsin received federal American Rescue Plan Act (ARPA) funds, and Evers allocated a historic level of \$100 million in ARPA funding to the Wisconsin Broadband Office to expand high-speed internet.

Wisconsin is at a critical juncture in its broadband story and is facing some monumental challenges. The Wisconsin Broadband Office is working hard to zero in on accurate location-based numbers to continue to refine its broadband expansion efforts. In its 2021 grant round alone, the PSC awarded Broadband Expansion Grant Program projects providing internet access to over 100,000 unserved or underserved locations in the state. It grew its Voluntary Granular Data Collection program and used data collected by other agencies, crowd-sourced data, and the National Broadband Availability Map (NBAM) to continue to improve understanding of access, performance, and costs in the state.

¹² "BroadbandNow Estimates Availability for all 50 States: Confirms that More than 42 Million Americans Do Not Have Access to Broadband" | [BroadbandNow.com](https://www.broadbandnow.com)

¹³ Proposed measures included: Broadband Expansion Grant funding; Supporting Municipal Broadband; Broadband Infrastructure Owned by Electric Utilities and Cooperatives; Broadband Line Extension Grant Program; Internet Assistance Program; Broadband Customer Protections; Broadband Planning and Leadership Grant Program; Broadband Granular Mapping Data; TEACH IT Infrastructure Grants. 2021-23 Executive Budget. [0 - 2021-23 Executive Budget revised 02232021 WEB.pdf \(wi.gov\)](#)



ROLE OF BROADBAND

In Wisconsin, broadband plays a key role in economic, public, and social sectors, including in education, healthcare, agriculture, manufacturing, industry, energy, public safety, tourism, and more. Whether it is a farmer leveraging precision agriculture, a student accessing learning opportunities online, a jobseeker applying for work, or a family member or friend staying connected, broadband brings endless potential and an essential ability for participation in modern society. Broadband bridges communities, both rural and urban. The COVID-19 pandemic has only heightened the need for broadband services for students to learn from home, workers to telecommute, and Wisconsinites to receive medical care from home.



BROADBAND SPEED GUIDE

When considering the many applications of high-speed broadband internet, it is critical to look at speed. The FCC's minimum download speeds listed by activity and excerpted from the [Broadband Speed Guide](#) are found below. At a minimum, the guide recommends 5 to 25 Mbps download speeds for student and telecommuting applications. Beyond download speeds, the FCC recommends putting emphasis on upload speeds, particularly for video conferencing, sharing larger files, interactive learning, medical applications that use HD imaging, and advanced cloud computing. When using these applications, it is generally best that upload speeds be as close as possible to download speeds. "In the few years preceding the pandemic, market research data showed that average upload speeds in the United States surpassed over 10 Mbps in 2017 and continued to increase significantly with the average upload speed as of November 2019 increasing to 48 Mbps attributable in part to a shift to using broadband and the internet by individuals and businesses to create and share video content using video sharing, video conferencing and other applications. Sending information became as important as receiving it."¹⁴

Activity	Minimum Download Speed (Mbps)
General Usage	
General Browsing and Email	1
Streaming Online Radio	Less than 0.5
VoIP Calls	Less than 0.5
Student	5-25
Telecommuting	5-25
File Downloading	10
Social Media	1
Watching Video	
Streaming Standard Definition Video	3-4
Streaming High Definition (HD) Video	5-8
Streaming Ultra HD 4K Video	25
Video Conferencing	
Standard Personal Video Call (e.g., Skype)	1
HD Personal Video Call (e.g., Skype)	1.5
HD Video Teleconferencing	6
Gaming	
Game Console Connecting to the Internet	3
Online Multiplayer	4

Other considerations include latency and data limits. These can play important roles when looking at certain broadband applications referenced above. In addition to sufficient download and upload speeds, service with low latency and no data limits is best for real-time applications.

¹⁴ Interim Final Rule, Department of Treasury, "Coronavirus State and Local Fiscal Recovery Funds," 86 Fed. Reg. 26786 (May 17, 2021) 26804, 26805



CURRENT STATE OF DIGITAL EQUITY

The National Digital Inclusion Alliance defines digital equity as a condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy. Digital equity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services. The vision of the State Broadband Plan is for all Wisconsinites to have the information technology capacity to fully participate in society. The Task Force discussed that the availability of broadband alone is not enough to successfully expand high-speed internet access to every residence. Affordable service, internet adoption support, availability of low-cost devices, technology support and digital literacy skills are needed to make full use of the internet. The Task Force discussed both the ethical imperative to ensure digital equity and the clear economic benefit; when more people subscribe to internet service, the overall value increases for everyone.

Adoption: Access to broadband infrastructure alone is not enough for all Wisconsin residents to make full use of the internet. Adoption relates to the actions of using the internet to holistically support the well-being of a person or group of people. Extensive public and private surveys suggest that since 2010, **there are three broad principal causes of an adoption gap in the United States: affordability, digital readiness, and perceived relevance.**¹⁵

Internet adoption data has been collected in different ways and made available aggregated at different geographies. According to the American Community Survey (ACS) 2019 estimates, 490,091 Wisconsin residents did not use internet service at home and nearly 15% of Wisconsin households did not subscribe to wireline broadband at home. Over 10% of Wisconsin households did not have any type of computer (desktop, laptop, tablet, or e-reader) in the home, and over 500,000 households do not have a desktop or laptop computer.

Among the Wisconsin households without a home wireline internet subscription, there were 238,926 (12.3%) households with internet access through a subscription to a cellular plan only; this is less than the national average of 15%. Since 2018, there has been a steady decline in those who use their smartphone as their primary means of online access at home. With the recent surge in virtual school and teleworking combined with data caps and data costs related to some cellular plans, more households may find cellular plans insufficient for their broadband needs.

Low-income households have the lowest rates of broadband adoption of any demographic group. The 2019 Wisconsin median household income was \$64,168. Low-income households (an income of less than \$20,000 a year) are 13.4% (314,992) of all Wisconsin households.

Of all low-income households, 42.2%, or 133,049 households, did not have a subscription to broadband of any type, a percentage worse than the nationwide figure of 34.9%, and a percentage more than three times higher than the 12.8% of Wisconsin households with annual income between \$50,000 and \$75,000 that did not have a subscription to broadband of any type.¹⁶

¹⁵ The Lewis Latimer Plan for Digital Equity and Inclusion A Collaboration Commissioned by the National Urban League. [https://nul.org/sites/default/files/2021-04/NUL%20](https://nul.org/sites/default/files/2021-04/NUL%20LL%20DEIA%20041421%20Latimer%20Plan_vFINAL_1136AM.pdf)

[LL%20DEIA%20041421%20Latimer%20Plan_vFINAL_1136AM.pdf](https://nul.org/sites/default/files/2021-04/NUL%20LL%20DEIA%20041421%20Latimer%20Plan_vFINAL_1136AM.pdf)
¹⁶ American Community Survey, 2019

Older adults in Wisconsin fall behind younger counterparts in adoption of digital tools. In 2019, one in three Wisconsin adults age 65 and older (30%) did not have a subscription to any type of broadband service at home, a rate three times higher than the rate for all other adults in the state. Older adults are less likely to own a computer or a smartphone than other adults.

Historically, white Americans have adopted broadband at higher rates relative to Black Americans, Latinx, and Native Americans. One in four Wisconsin Black Americans (24%) and one in five Native Americans (21%) didn't have any type of broadband subscription at home compared with one in six Latinx (16%), one in eight whites (12%), and one in twelve Asian Americans (8%).

The gaps can be even wider where wireline broadband is available, because Latinx and Black Americans with a broadband subscription are more likely than whites to rely on wireless data plans only for internet service. Compared to national figures, the lack of any type of broadband subscription at home is higher for Wisconsin Black residents (US 21%) and lower for Native American and Latinx people in the state (US 27% and 17%, respectively).¹⁷

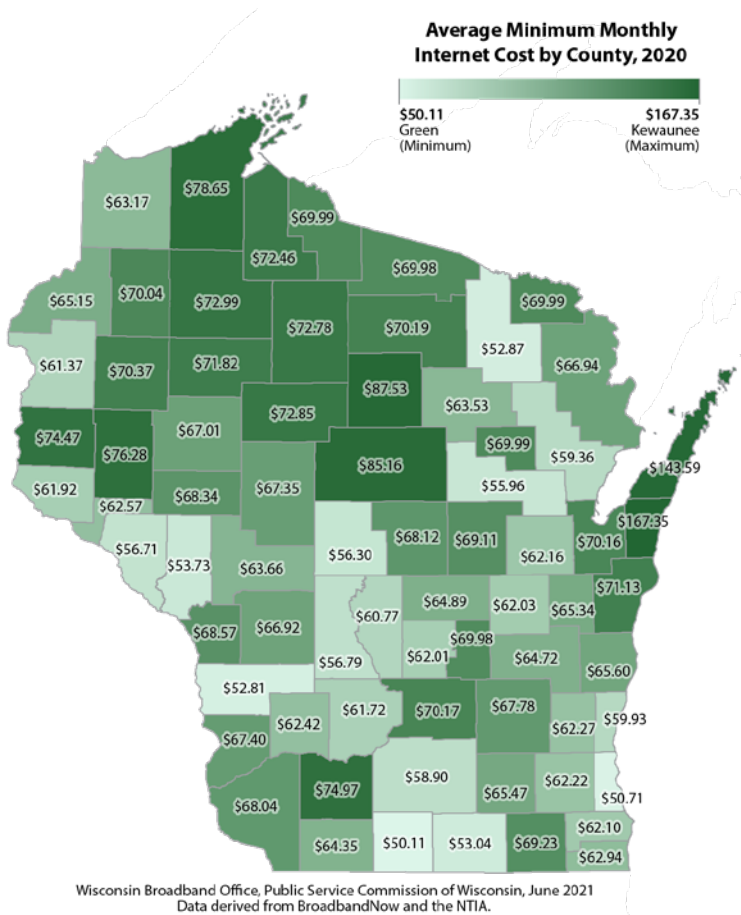
Affordability: Many households throughout the state do not have internet at home because the cost is too high. Pew research has found cost to be the number-one barrier to internet adoption. Data collected by the Department of Public Instruction (DPI) using the results of the Wisconsin Digital Equity Home Internet Survey shows across households with school-age children that 3.2% of K-12 students did not have access to the internet at home; this was attributed as much to affordability as it was to access.

The private organization BroadbandNow publishes a quarterly report, The State of Digital Inclusion, which provides the percentage of the population in each state with access to home internet. The report uses the benchmark of \$60 per month as the indicator of an "affordable" internet service. According to its 2019 Q4 report, in Wisconsin only 44% of residents have a monthly internet service at a cost of less than \$60 per month. Thirty-one other states have a higher percentage of people with access to affordable plans.

ONLY
44%
OF RESIDENTS
have access to
internet service
at less than
\$60 per month

¹⁷ American Community Survey, 2019





Wisconsin's goal, as indicated in The State Broadband Plan, is for all low-income households to have access to fixed home internet service for a cost of less than \$25 per month.

A number of providers have special programs for low-income households or low-income K-12 students. Some examples include Charter's Spectrum Internet Assist, AT&T's Access AT&T, Cox's Connect2Compete, Comcast's Internet Essentials, and Bevcomm's low-income assistance program. The eligibility, limitations, and geography vary among the programs. The cost of service ranges from \$10 to \$40 per month for an eligible household. Data regarding the number of people enrolled in these programs was not available for this report.

In December of 2020, as the COVID-19 pandemic continued to necessitate distance learning, telework, and reliance on telehealth, Congress created the temporary Emergency Broadband Benefit Program (EBBP) to address affordability, one of the main barriers to internet adoption. The EBBP is administered by the FCC. It offers a \$50-per-month discount for low-income households to offset the cost of broadband subscriptions. The benefit increases to \$75 per month for those who qualify and reside on tribal land. Eligible households may also qualify for a discount on a laptop, desktop, or tablet computer if their provider

is participating in the device benefit. The benefit program launched nationwide on May 12, 2021, and as of June 13, 2021, more than 2.5 million households were receiving the monthly internet discounts. In the first month of the EBBP program, 57,636 Wisconsin households have enrolled in the program. Wisconsin is in the top 10 states for the percentage of eligible households that have enrolled.



Digital Inclusion: Digital equity does not occur without intentional strategies, policies, programs, and organizations doing digital inclusion work. The National Digital Inclusion Alliance uses the following working definition:

“Digital inclusion work entails efforts to ensure all individuals and communities, including the most disadvantaged, have access to and use of Information and Communication Technologies (ICTs).

This includes 5 elements:

1. Affordable, robust broadband internet service
2. Internet-enabled devices that meet the needs of the user
3. Access to digital literacy training
4. Quality technical support
5. Applications and online content designed to enable and encourage self-sufficiency, participation, and collaboration

Digital Inclusion must evolve as technologies advance. Digital Inclusion requires intentional strategies and investments to reduce and eliminate historical, institutional and structural barriers to access and use technology.”¹⁸

There are several organizations focusing on digital literacy and training, internet adoption, and affordability throughout Wisconsin. Some examples include Techquity, Rural Housing Foundation, Digital Bridge, DANEnet, YWCAs, Urban Leagues, Boys and Girls Clubs, independent living centers, community action programs, and adult literacy programs. It is not nonprofits alone that do digital inclusion work; schools, libraries, technical colleges, and UW Extension also contribute to the digital inclusion landscape. With the onset of the pandemic, healthcare institutions, banks, and credit unions have also increasingly become digital literacy educators and technical support providers for their patients and customers. Wisconsin has a rich variety of people, institutions, and organizations working on the ground to support digital literacy and internet adoption. The Task Force discussed ways to identify and scale “what works” and strengthen the digital inclusion ecosystem in the state. A digital equity work group was formed and developed recommendations for the report.

¹⁸ <https://www.digitalinclusion.org/definitions/> (Reference June 2, 2021)



TOP RECOMMENDATIONS

The Task Force identified the following as top recommendations to address the State's broadband goals, including strategies for successfully expanding high-speed internet access to every residence, business, and institution in the state; initiatives for digital inclusion; and pathways to unlocking and optimizing the benefits of statewide, affordable access to broadband for all Wisconsin communities.

- Explore hybrid models of broadband infrastructure development and ownership. Create a shared risk mechanism for public/private partnerships that make use of publicly owned infrastructure to reach underserved locations by private internet service providers.
- Increase construction and permitting coordination.
- Increase Broadband Expansion Grant Program funding.
- Collect internet access data from all ISPs at household and business levels of granularity.
- Increase broadband consumer protections and pricing transparency.
- Establish a State Internet Assistance Program.
- Establish a statewide Digital Equity Fund operated by a nonprofit or similar organization with a mission to fund, strengthen and support digital inclusion activities and ideas that lead to all Wisconsin residents having the information capacity needed to fully participate in society.
- Develop and fund a statewide Digital Navigator program to assist under-connected people and solve a wide range of adoption issues. Digital navigators should be embedded in organizations with strong and trusting relationships to the target populations, with the organizational capacity and cultural competency to make an impact.
- Assess broadband adoption and lack of adoption among households not adopting internet based on means, needs, connectivity, and prioritization.
- Align, coordinate, and maximize present and future federal funding.
- Increase funding for broadband administration.
- Establish and support a coalition of willing, engaged broadband leaders to connect communities with providers, local and regional partners, planning and technical assistance opportunities, funding opportunities, and resources.
- Create planning and implementation grants for regions and communities.

FULL RECOMMENDATIONS: ACCESS, AFFORDABILITY, ADOPTION, AND ALL OF THE ABOVE

In addition to the top recommendations provided above, full recommendations below are broken out by Access, Affordability, and Adoption or what are known as the “Three A’s.” Together, these Three A’s stand as the key pillars to broadband access. In addition, there is a fourth category of recommendation called “All of the Above.” This category houses recommendations that support or impact multiple categories.

While recommendations were drafted and formed by subcommittees, they have been organized by the Three A’s for the sake of readability and cohesiveness. Below are short descriptions of each of the Three A’s.

Access: can be defined as the ability for a location in the state, prioritized by households and businesses, to connect with effective broadband (25/3 Mbps and greater) access.

Affordability: can be defined as the presence of service options financially available to all households.

Adoption: can be defined as the process and related actions of using the internet to holistically improve the well-being of a person or group of people.

ACCESS RECOMMENDATIONS

Top Recommendation: Explore hybrid models of broadband infrastructure development and ownership. Create a shared-risk mechanism for public/private partnerships that make use of publicly owned infrastructure to reach underserved locations by private internet service providers.

Recommendation: Make use of the current and future facilities of publicly owned utilities, investor-owned utilities, and electric cooperatives to deliver internet service and/or to partner with providers of broadband service.

Recommendation: Reduce barriers to publicly owned infrastructure in cases where it will not unfairly compete with private businesses and will serve communities or locations without broadband access.

Top Recommendation: Increase construction and permitting coordination.

Recommendation: Consider a state directory of leasable dark fiber, available middle-mile fiber, and lit fiber with excess capacity.

Recommendation: Improve the coordination of infrastructure construction among all types of projects, better identify opportunities for smarter digging, and develop a mechanism for prioritizing projects most suitable for joint construction.

Recommendation: Coordinate a state working group to identify “pain points” on permitting, work to streamline permitting, and add resources to accelerate broadband infrastructure permitting.

Top Recommendation: Increase Broadband Expansion Grant Program funding.

Recommendation: Establish Broadband Line Extension Grant Program.

Recommendation: Continue TEACH¹⁹ IT funding.

19 Technology for Education Achievement (TEACH) is a program administered by the Wisconsin Department of Administration, Division of Enterprise Technology. TEACH subsidizes, through USAC’s E-rate, much of the cost of the category 1 circuit to provide telecommunications access such as data lines to eligible schools, libraries, and educational institutions.

Recommendation: Continue to explore creative ways to serve challenging areas of the state where providing access may not result in a return on investment.

Top Recommendation: Collect internet access data from all ISPs at household and business levels of granularity.

Recommendation: Identify areas of greatest need for connectivity improvements statewide as well as areas of the state with minimal/no need for fixed broadband access.

Recommendation: All raw coverage and speed data should be available for analysis at the address level, when possible, while protecting appropriate confidentiality.

AFFORDABILITY RECOMMENDATIONS

Top Recommendation: Increase broadband consumer protections and pricing transparency.

Recommendation: Create standard labeling or disclosure for broadband services that would include monthly charges for data, other charges, additional fees, network performance, privacy information, contract terms, and complaint contact information.

Recommendation: Create standard billing for broadband services that would include information about the amount of data the customer actually used, network uptime during the billing period, and average network speeds delivered.

Recommendation: Encourage internet service providers to build resilient and redundant infrastructure to service Wisconsin residents and limit extended outages; provide accountability measures for extended outages of internet services to customers.

Recommendation: Explore implementing something similar to the Universal Service Administrative Company (USAC) testing tool²⁰ for providers with state funding to determine the speed of internet service from the demarcation point to the internet and make the speed test data public.

Top Recommendation: Establish a Wisconsin Internet Assistance Program.

Recommendation: Define broadband affordability as ratio of income.

Recommendation: Gather and collect data across all regions of the state, to better understand from residential and commercial users the affordability and obstacles to broadband utilization, with as granular of detail as reasonable.

²⁰ <https://www.usac.org/high-cost/annual-requirements/performance-measures-testing/>



ADOPTION RECOMMENDATIONS

Top Recommendation: Establish a statewide Digital Equity Fund operated by a nonprofit or similar organization with a mission to fund, strengthen, and support digital inclusion activities and ideas that lead to all Wisconsin residents having the information capacity needed to fully participate in society.

Recommendation: Provide both one-time funding for the establishment of the Digital Equity Fund and annual sustaining contributions from the State through general purpose revenue, assessments, or allocation of federal funding to ensure the successful ongoing operations.

Top Recommendation: Develop and fund a statewide Digital Navigator program to assist under-connected people in solving a wide range of adoption issues. Digital navigators should be embedded in organizations with strong and trusting relationships to the target populations, with the organizational capacity and cultural competency to make an impact.

Recommendation: The state should fund a statewide Digital Navigator program with sustained and consistent funding to help close the adoption and use gap.

Recommendation: Explore programs and pathways that keep fully functional internet-enabled computers in the state to be repurposed through reputable channels for use by low-income households and under-connected Wisconsin residents.

Recommendation: State government, large institutions, and the UW system should be encouraged to provide their retired equipment to programs that focus on repurposing devices for low-income state residents.

Recommendation: Require that repurposed computers meet certain technical specifications, be professionally refurbished, have licensed operating systems, come with basic productivity software, and include at least a one-year warranty.

Top Recommendation: Understand reasons for households that do not adopt broadband, focusing on means, needs, connectivity, and prioritization.

Recommendation: Gather and collect adoption data with as granular of detail as reasonable, to better understand the needs, experiences, and priorities of residential and commercial users over time.

ALL OF THE ABOVE RECOMMENDATIONS

Top Recommendation: Align, coordinate, and maximize present and future federal funding.

Top Recommendation: Increase funding for broadband administration.

Top Recommendation: Establish and support a coalition of willing, engaged broadband leaders to connect communities with providers, local and regional partners, planning and technical assistance opportunities, funding opportunities, and resources.

Top Recommendation: Create planning and implementation grants for regions and communities.

DISCUSSION OF RECOMMENDATIONS BY SUBCOMMITTEE



POLICY AND LEGISLATIVE

REVIEW AND DISCUSSION

Persistent gaps in internet access, affordability, and adoption remain despite significant private and public sector investments in broadband infrastructure. In rural areas, in particular, ISPs report that there is an insufficient return on investment to make the business case for new or improved infrastructure. As a result, broadband deployment often does not emerge as a result of regular market forces without some form of public support. In many less rural areas, competition is only an occasional occurrence because return-on-investment challenges deter new investors from competing against existing incumbent providers. This limited competition is typically associated with harm to consumers in the form of higher prices, lower-quality service, slower innovation, and reduced customer service.

Certainly, time and funding are significant factors in reaching the goal of all Wisconsin homes and businesses having access to at least one internet service with minimum speeds of 25/3 Mbps by 2025.

However, time and money alone are not enough to achieve the Task Force goals. Changes to current policies and legislation would allow the State to accelerate progress toward Task Force goals, use public funding more equitably, target limited resources to gain the greatest impact, and ensure that broadband is available, accessible, and used by Wisconsin residents.

Some additional challenges include finding the right balance of policies and legislation to lay the foundation for the Task Force goals to be reached while ensuring that ISPs do not have unnecessary regulation or unfair competition.

The subcommittee on policy and legislation discussed: accountability for advertised speeds and other consumer broadband protections; municipal broadband services, risks and barriers; public/private partnerships for infrastructure build-outs; incentives or prioritizing middle-mile build-out; and dig-once or dig-smart policies.

PUBLIC/PRIVATE PARTNERSHIPS

Communities wanting improved broadband service are usually limited to two options: waiting for the private sector or addressing the challenge entirely as a public enterprise. Throughout the country and within the state, promising practices of public/private partnerships are emerging. These models range from a public owner with a private operator to a public developer that sells the project to a private owner. The goal of these partnerships should be to share the risks and rewards, provide communities choice and agency in broadband decision making, and provide accessible, high-performance broadband service.

In addition to local government, large utilities in the state are in the process of expanding their own privately held, high-speed data and communication networks. These networks provide critical situational awareness, provide

support to safety functions, and help crews make repairs and restore electricity following natural disasters and storms. These networks serve to support the safe, efficient, and reliable provision of electricity. In some circumstances, these networks have excess bandwidth capacity that can have value for middle-mile transmission of internet data.

Additionally, state and local governments own networks and towers for communications and to maintain a variety of government functions, which could also be used in partnerships. Community anchor institutions were also explored as a possible solution; with such anchor institutions already fitted with high-speed internet, municipalities are likely to have clear guidance on how to leverage this investment and extend build-out to surrounding residences and businesses, doing this with an eye toward addressing the concern that building out near anchor institutions, which are usually in high-density areas, has the effect of further islanding the surrounding low-density areas.

The subcommittee discussed these opportunities and associated challenges with both meeting the Task Force goals and maintaining a fair and level playing field for incumbent and new ISPs.

Top Recommendation: Explore hybrid models of broadband infrastructure development and ownership. Create a shared risk mechanism for public/private partnerships that makes use of publicly owned infrastructure to reach underserved locations by private internet service providers.

- Use community anchor institutions as starting points for community-based access and internet competition.
- As needed, explore the development of open-access middle-mile networks in areas of the state that are difficult to serve or that lack redundant, resilient broadband infrastructure.
- Where state-owned infrastructure is available for use by ISPs, the details and locations of these assets could be shared with a single agency, mapped, and made publicly available for use by communities and providers.



WISCONSIN CASE STUDY: ELECTRIC COOP/TELCO PARTNERSHIP WISCONSIN

In 2019, Nsight Teleservices and Washington Island Electric partnered to dramatically improve the capacity of middle-mile broadband service to Washington Island in Door County by installing a submarine fiber cable from Northport Pier to Plum Island to Washington Island. Nsight Teleservices was pursuing grant funding to build middle-mile service to Washington Island. Around the same time, Washington Island Electric Cooperative (WIEC) discovered substantial ice damage to the submarine power line and decided to pursue a new route to the island to reduce future ice damage. The parties discovered that they could buy a suitable submarine electric cable that had broadband fiber built in and pursued a partnership to replace the power line and provide a middle-mile fiber route to the island. The partnership resulted in reduced costs and a fiber connection to unserved locations; the PSC awarded a \$104,331 grant to support the project. Nsight Teleservices will own and maintain the fiber facility.

Recommendation: Make use of the current and future facilities of publicly owned utilities, investor-owned utilities, and electric cooperatives to deliver internet service and/or to partner with providers of broadband service.

- Allow rural electric cooperatives the use of electric easements and access to other easements for use in broadband deployment.

MUNICIPAL BROADBAND

The subcommittee found that increasing hybrid models of development and service should be a top priority but also acknowledged that some locations do not have an available private partner. In these cases, communities may wish to explore an entirely publicly owned solution.

Municipal broadband is allowable under certain conditions but difficult in the state of Wisconsin. Wisconsin is among 18 states with explicit restrictions on municipal broadband. UW-Extension's recent report, *Broadband and the Wisconsin Economy*, provides the following analysis:

“Wisconsin is one of three states with three identified barriers (funding barriers, competition barriers, and bureaucratic barriers) which make it functionally impossible for a municipality to build and provide broadband service to its citizens at a price its citizens can afford.”²¹

The Wisconsin Legislative Council's Utilities and Energy Briefing Book published November 2018 indicates, “State law prohibits, with a few exceptions and under certain circumstances, a municipality from constructing, owning, or operating a facility for providing video service, telecommunications service, or broadband service to the public unless the municipality: Holds a public hearing on enacting an ordinance to do so, notice is given for the hearing; and the municipality prepares and makes available for public inspection a report estimating the total costs of, and revenues derived from, constructing, owning, or operating the facility for a period of at least three years.”²²

In some parts of our state, there are no internet service providers who are interested in expanding to provide broadband service or the existing provider is not planning on improving the existing service to meet the broadband access needs of the community. In the early 20th century, similar challenges were experienced with the expansion of electrification. This led to the establishment of dozens of municipally owned and rural cooperative electric utilities. This allowed people to locally take control and work to bring electricity to themselves and their neighbors. Supporters of municipal broadband suggest that in the absence of adequate service, local governments must be able to pursue their own network to meet the community's need for this essential service. Research by Whitecare and Gallardo, 2020, shows that barriers to municipal broadband have a negative impact on broadband availability.²³ In recent years a number of other states including Arkansas, Colorado, Washington, and California have removed and reduced these barriers.

Alternately, internet service providers contend that government-supported municipal broadband constitutes unfair competition with private providers and may discourage their future investment and unfairly impact past investments. Opponents assert that broadband is not a utility and that municipalities are ill-equipped to build, operate, and maintain such networks. Furthermore, in rural areas where there are few areas of high consumer density, municipalities may create islands of service in only those densely populated areas. This can further lower the financial viability for companies that would provide service to both densely populated areas and sparsely populated areas.

Recommendation: Reduce barriers to publicly owned infrastructure in cases where it will not unfairly compete with private businesses and will serve communities or locations without broadband access.

- For communities pursuing publicly owned broadband infrastructure, reduce the hurdle of producing a total cost report by creating access to a cost-model report tool approved by the Public Service Commission.
- When communities actively pursue public broadband infrastructure investments in good faith, legislation should specify the manner, timeframe, and court in which any challenge or grievance must be filed.

²¹ *Broadband and the Wisconsin Economy*, University of Wisconsin-Madison Extension, page 19. [2021-01-07-Broadband-Report.pdf \(wisc.edu\)](#)

²² Wisconsin Legislative Council's Utilities and Energy Briefing Book published November 2018

²³ State broadband policy: Impacts on availability Brian Whitacre, Roberto Gallardo, Telecommunications Policy, Volume 44, Issue 9, 2020, <https://doi.org/10.1016/j.telpol.2020.102025>

CONSUMER PROTECTIONS AND PRICE TRANSPARENCY

A common complaint heard by Task Force members, the State Broadband Office, and the state’s consumer protection agency, Department of Agriculture, Trade and Consumer Protection, is that the internet speeds that people are paying for are, at times, significantly lower than what they experience. Speeds can be affected by a wide variety of variables ranging from customer devices receiving or broadcasting the service to provider equipment and technology to things like trees, geography, and sometimes even the weather. While many customers believe they are required to get an advertised speed, this is often not reflected in their service agreement as a guarantee but more likely a range or a service that is “up to” a certain speed. The subcommittee discussed the challenges that consumers face in understanding their service and their internet use.

One charge of the Task Force was to identify barriers regarding access, affordability, and adoption. While the cost of internet service may certainly be a barrier, the subcommittee discussed the lack of uniformity and transparency in internet service plan pricing.

“Internet service plans feature a litany of additional fees and hidden costs that consumers must navigate to determine total price ... common ancillary fees include:

1. Installation and activation fees
2. Equipment fees
3. Penalties for exceeding data caps
4. Early termination fees and minimum contract lengths”

(The Cost of Connectivity 2020)

Throughout the process, consumers often have a number of choices regarding their service in addition to the baseline price for service; this may include self-installation or installation by the company, equipment rental or purchase, length of contract, and whether or not the service has data caps. The subcommittee considered that uniform internet service information and standard pricing and billing information may reduce barriers, increase affordability and improve customer experience. The idea, sometimes called a “broadband nutrition label” is similar to the 2016 proposal by the FCC.

Broadband Facts	
Fixed broadband consumer disclosure	
Choose Your Service Data Plan for 50Mbps Service Tier	
Monthly charge for month-to-month plan	\$60.00
Monthly charge for 2 year contract plan	\$55.00
Click here for other pricing options including promotions and options bundled with other services, like cable television and wireless services.	
Other Charges and Terms	
Data included with monthly charge	300GB
Charges for additional data usage – each additional 50GB	\$10.00
Optional modem or gateway lease – Customers may use their own modem or gateway; click here for our policy	\$10.00/month
Other monthly fees	Not Applicable
One-time fees	
Activation fee	\$50.00
Deposit	\$50.00
Installation fee	\$25.00
Early termination fee	\$240.00
Government Taxes and Other Government-Related Fees May Apply: Varies by location	
Other services on network	
Performance - Individual experience may vary	
Typical speed downstream	53 Mbps
Typical speed upstream	6 Mbps
Typical latency	35 milliseconds
Typical packet loss	0.08%
Network Management	
Application-specific network management practices?	Yes
Subscriber-triggered network management practices?	Yes
More details on network management	
Privacy See our privacy policy	
Complaints or Inquiries	To contact us: online/(123)456-7890 ; To submit complaints to the FCC: online/(888)225-5322
Learn more about the terms used on this form and other relevant information at the FCC’s website.	

Broadband Nutrition Label Example

Top Recommendation: Increase broadband consumer protections and pricing transparency.

Recommendation: Create standard labeling or disclosure for broadband services that would include monthly charges for data, other charges, additional fees, network performance, privacy information, contract terms, and complaint contact information.

Recommendation: Create standard billing for broadband services that would include information about the amount of data the customer actually used, network uptime during the billing period, and average network speeds delivered.

Recommendation: Encourage internet service providers to build resilient and redundant infrastructure to service Wisconsin residents and limit extended outages, provide accountability measures to internet service providers for extended outages of internet services to customers.

Recommendation: Explore implementing something similar to the USAC testing tool for providers with state funding to determine the speed of internet service from the demarcation point to the internet and make the speed test data public.

BUILDING FASTER AND SMARTER

The subcommittee sought policy solutions to promote the efficient and strategic expansion of broadband facilities across the state. The subcommittee reviewed technical guides to dig-once policies, previously proposed legislation in Wisconsin, and practices and policies in other states. Most broadband investments are made by private companies, some of which receive significant public grants and subsidies. These projects are largely coordinated through the local governments and the provider. The committee found that a more nuanced approach that improves construction coordination and communication and streamlines permitting is a more efficient way to increase broadband than a statewide dig-once policy.

While speed and coordination were strong desires of the subcommittee, neither of these goals should diminish the critical role of safety and regulation in the broadband construction industry in Wisconsin. The subcommittee iterated those contractors building broadband in the state, with or without grant funding, should have the business acumen, technical proficiencies, and workforce to ensure quality installation while maintaining the safety and well-being of employees. This includes the use of the one-call Diggers Hotline system. Further, the owners of broadband facilities should continue to respond to locate requests from Diggers Hotline within the allowable timeframe.

Top Recommendation: Increase construction and permitting coordination.

Recommendation: Consider a state directory of leasable dark fiber, available middle-mile fiber, and lit fiber with excess capacity.

Recommendation: Improve the coordination of infrastructure construction among all types of projects, better identify opportunities for smarter digging and develop a mechanism for prioritizing projects most suitable for joint construction.

Recommendation: Coordinate a state working group to identify “pain points” on permitting, work to streamline permitting, and add resources to accelerate broadband infrastructure permitting.



FUNDING

REVIEW AND DISCUSSION

OVERVIEW OF STATE FUNDING

The [Broadband Expansion Grant Program](#) administered at the Public Service Commission of Wisconsin has been a key mechanism toward the expansion of advanced telecommunications capability in underserved areas of the state. The program is aimed at providing funds to assist eligible entities in deploying broadband infrastructure in areas of the state that are costly to serve. These unserved and underserved areas of the state can be challenging to serve due to population density, topography, and more.

Since 2014, the grant program has awarded 268 grants totaling over \$72.5 million. A map of past awards from the fiscal year 2014 through 2020 can be found [here](#). A map of recently awarded (March 2021) fiscal year 2021 grants can be found [here](#). Since the program's inception, it has awarded funding to projects that will result in 20,000 unserved and underserved businesses and 200,000 unserved and underserved households having access to new or improved high-speed internet. In addition, the program has supported over 50 miles of new middle-mile infrastructure that will improve access to an additional 50,000 locations.

\$72.5 in 268 grants have
MILLION been awarded
since 2014

Wisconsin Stat. [§196.504](#) defines “Eligible applicant” for purposes of the grant program to mean any of the following:

1. An organization operated for profit or not for profit, including a cooperative.
2. A telecommunications utility.
3. A political subdivision that submits an application in partnership with an eligible applicant under subd. 1. or 2.

State statute also defines geographic areas of the state to be determined as eligible (underserved) and priority (unserved).

“Underserved” means an area served by fewer than two broadband service providers.

“Unserved area” means an area of this state that is not served by an internet service provider offering internet service that is all of the following:

1. Fixed wireless service or wired service.
2. Provided at actual speeds of at least 20 percent of the upload and download speeds for advanced telecommunications capability as designated by the Federal Communications Commission in its inquiries regarding advanced telecommunications capability under 47 USC 1302 (b).

Statute also sets forth criteria that shall give priority to projects that:

- include matching funds
- involve public/private partnerships
- affect unserved areas
- are scalable
- promote economic development
- will not result in delaying the provision of broadband service to neighboring areas to be served by the proposed project
- affect a large geographic area or a large number of underserved individuals or communities

Additionally, statute sets forth grant application criteria that shall receive consideration:

- the degree to which the proposed projects would duplicate existing broadband infrastructure, information about the presence of which is provided to the commission by the applicant or another person within a time period designated by the commission
- the impacts of the proposed projects on the ability of individuals to access healthcare services from home and the cost of those services
- the impacts of the proposed projects on the ability of students to access educational opportunities from home

Funding for the Broadband Expansion Grant Program has come from the universal service fund and one-time transfers from the federal E-Rate fund.

Schools and libraries are eligible for funding from the Federal Communications Commission (FCC) E-rate program. Funds can be used to purchase internet service to those anchor institutions. The State of Wisconsin facilitates this effort through the procurement of services under a statewide network called BadgerNet. The Department of Administration Division of Enterprise Technology (DET) manages the BadgerNet. One feature of the statewide program is to subsidize the monthly rates using a consolidated E-rate application DET submits to the FCC on behalf of school and library participants. The pooled purchase program has historically created financial benefits for participants, and the consolidated application saves local staff time related to administrative tasks.

E-rate also provides support for other areas. Schools and libraries use funds established in 2015 specifically to build wireless networks within their buildings. This was very important as schools converted to instructional models where each student was assigned a computer or tablet. Libraries have also benefited as more patron visits to those buildings involved access to the internet via the library Wi-Fi network.

Schools and libraries may also apply for E-rate funding to help build connectivity across their buildings. Many have opted to do so within Wisconsin, oftentimes to augment their BadgerNet connections.

OVERVIEW OF PAST, PRESENT, AND FUTURE FEDERAL FUNDING

Connect America Fund (CAF) Phase II, commonly called “CAF II,” is a six-year fund where the FCC awarded \$572,632,176 to three telecommunications carriers (AT&T, CenturyLink, Frontier) in Wisconsin to build voice and broadband-capable infrastructure to 230,451 locations.

In order to receive CAF II funding, carriers must offer at least one voice and one broadband service commercially. Service providers must offer broadband at speeds of at least 10/1 Mbps upstream.

Carriers must complete:

- 40 percent of deployments by the end of year 3 (2017)
- 60 percent of deployments by the end of year 4 (2018)
- 80 percent of deployments by the end of year 5 (2019)
- 100 percent of deployments by the end of year 6 (2020)

A map of deployment thus far is available [here](#). Note: AT&T, CenturyLink, and Frontier all opted to receive a [7th year of CAF II support](#).

Connect America Fund (CAF) Phase II Auction, commonly called “CAF II Auction,” provides support to carriers to deliver service in areas where the incumbent price cap carrier didn’t accept CAF II model-based funding and in extremely high-cost areas located within the service areas of the incumbent price cap carriers. CAF II Auction is a six-year fund where the FCC awarded \$4,709,504.90 to four bidders (Wood County Telephone Company d/b/a Solarus, Viasat, Inc., JCWIFI.com LLC, and Bruce Telephone Company, Inc.) in Wisconsin to build voice and broadband capable infrastructure to 7,789 locations.

In order to receive CAF II funding, carriers must offer at least one voice and one broadband service commercially. Service providers must offer broadband at speeds of at least 25/3 Mbps upstream.

Carriers must complete:

- 40 percent of deployments by the end of year 3 (2022)
- 60 percent of deployments by the end of year 4 (2023)
- 80 percent of deployments by the end of year 5 (2024)
- 100 percent of deployments by the end of year 6 (2025)

Alternative Connect America Cost Model, Revised Alternative Connect America Cost Model, and **Alternative Connect America Cost Model II**, which are collectively commonly called “ACAM,” provide funding to rate-of-return carriers. The Revised ACAM program is a 10-year fund where the FCC awarded \$323,942,390 to build voice and broadband-capable infrastructure to 53,747 locations in Wisconsin. The ACAM II program is also a 10-year fund where the FCC awarded \$163,137,870 (total for WI) to build voice and broadband-capable infrastructure to 21,080 locations in Wisconsin.

In most ACAM locations, service providers must offer broadband at speeds of at least 25/3 Mbps.

A map of deployment thus far is available [here](#).

[Rural Digital Opportunity Fund \(Auction 904\)](#) (RDOF) is a ten-year, \$20.4 billion fund distributed by using a reverse auction mechanism in two phases. The Phase I auction, which began on October 29, 2020, targeted over six million homes and businesses nationally in census blocks that are entirely unserved by voice and broadband with speeds of at least 25/3 Mbps. Phase II will cover locations in census blocks that are partially served, as well as locations not funded in Phase I.

For Wisconsin, Phase I of the RDOF auction resulted in \$373 million in winning bids to 14 bidders and 240,000 locations.

Almost all Phase I eligible locations received a winning bid. CCO Holdings was awarded the most locations at 143,269 with \$168 million in support. LTD Broadband was awarded the most funding at \$189 million for 88,000 locations. Notably, almost all bids in WI were in the gigabit, low-latency tier.

While the Phase I auction initially had a budget of \$16 billion, \$9.2 billion was actually won across the nation. This was due to the reverse auction mechanism. A remaining \$6.8 billion is leftover from Phase I, which, coupled with \$4.4 billion originally allocated, will result in a total of \$11.2 billion for Phase II aimed at partially unserved areas and areas not won in Phase I.

Winning RDOF bidders have until the end of year 3 to reach 40%, with 20% additional every year beyond until complete.

The United States Department of Agriculture (USDA) furnishes funds for broadband expansion via [several grant and loan programs](#). A few Wisconsin examples are provided below.

[ReConnect Loan and Grant Program](#) - In the fiscal year 2020, Ntera, LLC was awarded a 100% grant award for \$3,095,922. The primary objectives of the project are to bring broadband with speeds up to 1 Gbps/1 Gbps to customers utilizing FTTH technology and to provide a strategically placed backbone fiber optic cable allowing for future expansion projects. The target areas are rural, west of the city of Cornell, north of the village of Cadott, west of the village of Sheldon, west of the city of Gilman, and a portion of the town of Sigel. More information can be found [here](#).

[Telecommunications Infrastructure Loans and Loan Guarantees Program](#) - The Chibardun Telephone Cooperative Inc. received a \$10.2 million loan to install 328.5 miles of fiber to the premises (FTTP) to serve the rural areas of the Prairie Farm and Sand Creek exchanges. More information can be found here: <https://www.rd.usda.gov/node/17836>.

American Rescue Plan Act of 2021 - As of the time of the drafting of this report, Governor Evers had recently announced \$100 million in funds from the American Rescue Plan Act (ARPA) of 2021 for broadband access, dedicated to expanding high-speed internet across the state.²⁴

²⁴ [Press Release: Gov. Evers Announces \\$100 Million Investment in First Round of Federal Funding for Broadband Access \(govdelivery.com\)](#)

RECOMMENDATIONS

ACCESS

Top Recommendation: Increase Broadband Expansion Grant Program Funding

It is critical that this increased funding be tied to targets, so it is clear how long and for how much the increased funding needs to be maintained. While grant program funding is primarily aimed at large capital expenditures in broadband infrastructure, network maintenance and operational expenses should also be considered.

Recommendation: Establish a Broadband Line Extension Grant Program

A newly proposed line extension program should be connected to the broadband expansion grant program to ensure the programs work in a complementary fashion. When establishing a line extension program, the potential for administrative and logistics hurdles for internet service providers should be considered.

Recommendation: Continue TEACH IT Funding

This funding was established as a grant program in which schools and libraries were able to use funds for their internal networks as well as for critical issues including cybersecurity defenses. The funds are allocated in a manner that focuses on the most rural locations and those with economically disadvantaged students.

AFFORDABILITY

Top Recommendation: Establish a State Internet Assistance Program

An established state internet assistance program would ensure a more permanent and impactful funding source to address the issue of affordability in the state. While existing and future federal programs do seek to address this issue, they oftentimes are temporary or do not provide a meaningful enough discount on monthly broadband expenses. Additionally, the state should be encouraging and increasing philanthropic efforts and involvement when it comes to the issue of affordability. Philanthropic efforts should be thought of as supplemental and complementary, not a replacement for state funding and programs.

An example that should be leveraged for affordability is the collaboration between DPI, the Cooperative Educational Service Agencies (CESAs), and ISPs, called the “Digital Learning Bridge.” Created at the outset of the pandemic to address the connectivity needs of students, the Bridge is a statewide procurement tool that allows ISPs to provide connectivity subscriptions to school districts who in turn target families in need of broadband access. Public resources (local, state, and federal), as well as private philanthropy, can be used to fund these connections. The process eliminates burdensome administration through bulk billing and account management. Over 100 school districts currently leverage the bridge and over 40 ISPs participate.

ALL OF THE ABOVE

Top Recommendation: Align, Coordinate, and Maximize Present and Future Federal Funding

It is critically important to coordinate the various layers of broadband funding that have been in existence and are coming into existence. The subcommittee agreed that some federal funding should be used to address the issue of affordability, in addition to supporting access. These federal stimulus dollars should be leveraged in an effort to project the need for state funding.

Recommendation: Continue to address and explore creative ways to serve challenging areas of the state where there may not be a return on investment

EXAMPLES: BCPL, BONDING

A key root cause of the rural broadband problem is the cost to serve. It can easily cost \$2,000 or more per household to connect fiber to rural households due to the distance between locations. The return-on-investment payback period could take more than 20 years at the current monthly Internet subscription rates. Private sector companies cannot afford that long return on investment (ROI) for their shareowners, so they don't move into rural markets and instead focus on the more profitable denser urban and suburban areas.

When focusing on infrastructure issues, public funding allows for long-term returns on investment. Roads, sewer, and buildings are examples of these long-term uses. Broadband falls into this category, especially when focused on technologies that persist for 50 years or longer. Public capital can be leveraged by local governments to help create public/private partnerships that meet the goals of rural communities for high-quality, high-speed, affordable broadband.

One example of an existing public fund for infrastructure is the Board of Commissioners of Public Lands Trust Fund Loan Program. This program has provided funding for hundreds of public projects as well as uses for hundreds of municipalities for many years. The simple administrative process and lack of fees make it an easy-to-navigate process. The basis for the loans is the Common School Fund, the primary source of funding for the school library media programs in every school district in the state. Payments made in return for the loans are given back to the Common School Fund. This program can be used as a local match to any other state or federal broadband grant program and makes that investment much easier to absorb at the local level.

Top Recommendation: Increased funding for broadband administration

With the increase in demand, attention, and various layers of broadband funding coming online, it is vitally important to increase funding for administration in concert with these changes. Administration can include things such as:

- Ensure accountability of public investments
- Staffing for public and private entities
- PSC Wisconsin Broadband Office and other associated state agency staffing
- Mapping, Grant Program Administration, Internet Assistance Program
- Increase resources, materials, and supplies to support providers and potential supply chain related issues

Top Recommendation: Establish a Broadband Planning and Leadership Grant Program

This recommendation was also elevated by the Active Network Building and Community Alignment subcommittee as discussed later in this report.



DATA AND MAPPING

REVIEW AND DISCUSSION

Intelligent and holistic broadband planning and monitoring rely on comprehensive and reliable data. Mapping products and additional data help stakeholders and policymakers focus their attention to best allocate expansion funding and equitably direct programs to make high-speed connectivity ubiquitous for all communities. The charge of the Data and Mapping Subcommittee was to identify ways that mapping and data initiatives can be improved to accelerate the improvement of broadband access, affordability, and adoption across Wisconsin. Subcommittee members discussed a range of mapping and data topics over four meetings. Each meeting generally placed focus on topics defined by the subcommittee as follows.

Access: The ability for a location in the state, prioritized by households and businesses, to connect with effective broadband (25/3 Mbps and greater) access. Validation of service quality and reliability is also covered under “access.”

Affordability: The presence of service options financially available to all households. In impoverished situations, households with income below 200% of the federal poverty level have access to fixed, home internet service at a cost of less than \$25 per month, per PSC Broadband Plan goals. Other economically sound options should be available for better-off households and businesses.

Adoption: The process and related actions of utilizing the internet to holistically improve the well-being of a person or group of people.

ACCESS

INTRODUCTION

If improving broadband access, affordability, and adoption for all were to be depicted as a race, then understanding the status of broadband access represents a starting point. Having mapping data granular to the individual household and business levels is vital for understanding who still needs broadband access. Further, data standards used to track access offer the clearest foundation to gather broadband affordability and adoption data.

MAPPING INTERNET ACCESS DATA

Mapping current internet coverage is foundational in understanding the status of broadband deployment, making intelligent expansion funding allocations, and tracking changes over time. The Wisconsin Broadband Map (WBM), built and hosted by the PSC, offers a look at coverage from all ISPs who report their coverage to the PSC and the FCC. Roughly two-thirds of ISPs serving Wisconsin voluntarily submit a report of their internet coverage up to twice annually. Some of these ISPs submit their coverage through granular geospatial formats that enable more accurate mapping and analysis by PSC staff.

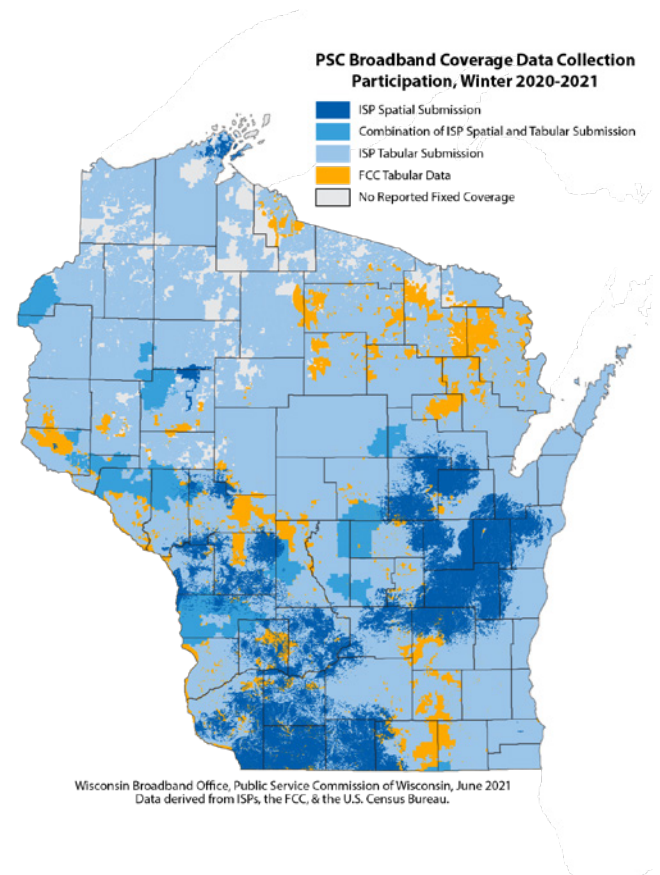
This granular mapping method is preferred by the PSC and most other broadband planning entities. In fact, the FCC is currently developing its own granular internet coverage data collection program. This new program should go live in the next couple of years and should be a vast improvement from their current U.S. Census block-based mapping model. It is crucial for the state of Wisconsin to continue mapping and communicating the status of internet deployment, as the state mapping program can be nimbler than the federal program and can work to handle broadband mapping and planning concerns that are unique to Wisconsin. At the same time, the state should not be running a mapping program that forces ISPs or other entities to report data in duplicative and redundant methods relative to the FCC.

The state of Wisconsin should continue receiving and mapping data submissions that are shared between ISPs and the FCC where it is useful to the state. Ideally, the state would gather data in addition to the FCC's to solidify the geographic detail, data reporting standards, and other details of deployed access in Wisconsin. In particular, as the FCC builds up its granular mapping program, the PSC could work with ISPs to convert coverage data submissions toward a household and business level of granularity. In some respects, the PSC has already begun this process through its guidance of ISPs in submitting granular data to the PSC's coverage data collection program and through a survey conducted in the fall of 2020 to understand ISP mapping methodologies. Further work on this step will help ISPs prepare for the upcoming FCC standards and will help the PSC improve its broadband mapping offerings for the agency and its stakeholders.

Top Recommendation: Wisconsin should collect internet access data from all ISPs at a household and business level of granularity.

Recommendations:

- Where possible, internet access data should depict all areas that can have access deployed upon request/contract without building additional backbone or middle-mile infrastructure.
- Wisconsin should follow the most rigorous and current FCC internet mapping standards with the capability to add additional, complementary standards.
- Wisconsin should work with ISPs and the FCC to establish coverage reporting standards for ISPs to ensure all internet coverage data is reported equally.



DETERMINING PRIORITY AREAS FOR INTERNET ACCESS

To best identify areas for broadband funding priority, an understanding of the geographic distribution of people, development, and environmental obstacles across Wisconsin is vital. The PSC should determine a workflow to analyze existing geographic data to rank anticipated need and use for broadband at local levels. This workflow needs to identify unserved and underserved areas that would have the greatest impact on minimizing the digital divide once serviced. Data that supports this ranking system include taxable parcels, business locations, building footprints, local zoning, land use, and planned land use, among others. Conversely, filtering areas of limited use for fixed broadband, such as wetlands and other places with development limitations can help distinguish areas with greater demand for broadband.

The North Central Wisconsin Regional Planning Commission has developed maps where areas of Langlade County are ranked based on the concentration of local development. This example can be closely followed to identify priority areas needing broadband service. The Southwest Wisconsin Regional Planning Commission, Brown County, and DPI also assembled mapping data from the PSC, FCC, and local sources to inform development on a local basis. The PSC should continue collaborating with partners to develop a statewide geographic knowledge base.

At the federal level, effort is being made to establish a broadband “fabric,” which will serve to indicate areas that should need fixed internet access. Fabric solutions implemented by the federal government and offered by contractors will likely implement data from nationwide sources and may offer useful and cost-effective components for the PSC. However, most of Wisconsin’s development and environmental mapping data are made and maintained by state, county, and local units of government. This wealth of data is an asset in the effort to rank areas of need. Wisconsin state government is making progress to gather local geospatial data, especially with taxable parcels. The Next Generation 911 issue demands updated and accurate addressing data and standards. Broadband mapping will directly benefit from the progress with these efforts and should dovetail to inform and collaborate on these projects. The PSC also recognizes that broadband mapping stands to improve through the gathering of data not fully available at the statewide level, like building footprints and public-owned lands. By working with individuals in Wisconsin’s GIS community and groups, like the Wisconsin Land Information Association (WLIA), the PSC can drive improvements for geospatial data benefiting broadband mapping and other topics of statewide importance.

The Wisconsin Broadband Office is currently the state administrator on the National Broadband Availability Map (NBAM). The NBAM is a GIS platform used to visualize and analyze federal, state, and commercial broadband data sets. This includes data from the FCC, U.S. Census Bureau, Universal Service Administrative Company, U.S. Department of Agriculture, U.S. Department of the Treasury, Ookla, Measurement Lab, BroadbandNow, White Star, and the state governments. Users, including administrators from 36 participating states and four federal agencies, access the NBAM mapping platform and use these data resources to better inform broadband projects and funding decisions in their states. Below is an example of a map developed using multiple data layers from the NBAM that can be used to help and inform local communities about speed and cost.

Top Recommendation: Wisconsin should work to identify areas of greatest need for connectivity improvements statewide and areas with minimal/no need for fixed broadband access.

Recommendation: Wisconsin should work to gather data from local, tribal, private sector, federal, and other state agency sources to better rank the local need for improved internet coverage and help the PSC and other broadband stakeholders make informed decisions with grants and statewide broadband implementation.

WAUSHARA COUNTY

Tests on 778 Devices

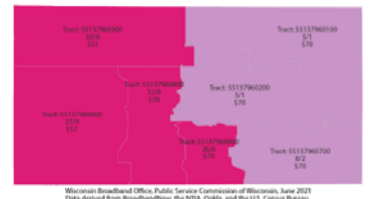


Ookla Median County Speeds (Mbps)

Download	Upload
11	2.1

Rank among Wisconsin Counties (72)

69th	66th
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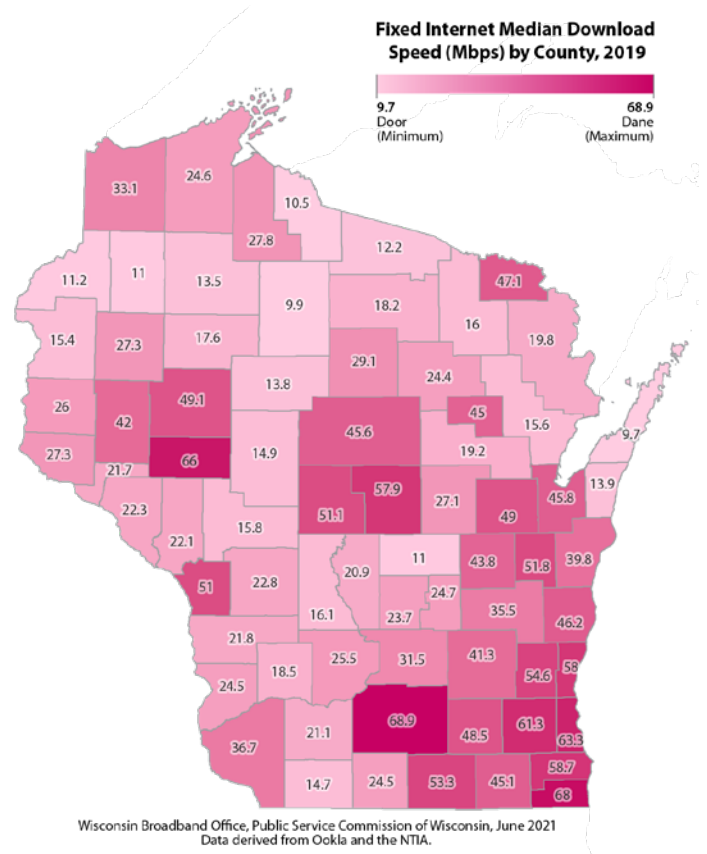


GATHERING COVERAGE VALIDATION DATA

Robust efforts to test coverage performance and survey for broadband needs can help evaluate the connectivity landscape and verify the success of programs meant to help those lacking access. Standardized testing and surveys allow citizens and communities to contribute to the broadband planning effort. ISPs, with their own methods to test performance and knowledge of their networks, can also contribute to this work. Several conditions can make testing and surveying more viable, consistent, and useful. Validation data initiatives should be open to contributions at any time. Geographic granularity for these initiatives should be as fine as possible, while also preserving appropriate confidentiality for consumers and sensitive infrastructure. The ability to regularly report validation and survey results is essential for evaluating connectivity.

Speed testing and survey initiatives have been led by disparate communities and agencies, bringing in data with limited compatibility and usefulness over time. Implementing standardized mechanisms to validate coverage and gauge consumer experiences is an important aspect in forming critical mass around testing and surveying. The PSC is developing a broadband survey template, the Wisconsin Internet Self-Report (WISER). WISER is designed to collect essential information on consumer internet experiences, enabling standardized analysis on collected data. WISER should be scalable as a statewide tool, in part because it can be adapted so partners can launch their own campaigns to collect data while remaining compatible with the original tool.

Given that it is practically impossible to take every technical factor into account when testing broadband, it is imperative for Wisconsin to consider a wide range of testing options. This provides the opportunity to learn to apply these options to collect more useful broadband performance data. The PSC should consult with partners to maximize testing and gather results from all parts of the internet service infrastructure. The PSC's work with DPI and their current use of the National Broadband Availability Map to view speed test data shows that partnerships are already in place.



Top Recommendation: All raw coverage and speed data should be available for analysis at the address level when possible while protecting appropriate confidentiality.

Recommendations:

- All coverage and speed data should be reported to or gathered and collected by Wisconsin, in as granular a fashion as possible.
- All raw data used for coverage validation ideally will be accessible to Wisconsin continuously as data are collected. Data should be available in a publicly reportable format at least every six months.
- Wisconsin should consider using multiple sources and datasets for validating speed data.
- Wisconsin should consider requiring Broadband Expansion Grant awardees to submit an inventory of addresses that can be served, are serviced, or the number of addresses served by census block to support coverage validation for the grant program.

AFFORDABILITY

INTRODUCTION

After establishing the framework of a broadband coverage inventory, understanding cost and affordability for consumers is the next logical step for improving broadband use for all. Using access data as a foundation, having additional affordability mapping data would help the state of Wisconsin and PSC understand how to support those facing internet cost burdens.

ESTABLISHING AFFORDABILITY CRITERIA

When thinking about broadband affordability in the state of Wisconsin, the subcommittee evaluated whether the federal guidelines were suitable for income and service equity within the state. It was noted that individual and household income levels can fluctuate in and out of common eligibility thresholds for affordability programs. Being intermittently and slightly above the income threshold often means that the individual or household cannot easily afford regular rates for broadband services. Subcommittee members agreed that a different income criterion, or a ratio, is needed to ensure that income fluctuation should not force customers to lose their fixed internet services. This new criterion should also allow many Wisconsin residents to subscribe to adequate fixed home internet service at a cost of less than \$25 per month. Other economically sound options should also be available for those somewhat better off, but not yet prospering.

Top Recommendation: Wisconsin should define Broadband Affordability as a ratio of income.

Recommendation: The state of Wisconsin should establish a new Broadband Affordability Program supporting people, where the individual or family income reference should be within 200% of the federal poverty level.

COLLECTING AND GATHERING AFFORDABILITY DATA

Additional data are needed to assess how the affordability of broadband service impacts adoption, and what is currently considered affordable for people and small businesses. Data will also help define what is affordable for low-income individuals and households. Currently, few publicly available datasets, such as the Census, are available and monitored by Wisconsin to capture whether households are subscribing to internet service. However, no cost of the service is collected. BroadbandNow, a commercial entity makes public-facing platforms to search the average cost by zip code, but the full granular database behind the platform is not free of charge. Cataloged pricing, low-cost offers and programs, and needed support are critical data sets that need further exploration.

The State of Wisconsin is currently funding the expansion of broadband infrastructures, but it does not request the price of service in its reporting requirements. No specific affordability data is directly collected from ISPs or from residents and businesses to understand broadband costs for subscribers and non-subscribers.

To understand the overall broadband affordability and that for low-income individuals/households, new data should be obtained from ISPs and the population at large. New monitoring plans should be put in place for infrastructure and related programs. Lastly, to address the lack of state affordability programming, it is important to assess whether the state of Wisconsin should contribute support beyond what is offered through the federal and state Lifeline programs and other government initiatives.

Top Recommendation: Wisconsin should gather and collect data across all regions of the state to better understand from residential and commercial users the affordability and obstacles to broadband utilization, with as granular of detail as reasonable.

Recommendations:

- Wisconsin should gather and implement all affordability-related data collected by the FCC, including the National Lifeline Accountability Database (NLAD), and other entities as reasonable to use as a starting point to understand broadband affordability. These data should be harvested in as repeatable and sustainable a method as possible.
- Wisconsin should work with providers, communities, partnering groups, and private citizens to identify components of broadband affordability that are not harvested in existing data collections.
- Wisconsin should collect additional data deemed important for understanding broadband affordability and/or advocate that appropriate entities include these additional data in their already existing data collection efforts.
- Wisconsin should consider synthesizing existing data collections and their own efforts to draft a recurring report on the state of broadband affordability in Wisconsin to support planning and program development.
- Wisconsin should work with providers and other entities to collect and maintain an inventory of all internet low-cost plans for use in the state broadband map and other applications and ease the process for eligible households of qualifying and signing up for internet plan offers.
- Wisconsin should collect and maintain an inventory of all internet service plans for analysis and potential provider and consumer matchmaking.

ADOPTION

INTRODUCTION

If improving broadband access, affordability, and adoption begins by providing access to quality internet infrastructure and continues by offering services at an affordable cost, then adoption is the last step of a process that goes beyond merely signing a service contract as it relates to the actions of utilizing the internet to holistically support the well-being of a person or group of people.

Understanding and increasing internet adoption is tight to affordability data, but adoption requires an evaluation of three intertwined elements, the service (technology type by price), the providers (subscription list by type), and the users (by type and by needs, means, and priorities). Having mapping data that measures households and business adoption in relation to internet service type is critical for understanding who still lacking the benefits of internet utilization. Having data – ideally, mapping data – that measure the needs, means, and priorities of those who cannot afford any internet subscription, and who subscribed to only basic or low-quality internet service, is fundamental to understanding how to support the increase of adoption over time. Moreover, having data of providers' limitations in establishing new business models that go beyond predefined prices and services, is important for creating subsidy programs.

By assessing and inventorying the currently available mapping data related to adoption, the subcommittee was able to make recommendations to encourage the state of Wisconsin and the PSC to use alternative income criteria for increasing adoption and for creating programs that would include expanding internet literacy and skills.

The state and the PSC should be able to build upon existing mapping and data collection initiatives, and to develop new, specific ones, allowing for mapping the adoption data in as granular a fashion as possible, and understanding the needs, experiences, and priorities of residential and commercial users over time.

IDENTIFYING ADOPTION CRITERIA

Identifying adoption criteria is critical in identifying data sources and methods to map adoption data statewide. Assessment helps the state and ISPs to address areas and types of populations that need support beyond access and affordability, to expand adoption to all in Wisconsin. Top adoption criteria, beyond access and affordability, that the subcommittee identified as key includes the following:

1. Access to Any Internet Service
2. Cost and Affordability of Service
3. Presence or Lack of Equipment (computers, laptops, and other devices)
4. Knowledge or Lack of Digital Literacy
5. Perception of Relevancy of Broadband in a Person's Life

(Reference: <https://www.ncbroadband.gov/broadband-nc/state-broadband-plan/broadband-adoption>)

The PSC's existing Broadband Grant Program provides the first critical step to allowing for adoption to be an option for people and businesses, as it relates to getting "access" to the internet.

Other entities, such as a number of providers, nonprofit organizations, libraries, and school districts throughout the state, already sponsor strong digital literacy/education programs, free computer equipment distributions, and low-income internet service offers to aid with broadband adoption barriers. The challenge is getting this information to the households that need it the most.

With the collaboration of all the entities involved in expanding adoption, including ISPs, the PSC can collect data and create and maintain a publicly available clearinghouse so that Wisconsinites have a centralized reference that hosts the many existing resources, such as low-cost offers, digital literacy classes, a list of organizations willing to assist in providing digital equipment, and tech support.

With the collaboration of all stakeholders involved in the implementation of the Wisconsin Digital Equity and Inclusion Plan, the PSC WBO can coordinate the design of surveys, focus groups, and related questionnaires designed to capture the top adoption criteria; those questionnaires would be administered by stakeholders and then collected and mapped by the PSC.

Top Recommendation: Wisconsin should understand broadband adoption, and lack of adoption among households not adopting internet, based on means, needs, connectivity, and prioritization.

COLLECTING AND GATHERING ADOPTION DATA

Knowing what entities have adopted broadband is pivotal to the execution of any recommendation that this Task Force may make. Adoption data collections need to be easily executed and repeatable, granular in geographic detail, and compatible over time. Adoption data must also be able to be challenged and verified so that it can be shown to be accurate.

The FCC attempts to collect subscriber data from [libraries and schools](#) using the [471 forms](#) that it receives. These forms do not collect data at a granular level, they cannot be tested, and they are not easy to create for the providers. The DPI collects adoption data and quality of internet service from families with children in public schools through a voluntary online survey, but to protect confidentiality the granular data is not publicly available.

The PSC gathers adoption data from the Census' American Community Survey (ACS) to map whether a household subscribes to internet service and with what type, but this data suffers from the same granularity issues as the FCC. Access data also doesn't capture the nuances of non-adoption. The PSC also monitors through its Broadband Expansion Grant program by requesting adoption statistics from grantees at the time of their reimbursement process, but no reporting is requested after the grant completion. No specific adoption data is collected from ISPs who don't receive grant funding. The PSC is preparing to pilot a data collection tool, the Wisconsin Internet Self-Report, to gather data from residents and businesses to spatially understand adoption. This online survey is now in refinement, with aspirations to provide a more robust and consistent-over-time adoption data collection.

The state of Wisconsin should work with the FCC's new data collection methods to design a supplemental statewide system that systematically collects granular data from providers that accurately reflect the current levels of broadband adoption in the state. The data collection method should have the full buy-in of Wisconsin's ISPs. Supplemental adoption data can be collected by using existing data mining technologies, enhancing and standardizing current reporting, and by self-reporting from users. To create a complete picture, alternative data collection from non-adopting entities should be developed.

Top Recommendation: Wisconsin should gather and collect adoption data with as granular of detail as reasonable to better understand the needs, experiences, and priorities of residential and commercial users over time.

Recommendations:

- Wisconsin should support and maintain an inventory of community and state-led initiatives that promote both broadband adoption and digital equity.
- Wisconsin should support and maintain an inventory of community-led trainings that build digital literacy skills and provide technical support for residents.
- Wisconsin should gather and implement all adoption-related data, as reasonable, if any exists, collected by the FCC and other entities to use as a starting point to understand broadband adoption. These data should be harvested in as repeatable and sustainable a method as possible.
- Wisconsin should work with providers, communities, partnering groups, and private citizens to identify additional components of broadband adoption that are not harvested in existing data collections.
- Wisconsin should collect additional data deemed important for understanding broadband adoption and/or advocate that those appropriate entities include these additional data in their already-existing data collection efforts.
- Wisconsin should consider synthesizing existing data collections and their own efforts to draft a recurring report on the state of broadband adoption in Wisconsin to support planning and program development.



ACTIVE NETWORK BUILDING AND COMMUNITY ALIGNMENT

REVIEW AND DISCUSSION

Wisconsin can support the significant number of local communities seeking to expand broadband access, affordability, and adoption and at times lacking the human, financial, or technical resources needed to pursue a project or a plan. Partnerships, coalitions, programs, and resources that could support communities pursuing broadband access, affordability, and adoption should be considered.

Part of the underlying issue with broadband connectivity lies within the fact that a complete system of infrastructure that reaches every corner of the state is not in place. Broadband infrastructure is mostly in place and robust in urban settings where the density of population allows for a positive return on investment. The picture starts to change once you leave the urban setting, venturing into a more rural landscape where population density downshifts.

All but nine counties in the state contain populations that include 25% or more that are designated rural. This lack of population density in so many portions of the state is part of the obstacle – infrastructure buildout will be less of a priority, or in some cases not viable, in places where the return on investment might not be present. The daunting fact is the amount of land that is covered in this less densely populated manner. That doesn't mean it is impossible – it means that concerted effort needs to be placed in order to remedy the situation and that communities need the tools and resources to initiate studies and planning where timely, viable opportunities for increased access, affordability, and adoption do not appear available.

Turning squarely to the infrastructure access component of the Three A's, acknowledging the relevant, applicable work done within the Digital Equity and Inclusion section of this report, how can the task of leading such a widespread, multilayered coalition or program be achieved?

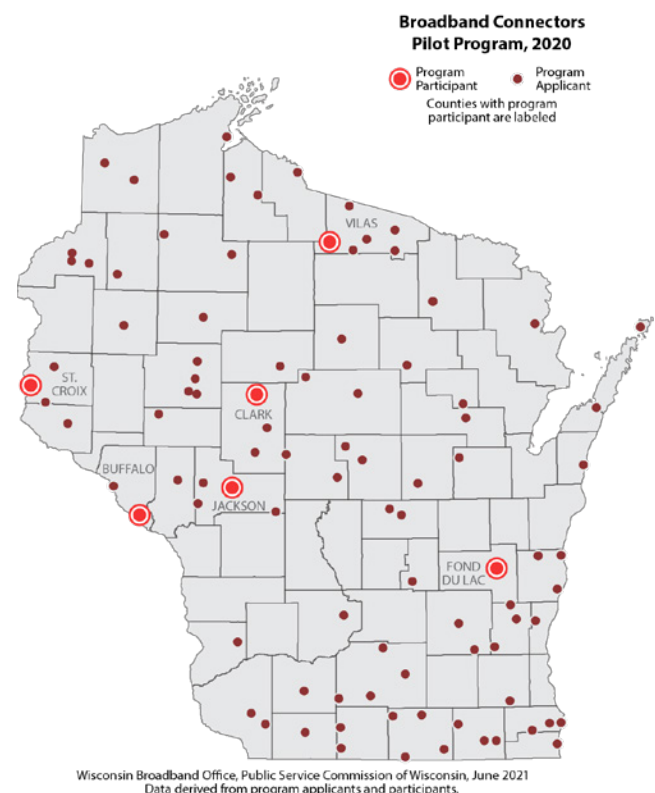
The answer lies in the Governor's statement as a guide for discussions from the top down – "connecting the dots." Collaboration of the many entities that can provide resources becomes a priority, and this Task Force subcommittee found the development of these conversations and opportunities needs to be supported and, in some instances, funded.

Looking to the layers of potential collaborators of these active networks:

- The PSC's WBO is approached by many communities who have come to recognize their broadband issues but need assistance in finding a provider who will be part of the infrastructure buildout and offer service in their area. The challenge for some communities is getting ready for their first PSC grant-funded project if they (1) don't have previous expertise, (2) have not done base-level committee preparations and alignment of the community, and (3) have not had time to raise match capital.
- Many counties (rural and urban) have not been tasked with understanding the comprehensive broadband picture in their jurisdiction. The cost-benefit analysis of this step is starting to be made, by standout examples including [Marathon](#), [Brown](#), and Taylor counties, but the trend toward this activity is in the early stages and will become even more beneficial as all 72 counties move towards this activity. A significant barrier to this new, growing area of importance is the lack of county-level administrators in many rural counties. Without an individual in this key position, leadership in projects such as this falls to economic development directors at the county level, which are also sometimes funded at a part-time capacity or active via committee structure.
- Wisconsin operates with nine (9) Regional Planning Commissions (RPC) and nine (9) Regional Economic Development Organizations (REDOs). Each has slightly different focuses (RPC is closer to municipalities by nature of their work and REDO is closer to businesses and other community members). It is observed the relationships overlap in some way, and this layer has begun to communicate as the nine regions developing a stronger focus on this issue. Pulling exemplary work from one community, and then discussing the merits of attempting to replicate the strategy throughout the state has begun. This work could be beneficial in assisting state agencies tasked with the line extension grants and the technical assistance grants. The RPCs and REDOs would have detailed information about each community to benefit decision-making.
- Many, if not most, regions are establishing broadband committees or are moving in this direction. At this level, multiple counties can come together with diverse stakeholders, including associations, providers, and others, to see if there are common issues, programs to partner on together, and other creative problem-solving events that can take shape.
- The PSC WBO provides some forms of technical assistance to communities, as its resources allow, and coordinates both a stakeholder and an interagency working group on broadband matters. This type of "connecting the dots" about broadband efforts is beneficial.

Some clear steps allowing states to align resources to community broadband expansion needs are: (1) knowledge building, (2) aligning the collaborators, (3) funding first projects, and (4) matching technical assistance programs to the needs of the community. The PSC WBO and Wisconsin Economic Development Corporation (WEDC) through their Office of Rural Prosperity conducted the Broadband Connectors Pilot Program in the fall of 2020 to test this strategy. The response from the communities was 96 applications submitted during an exceptionally short application period of nine days only. This overwhelming number of communities that applied in such a short window speaks to the level of demand for such a service in the state.

Six communities were selected for this pilot including two counties, two tribal entities, one school district, and one township. The communities were the Lac du Flambeau Band of Lake Superior Chippewa Indians, Ho-Chunk Nation, the school district of Owen-Withee, town of Cross, St. Croix County, and Fond du Lac County. This program was designed to help communities in Wisconsin better identify and capitalize upon opportunities to increase broadband availability in their areas. Additionally, the program aimed to provide communities with technical assistance for a greater likelihood of a successful application for federal, state, or private-sector funding for broadband expansion.



EXAMPLE OF ACTIVE NETWORK BUILDING AND COMMUNITY ALIGNMENT: COMMUNITY BROADBAND ACTION NETWORK (CBAN)

CBAN is an Iowa-based advocacy organization that leads “[a]dvocates and community leaders who want to solve this challenge [but] are usually on their own to determine where to start and, once having started the process, where to go next.” They do this by leading communities through five steps: (1) explore and advocate, (2) plan and analyze, (3) design and build, (4) launch and operate, and (5) leverage and reinvest. Their diverse membership body includes local advocates, communities themselves, providers, and vendor memberships.

RECOMMENDATIONS

With significant numbers of Wisconsinites unable to access, afford, and adopt internet, together with historic levels of federal stimulus funding to aid local and state governments, and for the construction of capital projects, in addition to RDOF investment, USDA ReConnect, state investment, and private investment, we are in a time of peak urgency, need, and opportunity.

Our ability to move strategically during the coming years will allow us to maximize the dollars available in Wisconsin to reach our state’s ubiquitous and high-performance service goals.²⁵ This strategic move will require technical and leadership assistance to communities, and public/private coordination at the community, region, and state levels.

Top Recommendation: Establish and support a coalition of willing, engaged broadband leaders to connect communities with providers, local and regional partners, planning and technical assistance opportunities, funding opportunities, and resources.²⁶

- This coalition might: 1) use the CBAN model, b) use the Broadband Connectors model permanently, or 2) include entities who are already engaged in this work.
- This coalition should create a forum for matchmaking and partnership finding, perhaps in the form of an online tool or portal.
- This coalition should include working members representing groups who are not the “usual suspects” in the broadband expansion space, and who represent underrepresented communities including communities of color and low-income communities.

ALSO FROM THE BLUE RIBBON COMMISSION REPORT:

Elevate and share success stories from rural communities. Stakeholders expressed an interest in learning more about what’s working in other regions of the state and who is working on those projects. Explore new ways to share successful projects, ideas, and initiatives so that rural leaders can learn from each other and don’t have to reinvent the wheel.

- Explore and share “how-to” ideas from the “doer” rural Wisconsin communities and what other states are doing. Rural stakeholders cited several rural Wisconsin community efforts that have succeeded at providing better broadband and coverage. Especially now, in the wake of COVID-19, innovation is happening nationwide to hasten and improve rural coverage. Consider dedicating a special state staff effort to mine these policy and implementation ideas; to create new resources based on best practices; and to host virtual information, learning, and advising sessions for rural community doers – and aspiring doers – in Wisconsin.

²⁵ State goals is the State Broadband Plan. [WisconsinBroadbandPlan2021.pdf](#)

²⁶ There was a similar recommendation in the Blue Ribbon Commission Report: Strengthen leadership training to build capacity across rural Wisconsin. Governor’s Blue Ribbon Commission on Rural Prosperity. [Web_Governors-Blue-Ribbon-Commission-Report.pdf \(wedc.org\)](#)



EXAMPLE: AMERICAN CONNECTION CORPS

Lead For America (LFA) and the American Connection Project (ACP) are teaming up to mobilize leaders to return to their hometowns to coordinate broadband development and digital inclusion locally and across the country. The American Connection Corps (ACC) will be the nation's largest fellowship program focused on bridging the digital divide. Fifty American Connection Corps Fellows will serve in select states in a two-year pilot initiative. As part of the national network, ACC Fellows will have access to premier national training on community organizing, broadband, and digital inclusion, and a network of young homecomers nationwide. Host communities will be featured in national news outlets and will help inform the work of the American Connection Project Policy Coalition. ACC Fellows will serve their home communities in locations nationwide through high-impact, high-urgency two-year placements focused on closing the digital divide and building the next generation of leaders. Fellows will also participate in LFA's national Changemaker Summit, attend quarterly retreats, receive 1:1 expert mentorship, and join a growing community of young local leaders.

This program is starting in multiple states but could be introduced in Wisconsin if desired.

Top Recommendation: Create Planning and Implementation Grants for Regions and Communities.

Planning grants would allow regions or communities to hire contractors to make the community ready for broadband infrastructure investment, where the communities do not have sufficient technical or human resources to initiate this type of planning on their own. Planning activities would include need, coverage, affordability, equity, and adoption assessments; assessment of opportunities to partner with local stakeholders to strengthen a project; opportunities for regional project development; assessment of private providers who may be willing and able to construct the project and under what funding scenarios, match, grant, and low-cost financing opportunities are available; and alternative options and arrangements where providers are not able to capture the needed return on investment or are not able to fit the project into planning.

Alternative options may include making a project more affordable by leveraging utility-owned middle-mile fiber under a lease agreement, exploring the feasibility of municipal broadband, or the creation of a cooperative under a longer public return-on-investment timeframe. Planning grants should prioritize future-proof and equitable solutions. Participants in the Task Force process raised concerns that hiring consultants can lead communities down the wrong path to embark on projects that aren't viable. Other participants offered that this concern has been mitigated in other states by not hiring contractors with a conflict of interest – essentially contractors who would also build the service, impartial consultants who can invest the time in studies, identifying barriers and solutions, matchmaking with providers, and funding opportunities in order to forge a path and leave the community with an individualized, actionable roadmap. The Governor proposed Broadband Connector Program and Planning Grants (\$600,000 GPR for planning grants administered by the PSC, two positions at DOA for the Grant Resource Team) in his 2021-23 Executive Budget Proposal. The Task Force supports this and like proposals.



EXAMPLE:

Minnesota-based philanthropy the [Blandin Foundation](#) stands with Minnesota's rural leaders and communities as they create and claim futures that are resilient, vibrant, and connected. Since 2003, the Blandin Community Broadband Program has engaged at local, state, and federal levels to ignite and sustain policies that support rural access to robust broadband.

As a leader in the state on advancing the connectivity needs of Minnesota, the Blandin Foundation goes beyond the regular actions of a foundation in acting as a convener, research partner, and advocate. They play a key role in local leadership capacity through their [Community Leadership](#) training system. Upon completion of community leadership training, the locality is able to apply for the first round of support – often a broadband planning grant.

The area of local leadership development was found to be necessary for the Blue Ribbon Commission on Rural Prosperity, but also seen in the many requests in Wisconsin for technical assistance support. The Blandin Foundation's system will likely be a great example to study.



DIGITAL EQUITY AND INCLUSION

REVIEW AND DISCUSSION

The subcommittee was tasked to investigate appropriate measures of digital inclusion and strategies for addressing identified gaps and inequities. Throughout the Task Force meetings equity has been a reoccurring theme and focus of many discussions. The subcommittee on Digital Equity and Inclusion discussed the current state of digital equity and inclusion in Wisconsin; practices and trends from other states; issues related to digital literacy, internet adoption, and affordability; and other target digital inclusion strategies. In particular, the committee explored the development of a digital equity fund, device strategies, and the development of a digital navigator program.

DIGITAL EQUITY FUND

Throughout the Task Force discussions, meetings, and surveys, members and the public have identified the need to grow and support digital inclusion activities throughout the state. Both the chairperson of this Task Force and staff from the PSC have been contacted by businesses, philanthropic foundations, and individuals that have expressed a desire to provide financial and programmatic support to improve broadband access and digital inclusion in the state.

While a huge number of dedicated nonprofits, schools, libraries, businesses, technical colleges, and communities are working on digital inclusion activities in the state, most of these activities happen in silos, without coordination and without dedicated funding to sustain them. A strong ecosystem of support and funding for digital inclusion activities is one of the subcommittee's recommendations.

The committee considers the establishment of a statewide Digital Equity Fund an innovative approach to expanding broadband adoption and digital literacy. This could be a fund started by the state but eventually operated by a nonprofit or similar public benefit corporation. The fund would be overseen by a board of directors which could include members appointed by the Governor or PSC and with representation from digital inclusion practitioners. The fund would provide grants for digital inclusion activities, write white papers, fund statewide programs, and develop best practices. In addition to funding, the Digital Equity Fund could support communities of practice for digital inclusion and work with internet service providers in the state on developing practices that support broadband adoption, digital literacy, and affordable internet access.

With the large influx of federal funds available through the FCC's Emergency Connectivity Fund and the American Rescue Plan Act funding allocated to broadband including digital literacy and internet adoption, now is an excellent time to establish a fund that will increase digital inclusion, leverage additional federal and private dollars, and support the ongoing broadband infrastructure activities in the state.

Top Recommendation: Establish a statewide Digital Equity Fund operated by a nonprofit or similar organization with a mission to fund, strengthen, and support digital inclusion activities and ideas that lead to all Wisconsin residents having the information capacity needed to fully participate in society.

Recommendation: Provide both one-time funding for the establishment of the Digital Equity Fund as well as annual sustaining contributions from the state to ensure the successful ongoing operations.

DIGITAL NAVIGATORS

Historically, most individuals have had to navigate home internet access, devices, and technical support on their own, which leaves some unable to fully participate in our society, education systems, and economy. Previously many individuals relied on group access at anchor institutions, such as public libraries, community centers, and schools. Before the pandemic, this was limited and inconvenient. During the pandemic, many residents lost access to these institutions at the same time that their needs for access and support grew exponentially.

Digital inclusion has not yet been fully integrated into our social support systems and community institutions. Many community members were left without internet access, working devices, the financial means to purchase service, digital literacy skills, or technical support.

The digital equity and inclusion subcommittee considered this challenge of how to help and engage residents that need additional supports to access and make use of the internet. One recommendation is the development and funding of Digital Navigators.

Digital Navigators are individuals who address the whole digital inclusion process – home connectivity, devices, and digital skills – to help unconnected and under-connected people solve a wide range of adoption issues. Digital Navigators have a balance of technical savvy, education skills, and cultural competence.

The committee suggests it would be critical to have Digital Navigators that have different language skills, knowledge of assistive technologies for people with disabilities, and other attributes to ensure comprehensive outreach to the target populations. Several states including Wisconsin have grant programs that support this, but many states are considering developing state networks and/or specifically targeted funding.

Top Recommendation: Develop and fund a statewide Digital Navigator program to assist under-connected people in solving a wide range of adoption issues. Digital Navigators should be embedded in organizations with strong and trusting relationships to the target populations, with the organizational capacity and cultural competency to make an impact.

Recommendation: The state should fund a statewide Digital Navigator program with sustained and consistent funding to help close the adoption and use gap.

DEVICES

Broadband access alone is not sufficient to close the digital divide in Wisconsin. Access to functional internet-enabled devices, like a desktop computer, laptop computer, or tablet, is critical to make full use of the internet. In Wisconsin in 2019, 78% of households had a desktop or laptop computer, 76.3% of households had a smartphone, and 58.3% of households had a tablet. A full 11% of Wisconsin households did not have any computer in any category in 2019 (BroadbandUSA Community Report 2019).

11% OF WISCONSIN HOUSEHOLDS
did not have any computer in 2019

The committee did discuss the role of smartphones as the primary device for internet access. The committee found that smartphones are inadequate to make full use of the internet for participation in society. They are not sufficient for many educational, economic, and telehealth uses. During the pandemic, the number of smartphone-dependent internet users declined. In 2018, 20% of the population were smartphone-only users, and in the first quarter of 2021, 15% of the population were smartphone-only users (Pew Research). This downward trend may reflect how critical home internet access and computers with bigger screens have become in the pandemic.

The committee explored efforts that have taken place in other states, like Illinois' new initiative to bring the national nonprofit PCs for People to the state. Wisconsin has a number of small nonprofits that sell or provide computers to low-income households and a number of computer refurbishers that participate in the e-Stewards Digital Equity Program or Alliance for Technology Refurbishing and Reuse. These programs are currently limited to Dane and Milwaukee counties and should be expanded or replicated to serve the entire state.

Recommendation: The state should explore programs and pathways that keep fully functional, quality internet-enabled computers in the state and to be repurposed through reputable channels for use by low-income households and under-connected Wisconsin residents.

Recommendation: State government, large institutions, and the UW system should be encouraged to provide their retired equipment to programs that focus on repurposing devices for low-income state residents.

Recommendation: Repurposed computers should meet certain technical specifications, be professionally refurbished, have licensed operating systems and basic productivity software, and include at least a one-year warranty.

APPENDIX

Appendix I

Governor Evers' Executive Order # 80 Relating to the Creation of the Governor's Task Force on Broadband Access



OFFICE OF THE GOVERNOR

EXECUTIVE ORDER #80

Relating to the Creation of the Governor's Task Force on Broadband Access

WHEREAS, broadband access is an essential catalyst for economic development, rural prosperity, and community health across the state of Wisconsin;

WHEREAS, broadband access provides a gateway to education, employment opportunity, workforce readiness, essential services, telehealth, and civic participation;

WHEREAS, broadband access affects healthcare, tourism, agriculture, manufacturing, public safety, energy, and commerce;

WHEREAS, according to the Federal Communications Commission's 2020 Broadband Deployment Report, approximately 410,000 Wisconsin residents, including 398,000 Wisconsin residents living in rural areas, lack any access to a fixed, terrestrial broadband service with a speed of at least 25 Mbps download and 3 Mbps upload;

WHEREAS, the COVID-19 pandemic has clearly demonstrated that, without broadband, many of Wisconsin's workers are unable to do their jobs or seek employment, our children cannot access virtual learning, and healthcare through telemedicine is inaccessible;

WHEREAS, expanding access to broadband internet is challenging in Wisconsin where many areas of our state do not have the population density to support a return on investment for internet service providers;

WHEREAS, access alone will not meet our goals—internet adoption and digital literacy are key components of equitable access;

WHEREAS, even in areas where broadband service is available, it may still be inadequate due to affordability, speed, or reliability concerns;

WHEREAS, all Wisconsinites should have the information technology capacity needed for full participation in our society, democracy, and economy; and

WHEREAS, solving Wisconsin's broadband challenges calls for a multifaceted strategic approach, with input from a variety of stakeholders.

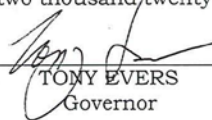
NOW, THEREFORE, I, TONY EVERS, Governor of the State of Wisconsin, by the authority vested in me by the Constitution and the laws of the State, including Section 14.019 of the Wisconsin Statutes, do create the Governor's Task Force on Broadband Access, and hereby order the following:

1. The Governor shall appoint an individual to chair the Task Force, and additional members who have experience or interest in broadband or digital inclusion.

2. The Governor's Task Force on Broadband Access shall be staffed by the State Broadband Office, housed at the Public Service Commission of Wisconsin.
3. The Task Force shall do the following:
 - a. Research and recommend forward-looking broadband policies and initiatives that address state broadband goals and needs;
 - b. Promote the efficient, strategic expansion of the broadband facilities and adoption across the state;
 - c. Explore and develop solutions, in collaboration with key broadband stakeholders and experts;
 - d. Report to the Governor and Legislature, annually by June 30, on:
 - i. Recommendations for facilitating the deployment and adoption of broadband in Wisconsin;
 - ii. Appropriate measures of digital inclusion and strategies for addressing identified gaps and inequities;
 - iii. Opportunities for coordination among state, local, and federal agencies;
 - iv. Current and future needs, barriers, and goals regarding broadband access, affordability, and adoption;
 - v. Opportunities for innovative approaches and partnerships to expand broadband adoption;
 - vi. The role of broadband in Wisconsin's key economic, public, and social sectors, including in education, healthcare, agriculture, manufacturing, industry, Tribal Nations, energy, libraries, public safety, and tourism;
 - vii. The extent to which consumers, health care providers, educational institutions, libraries, and service providers have accessed federal Universal Service Funds;
 - viii. Advances in broadband technology; and
 - ix. The adequacy and appropriateness of existing statutory broadband goals.
 - e. Identify and prepare technical or white papers on top priority issues concerning broadband in Wisconsin, as necessary.



IN TESTIMONY WHEREOF, I have hereunto set my hand and caused the Great seal of the State of Wisconsin to be affixed. Done at the Capitol in the City of Madison this fourteenth day of July in the year of two thousand twenty.


TONY EVERS
Governor

By the Governor:


DOUGLAS LA FOLLETTE
Secretary of State



STATE BROADBAND PLAN



OUR VISION: ALL WISCONSINITES HAVE THE INFORMATION TECHNOLOGY CAPACITY NEEDED TO FULLY PARTICIPATE IN SOCIETY.

The Public Service Commission of Wisconsin is committed to equitable access to broadband service. High-performance broadband is essential for participation in society, for health and for the economic development of our state. Many thousands of Wisconsin residents do not have access to the minimum speed of 25 megabits per second download and 3 megabits per second upload (25/3 Mbps), thousands more are unable to afford service and throughout the state residents have issues with the speed, quality and performance of their internet. Broadband is now an essential service. Broadband access coupled with digital inclusion activities are critical for economic and educational opportunities, and access to essential services.

OUR MISSION: MAKE HIGH PERFORMANCE BROADBAND MORE ACCESSIBLE, RESILIENT, COMPETITIVE AND AFFORDABLE IN WISCONSIN.

GOALS

Resilient Every Wisconsin community will have access to at least 1 gigabit per second symmetrical broadband service to anchor institutions such as schools, hospitals, government buildings, business parks and enterprise centers by 2024.

Accessible: 97% of Wisconsin homes and businesses will have access to at least one internet service with minimum speeds of 25 megabits per second download and 3 megabits per second upload (25/3 Mbps) by 2025.

Affordable: 75% of households with income below 200% of the federal poverty level have access to fixed, home internet service at a cost of less than \$25 per month by 2025.

High Performance: 75% of Wisconsin homes and businesses will have access to at least one internet service with a minimum speed 100/20 Mbps service with preference on symmetrical service, no usage limits and latency low enough to run interactive video applications by 2025.

STRATEGIES

LEADERSHIP AND VISION

Lack of broadband access is a complex yet solvable problem. With a clear vision, strong leadership and the investment of financial resources, significant, measurable, progress is achievable.

How

- Serve as the leader and coordinator of broadband and digital equity programs, data and activities for the State of Wisconsin.
- Staff the Governor’s Task Force on Broadband Access and provide expertise, information and data as the Task Force executes their charge to recommend policy, programmatic, and funding pathways that advance broadband goals and digital equity.
- Provide interagency leadership, information and alignment of Broadband goals, data and strategies across the state.

DATA BEFORE DEPLOYMENT

Communities, WBO staff and policy makers need excellent data and accurate maps to make decisions on broadband. The current available data on broadband is insufficient. The Wisconsin Broadband Office will strive to know the level of internet access, speed, and cost for every location in the state. The WBO will continue to provide the State expertise on Broadband data.

How

- Continue to update and improve the Wisconsin Broadband Map (WBM).
- Grow our granular data collection program.
- Use data collected by other agencies, crowd-sourced data and the National Broadband Availability Map (NBAM) to continue to improve understanding of access, performance and costs in the State.
- Use American Community Survey and other data to provide information regarding whether broadband is equitably available and affordable for people with disabilities, low-income households, women and minority owned businesses and households that include Black, indigenous and people of color.

INFRASTRUCTURE INVESTMENTS

A robust, resilient broadband infrastructure with ubiquitous access for homes, businesses, public services and community anchor institutions is critical for economic development, rural prosperity and access to essential services. Population density, geography and household income impact the return on investment for internet service providing businesses. The use of public grant funds directs and supports broadband infrastructure development to needed locations in the state.

How

- Continue and grow our effective Broadband Expansion Grant program with strategic investments of grant funds to support broadband infrastructure in underserved and unserved areas.
- Promote public-private partnerships, prioritize high performance projects and leverage additional public and private investment in broadband infrastructure.
- Coordinate and combine federal, state, local, and private dollars to broadband infrastructure investments.

DIGITAL EQUITY AND INCLUSION FRAMEWORK

Availability of broadband alone is not enough to solve this problem, targeted strategies for internet adoption, device access, digital literacy, and affordable service are key components of the vision. The WBO will work to ensure that all individuals and communities, including the underrepresented, have access to information technology capacity. This is needed for full participation in our society, democracy and economy.

How

- Publish the Wisconsin Digital Equity and Inclusion Plan informed by stakeholder input and data.
- Develop and support intentional activities and investments to reduce and eliminate historical, institutional and structural barriers to broadband access and the use of information technology.
- Disseminate best practices for broadband access, affordability, devices, internet adoption and digital literacy skills training.

PARTNERSHIP AND CAPACITY BUILDING

Technical assistance, education, and facilitation are often areas that local communities including counties, cities, villages and towns lack in addressing broadband connectivity. Alongside strategic partners, the WBO will work to increase available resources in these areas and help communities develop plans to address these issues. These efforts and resources are a key step in working towards increased availability, affordability, and adoption of broadband technologies.

How

- Update and publish a playbook as a resource for communities and technical assistance providers.
- Promote community certification programs, such as Broadband Forward! and Telecommuter Forward! and provide support for communities through the process.
- Support Broadband Connectors Program work, facilitate connections between communities and providers and between projects and funders.

Wisconsin Broadband Office, Public Service Commission of Wisconsin

psc.wi.gov PSCStateBroadbandOffice@wisconsin.gov
4822 Madison Yards Way, P.O. Box 7854, Madison, WI 53707-7854

TECHNOLOGY TYPES COMMONLY USED

Source: Wisconsin Broadband Office

Landline Switched-Access Service: Internet access is still offered over the traditional analog landline facilities. Dial-up access to an internet service provider uses the voice portion of the telephone access line, preventing simultaneous or dual-use of the line. This technology provides a low-speed data rate that is increasingly disfavored for internet communications and does not meet the definition of broadband.

Digital Subscriber Line (DSL): DSL transmits digital IP-formatted messages over standard telephone lines. The DSL service can be used simultaneously with the voice telephone service over the same telephone access line. This is possible because DSL uses higher frequency bands – the voice band range of the telephone line is 0 to 4 kilohertz (kHz), while DSL transmits signals in the range of 25 kHz to 1.5 megahertz (MHz). A DSL modem is required to access the DSL signal. DSL provides continuous access to an internet service provider.

Cable Internet: Cable internet service uses the hybrid fiber and co-axial cable frequently deployed by cable television companies providing television service. Cable provides continuous access to an internet service provider. Cable requires the provider to replace or bypass the existing copper telephone facility with a second wireline network. A cable modem is required with this technology choice as well.

Fiber-to-the-Home/Premises (FTTP): FTTP is a means to provide communications service by connecting a business or residence to the switch entirely by an optical fiber from an optical network interface at the point of entry at a residence or business. The optical fiber replaces the existing copper telephone line to a residence. As with cable internet, FTTP requires the provider to replace or bypass the existing copper telephone facility. Currently, FTTP service provides much faster connection speeds than DSL or cable internet service.

Fixed Wireless: Fixed wireless connects a subscriber's home or business to a serving antenna by radio link. In the past, fixed wireless has been popular in rural areas because it can be installed without incurring the cost of a wireline network. The frequencies for fixed wireless are generally limited to line of sight. The coverage area can also be limited depending upon whether the broadcast spectrum in use is licensed or not (unlicensed fixed wireless must operate at lower power levels than licensed spectrum). Transmission speed for fixed (and mobile) wireless also depends upon the transmission technology. Third generation (3G) WiMAX provides an IP-formatted signal with a download speed of up to 6 Mbps while fourth generation (4G) LTE provides a similar IP formatted signal with a download speed of up to 300 Mbps. The introduction of wireless 5G service began in 2017.

Mobile Wireless: A variety of mobile wireless carriers offer internet access using the 3G, 4G and 5G LTE transmission technologies. In rural areas, antennas are located to facilitate communication while traveling along roads. Some locations away from major roads in the northern portion of the state lack access to a mobile wireless signal. Mobile wireless internet service can have significant monthly data limits. 5G, or fifth generation, is the next iteration of cell phone networks. 5G service will be faster and have lower latency than 4G LTE, and will require densely deployed "small cells" rather than the macro cell towers commonly used for 4G. Because many 5G small cells must be deployed closely together in order to create the network, the technology is best suited to densely populated cities.

Satellite Internet Service: Satellite-based communications services offer an attractive telecommunications alternative for individuals that are located in remote areas. Subscriptions to satellite services are generally driven by the demand for television service in rural areas that lack a cable television service provider. This technology is affected more than the others by adverse weather and network congestion. Traditional satellite internet access can have significant monthly data limits and suffers from high latency (the time it takes for a transmission signal to make a round trip between originating and terminating ends of the calls). High latency diminishes the utility of Voice over IP communications, interactive online gaming, live videoconferencing and remote-control device applications. A number of low-orbit satellite services are online and may be offered widely in the future. These services have higher speeds and lower latency than previous satellite technology.

If this work were to live up to its fullest potential, what do you dream (or vision) is possible?



REFERENCES:

- Federal Communications Commission, “Fourteenth Broadband Deployment Report”, <https://www.fcc.gov/document/fcc-annual-broadband-report-shows-digital-divide-rapidly-closing>
- BroadbandNow, “BroadbandNow Estimates Availability for all 50 States: Confirms that More than 42 Million Americans Do Not Have Access to Broadband”, <https://broadbandnow.com/research/fcc-broadband-overreporting-by-state>
- Pew Charitable Trusts, “State Broadband Policy Explorer”, <https://www.pewtrusts.org/en/research-and-analysis/data-visualizations/2019/state-broadband-policy-explorer>
- 2019-21 Executive Budget, <https://doa.wi.gov/budget/SBO/2019-21%20Executive%20Budget%20Complete%20Document.pdf#page=440>
- Federal Communications Commission, Broadband Progress Reports, <https://www.fcc.gov/reports-research/reports/broadband-progress-reports>
- 2021-23 Executive Budget, <https://doa.wi.gov/budget/SBO/2021-23%20Executive%20Budget%20Complete%20Document.pdf>
- Federal Communications Commission, Broadband Speed Guide, <https://www.fcc.gov/consumers/guides/broadband-speed-guide>
- Interim Final Rule, Department of Treasury, “Coronavirus State and Local Fiscal Recovery Funds”, <https://www.govinfo.gov/content/pkg/FR-2021-05-17/pdf/2021-10283.pdf>
- “The Lewis Latimer Plan for Digital Equity and Inclusion” A Collaboration Commissioned by the National Urban League, https://nul.org/sites/default/files/2021-04/NUL%20LL%20DEIA%20041421%20Latimer%20Plan_vFINAL_1136AM.pdf
- BroadbandNow, “The State of Broadband in America, Q4 2019”, <https://broadbandnow.com/research/q4-broadband-report-2019>
- National Digital Inclusion Alliance, Definitions, <https://www.digitalinclusion.org/definitions/>
- Universal Service Administration Company, Performance Measures Testing, <https://www.usac.org/high-cost/annual-requirements/performance-measures-testing/>
- University of Wisconsin-Madison Extension, “Broadband and the Wisconsin Economy”, <https://economicdevelopment.extension.wisc.edu/files/2021/01/2021-01-07-Broadband-Report.pdf>
- Brian Whitacre, Roberto Gallardo, “State broadband policy: Impacts on availability”, <https://doi.org/10.1016/j.telpol.2020.102025>
- Public Service Commission of Wisconsin, Broadband Expansion Grant Program, <https://psc.wi.gov/Pages/Programs/BroadbandGrants.aspx>
- Public Service Commission of Wisconsin, Map of Fiscal Year 2014 through 2020 Broadband Expansion Grant Awardees, <https://maps.psc.wi.gov/apps/ExpansionGrantAwardees/>
- Public Service Commission of Wisconsin, Map of Fiscal Year 2021 Broadband Expansion Grant Awardees, <https://psc.wi.gov/Documents/broadband/BbExpG43.pdf>
- Universal Service Administration Company, Connect America Fund Broadband Map, <https://data.usac.org/publicreports/caf-map/>
- Federal Communications Commission, “WIRELINE COMPETITION BUREAU AUTHORIZES ALL ELIGIBLE PRICE CAP CARRIERS TO RECEIVE A SEVENTH YEAR OF CONNECT AMERICA FUND PHASE II MODEL-BASED SUPPORT”, <https://docs.fcc.gov/public/attachments/DA-20-1352A1.pdf>
- Federal Communications Commission, Auction 904: Rural Digital Opportunity Fund, <https://www.fcc.gov/auction/904>

United States Department of Agriculture, Telecom Programs, <https://www.rd.usda.gov/programs-services/all-programs/telecom-programs>

United States Department of Agriculture, ReConnect Loan and Grant Program, <https://www.usda.gov/reconnect>

United States Department of Agriculture, “Trump Administration Invests \$3 Million in High-Speed Broadband in Rural Wisconsin”, <https://www.usda.gov/media/press-releases/2020/10/08/trump-administration-invests-3-million-high-speed-broadband-rural>

United States Department of Agriculture, Telecommunications Infrastructure Loans & Loan Guarantees, <https://www.rd.usda.gov/programs-services/telecommunications-infrastructure-loans-loan-guarantees>

United States Department of Agriculture, “USDA Invests \$10.2 Million in Rural Broadband Service in Wisconsin”, <https://www.rd.usda.gov/node/17836>

Gov. Evers Announces \$100 Million Investment in First Round of Federal Funding for Broadband Access, <https://content.govdelivery.com/accounts/WIGOV/bulletins/2d9c1a3>

Universal Service Administrative Company, FCC Form 471 Filing, <https://www.usac.org/e-rate/applicant-process/applying-for-discounts/fcc-form-471-filing/>

Marathon County Broadband Assessment Study, <https://www.co.marathon.wi.us/Home/Announcements/tabid/66/articleType/ArticleView/articleId/990/Broadband-Assessment-Study.aspx>

Brown County Broadband Speed Test, <https://www.browncountywi.gov/community/brown-county-broadband-speed-test-initiative/general-information/>

Community Broadband Action Network, <https://broadbandaction.com/why-cban/>

Governor’s Blue Ribbon Commission on Rural Prosperity, https://wedc.org/wp-content/uploads/2020/12/Web_Governors-Blue-Ribbon-Commission-Report.pdf

Lead For America, American Connection Corps, <https://www.lead4america.org/american-connection-corps>

Blandin Foundation, Broadband, <https://blandinfoundation.org/programs/broadband/>

Blandin Foundation, Community Leadership, <https://blandinfoundation.org/programs/community-leadership/>