Dane County Department of Planning and Development

Dane County Broadband Infrastructure Engineering Assessment Final Report

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This introduction has been written by Dane County Department of Planning and Development staff and is intended to provide a brief summary on the following document: AECOM's Dane County Broadband Infrastructure Engineering Assessment Final Report.

Access to affordable, reliable broadband internet service has become a necessity to fully participate in modern society. From remote work, schooling, and healthcare services, to commerce and entertainment, we rely on broadband every day.

Dane County is the second largest, and fastest growing county in Wisconsin. The county's population is expected to grow by 25%, adding close to 150,000 residents over the next two and a half decades. Home to the state capital, the state's flagship university, and major healthcare, technology, and manufacturing employers, it's no surprise that more people want to call Dane County home. Dane county is also an agricultural powerhouse, ranking first in the state in the value of agricultural products, and in top 20 counties nationwide. The county has a vibrant and diverse economy that benefits both the surrounding region and entire state.

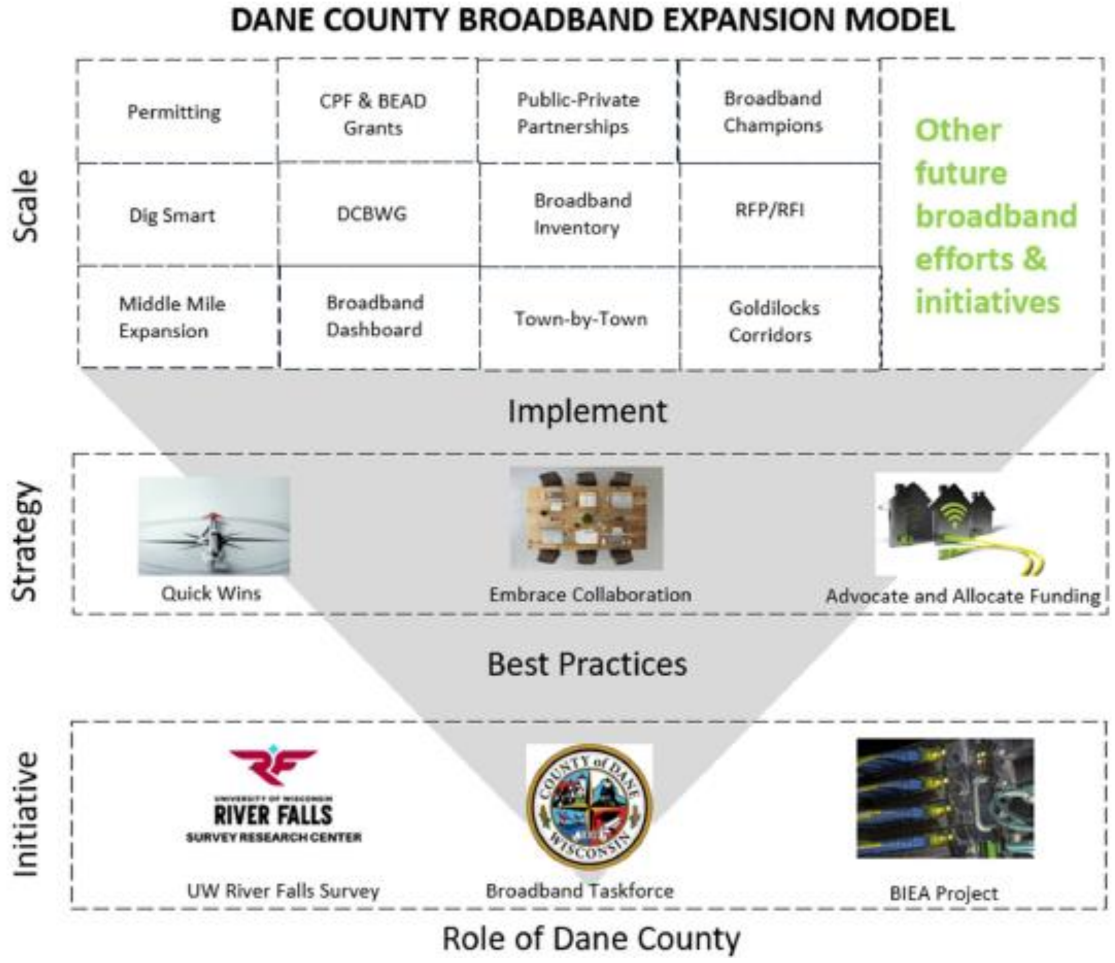
Yet despite its importance to the economic wellbeing of Wisconsin, tens of thousands of the county's rural residents suffer the same lack of access to broadband internet service that plagues rural areas across the state and nationwide. As we learned during the Covid 19 pandemic, this lack of service is not just an annoyance to those without it, but a pressing problem affecting the wellbeing of our communities, institutions, and the economy as whole. It's a problem that needs to be addressed at all levels of government.

In 2021, Dane County established its first ever Broadband Task Force. Comprised of representatives from an array of stakeholders, the Task Force conducted research, consulted subject matter experts, and solicited input from county residents, eventually outlining over 2 dozen recommendations in its report to the County Board. One of those recommendations was to conduct a broadband engineering assessment to both better understand the scope of the problem, and identify concrete and actionable strategies to expand broadband infrastructure to unserved and underserved areas of the county.

AECOM was selected to conduct the broadband engineering assessment and initiated the project in the fall of 2022. The assessment was divided into 3 discreet phases, first conducting an inventory of the current broadband providers and location of infrastructure assets throughout the county, next reviewing various broadband technology options and their relative strengths, weaknesses, and suitability to meet particular last mile needs, and finally compiling specific implementation recommendations and coordinating with ISPs and municipal stakeholders to begin scoping out broadband expansion opportunities.

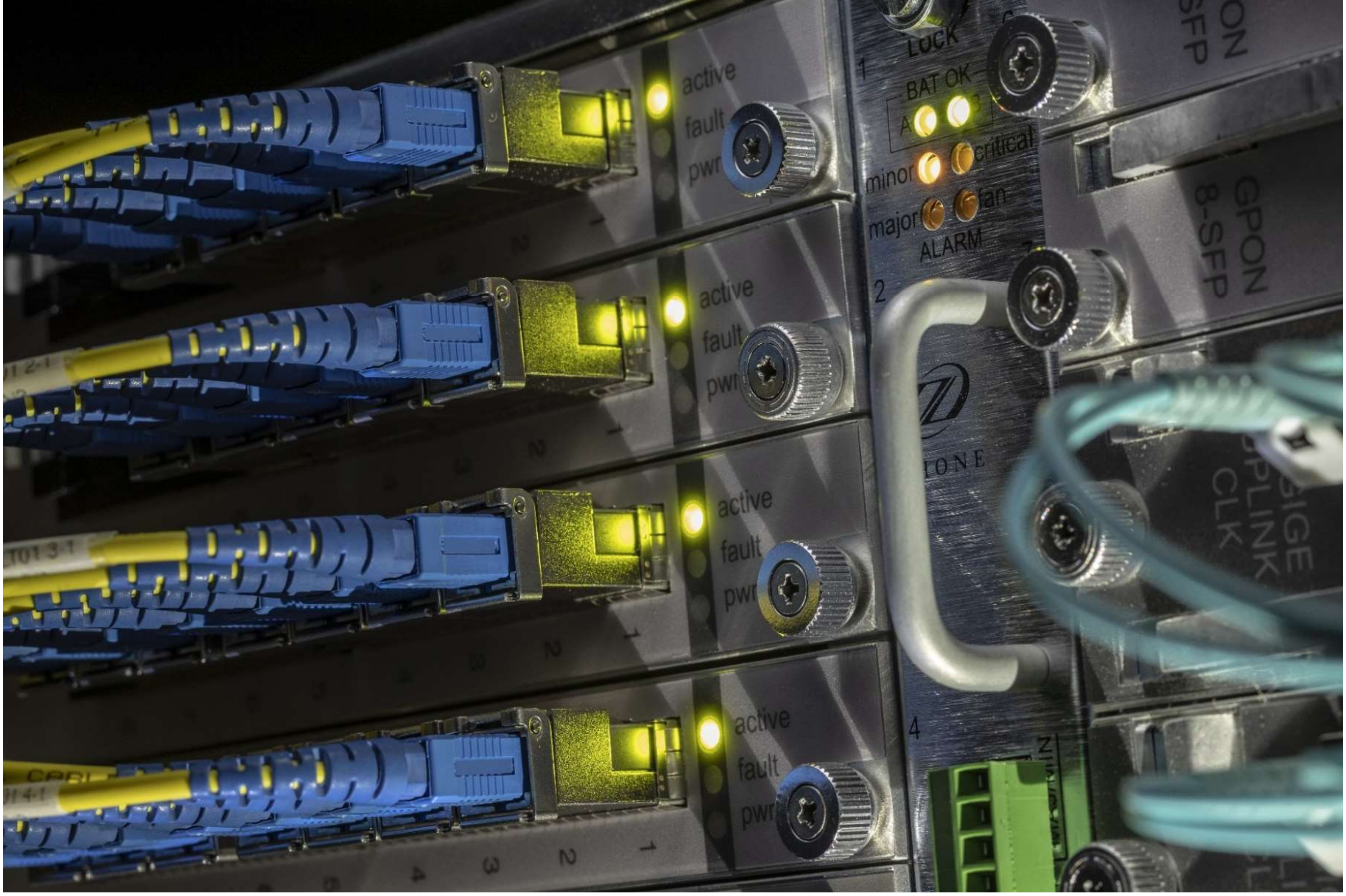
As a part of AECOM's analysis, a "gap assessment" identified the number of un/underserved locations and provided a breakdown analysis for each of the county's 60 municipalities. Not surprisingly, the 5 communities with the most un/underserved locations were rural townships, in comparison to suburban and urban communities which enjoy comparatively robust broadband service. The assessment also considered the relative location of existing fiber infrastructure to locations lacking broadband, finding that over 80% of the un/underserved locations throughout the county are within 1/2 mile of existing fiber lines. The analysis also provides rough cost estimates for expanding fiber, and further examines corridors within each municipality that represent the best options to bridge broadband connectivity between existing infrastructure and currently un/underserved areas.

AECOM provided several recommendations to Dane County as they work to address broadband connectivity. They include: Middle Mile Expansion, Policy Review & Action, Update and Maintain a Broadband Asset Inventory, Launch the Dane County Broadband Working Group, Launch the Broadband Dashboard, Release a Request for Proposal (RFP)/Request for Information(RFI), and Engage with the Wisconsin Broadband Office (WBO). Many of these recommendations are already underway in Dane County. Below you will find a graphic of many of AECOM's recommendations to Dane County.


DANE COUNTY BROADBAND EXPANSION MODEL
Scale
Permitting
CPF & BEAD Grants
Public-Private Partnerships
Broadband Champions
Other future broadband efforts & initiatives
Dig Smart
DCBWG
Broadband Inventory
RFP/RFI
Middle Mile Expansion
Broadband Dashboard
Town-by-Town
Goldilocks Corridors
Implement
Strategy
Quick Wins
Embrace Collaboration
Advocate and Allocate Funding
Best Practices
Initiative
UNIVERSITY OF WISCONSIN RIVER FALLS SURVEY RESEARCH CENTER
UW River Falls Survey
Broadband Taskforce
BIEA Project
Role of Dane County

Staff would like to extend their thanks to the Dane County Broadband Task Force leadership, include Supervisors Ratcliff, Glazer, and McGinnity. Staff would also like to thank Task Force members for their feedback and robust discussion in creating and finalizing the report. Finally, staff would like to thank AECOM for time and efforts in authoring the report.

As stakeholders and interested parties read the following AECOM report, please do not hesitate to reach out to Jaron McCallum, Dane County's Broadband Coordinator, with questions. Jaron can be reached via email at McCallum.Jaron@countyofdane.com or via phone at 608-206-6316.



Dane County Broadband Infrastructure Engineering Assessment Final Report

September 2023

Acknowledgments

Our gratitude goes to Dane County, the participants of the Dane County Broadband Taskforce, and the community leaders and members for their unwavering support and active involvement in the project. Their invaluable feedback has been a cornerstone throughout the project's journey. We extend special appreciation to Dane County Supervisors Melissa Ratcliff, Jeffrey Glazer and Kate McGinnity, along with Todd Violante, Majid Allan and Jaron McCallum from the Dane County Planning and Development Department. Their guidance and partnership have been instrumental in propelling Dane County's efforts towards establishing an inclusive broadband infrastructure that serves every resident equitably.

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Global Broadband Leader

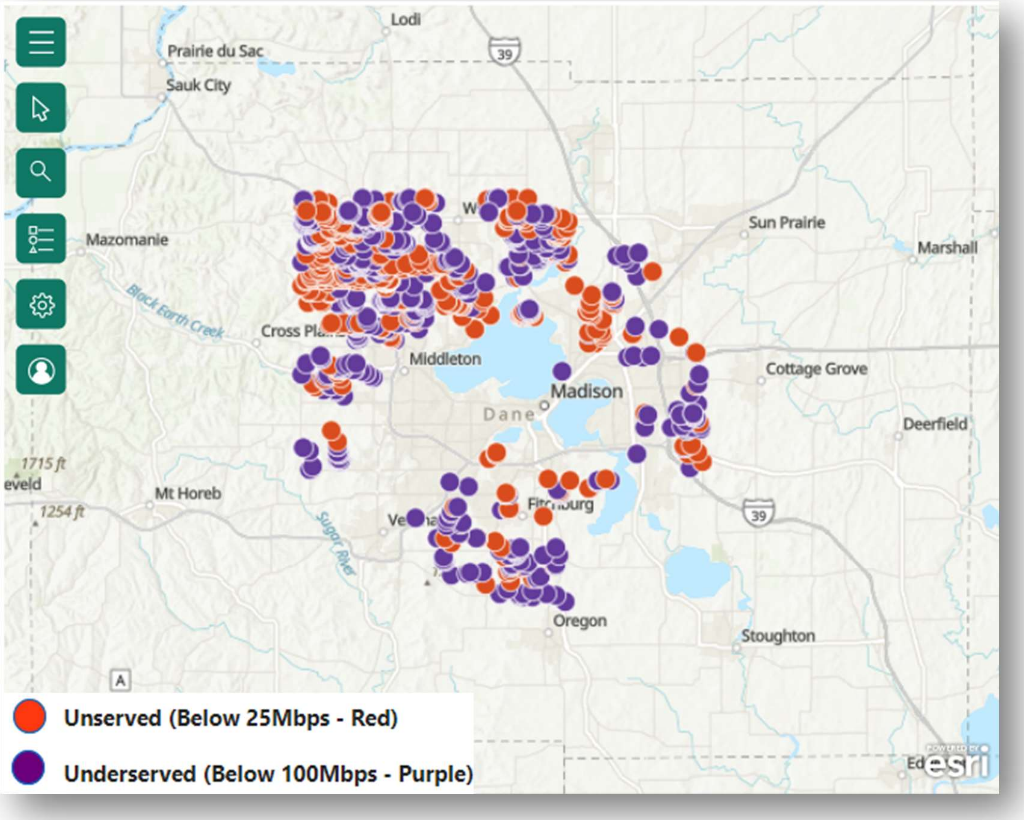
EXECUTIVE SUMMARY

Dane County

Dane County, the fastest growing county within the state of Wisconsin, holds several key attributes that distinguish it as a vital economic and cultural hub. Its prominence is underscored by its position as the leading agricultural producer, its role as the nucleus of the state's administrative functions and its hosting of the flagship university system. Dane County is the center for industries such as technology and healthcare, serving as a major source of employment and innovation. In light of these attributes, it is imperative to address the existing broadband connectivity disparities within the county to continue its prosperity and development.

Despite its central position, areas that are located merely 5-10 miles from the state capitol building remain inadequately served in terms of broadband (1,070 locations). These gaps in connectivity hinder the potential of individuals, businesses and community anchor institutions (CAIs) to fully participate in the modern digital economy. The need for broadband access has never been more pronounced, as this technology has transformed into an essential utility for economic, educational and social advancement. The interdependence of various industries, ranging from technology-driven enterprises to healthcare institutions, underscores the urgency of universal, reliable high-speed internet access in Dane County.

Un(der)served within 10 miles of Madison:


Lodi
Prairie du Sac
Sauk City
39
Mazomanie
Black Earth Creek
Cross Pla
Middleton
Madison
Dane
Sun Prairie
Marshall
Cottage Grove
Deerfield
1715 ft
eveld
1254 ft
Mt Horeb
Sugar River
39
Oregon
Stoughton
A
esri
Unserved (Below 25Mbps - Red)
Underserved (Below 100Mbps - Purple)

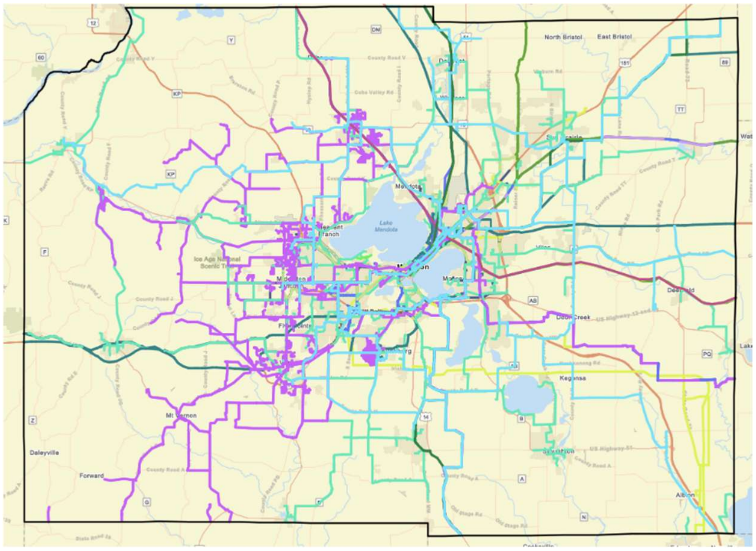
Internet access has evolved from being a luxury to an essential utility, much like electricity and water. A critical area of focus revolves around distinguishing between two distinct groups: the "Have Nots" and the "Do Nots." The "Have Nots" are individuals who lack access to the internet, while the "Do Nots" encompass those who, for various reasons, either cannot afford or choose not to adopt broadband.

Addressing the needs of the "Have Nots" primarily involves tackling the technical aspects of the problem. However, addressing the "Do Nots" poses a more substantial challenge and necessitates collaborative efforts within communities to forge synergistic partnerships to overcome this hurdle.

For instance, a study by the Phoenix Center revealed that the $4.7 billion Broadband Technology Opportunities Program failed to significantly impact home broadband adoption rates, suggesting that taxpayer dollars were essentially squandered. Similarly, Chicago Connected discovered that fewer than half of eligible individuals accepted the offer of free internet service. Despite endeavors to promote adoption among low-income consumers, many Americans simply opt not to subscribe to or purchase broadband services, rendering subsidies less effective.

Taking into account the essential need for internet connectivity and affordability along with Dane County's significance, the state of Wisconsin must recognize the pressing need for broadband expansion within Dane County. As it stands today, according to the FCC, Dane County currently stands at 11,048 un(der)served locations throughout the county. By supporting Dane County's broadband expansion initiative, the state not only recognizes the reality of Dane County's broadband divide, but bolster's the county's capacity to contribute to the state's prosperity and demonstrates its commitment to advancing the well-being of all its residents.

Broadband Taskforce



Dane County Fiber Networks

In response to the evolving demands of bridging the digital divide within Dane County, the Dane County Broadband Taskforce (Taskforce) was established in 2021 to (1) better understand the current state of broadband infrastructure within Dane County (2) identify the challenges and opportunities for broadband expansion and (3) establish a path forward to explore various ways to provide broadband access to those that may be lacking service or do not have service at all. The Taskforce is composed of 15 members representing a broad range of interests, including the Dane County Board of Supervisors; Dane County Executive; Dane County Towns Association; Dane County Cities and Villages Association; healthcare industry; school districts; older adults; broadband industry; Madison College; and community-based youth advocates.

Under the leadership of County Board Supervisors Melissa Ratcliff (Chair), Kate McGinnity (former Vice-Chair), and Jeffrey Glazer (current Vice-Chair), the Task Force has met over two-dozen times and hosted presentations from numerous entities involved in broadband expansion, including but not limited to the following: Wisconsin Public

Service Commission (PSC); Door County; Marathon County; Town of Vermont; Metropolitan Unified Fiber Network (MUFN); Dane County Controller and Dane County Legislative Liaison; UW-Dane County Extension; UW-River Falls; and the Madison Region Economic Partnership (MADREP).

This pivotal step marked progress towards addressing the issues of broadband accessibility and affordability, particularly in the rural areas of Dane County. The primary mission of the Taskforce and this Broadband Infrastructure Engineering Assessment (Assessment) project is to analyze the prevailing broadband landscape within the expanse of Dane County. Preceding the Assessment initiative, the Taskforce initiated two undertakings: the UW River Falls Survey and the Taskforce Reports. The UW River Falls Survey Report unveiled that 40% of the rural population surveyed lacked internet access meeting the 25/3Mbps standard. This survey illuminated the scope of the necessity and indicated the need for further investigation to identify specific gaps. The Taskforce Report recommended embarking on a broadband infrastructure engineering assessment project to perform a deeper dive into enhancing broadband availability countywide. These preliminary actions established the foundation and provided a strategic starting point for the subsequent Assessment project.

The Taskforce has now charged the Assessment project with the task of formulating practical, informed and locally specific recommendations to the County, aimed at improving broadband access for households, businesses and community anchor institutions (CAIs) grappling with inadequate or non-existent connectivity. This report summarizes the project goals, best practices in broadband expansion, the role of Dane County, high-impact gap assessment, potential funding opportunities and implementation recommendations.

University of Wisconsin River Falls Survey Report & Conclusions

In February 2022, the Taskforce tasked the Survey Research Center (SRC) to initiate a survey among rural residents of Dane County to assess the availability of broadband internet beyond the greater-Madison area. The designated area of focus was divided into two sections: the North region (marked as severely underserved) and the South region (identified as marginally underserved). This survey involved a random selection of residents from both the North and South regions. The data collection phase concluded in April 2022, yielding responses that surpassed the minimum sample size necessary for generating statistically reliable findings. Specifically, the North region garnered a total of 409 responses (exceeding the required sample size of 378), while the South region accumulated 412 responses (surpassing the required sample size of 381).

The report's findings indicated that the primary issue regarding internet accessibility for most Dane County residents stems from the subpar quality of available services rather than an outright absence of coverage in their vicinity. Based on the survey results, it was deduced that a minimum of 40% of residents in Dane County who possess home internet services lack access to broadband-standard upload and download speeds. In terms of cost and pricing, respondents expressed strong dissatisfaction with the expenses associated with these services.

Residents consistently conveyed the sentiment that the prices charged were disproportionately high given the mediocre speeds and the unreliability of the internet service. The survey strongly supported the distinction between the North region, which reported significantly slower speeds compared to the South region. Overall, a substantial majority of residents are confronted with subpar internet quality.

While the survey concentrated on the rural population of the county, even residents living close to urban areas reported inadequate access to fast and dependable internet services. Certain results even suggested that coverage, speed, and reliability varied within the same neighborhoods. The survey clearly underscored the prevalent demand for high-quality internet services across the county, with a considerable portion of residents expressing their endorsement for the county's endeavor to achieve this objective.

Broadband Infrastructure Engineering Assessment (Assessment) Project

In May of 2022, the Dane County Taskforce was seeking a broadband consultant to conduct a broadband infrastructure engineering assessment and act as a broadband expansion coordinator. Through a Request for Proposal (RFP) process, the project was awarded to AECOM. The project kicked off in September of 2022 and this project is aiming to address un(der)served areas and develop a comprehensive strategy to provide reliable broadband service to every residence and business in Dane County. The project includes assessing existing infrastructure, technology options, and models for service provision, with an emphasis on leveraging federal funding. The Assessment project also plays a key role in identifying and then implementing the Assessment report's recommendations and coordinating broadband expansion efforts throughout the county, including collaborating with ISPs and assisting local communities in project development and grants. The Assessment project also focuses on expanding last mile broadband expansion in Dane County. The last mile refers to the fiber (or copper or fixed wireless) connection between the middle mile service provider network and the end-users (homes, businesses, CAIs). In rural areas, the last mile may be several miles from the nearest service provider and may be limited to only one existing provider or no terrestrial providers at all.

Dane County Broadband Goals

Dane County created the Assessment project to analyze, select and implement the best solutions to improve broadband access across the entire county. The Assessment project identified five goals for the expansion of broadband in Dane County:

1. Improve broadband access across the entire county.
2. Address gaps in service.
3. Support municipalities as they prepare to seek grants.
4. Provide strategies to achieve >100Mbps/20Mbps service to every home and business.
5. Identify interim and transitional solutions for broadband connectivity.

Role of Dane County in Expanding Broadband Networks

In the context of connecting end users throughout Dane County, broadband networks offer a versatile bandwidth infrastructure, encompassing a range of deployments, including private, public, local agency and government. This varying bandwidth infrastructure and service providers are composed of various components and technologies designed to provide last mile connectivity to enable residential, business and CAI internet services.

Privately operated networks are established, maintained and managed by Internet Service Providers (ISPs) within the private sector. There are various categories of private broadband networks, each serving distinct purposes. Some private networks offer services like fiber-to-the-home, establishing a direct connection between businesses and consumers. In contrast, other private broadband network operators like Crown Castle or Zayo provide fiber infrastructure services to mobile carriers. These carriers, such as Verizon or T-Mobile, utilize Crown Castle's fiber network to establish connections between cell towers or antennas, facilitating the delivery of 4G/5G or LTE services to mobile phones. Additionally, certain private broadband networks are primarily used for long-haul or middle-mile connections to critical data centers or points of presence. These types of broadband infrastructure play a crucial role in providing Internet access connections to service providers like Spectrum, Verizon, TDS Telecom, and others.

On the other hand, **public broadband networks** across the country that are managed by local or state governments (1) offer a platform to bolster advanced transportation initiatives, public-private partnerships, research and education, and connect CAIs, and (2) allow conduit and fiber resource sharing and real-time monitoring of public utilities. Publicly owned broadband infrastructure is widespread throughout the United States. Much of this infrastructure is under the ownership of a state's Department of Transportation (DOT). This arrangement often occurs because the DOT controls a significant portion of the right-of-way, and as part of the right-of-way access agreements negotiated with service providers, as an example, the DOT may receive 48 fibers within the same fiber infrastructure or in a separate fiber optic cable for the DOT sole use.

In some instances, involving publicly owned infrastructure, state IT departments or counties have invested in building, owning, and operating broadband infrastructure exclusively for serving specific government locations only, typically known as CAI locations. These networks are generally not geared towards providing internet service to residential consumers. Public entities typically build excess capacity, conduit, and/or fiber that can be leveraged through public-private partnerships. Local, regional, or national service providers can resource-share access, lease fiber or conduit, or engage in revenue-sharing agreements with the public entity that owns the broadband infrastructure, fostering collaboration and expanding connectivity. The latter arrangement can be beneficial for the service provider because they do not have the burden of capital outlay to build out a middle mile infrastructure.

In both cases and scenarios above, Dane County can assume a pivotal role in facilitating the expansion of broadband network access across its areas. When facilitated properly, Dane County, by leveraging its resources and advocacy, can catalyze connectivity, empower communities and pave the way for last mile bandwidth infrastructure to enhance the quality of life for its residents.

The role of Dane County:

1. **Planning and Investment:** Dane County has funded and launched the Assessment project to analyze and assess the appropriate strategies to put forth, and recommendations to carry out, to bridge the broadband divide. Engaging informally or formally with ISPs, through non-disclosure agreements (NDAs) and a request for proposal or information (RFP or RFI) can allocate resources and investments strategically. Through this process, Dane County can subsidize and/or incentivize the expansion of broadband networks to un(der)served parts of the region. As for affordability planning, putting forth, maintaining and tracking Affordable Connectivity Program (ACP) metrics will gauge how and where Dane County can focus its attention to bridge the affordability gap.

2. **Coordination with State and Regional Efforts:** Align the broadband expansion efforts with broader state and federal funding programs such as the Capital Project Funds (CPF) and Broadband Equity, Access and Deployment (BEAD) programs. Collaborative efforts with the Wisconsin Broadband Office (WBO) can identify specific areas that are eligible for funding and advocate for projects in those areas. Dane County can work with the WBO to identify appropriate last mile thresholds for the BEAD program. In the BEAD program, a subsidy cost per last mile location will be employed during the project selection process. If the last mile threshold is not set high enough, locations that have historically been left out or provided the bare minimum when it comes to un(der)served broadband investment. Leaning towards higher thresholds can also enable more fiber to be brought to more households and help Dane County put forth a more future-proof technology

across the county. If the threshold is set too low, providers will need to increase their match, which could limit participation in the programs.

3. **Policy Advocacy:** Advocate for broadband-friendly policies at the county and state levels, including supporting legislation that is less restrictive to publicly owned infrastructure and minimizes regulatory barriers. Policies such as "Dig Smart" can be put in place to focus on, for example, when new housing developments or business parks are built, so that ample conduit and handhole systems are constructed to enable an open access system allowing multiple ISPs to serve the development or business park. Additionally, when new county roads are planned and constructed, requiring the same type of conduit system to be built, will allow multiple service providers to traverse the pathway, enabling a more robust middle mile infrastructure.

4. **Data Collections and Mapping:** Create a single view of the broadband landscape in Dane County. Continuously maintain and update the existing broadband assets inventory across the county. Subscribing to database(s) such as GeoTel or FiberLocator and working closely with private ISPs to understand where assets contrast with un(der)served locations are paramount to being apprised of where gaps are or could be in the future. This can enable targeted interventions and data-informed decision-making by helping prevent the emergence of further un(der)served locations in Dane County in the future. This data collection and mapping role now becomes a proactive strategy by addressing and identifying locations before they escalate to un(der)served in a more timely and anticipatory manner.

5. **Community Engagement:** Launch and lead the Dane County Broadband Working Group (Working Group), which comprises of the Dane County Broadband Program Manager, Dane County Broadband Coordinator, a representative from the Wisconsin Broadband Office (WBO), a University of Wisconsin representative, private service provider representatives and a representative from the Towns and Cities and Villages Associations to facilitate opportunities for collaborative broadband expansion initiatives. The Working Group will foster awareness and collaboration among county-wide stakeholders. The Working Group will inventory, understand and have the capability to provide updates on current projects (such as the CPF and BEAD), identify future projects and provide interaction points for different stakeholders to share their challenges, concerns and successes. The Working Group differs from the Taskforce. The Taskforce involves more diverse stakeholders and is responsible for analysis, policy and oversight. The Working Group has a narrower focus; it will be task-specific and more directly involved in executing projects or initiatives.

6. **Grant Funding and Support:** Actively pursue grants, maintain grant awareness, advocate and support grant applicants and publish a grant dashboard illustrating progress and success of grants throughout the County. Formal support of grants can be demonstrated through a "Letter of Support" for service providers. Furthermore, the County may consider additional ways to demonstrate robust public private partnerships like financially contributing to a grant project, waiving or easing permitting, or helping to promote the internet service once installed. Financially contributing to a grant project can assist in lowering last mile grant match percentages and enable a lower cost of entry for grant applicants. As the CPF and BEAD programs are initiated, Dane County can provide a webpage for the public to view grant awards by provider, targeted locations, grant awards programs, awarded grant dollars, where construction is taking place, addresses passed, and other pertinent information requested by the public.

Dane County Expansion Guidelines

Expanding broadband access at the county level involves a combination of strategic steps.

Step 1:

Assemble County-Wide Stakeholders (public and private), Define Goals and Identify Broadband Champions

Central to the effort of expanding broadband is identifying a Broadband Champion, an individual or group, such as the Taskforce and the Working Group, well-entrenched within local jurisdictions. Dane County has achieved part of this by establishing the Taskforce, but the Working Group is about implementing and executing broadband expansion. Broadband expansion requires a sustained commitment. It necessitates leaders capable of creating transformative change and remain abreast of the latest bandwidth infrastructure technologies and advancements to effectively lead their regions towards success.

Step 2:

Current Inventory Assessment

Accurate and up-to-date existing broadband asset maps are indispensable for counties, serving both as vital tools for broadband expansion and preemptively identifying gaps that may exist throughout the county. The Assessment project encompassed the mapping of existing public and private sector broadband infrastructure pathways, along with ownership details. Perpetually maintaining a status of the inventory map remains paramount, particularly as new broadband assets are deployed or introduced over the next several years. The creation of the unified map necessitated collaboration with stakeholders and utilizing subscription and publicly available data. The task of accessing the current broadband inventory revealed challenges. Not all ISPs readily share their data, and even if shared, the information might be incomplete or infrequently updated. Moreover, some infrastructure owners might consider their data sensitive due to security, confidentiality or competition apprehensions.

To overcome these hurdles, data sharing agreements or NDAs can be instrumental. Such arrangements empower ISPs and public entities to share their data in confidence with entities such as Dane County, to help facilitate an inventory that remains accurate and current while safeguarding the integrity of the information.

Maintaining an updated broadband inventory is indispensable for Dane County. By securing cooperation, streamlining data sharing, allocating funding to subscription services and prioritizing confidentiality, Dane County can forge an accurate, single view and real-time resource that not only aids in broadband expansion but also contributes to the collective understanding of bandwidth infrastructure. The maintenance of the inventory is never complete, it is a perpetual effort that takes careful diligence and coordination. Identifying an owner within Dane County will be an important first step to establishing the broadband inventory.

Step 3:

Tailoring a Broadband Expansion Approach

Counties embarking on the journey to expand broadband within their jurisdiction can strategically tailor their approach by considering a range of methods, either individually or in collaboration, which resonate with the local landscape. This customization means aligning Dane County's distinctive requirements, surrounding community objectives, existing broadband infrastructure and the available level of public capacity and investment. Among the array of approaches are:

1. **Collaborate with Existing ISPs:** Under this approach, the county can advocate for funding of expanding private ISPs infrastructure to get to un(der)served locations throughout the county. This could come in the form of advocacy, county or state subsidies and federal grants.

2. **Forge Public-Private Partnerships (P3s):** Dane County has the potential to facilitate the growth of a network similar to MUFN, expanding the middle mile infrastructure to reach areas beyond the central parts of the county. This could involve various P3 approaches, such as the county providing financial support for the expansion of the MUFN network or establishing a similar network independently. Collaboration with established middle mile infrastructure providers like Zayo or Lumen is another feasible option for creating an open access infrastructure.

   Under any of these circumstances, Dane County could actively seek state and federal grants to facilitate the extension of the middle mile network to the outskirts of the county. Notably, this expansion has the potential to introduce an open access infrastructure, fostering increased competition in the peripheral regions of the county. Additionally, the integration of a public sector value add could promote coordination among key entities like MUFN, the Wisconsin Department of Transportation, and Dane County Highway & Transportation. This collaboration would aim to identify strategic "Goldilocks Corridors", facilitate efficient "Dig Smart" initiatives, and create Gigabit CAI connections across the entire county.

3. **Funding Allocation:** Allocate funds for a subsidy program. Identifying funding sources such as American Rescue Plan Act (ARPA), county capital project budgets and federal and state grants such as Capital Project Funds (CPF) and BEAD funding, can help to offset financially prohibitive last mile builds and allow for higher cost thresholds that are focused on unserved locations first and underserved locations secondarily. Additionally, contribute public subsidies to a county version of the ACP program.

4. **Dig Smart:** Implementing “Dig Smart” policies entails installing conduits during local or middle mile construction undertakings, such as new business parks, new housing developments or new road construction. The approach facilitates future installation of fiber, providing ample room for an open-access conduit system through the conduits installed as part of the construction project. This streamlines the process of construction, reduces the amount of right-of-way disruption, limits risk to the traveling public and future-proofs connectivity in the area. While “Dig Smart” can help create a more conducive environment for expanding the broadband infrastructure, particularly in the middle mile segments or “new build” scenarios for business parks and housing developments, it is not applicable to aerial pathways and is not practical in sparsely populated last mile areas.

5. **Request for Proposal (RFP)/Request for Information (RFI):** Develop a detailed RFP or RFI template outlining the criteria, eligibility requirements and expectations for private service providers interested in participating in the program. The RFP/RFI can aim to solicit market insights and identify areas where service providers are amenable to extending their services with potential assistance from public subsidies. This process presents an avenue for Dane County to advocate for project areas associated with CPF and BEAD funding programs. These county funds could be braided with other state and federally funded projects to help offset higher match constraints, especially for those local providers where matching minimum percentages can be more challenging when facing regional or national provider competition.

6. **Fusion of Approaches:** The broadband divide is a very complex and long-term challenge, a challenge that cannot be fixed with one approach. The county can explore fusing multiple approaches to craft a distinct

strategy. By braiding elements of various approaches, Dane County can harness the advantage of each, tailored to its individual scenario. Addressing the divide is not a matter of “either-or” but rather an “and.” It requires a flexible approach that integrates multiple methodologies to effectivity bridge the broadband divide.

Step 4:

Implementing Strategies for Broadband Expansion

In the pursuit of fostering broadband expansion, Dane can focus on the following:

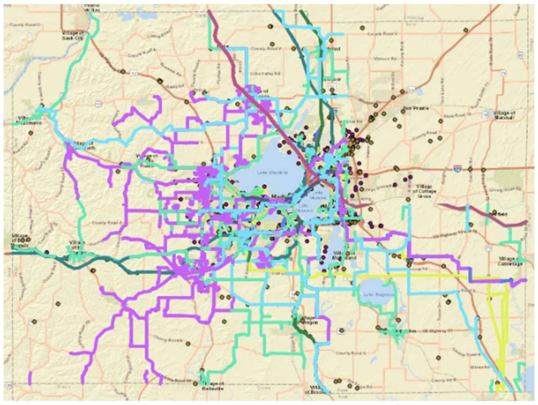
1. **Quick Wins:** Identify “low-hanging fruit” locations in areas that can be served quickly and cost effectively, where service providers extending into areas can pass the denser proportion of un(der)served locations. Pairing up the easier to reach un(der)served locations with “Goldilocks Corridors” can also expedite the deployment of fiber infrastructure. As an example, we carried out an assessment of un(der)served locations located within a half-mile radius of existing fiber infrastructure, municipality by municipality. Within this analysis, we identified easily achievable opportunities that could deliver “quick wins”. To provide a concrete instance, there are five municipalities with 15 Broadband Service Locations (BSLs) that could be connected at an approximate cost of $75,628, If Dane County contributes a 25% match for those locations would cost the county approximately $18,907 and five municipalities could now move into the ”served” column. Quick wins will show visual progress and immediate benefits to the un(der)served communities and demonstrate the commitment to addressing the broadband divide. These successful outcomes can inspire further investment and participation among stakeholders. To celebrate some quick wins, plan and coordinate groundbreaking ceremony(ies) in a symbolic location that represents the project’s impact.

2. **Embrace Collaboration and Coordination:** Encourage and sponsor collaborative efforts, coordination among cities, towns, villages, the WBO and private service providers, especially those providers who provide service within each city, town or village. This coordination and collaboration can foster a sense of unity within Dane County, the newly hired Broadband Expansion Coordinator can create more transparency that can capitalize on shared resources and shared project development. Establishing the Working Group can cast a wider net and create more real-time visibility into identifying quick wins within Dane County.

3. **Influence and Allocate Funding:** Advocate for how state and federal dollars can be spent to support the execution of the CPF and BEAD programs. Allocate funds for a subsidy program where county funds can be braided with state and federal dollars to help de-risk cash matches by service providers competing in the CPF and BEAD programs. As an example, of de-risking a cash match, some local or regional ISPs may only be in a position to contribute 10% towards a match, if Dane County can contribute the remaining percentage that service provider can be in a position to meet the grant requirements of a 25% cash match. Present the WBO with information regarding the specific un(der)served areas within Dane County. Advocate for setting reasonable last mile cost thresholds that motivate providers to extend fiber infrastructure, striking a balance between affordability and viability so providers feel like they have a workable business model.

Irrespective of chosen strategies, Dane County’s commitment to broadband expansion can be fortified through pragmatic and well-considered best practices. By adopting these measures, Dane County can enhance its broadband infrastructure, promote connectivity and create a solid foundation for broadband advancement.

Summary of Broadband Infrastructure Gap Assessment



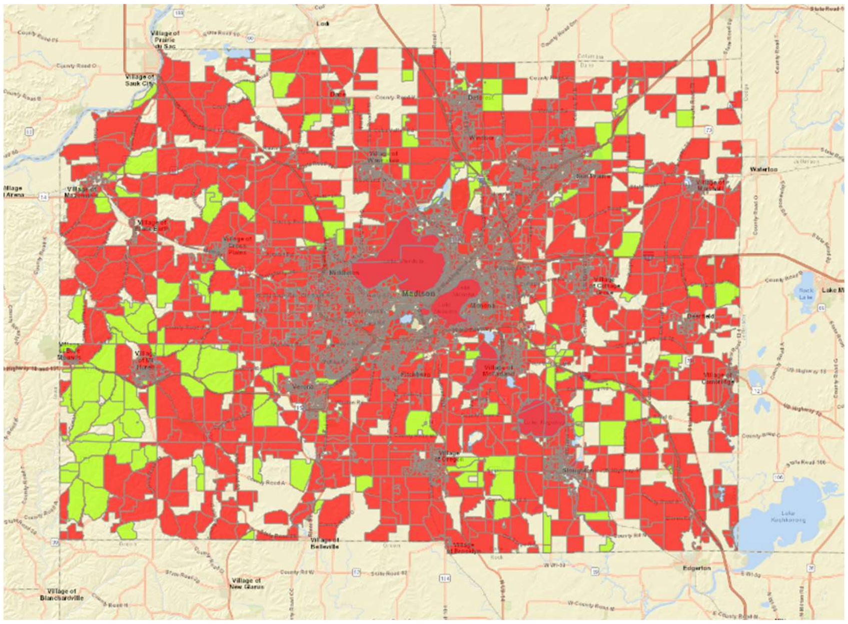
Existing Broadband Infrastructure Network

The Assessment evaluated gaps in the existing broadband assets based on existing public and private sector service providers pathways and opportunities to connect to unserved and underserved homes, businesses and CAIs.

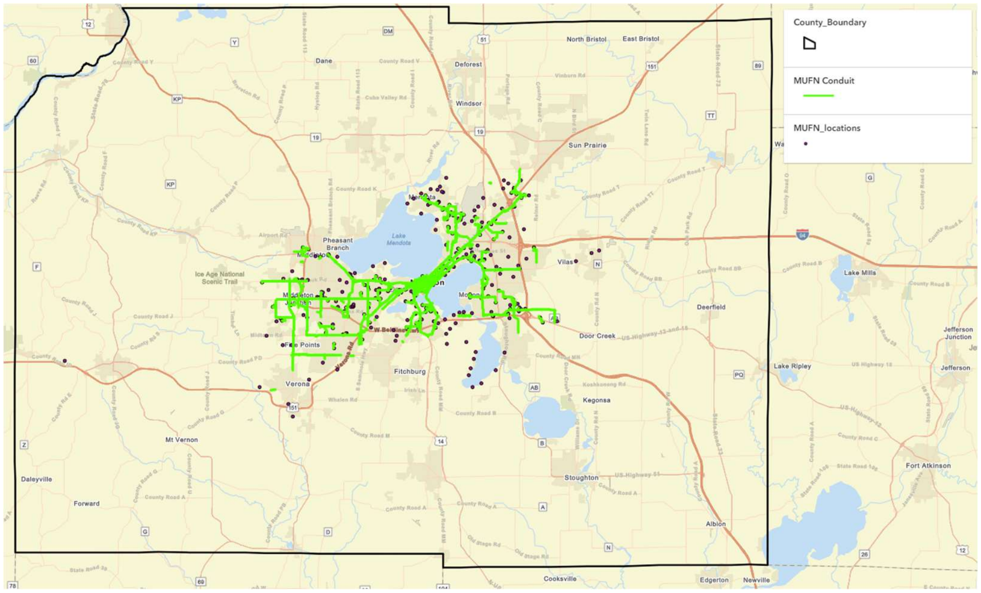
Key Findings:

1. **In the context of a “complete” inventory, developing a reasonably complete inventory of broadband infrastructure is challenging and requires an ongoing commitment.** Dane County should subscribe to a database that works with existing service providers and plots their broadband infrastructure assets on an ongoing basis. Dane County will need to keep in mind that producing a comprehensive inventory may prove unattainable given the nature associated with the maintenance of a fiber inventory. There are currently service providers who provide broadband service within Dane County but are not represented in this inventory due to the fact they do not provide their infrastructure data to subscription datasets.

2. **Delineations of service gaps** illustrates that a substantial segment of the Dane County population accesses the internet through cable/DSL subscriptions, emphasizing the fiber infrastructure is in areas that are the most densely populated. There are considerable voids within broadband accessibility when compared to existing fiber infrastructure and un(der)served locations. An indicator of this "fiber vs. other” gap, and according to Ookla speed test data, the majority of Dane County tests below advertised speeds. Below, **red** is noted as NOT testing to advertised speeds, while **green** has tested to advertised speeds.



3. **MUFN's footprint** shown below is contained within the central parts of Dane County. MUFN's middle mile infrastructure could be utilized to extend into broader parts of Dane County; however, there would need to be a sizable contribution from a capital and operational aspect to make it a realistic partner for other service providers. Below, MUFN's footprint is noted in **green**, with the MUFN Service locations noted as **blue** dots.


County_Boundary
MUFN Conduit
MUFN_locations
Dane
Deforest
Windsor
North Bristol
East Bristol
Sun Prairie
Pheasant Branch
Lake Mendota
Ice Age National Scenic Trail
Middleton
Vilas
Lake Mills
Deerfield
Door Creek
Fitchburg
Verona
Kegonsa
Mt Vernon
Daleyville
Forward
Stoughton
Albion
Cooksville
Edgerton
Newville
Lake Ripley
Jefferson Junction
Jefferson
Fort Atkinson

4. **"Goldilocks Corridors"** are located within local and regional areas that demonstrate the strongest need and highlight the biggest gaps in broadband connectivity and availability. They represent ideal corridor candidates to bridge broadband connectivity between existing infrastructure. So much of Dane County's existing infrastructure is defined by spurs sporadically reaching into cities, towns and villages, however, the lack of depth and cascading infrastructure manifests itself by the number of un(der)served locations that often lie in the "in-between" areas of existing infrastructure. The "Goldilocks Corridors" also align with serving the top BEAD site prospects and contribute to expanding more future proof technologies. "Goldilocks Corridors" will be identified in greater detail in the Town-by-Town Gaps Assessment.

Nearest Provider

Un(der)served Locations

Middle & Last Mile Gaps

Overall Guidance & Recommendation

To propel county-wide local broadband expansion, Dane County needs to play the lead role in fostering connectivity, empowering communities and paving the way for last mile broadband infrastructure. Standing up a Working Group, maintaining an accurate fiber inventory, implementing sound and practical policies, advocating for contributing funds, and assisting in directing state and federal grants to the most eligible areas will orchestrate a new era of enhanced and affordable connectivity and enduring growth.

Final Report Framework

The Assessment Final Report is organized as follows:

INTRODUCTION
an opening to the Final Report
page 16

CURRENT ASSESSMENT
existing broadband data inventory
page 22

GAP ASSESSMENT
a preliminary view of gaps in coverage
page 37

MUNICIPALITY-BY-MUNICIPALITY HIGH IMPACT GAPS ASSESSMENT
analyzing each city, town and village
page 47

RECOMMENDATIONS & NEXT STEPS
guidance through short, mid and long-term broadband expansion
page 108

APPENDICES
a resource section containing additional broadband information, data and materials
page 115

INTRODUCTION

Project Need

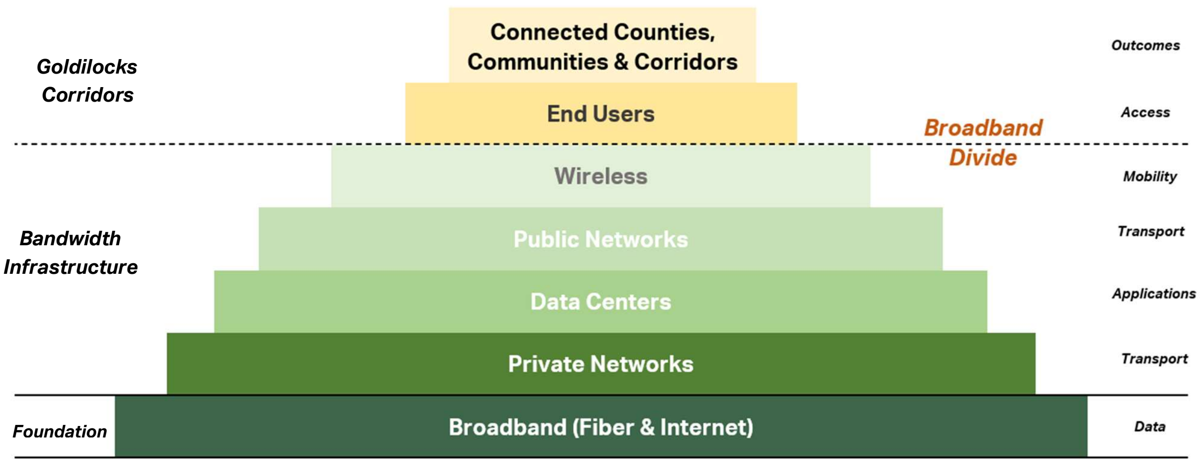
The events of 2020 starkly highlighted the value of broadband connectivity. In an era where governmental, social, business, healthcare and educational interactions have undergone almost complete digitization, the pandemic quantified what it means to be connected and more importantly demonstrated the significance of not being connected. This unmistakable awareness underscores the universality of the broadband divide, impacting aspects as diverse as the quality of life, public safety, social equity, and citizen services. In light of these realizations, it becomes imperative to adjust our perspective and embrace a unified approach to enriching our community's daily experiences.

This unified strategy involves recognizing the inherent worth of a diversified bandwidth infrastructure. It entails shifting our paradigm from going it alone to going together in partnership – a paradigm shift that promises to redefine the landscape of Dane County's well-being.

The Broadband Stack (Stack) shown below, is an illustration of how the combination of public and private bandwidth infrastructure is utilized to connect to devices, locations, end-users and communities to improve quality of life experiences, enhance public safety initiatives and foster economic development. At the foundation of the Stack lies a reliable, high-speed fiber infrastructure, serving as the bedrock to transport data and information reliably and at high speeds. Progressing upward through the Stack, it becomes imperative to understand the complex interaction between end user connectivity and the bandwidth infrastructure of networks in both the public and private sectors, along with datacenters and wireless mobility. The symbiotic relationship among these layers is pivotal in achieving an accessible and dependable connection for end users and devices alike.

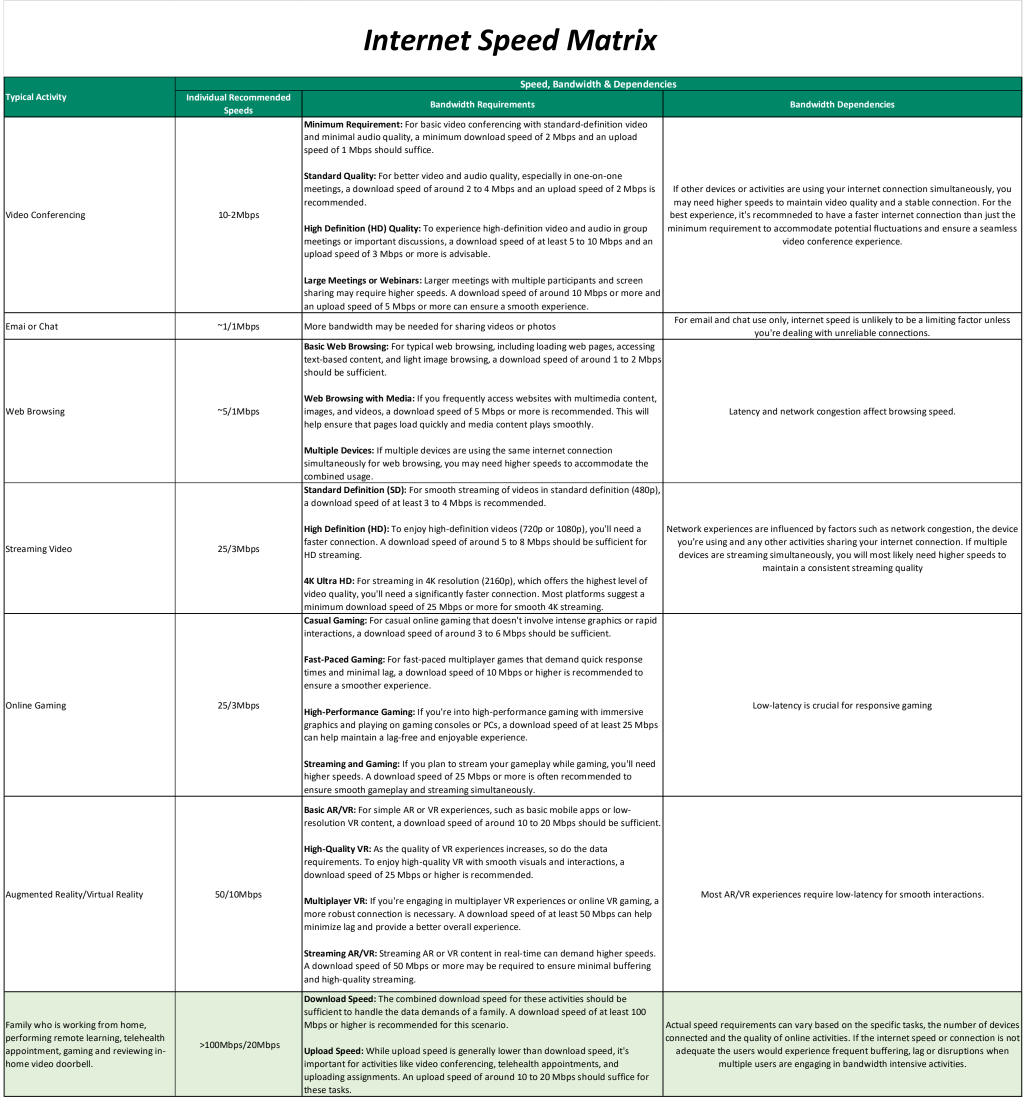
Every layer embedded within the Stack holds significance, contributing to the enhancement and advancement of key initiatives and objectives pursued by both the public and private sectors. The combination operates to bridge the broadband divide so corridors, cities, towns, villages, communities and counties can eliminate the disparities in connectivity.

Broadband is the foundation to ***bridge the divide***


Connected Counties, Communities & Corridors
End Users
Wireless
Public Networks
Data Centers
Private Networks
Broadband (Fiber & Internet)
Goldilocks Corridors
Bandwidth Infrastructure
Foundation
Broadband Divide
Outcomes
Access
Mobility
Transport
Applications
Transport
Data

Understanding Bandwidth Infrastructure

According to the FCC, broadband internet is characterized by a minimum download speed of 25 megabits per second (Mbps) and upload speed of 3 Mbps, often denoted as 25/3Mbps delivered through multiple technologies including fiber optics, wireless, cable, DSL and satellite. The Broadband, Equity, Access and Deployment (BEAD) Program is administered by the National Telecommunications and Information Administration (NTIA) and is funded via the Infrastructure, Investment, and Jobs Act (IIJA). The BEAD Program defines an “unserved” location as one lacking reliable broadband service with speeds of 25/3Mbps. An “underserved” location is defined as one lacking reliable broadband service with speeds of 100/20Mbps. Unlicensed fixed wireless and satellite technologies are not currently considered reliable. This alteration in definition reduces the likelihood of allocating state or federal funds to outdated technologies. Additionally, satellite and unlicensed fixed wireless access will not be eligible for funding. The FCC/NTIA are evaluating if both technologies could be allowed in extremely high last mile threshold locations; however, a decision has not been made at this time.



Internet Speed Matrix

Typical Activity	Speed, Bandwidth & Dependencies		
	Individual Recommended Speeds	Bandwidth Requirements	Bandwidth Dependencies
Video Conferencing	10-2Mbps	**Minimum Requirement:** For basic video conferencing with standard-definition video and minimal audio quality, a minimum download speed of 2 Mbps and an upload speed of 1 Mbps should suffice. **Standard Quality:** For better video and audio quality, especially in one-on-one meetings, a download speed of around 2 to 4 Mbps and an upload speed of 2 Mbps is recommended. **High Definition (HD) Quality:** To experience high-definition video and audio in group meetings or important discussions, a download speed of at least 5 to 10 Mbps and an upload speed of 3 Mbps or more is advisable. **Large Meetings or Webinars:** Larger meetings with multiple participants and screen sharing may require higher speeds. A download speed of around 10 Mbps or more and an upload speed of 5 Mbps or more can ensure a smooth experience.	If other devices or activities are using your internet connection simultaneously, you may need higher speeds to maintain video quality and a stable connection. For the best experience, it's recommneded to have a faster internet connection than just the minimum requirement to accommodate potential fluctuations and ensure a seamless video conference experience.
Emai or Chat	~1/1Mbps	More bandwidth may be needed for sharing videos or photos	For email and chat use only, internet speed is unlikely to be a limiting factor unless you're dealing with unreliable connections.
Web Browsing	~5/1Mbps	**Basic Web Browsing:** For typical web browsing, including loading web pages, accessing text-based content, and light image browsing, a download speed of around 1 to 2 Mbps should be sufficient. **Web Browsing with Media:** If you frequently access websites with multimedia content, images, and videos, a download speed of 5 Mbps or more is recommended. This will help ensure that pages load quickly and media content plays smoothly. **Multiple Devices:** If multiple devices are using the same internet connection simultaneously for web browsing, you may need higher speeds to accommodate the combined usage.	Latency and network congestion affect browsing speed.
Streaming Video	25/3Mbps	**Standard Definition (SD):** For smooth streaming of videos in standard definition (480p), a download speed of at least 3 to 4 Mbps is recommended. **High Definition (HD):** To enjoy high-definition videos (720p or 1080p), you'll need a faster connection. A download speed of around 5 to 8 Mbps should be sufficient for HD streaming. **4K Ultra HD:** For streaming in 4K resolution (2160p), which offers the highest level of video quality, you'll need a significantly faster connection. Most platforms suggest a minimum download speed of 25 Mbps or more for smooth 4K streaming.	Network experiences are influenced by factors such as network congestion, the device you’re using and any other activities sharing your internet connection. If multiple devices are streaming simultaneously, you will most likely need higher speeds to maintain a consistent streaming quality
Online Gaming	25/3Mbps	**Casual Gaming:** For casual online gaming that doesn't involve intense graphics or rapid interactions, a download speed of around 3 to 6 Mbps should be sufficient. **Fast-Paced Gaming:** For fast-paced multiplayer games that demand quick response times and minimal lag, a download speed of 10 Mbps or higher is recommended to ensure a smoother experience. **High-Performance Gaming:** If you're into high-performance gaming with immersive graphics and playing on gaming consoles or PCs, a download speed of at least 25 Mbps can help maintain a lag-free and enjoyable experience. **Streaming and Gaming:** If you plan to stream your gameplay while gaming, you'll need higher speeds. A download speed of 25 Mbps or more is often recommended to ensure smooth gameplay and streaming simultaneously.	Low-latency is crucial for responsive gaming
Augmented Reality/Virtual Reality	50/10Mbps	**Basic AR/VR:** For simple AR or VR experiences, such as basic mobile apps or low-resolution VR content, a download speed of around 10 to 20 Mbps should be sufficient. **High-Quality VR:** As the quality of VR experiences increases, so do the data requirements. To enjoy high-quality VR with smooth visuals and interactions, a download speed of 25 Mbps or higher is recommended. **Multiplayer VR:** If you're engaging in multiplayer VR experiences or online VR gaming, a more robust connection is necessary. A download speed of at least 50 Mbps can help minimize lag and provide a better overall experience. **Streaming AR/VR:** Streaming AR or VR content in real-time can demand higher speeds. A download speed of 50 Mbps or more may be required to ensure minimal buffering and high-quality streaming.	Most AR/VR experiences require low-latency for smooth interactions.
Family who is working from home, performing remote learning, telehealth appointment, gaming and reviewing in-home video doorbell.	>100Mbps/20Mbps	**Download Speed:** The combined download speed for these activities should be sufficient to handle the data demands of a family. A download speed of at least 100 Mbps or higher is recommended for this scenario. **Upload Speed:** While upload speed is generally lower than download speed, it's important for activities like video conferencing, telehealth appointments, and uploading assignments. An upload speed of around 10 to 20 Mbps should suffice for these tasks.	Actual speed requirements can vary based on the specific tasks, the number of devices connected and the quality of online activities. If the internet speed or connection is not adequate the users would experience frequent buffering, lag or disruptions when multiple users are engaging in bandwidth intensive activities.

What is Bandwidth Infrastructure?

Bandwidth infrastructure in the context of different internet service technologies is the underlying systems and components that enable the transmission of data, signals and information across fiber optic cable, wireless and satellite mediums. Each technology's bandwidth infrastructure has its own strengths and limitations, and their effectiveness depends on factors such as geographical location, user density and the specific needs of users. As Dane County advances its broadband expansion initiative each one of these will likely play a critical role in delivering high-speed and reliable internet services to diverse populations.

Fiber optic cable is considered the gold standard for internet speeds due to its properties and advantages over other types of cables, such as copper or coaxial (coax) cables.

FIBER OPTIC CABLE

1. **Speed of Light Transmission:** Fiber optic cables transmit data using light signals, which travel at the speed of light. This enables incredibly fast data transfer rates, minimizing latency and providing near-instantaneous communication.
2. **High Bandwidth:** Fiber optic cables have a much higher bandwidth capacity compared to traditional copper or coax cables. This means they can carry a larger volume of data simultaneously, making them ideal for activities like streaming, gaming, and large file transfers.
3. **Low Signal Loss:** Fiber optic signals experience minimal loss over long distances due to the internal reflection of light within the cable. This allows for data transmission over much greater distances without the need for reamplification or regeneration.
4. **Latency:** Refers to the time delay between sending data from the source to its destination and receiving a response back. It is the time it takes for data to travel from one point to another in a network. Latency is typically measure in milliseconds (ms) and is often considered as one of the factors that contribute to the overall responsiveness and quality of an internet connection.
5. **Immunity to Interference:** Fiber optics are not susceptible to electromagnetic interference, which can degrade signal quality in copper cables. This immunity ensures consistent and reliable data transmission, even in environments with electromagnetic interference.
6. **Security:** Fiber optic signals are difficult to intercept, making them more secure compared to other cable types. The lack of electromagnetic emissions from fiber cables also makes them harder to tap into without detection.

7. **Futureproofing:** The high bandwidth capacity of fiber optics makes them well-suited for future technology advancements, including emerging applications like virtual reality, augmented reality, and 8K video streaming.
8. **Symmetric Speeds:** Unlike some other internet technologies, fiber optics can offer symmetric upload and download speeds (e.g., 100Mbps/100Mbps), making them ideal for activities that require significant upload bandwidth, such as video conferencing and streaming.
9. **Durability:** Fiber optic cables are less susceptible to environmental factors like temperature changes, moisture, and corrosion. This durability contributes to their long service life and reliability. Fiber optic cables installed in the late 1990s are still used today.

While fiber optics offer numerous advantages, it is important to note that the deployment of fiber networks requires significant infrastructure investment, which can impact availability in certain areas. Despite this, the unparalleled speed, reliability, and potential for future technological advancements make fiber optic cables the benchmark for delivering reliable, high-speed internet connectivity.

Next best technology(ies) compared to fiber:

After fiber optic cables, the most viable technologies encompass wireless and copper infrastructure.

- **5G Wireless:** The rollout of 5G (fifth generation) wireless networks offers significantly higher speeds and lower latency compared to previous generations. While not as fast as fiber optics, 5G can provide ultra-fast speeds, making it a valuable option for areas where laying fiber optic cables is impractical or costly. The challenge with 5G is that it often relies on fiber optic cables to each antenna for backhaul connectivity. Backhaul refers to the network connections that link the 5G cell towers (or antennas) to the core network infrastructure. While 5G offers high bandwidth, it only uses radio waves to communicate to the end device. Its successful deployment and performance rely on fiber optic cables for high bandwidth, low latency data transfers. Additionally, 5G networks use higher-frequency bands, such as millimeter waves to achieve faster speeds and these higher frequencies have shorter wavelengths, which means they have difficulty traveling through obstacles like buildings, trees and even inclement weather. Some 5G deployments even require direct line of sight between, meaning the user's device and the cell tower (or antenna) signal can be disrupted if there is any type of obstruction in the way, which can lead to inconsistent coverage.
- **Fixed Wireless Access (FWA):** FWA utilizes wireless signals to provide internet access to homes and businesses. By using high-frequency radio waves, FWA can achieve speeds comparable to some fiber connections. However, signal strength, weather, distance and line of sight can affect its performance. Where laying traditional fiber optic cable is cost prohibitive, FWA can prove to be a short-term, band aid type of solution for internet service. Fixed Wireless using a licensed spectrum is eligible for BEAD funding.
- **Satellite Internet:** Advances in low Earth orbit (LEO) satellite technology have led to the development of high-speed satellite internet services. These systems use constellations of satellites in low Earth orbit to provide global coverage, offering a viable option for remote or un(der)served areas. Some challenges are cost of entry for the service. The equipment can be expensive along with the installation fees. Satellites are also vulnerable to space interference and at risk of damage from space debris. In 2022, a solar storm destroyed 40 Starlink satellites shortly after their deployment. While satellites are designed to operate in various weather conditions, heavy rain, snow or other adverse weather conditions can degrade signal quality or even lead to a service disruption. Satellite internet service is not defined as a “reliable” technology by the NTIA but could be permitted under the “extremely high cost per location” threshold in the BEAD program. It

is noted that draft guidance by the NTIA states to “prioritize projects designed to provider fiber connectivity directly to the end user.”

- **Gigabit Ethernet Over Coax (DOCSIS 3.1):** For areas with existing cable TV infrastructure, DOCSIS 3.1 technology allows cable providers to deliver gigabit-speed internet over coaxial cables, offering faster speeds than previous cable technologies. This technology is commonly used for cable television. Since DOCSIS3.1 utilizes a shared bandwidth model for the same coax cable segments, it can lead to network congestion during peak usage times. Since there are limitations with long distances, signal degradation can occur the farther an end user is from the network node. Some providers may throttle or limit upload/download speeds even though a plan is purchased for higher upload/download speeds.
- **Hybrid Fiber-Coaxial (HFC) Networks:** Some cable providers are upgrading their networks to utilize a mix of fiber optic and coaxial cables, allowing for higher speeds and improved performance. A typical HFC scenario is where a provider installs fiber optic cable along its backbone from its headend or central office to a section of town. From this termination point in town, coax cables are run to each end user. This allows for greater speeds and capacity to be reached along the backbone, and it is more economical to upgrade a small portion its infrastructure. However, the last mile to the household in most instances remains to be coax.

Technology Decision Matrix Summary

Category	Technology		
	Fiber	Wireless	Satellite (Low Orbit)
Bandwidth	High	Moderate	Low
Realibility	High	Moderate	Low
Scalability	High	Moderate	Low
Meets Federal Funding Requirements (March 2023)	Yes	Only Licensed	No
"Future Proof"	High	Low	Unknown
Coverage Range/Distance	High	Moderate	Moderate
Latency	Low	Moderate	High
Geographic Limitations	Low	Moderate	Low
Opportunities for Partnership	High	Low	Low
Life Expectancy	Fiber: 30 years	Network Equipment: 5-7 Years	Network Equipment: Unknown, technology in infancy
Portability	Low	High	High
Opportunities to add additional Communication / Infrastructure	High	High	Low
Expected Impact of Emerging Technology	Greater demand for fiber	Moderate	Moderate
Initial Infrastructure Cost	High	High	Low

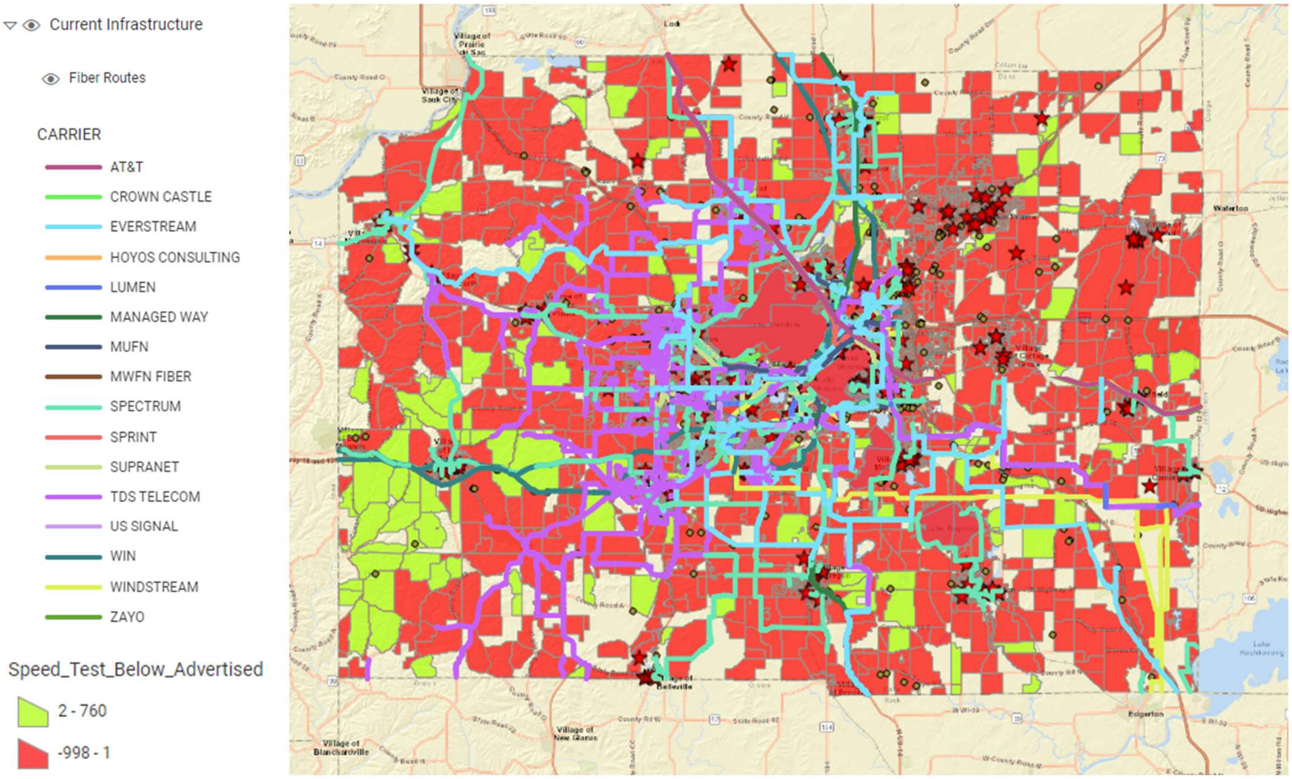
It is important to note that the choice of technology depends on factors such as location, costs, infrastructure availability, grant requirements and local regulations. While these technologies offer increased speeds compared to legacy technologies, none currently match the capacity, reliability, and potential for high-speed fiber optic networks.

Keep in mind, in the context of a FTTH network, it is important to note that there are some factors that can diminish the user experience. The first being oversubscription, which is the practice of provisioning network resources, such as bandwidth, at a level that exceeds the expected peak demand or usage from end users. It is often employed by service providers to balance cost-effectiveness with user experience. For example, a provider is offering services to a neighborhood with 100 households and allocates a total bandwidth of 1Gbps. Through analysis, the provider determines on average only about 30% of households use the internet heavily during peak hours. During peak hours, the expected maximum simultaneous usage across the entire neighborhood is approximately 300Mbps. In this scenario, the provider has oversubscribed the network at a ratio of 3:1. This means they provision only 300Mbps of bandwidth for the neighborhood, even though the total available bandwidth is 1Gbps. When oversubscription is not managed well, end users can experience various impacts to internet service quality such as, slower speeds, buffering and latency, reduced quality in streaming and poor call quality.

Second is a home network chokepoint between the hard-wired network router and the Wifi router. Even though a household may be provisioned for 1Gbps service, if the Wifi router is only capable of carrying traffic at a rate of 100Mbps, the devices connected to this Wifi router will only experience speeds of 100Mbps, not the 1Gbps service that is subscribed for the home. In order to fully experience the 1Gbps service, households would either need to hard wire their devices or upgrade their Wifi router to a speed that is more compatible to the needs of the devices and the end users.

CURRENT ASSESSMENT

Expanding broadband infrastructure requires knowledge of existing networks and identifying where broadband assets are located, including fiber lines, copper infrastructure, conduit, cell towers and associated speed test data. An updated map outlining these existing broadband assets and data will help facilitate coordination among Dane County, service providers, the WBO and local community stakeholders. Creating and maintaining a single-view map of county-wide broadband infrastructure throughout Dane County supports engagement and coordination efforts between the county and private ISPs. This engagement and coordination will assist in identifying, targeting and prioritizing gaps in the existing infrastructure, allowing for project development and advocation to include specific areas of broadband expansion to un(der)served areas. The map below represents the existing service provider's broadband infrastructure (multi-colored lines) that currently provide their data to a subscription database. The "stars" represent CAIs and the "circles" represent cell towers within Dane County. The **red** shaded areas represent sections of cities, towns or villages that currently test below advertised speeds. The **green** shaded areas represent sections of cities, towns or villages that currently test above advertised speeds.

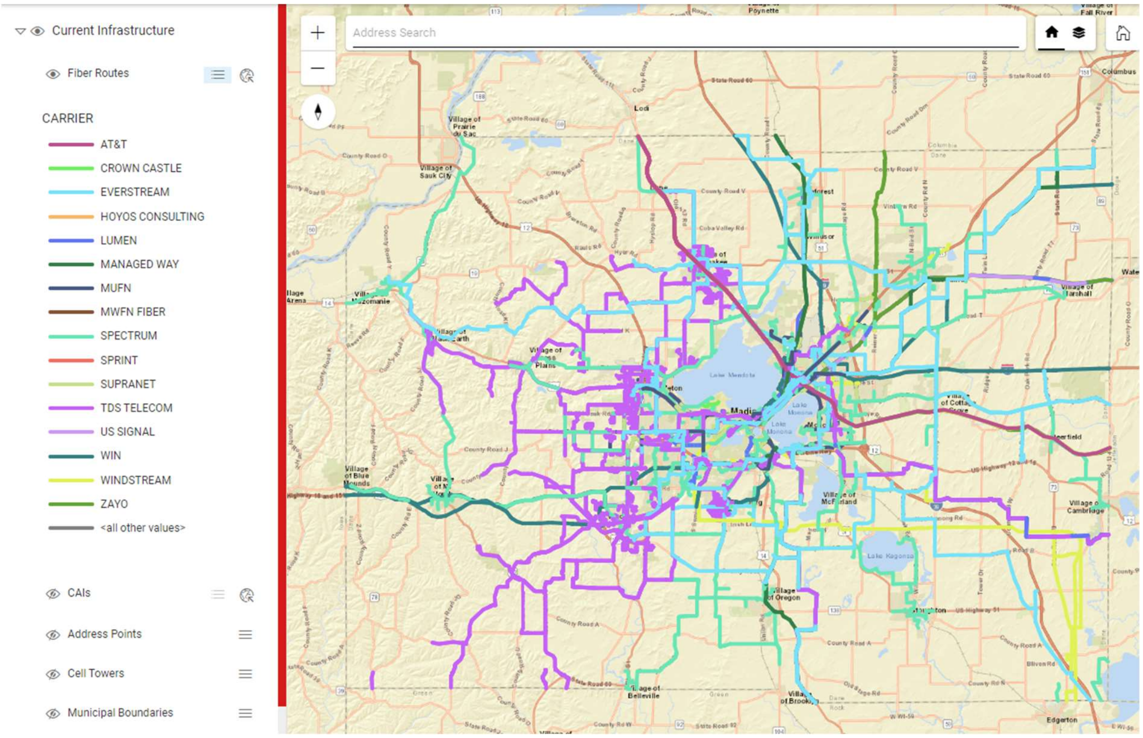

Current Infrastructure
Fiber Routes
CARRIER
AT&T
CROWN CASTLE
EVERSTREAM
HOYOS CONSULTING
LUMEN
MANAGED WAY
MUFN
MWFN FIBER
SPECTRUM
SPRINT
SUPRANET
TDS TELECOM
US SIGNAL
WIN
WINDSTREAM
ZAYO
Speed_Test_Below_Advertised
2 - 760
-998 - 1

Note: This data can be found on Dane County's interactive map portal via PlanEngage that is searchable, in greater resolution and should be maintained continuously.

Existing Network Owners

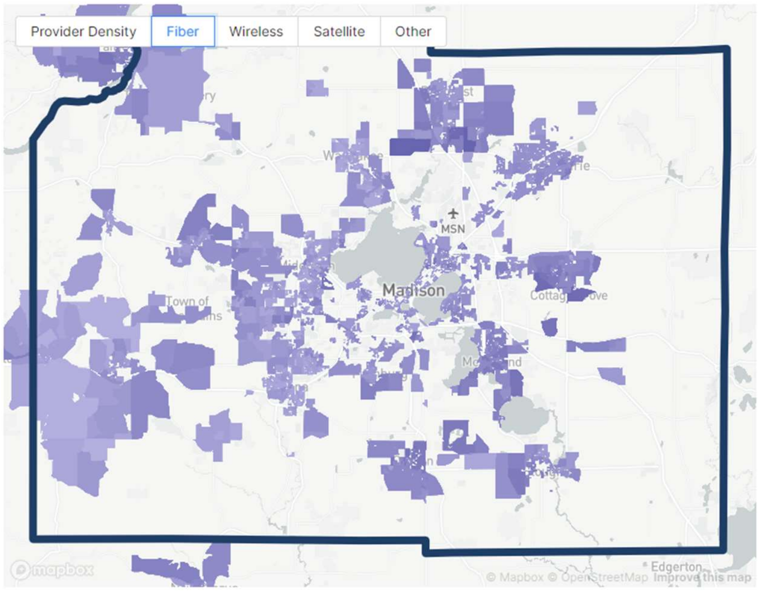
Dane County currently hosts approximately thirty-five internet service providers. This diverse range of offerings encompasses facilities-based providers that leverage both fiber and copper infrastructure (such as Spectrum/Charter Communications, TDS, AT&T, and CenturyLink), Wireless Internet Service Providers (WISPs) like United States Cellular, as well as satellite providers like VSAT Systems. The visual representation below illustrates the various owned terrestrial networks across the county, each denoted by a unique color corresponding to its owner. Notably, Spectrum/Charter and TDS Telecom exhibit the most comprehensive broadband infrastructure presence, surpassing other providers in terms of network footprint. Findings from the UW River Falls survey indicate that these two entities, Spectrum/Charter and TDS Telecom, extend their services to a sizeable portion of responding households, encompassing 56% of the total. The infrastructure coverage of these organizations affords them an amplified reach and market share compared to other providers within Dane County.

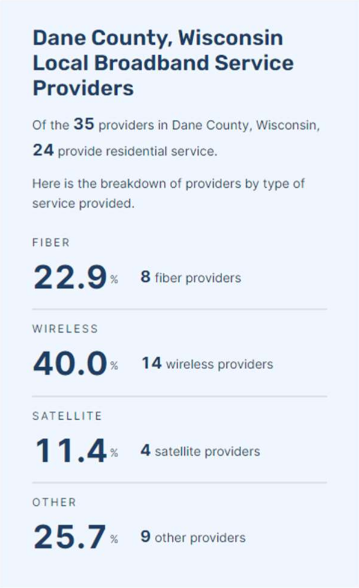
Diagram Below: Existing Broadband Infrastructure Inventory


Current Infrastructure
Fiber Routes
CARRIER
AT&T
CROWN CASTLE
EVERSTREAM
HOYOS CONSULTING
LUMEN
MANAGED WAY
MUFN
MWFN FIBER
SPECTRUM
SPRINT
SUPRANET
TDS TELECOM
US SIGNAL
WIN
WINDSTREAM
ZAYO
<all other values>
CAIs
Address Points
Cell Towers
Municipal Boundaries
Address Search

While there is a varied presence of broadband infrastructure in the county, not all network owners provide residential services to end users. Residential ISPs such as Spectrum/Charter, TDS, Windstream and others deliver directly to households and businesses. Some of the network owners are carrier-based service providers serving only businesses, governments agencies, and CAIs. This would include networks and companies such as Crown Castle, Zayo, etc. While these fiber providers do not sell directly to residential users, they can provide the opportunity for other companies to purchase internet service in bulk and resell it on their networks.

The map below according to broadbandmoney.com, reflects sparse and disconnected fiber infrastructure across Dane County. The highlighted **purple** areas represent a presence in fiber. There are pockets of fiber, but the gaps and disconnects prevail throughout the county.





Dane County, Wisconsin Local Broadband Service Providers

Of the **35** providers in Dane County, Wisconsin, **24** provide residential service.

Here is the breakdown of providers by type of service provided.

FIBER
22.9% **8** fiber providers

WIRELESS
40.0% **14** wireless providers

SATELLITE
11.4% **4** satellite providers

OTHER
25.7% **9** other providers

Please be note that there is a possibility of additional service providers operating within Dane County. These providers might not be mentioned in the provided list or present in publicly accessible data or subscription databases.

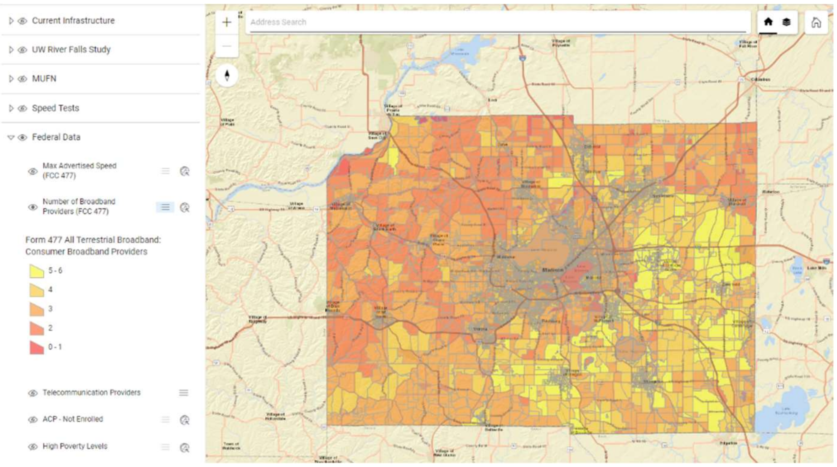
Dane County Broadband Providers:

1. Spectrum/Charter Communications
2. TDS Telecom/Metrocom
3. AT&T Wisconsin
4. CenturyLink
5. Lumen
6. ViaSat
7. UpNetWI
8. Starlink
9. Frontier Communications
10. LiteWire
11. HughesNet
12. Mt Horeb Telephone Company
13. Bug Tussel Wireless
14. Netwurx LLC
15. US Cellular
16. Consolidated Communications
17. Crown Castle Fiber
18. Earthlink Business, LLC
19. GCI Communication Corp.
20. Logix Communications
21. MCI
22. Metropolitan Unified Fiber Network
23. PATEC Business Services
24. US Signal Company
25. Voyant Communications
26. Hoyos Consulting
27. Country Wireless
28. McLeod USA Telecommunications, Inc.
29. Main
30. Four Lakes Broadband
31. Supranet
32. Windstream
33. Wisconsin Independent Telephone (WIN)
34. Zayo
35. Everstream

Number of Broadband Providers

Number of broadband providers leans heavily to the east and central parts of Dane County. The western portion and outer reaches of the county have more limited choices.

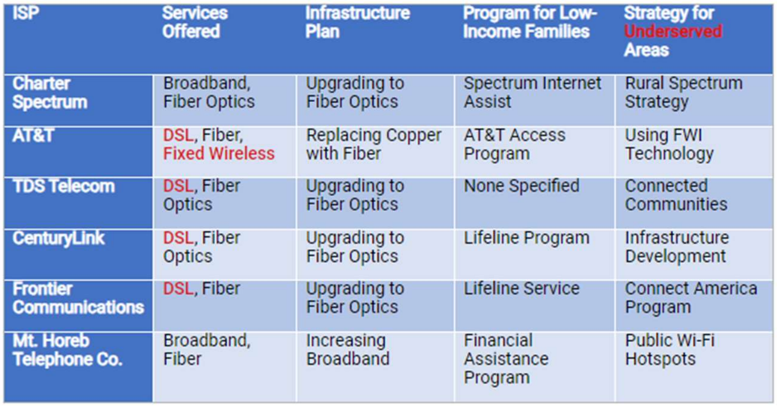
The diagram below shows the quantity of broadband providers across Dane County. Yellow represents 5-6 broadband providers in the area. Dark **orange** represents 0-1 broadband providers in the area.


Current Infrastructure
UW River Falls Study
MUFN
Speed Tests
Federal Data
Max Advertised Speed (FCC 477)
Number of Broadband Providers (FCC 477)
Form 477 All Terrestrial Broadband: Consumer Broadband Providers
5 - 6
4
3
2
0 - 1
Telecommunication Providers
ACP - Not Enrolled
High Poverty Levels
Address Search

The ISPs are aware of the digital divide in Dane County and have proposed various initiatives to tackle this issue, such as implementing strategies to upgrade its aging infrastructure and extend services to underserved areas.

Charter Spectrum is one of the largest ISPs in Dane County, offering services ranging from basic internet plans to high-speed broadband and fiber optics. To solve the issue of aging infrastructure, Charter Spectrum is investing heavily in upgrading its network from traditional coaxial cable to more advanced fiber-optic technology. They also plan to extend fiber lines to more remote areas of Dane County.

Charter Spectrum has established the "Spectrum Internet Assist" program to tackle the digital divide, offering high-speed internet at an affordable rate for low-income families and older adults. Moreover, to reach un(der)served areas, Charter Spectrum has the "Rural Spectrum Strategy", deploying new wireless spectrum technology to provide high-speed broadband to challenging rural areas.



ISP	Services Offered	Infrastructure Plan	Program for Low-Income Families	Strategy for Underserved Areas
Charter Spectrum	Broadband, Fiber Optics	Upgrading to Fiber Optics	Spectrum Internet Assist	Rural Spectrum Strategy
AT&T	DSL, Fiber, Fixed Wireless	Replacing Copper with Fiber	AT&T Access Program	Using FWI Technology
TDS Telecom	DSL, Fiber Optics	Upgrading to Fiber Optics	None Specified	Connected Communities
CenturyLink	DSL, Fiber Optics	Upgrading to Fiber Optics	Lifeline Program	Infrastructure Development
Frontier Communications	DSL, Fiber	Upgrading to Fiber Optics	Lifeline Service	Connect America Program
Mt. Horeb Telephone Co.	Broadband, Fiber	Increasing Broadband	Financial Assistance Program	Public Wi-Fi Hotspots

AT&T is another ISP in Dane County, offering DSL, fiber optics, and fixed wireless internet services. AT&T is taking steps to replace its older copper-based systems with fiber-optic technology, enhancing the quality of internet services and expanding capacity.

AT&T addresses the digital divide through the "AT&T Access Program", providing low-cost internet services to qualifying low-income households. For un(der)served communities, AT&T is using Fixed Wireless Internet (FWI) technology, transmitting a signal from an existing cell tower to a fixed antenna on the customer's home. This approach provides a home internet connection even in remote locations lacking wired infrastructure. By leveraging the resources provided by the FCC's Connect America Fund, AT&T has expanded the coverage of its broadband services to cater to the connectivity requirements of specific underserved areas located in Dane County.

TDS Telecom provides digital subscriber line (DSL) and fiber optic services to Dane County residents, including in urban and some rural areas. TDS Telecom is engaged in a long-term project to replace its aging infrastructure with advanced fiber-optic technology.

TDS has initiated a program called "Connected Communities", investing in infrastructure development in rural and underserved areas. The aim is to increase access to high-speed broadband services. They have also developed public Wi-Fi hotspots to provide internet services to communities that lack home-based internet access.

CenturyLink serves parts of Dane County with DSL and fiber optic services. CenturyLink is focusing on upgrading its infrastructure by converting its DSL-based network to fiber-optics, increasing internet speed and service reliability.

CenturyLink's "Lifeline Program" provides a monthly discount on internet services for eligible low-income customers. Utilizing resources from the FCC's Connect America Fund, CenturyLink has extended the reach of its broadband services to address the connectivity needs of certain underserved regions within Dane County. Their "Price for Life" program offers affordable, high-speed internet services with a price that will not change if the customer keeps their plan.

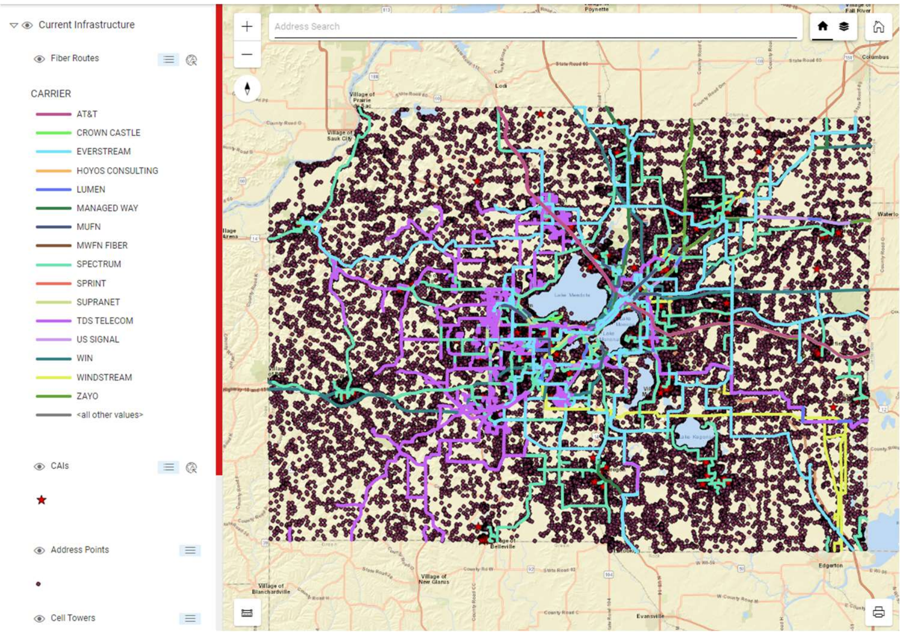
Frontier Communications provides DSL services to parts of Dane County, with an emphasis on rural areas. Frontier has been implementing a plan to modernize their existing DSL infrastructure by investing in fiber-optic networks.

Frontier's "Connect America" program has made steps towards resolving the digital divide. Frontier has used funds from the FCC’s Connect America Fund to build out broadband services to some underserved areas in Dane County. They also provide a "Lifeline" service, a federal assistance program that makes communication services more affordable for low-income customers.

In an attempt to bridge the digital divide, Mt. Horeb Telephone Company has been proactive in developing a comprehensive strategy. This includes increasing its investment in broadband infrastructure to underserved areas, offering affordable high-speed internet packages, and partnering with local schools and community centers to create public Wi-Fi hotspots. They are also running digital literacy programs aimed at educating communities on the benefits and usage of internet technology. Furthermore, they have established a financial assistance program for lower-income households to ensure they can afford reliable internet service.

The fiber map below represents the existing broadband infrastructure, CAI’s, cell towers, and all address points within the county. As can be seen in the map below, when the address points are viewed with the existing fiber networks the most apparent issue is the lack of dense and diverse infrastructure in the outer reaches of Dane County. Deploying and maintaining broadband networks can be costly and ISP’s weigh build costs against their return on investment (ROI), e.g., how many homes per mile can be passed and/or served and at what monthly recurring fee. It is often less expensive to utilize existing, inferior legacy network infrastructure, such as copper, to provide service, than to overbuild an entire network with a new fiber optic cable. It can be viewed as not being cost effective for a provider to build fiber into rural areas where the population density lacks the sufficient business case to support long stretches of middle mile builds with a low density of homes or businesses along the route(s). The result is less fiber available to the overall population, perpetuating the lack of connectivity issues to un(der)served areas of Dane County’s communities.

Existing Inventory Routes and All Dane County Address Points:

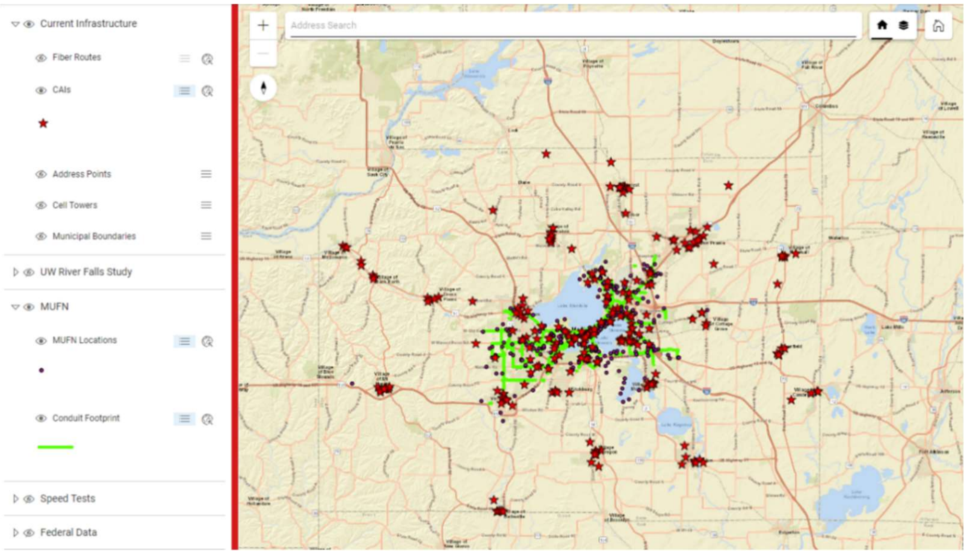


MUFN

The diagram below provides a view of an existing, middle mile metro network known as the Metropolitan Unified Fiber Network (MUFN) that serves the Madison, Middleton, and Monona areas. The network was built with a National Telecommunications and Information Administration (NTIA) grant through the Broadband Technologies Opportunities Program (BTOP) grant under the American Recovery and Reinvestment Act of 2009 (ARRA). MUFN is the single non-profit, cooperatively owned fiber network operating in Dane County today. The MUFN conduit and broadband assets are owned and maintained by two entities, the City of Madison and UW-Madison. MUFN's network is a consortium of 19 Madison area entities consisting of local units of government, CAIs and two commercial partners commercial partners. The current MUFN affiliates are City of Madison, City of Middleton, City of Monona, Dane County, DaneNet, Madison College, Madison Metropolitan School District, Middleton-Cross Plains School District, Monona Grove School District, South Central Library System, SupraNet Communications, UnityPoint Health – Meriter, University of Wisconsin – Madison, UW Health, WiscNet, Wisconsin Department of Public Instruction, Wisconsin Geological and Natural History Survey, Wisconsin Independent Network and Wisconsin State Lab of Hygiene. MUFN does own and operate its own network over the backbone, and MUFN is not a broadband provider. The consortium works directly with non-profits and commercial clients. Non-profit organizations can join MUFN as a member or work with either of the two commercial entities to determine how the network can be best utilized for their needs. Agreements to use the MUFN fiber are written as Memorandum's of Understanding (MOUs) between the organizations. MOUs are agreements between parties defining the mutually agreed upon nature and terms of the party's relationship. Organizations who are for-profit can work directly with MUFN's commercial partners to determine what they can do to support the for-profit entity. **MUFN's network serves all members with services or fiber that can be used for public and private networks.** Connections to the MUFN fiber network can be accomplished by MUFN's extending into an end user location or the affiliate building to connect to the existing fiber. The fiber network currently connects many of the community anchor institutions (CAIs) in its footprint. CAIs are defined as schools, libraries, medical and healthcare providers, community colleges and other institutions of higher education, and other community support organizations and entities such as police and fire stations. **MUFN also connects to commercial and residential locations for broadband services that are delivered by the**

commercial partners. MUFN is currently not interested in extending broadband beyond Dane County but has expressed interest supporting high-speed, affordable broadband throughout the county.

The diagram below shows MUFNs infrastructure footprint in green and CAIs (stars) from across Dane County:



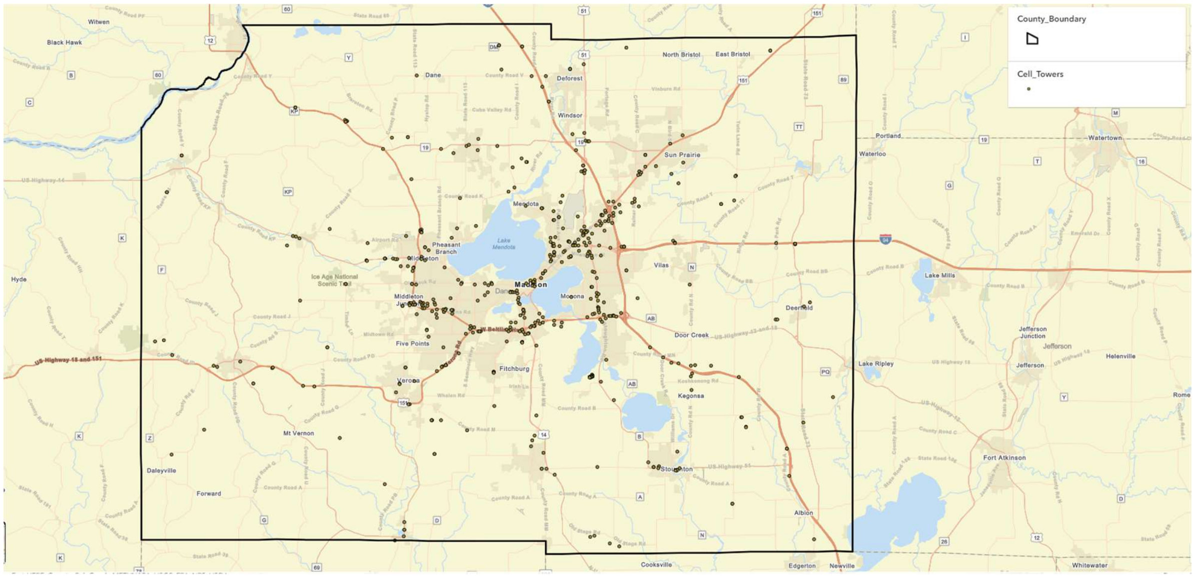
Wireless Broadband

Wireless broadband delivery stands as an alternative approach for provisioning broadband services. According to the UW River Falls Survey, approximately 18% of survey participants utilize various forms of wireless broadband internet access. Among these, fixed wireless access constitutes 7% of wireless broadband users. The concept of fixed wireless technology revolves around transmitting internet signals from a fixed point located miles away to a fixed point within a home, often involving devices like antennas or modems in static positions. In contrast, cellular internet, another wireless broadband variant, employs air-transmitted signals; however, the key distinction lies in the receiving devices. Cellular service emanates signals from fixed points (such as towers), while the receiving devices, such as cell phones or hotspots, remain mobile. UW River Falls survey findings reveal that 6% of participating households employ cellular or hotspot internet access for their broadband needs, while the remaining 5% rely on satellite services, such as Starlink for their broadband connections.

Comparatively, wireless broadband deployment offers certain advantages over fiber optic networks. Notably, wireless applications can be deployed rapidly, whereas fiber network deployment is typically time-consuming. Additionally, wireless deployment incurs lower material and equipment costs in contrast to fiber optic. These benefits can make wireless deployment appealing in more rural areas where fiber networks are absent and can also provide a short-term fix while waiting on longer term solutions, such as wired broadband infrastructure.

The existing cell tower infrastructure in Dane County serves as common fixed points for generating wireless broadband signals. While the urban areas have densely placed cell towers, the rural areas tower density it relatively sparse.

The diagram below depicts cell tower locations (dots) throughout Dane County:

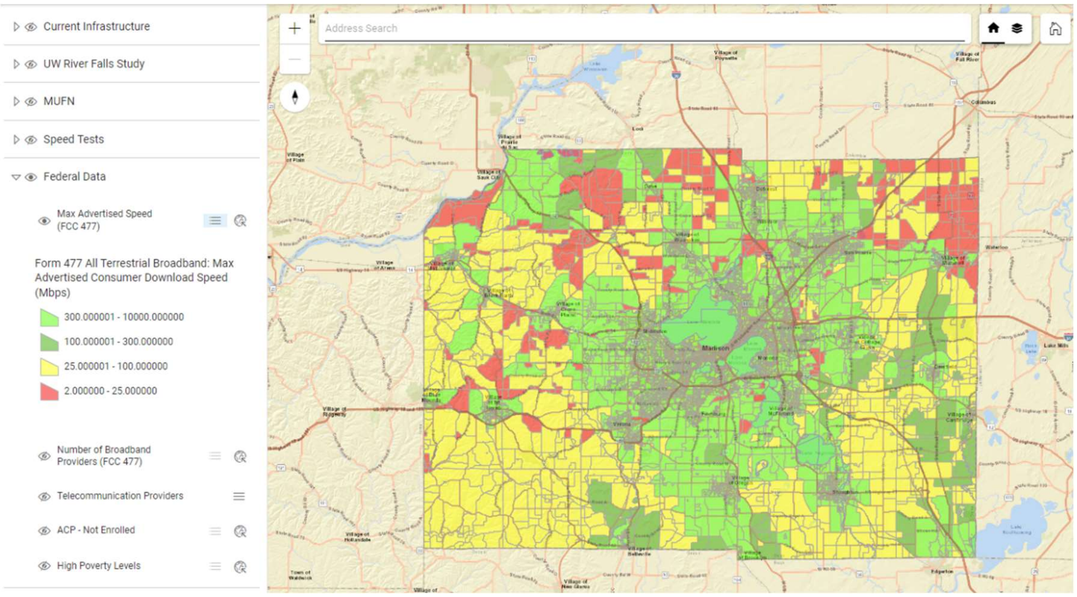

County_Boundary
Cell_Towers
Witwen
Black Hawk
Dane
Deforest
North Bristol
East Bristol
Windsor
Portland
Waterloo
Watertown
Sun Prairie
Mendota
Pheasant Branch
Middleton
Lake Mendota
Ice Age National Scenic Trail
Madison
Monona
Vilas
Lake Mills
Hyde
Deerfield
Door Creek
Jefferson Junction
Jefferson
Helenville
Five Points
Fitchburg
Verona
Lake Ripley
Kegonsa
Rome
Mt Vernon
Fort Atkinson
Daleyville
Stoughton
Forward
Albion
Cooksville
Edgerton
Newville
Whitewater

Broadband Service Max Advertised Download Speeds

This assessment also evaluated the internet quality experienced by current service subscribers. Outside the greater Madison area, a significant portion of residents fall within the un(der)served categories as per FCC guidelines. According to these guidelines, underserved broadband users have download speeds below 100Mbps and upload speeds below 20Mbps, while unserved users experience average download speeds below 25Mbps and upload speeds below 3Mbps. Generally, and in reality, neither classification aligns with reliable, high-speed broadband service. The demand for dependable high-speed broadband has been increasing over the years, and this necessity became acutely evident during the pandemic. The need persists even post-pandemic as the world increasingly relies on automated and application-driven services, remote education options, telecommuting, and telehealth services.

The UW survey delved into respondents' primary internet usage patterns. Entertainment, particularly streaming services, emerged as the most prevalent usage, with 71% of respondents frequently engaging in entertainment-related activities online. Following this, telecommuting for work (48% of respondents) and using the internet as the primary source for medical information or services (41%) were the next most popular household uses. Remote education also accounted for a substantial portion (32%) of respondents' frequent internet activities. Respondents were also questioned about how improved internet would impact aspects of their lives related to business, telecommuting, and agricultural ventures. While most respondents (74%) expressed uncertainty or reluctance to initiate, relocate, or expand a business, 26% indicated being somewhat likely or very likely to take such steps with improved internet. Enhanced internet access would also have a notable impact on telecommuting possibilities, with 46% of respondents seeing this potential, and 32% expressed strong likelihood in considering telecommuting. In the agricultural sector, internet was regarded as valuable (32%) or very valuable (38%). Collectively, these responses underscore the imperative of improved internet access across all facets of life for Dane County residents. This improved access could open employment opportunities, elevate quality of life, and exert economic influence through business growth, modernized agricultural practices, and increased efficiency in production.

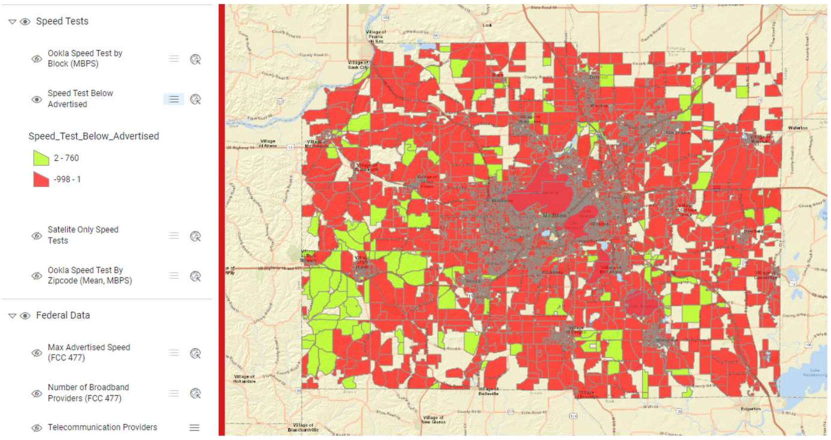
The diagram below shows the Max Advertised Speed Test (download speeds per FCC Form 477) for Dane County. Red, on the low end, reflects max advertised speeds between 2-25Mbps, while on the high end, light green, reflects 300Mbps-1Gbps speeds.


Current Infrastructure
UW River Falls Study
MUFN
Speed Tests
Federal Data
Max Advertised Speed (FCC 477)
Form 477 All Terrestrial Broadband: Max Advertised Consumer Download Speed (Mbps)
300.000001 - 10000.000000
100.000001 - 300.000000
25.000001 - 100.000000
2.000000 - 25.000000
Number of Broadband Providers (FCC 477)
Telecommunication Providers
ACP - Not Enrolled
High Poverty Levels
Address Search
Madison

Ookla Average Max Download Speeds vs. Max Advertised

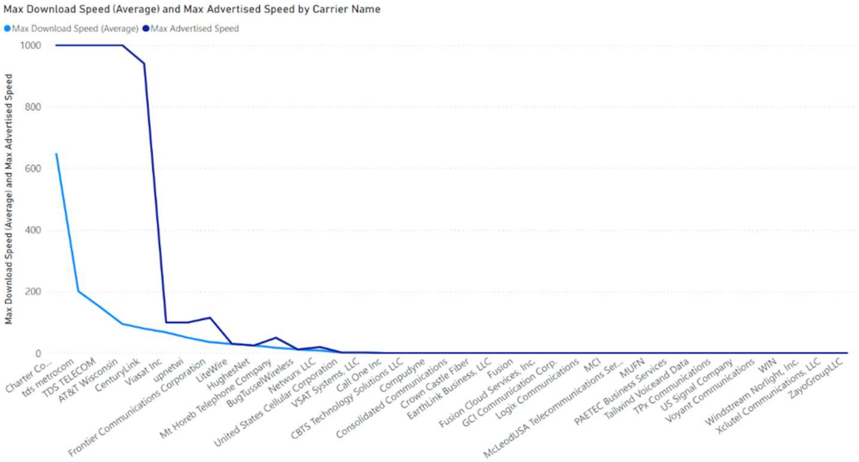
Ookla is the world's largest network performance dataset with precise geo-location on billions of tests. Drawn from billions of Speedtest® results (www.speedtest.net), Ookla's fixed broadband performance dataset provides governments, regulators, ISPs and mobile operators with insights about the state of fixed networks and broadband accessibility. When running a test, Ookla measures download/upload speeds, latency and identifies which provider you are using and can also discern the type of connection.

In contrast to the above diagram, the below map is a view of Ookla speed test results showing that actual speed tests throughout Dane County come in below advertised maximums. **Bright green** indicates speed test results within advertised speeds and **red** indicates speed test results that are below advertised speeds. When compared to the map showing the maximum advertised speeds, most of the county is receiving much lower speed than currently advertised.


Speed Tests
Ookla Speed Test by Block (MBPS)
Speed Test Below Advertised
Speed_Test_Below_Advertised
2 - 760
-998 - 1
Satelite Only Speed Tests
Ookla Speed Test By Zipcode (Mean, MBPS)
Federal Data
Max Advertised Speed (FCC 477)
Number of Broadband Providers (FCC 477)
Telecommunication Providers

UW River Falls study also queried respondents about their download and upload speeds. Download speeds were broken into six different categories. The highest download speed category was 100.1Mbps or faster which is above the download speed threshold for classifying service as underserved. 30% of the polled respondents stated their broadband download speeds fell into this category. The remaining five categories for download speeds, with response percentages, were 100Mbps-20.1Mbps (31%), 20Mbps-10.1Mbps (12%), 10Mbps-5.1Mbps (10%), 5Mbps-1.1Mbps (12%), Under 1Mbps (6%). The responses show that 70% of the respondents' download speed is at or below the underserved threshold and of the 70% that are underserved, approximately 18% are considered unserved. Upload speeds were also collected as part of the study and show similar results. The study broke the upload speeds into six categories as well. The two categories that were above the underserved threshold were 100.1Mbps or faster and 100Mbps-20.1Mbps. Responses showed that 10% of the people have upload speeds at or greater than 100.1Mbps and 11% fell into the 100Mbps- 20.1Mbps range. The remaining four upload speed categories, and their associated percentages, were 20Mbps10.1Mbps (20%), 10Mbps-5.1Mbps (19%), 5Mbps-1.1Mbps (21%), and Under 1 (19%). Upload speeds show similar results with the majority of the respondents (79%) at or below the upload speed threshold for underserved and approximately 40% would fall into the unserved classification.

Broadband Satisfaction



Broadband user satisfaction correlates directly to the quality of the service an end user is receiving. Customers pay for their connections and expect to receive the corresponding service levels. The quality of the connection is also important for the subscribers' intended broadband use. Connections that are too slow, intermittent, unreliable or unavailable cannot service the higher bandwidth needs to transmit data to engage in more popular activities like streaming services, gaming and on-line applications for telecommuting, remote learning, or remote healthcare. Responses to the UW River Falls survey show that only 19% of those reporting are very satisfied. The remaining 81% fall into four categories of somewhat satisfied (30%), neutral (17%), somewhat dissatisfied (19%) and very dissatisfied (15%). 51% of the respondents are not satisfied with their service.

Respondents who are dissatisfied with their service fell into four main categories. The highest percentage of responses (39%) said the services are too expensive. This also correlated with another part of the survey where 34% of the responses state they had no internet at home currently because it is too expensive. The remaining 61% of respondents were not satisfied with their service because it was too slow (32%), unreliable (27%), or they received poor customer service (11%). The data shows that 89% of the respondents are dissatisfied because of poor quality.

Dane County Broadband Providers Service Offerings

Name	Technology	Advertised Download Speed	Monthly Subscription	Notes
AT&T Wisconsin	DSL/Fiber	Up to 1Gbps	$55 - $80	Introductory Pricing
Bug Tussel Wireless	Fixed WirelessUp to 50 Mbps$40 - $150	Fixed WirelessUp to 50 Mbps$40 - $150	Fixed WirelessUp to 50 Mbps$40 - $150	
CenturyLink	Fiber	No Public Information*	No Public Information*	
Consolided Communications	FiberNo Public Information*No Public Information*ISP in other	FiberNo Public Information*No Public Information*ISP in other	FiberNo Public Information*No Public Information*ISP in other	
Country Wireless	Fiber/Fixed Wireless	Up to 1 Gbps	$60 - $125	
Crown Castle Fiber	Fiber	No Public Information*	No Public Information*	
Earthlink Business, LLC	Fixed Wireless	No Public Information*	No Public Information*	
Everstream	Fiber	No Public Information*	No Public Information*	
Four Lakes Broadband	Fixed Wireless	Up to 100 Mbps	Starting at $70	
Frontier Communications	DSL	10 - 115 Mbps	No Public Information*	
GCI Communication Corp	Fiber	No Public Information*	No Public Information*	Alaska ISP - Unsure of the Presence
Hoyos Consulting	Fiber	No Public Information*	No Public Information*	
HughesNet	Satellite	Up to 25 Mbps	$50 - $150	
LiteWire	P2P?	Unadvertised	$35 - $150	
T-Mobile 5G Home Internet	Fixed Wireless	33 - 245 Mbps	$50	
Logix Communications	Fiber	No Public Information*	No Public Information*	Business Internet Provider
Lumen	Fiber	No Public Information*	No Public Information*	
Main				
MCI	Fiber	No Public Information*	No Public Information*	Verizon Owned - Long Haul
Metropolitan Unified Fiber Network	Fiber	No Public Information*	No Public Information*	
Mt Horeb Telephone Company	DSL/Fiber	Up to 2Gbps	$60 - $150	
Netwurx LLC	Fixed Wireless	Up to 100 Mbps	$63 - $150	
PATEC Business Services	Fiber	No Public Information*	No Public Information*	Business Internet Provider
Spectrum/Charter Communications	Cable/Fiber	Up to 1Gbps	$50 - $130	
Starlink	Satellite	Up to 220 Mbps	$120 - $250	
Supranet	Fiber	No Public Information*	No Public Information*	Business Internet Provider
TDS Telecom/Metrocom	DSL/Fiber	Up to 2Gbps	$40 - $150	
UpNetWI	Fixed Wireless/Fiber	10 Mbps - 1 Gbps	$67 - $152	Limited Availbility and Speed
US Cellular	Fixed Wireless	Up to 300 Mbps	$30 - $50	Limited Availbility and Speed
US Signal Company	Fiber	No Public Information*	No Public Information*	Business Internet Provider
ViaSat	Satellite	Up to 30 Mbps	$70 - $150	
Voyant Communications	Fiber	No Public Information*	No Public Information*	Business Internet Provider
Windstream/McLeod USA Telecommunications Services, Inc	DSL/Fiber	Up to 8 Gbps	$40 - $250	Limited Availability in Dane County
Wisconsin Independent Telephone (WIN)	Fiber	No Public Information*	No Public Information*	Business Internet Provider
Zayo	Fiber	No Public Information*	No Public Information*	Business Internet Provider

Affordable Connectivity Program (ACP)

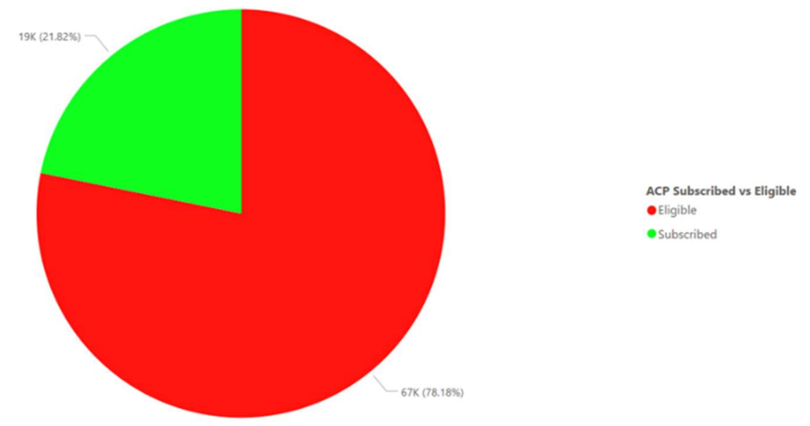


Diagram 8: ACP Eligible Households vs. Subscribed Households

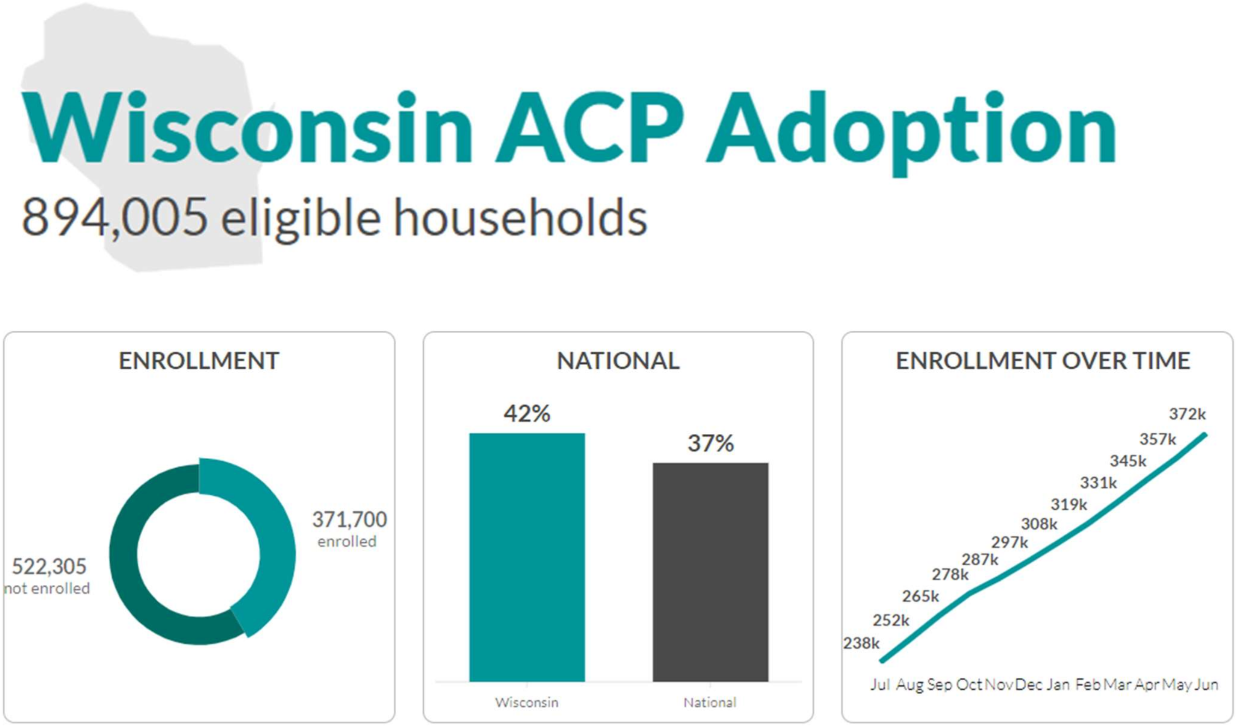
Dane County population in 2020 was 542,459 residents. The poverty rate was 11% which puts 59,670 people at or below the poverty line. The Affordable Connectivity Program (ACP) is a federally funded program that aims to provide affordable, high-speed internet to low-income households. The current ACP provides a discount of up to $30.00 per month for eligible households and up to $75.00 per month for Tribal lands. Eligible households are also able to receive a one-time discount of up to $100.00 to purchase a laptop, desktop computer, or tablet from a participating provider. There are approximately 67,000 Dane County residents who are eligible to participate in ACP, but only approximately 21,688 of the eligible households are enrolled. This shows that 78.2% of the eligible households are not enrolled in the program, see below. With a discount of $130.00 per household (includes the $100.00 purchase discount), and only 21.8% of those eligible participating, the amount of federal funding not being used by eligible households is approximately $8,710,000.00. Lack of ACP participation in the program can be attributed to residents not knowing about the program or not knowing how to apply. The FCC recognizes the need to bring awareness to the program and opened an Affordable Connectivity Outreach Grant program on November 10, 2022. The purpose of the grant program is to facilitate the promotion of the ACP and increase awareness and participation in the ACP. There is a total of $70,000,000.00 available for this program and it is split across two different grants. The National Competitive Outreach Program (NCOP) is allocated $60,000,000.00. Of the $60,000,000.00, $27,000,000.00 will be reserved for each state to receive a minimum of $500,000.00 for ACP outreach initiatives. The Tribal Community Outreach Program (TCOP) receives the remaining $10,000,000.00 to be used for ACP outreach activities specific to tribal communities.

In early 2023, the Dane County Planning and Development department applied for the FCC Affordable Connectivity Program (ACP) Outreach Grant in an effort to increase the awareness of this program. Dane County was subsequently awarded a grant for $86,500 to do this work. The outreach will include a multi-pronged outreach effort including holding sign-up events in the rural areas of the county, working with Spanish and Hmong community organizations to reach non-English speakers, and utilizing the existing service infrastructure that Dane County already has in place to increase sign-up and awareness.

As a trusted facilitator, Dane County already plays a role in every resident's life by providing a wide variety of services to support and improve people's lives. The ACP Outreach Grant funds will provide another opportunity to support residents in the community.

EducationSuperHighway functions as a nationwide nonprofit organization dedicated to addressing the digital divide for around 18 million households that possess Internet accessibility but face affordability barriers. The organization's primary emphasis lies in the most disconnected communities across the United States, where over 25% of the population lacks Internet connectivity.

According to EducationSuperhighway's data, Wisconsin currently boasts an ACP enrollment rate of 42%, while as of January 2023, Dane County's enrollment stands at 37%.



Broadband Listening Sessions

The Broadband Listening Sessions, a platform for dialogue with local leaders, emphasized the power of open discussion in understanding, capturing and ideating on ways to address broadband issues. Its success advocated for the continuation of such exchanges and facilitated a dynamic discourse to generate solution-oriented discussions. Much of the local, community feedback was produced during the Broadband Listing Sessions, a practice that will continue on a regular and frequent interval throughout the funding cycle of state and federal grant programs. The Towns listed below are several examples of the in person and virtual engagement sessions that took place over the course of the project.

During the Assessment project, community engagement took place across various towns in Dane County by way of town hall meetings and broadband listening sessions. The local engagement efforts were held with community leaders and citizens, which captured and highlighted the varying levels of satisfaction, challenges, feedback and ambitions related to improved broadband connectivity and affordability. It provided key elements for the recommendations within this report regarding specific areas of focus for future broadband development projects, targeted areas of expansion for private service providers and the reality of broadband gaps in these communities.

In October of 2021, a representative of the **Town of Vermont**, John Hallick, presented to the Broadband Task Force on the town's independent efforts to promote and expand broadband within their jurisdiction. The town established an Internet Task Force and extensively researched broadband and explored available funding opportunities. Typical of other rural towns in Dane County, the primary issue was the distance between homes, businesses, and available service corridors and the economic cost/benefit to the service provider to extend service. The town initiated a dialogue with the ISPs, created and distributed a hardcopy survey to all its residents, and additionally received between 600 and 800 resident letters and petitions calling out the need for broadband service in the town. This information was used to approach the Governor's Office and successfully secure funding through the Wisconsin Public Service Commission (PSC) and the FCC to expand broadband availability in the town. The approval process took approximately nine (9) months, and the construction phase took upwards of an additional year. Service stemmed from a hub in the Village of Black Earth and extended out to an additional 7 to 8 primary locations in the Town of Vermont.

In Stoughton, the city is undertaking an ambitious plan to bolster its broadband infrastructure by incorporating fiber optic cables across every street. The scale of this endeavor points towards a substantial commitment and awareness to improving connectivity for all residents. This initiative, if successful, may position Stoughton as a leader in the county's broadband landscape, and aligns with the city's Smart City initiative.

In the Town of Berry, Mike Theis is leveraging his expertise in telecommunications grant writing to address connectivity issues by helping craft and evaluate grant language. His efforts underscore the importance of strategic collaborations and the potential impact of grant funding in addressing such infrastructural challenges. The lack of clarity about the collective status of grant applications throughout Dane County necessitates ongoing communication with the local communities to bring forth seamless and coordinated execution and transparency.

In contrast, the **Town of Perry's** broadband infrastructure can be classified as typical for a smaller town, with aging legacy equipment serving the town hall. This illustrates a picture of significant infrastructure challenges that require immediate attention and partnership with either Dane County or private service providers to update or upgrade their connectivity infrastructure.

Town of Perry Town Hall

The **Town of Westport and Town of Oregon** highlight the importance of nuanced understandings of local broadband needs. Despite the perception that most of Westport is adequately served, there are still numerous pockets of the community that are not receiving sufficient service. Similarly, Oregon has specific regions underserved by existing broadband services. These cases underscore the importance of more granular assessments needing to be performed to identify areas in need and allocate resources effectively.

Lastly, the **Town of Rutland** presents an example of dissatisfaction with a service provider, illustrating the importance of holding service providers accountable and the necessity of ongoing negotiations to bridge digital gaps. It emphasizes the importance of transparency, consistency, and accountability from service providers and more importantly the role of the County to partner with local communities to bring forth real change in the broadband landscape.

Overall, the local coordination efforts paint a varied and diverse picture of the current state of broadband infrastructure across various towns in Dane County, each with their unique and locally specific needs, challenges, and potential solutions. The local community engagement highlights the need for standing up the Working Group. Because no one solution will fix it all and highlighting the importance of Dane County to play the leading role in organizing, facilitating and coalescing the towns and villages, the county can solidify shared goals, empower cities, towns and villages to work together and create a consistent expectation of broadband access and affordability across the entire footprint of the County. It also serves as a reminder of the need for Dane County to orchestrate the broadband expansion efforts by adding in private service providers to the conversation and perform a deeper dive analysis to enable future discussions in improving the state of broadband connectivity across these communities.

GAP ASSESSMENT

The gap assessment, particularly includes a county-by-county comparison, un(der)served gaps, key findings, top 5 most un(der)served locations, fewest remaining locations, and an overview of existing broadband providers, accomplishes several important objectives:

1. **Identifying Disparities**: The assessment reveals disparities in broadband access and availability between counties that border Dane County, shedding light on how Dane County stands in the region.
2. **Priority Locations**: It identifies the specific municipalities within the county that have the most un(der)served locations remaining allowing for targeted interventions.
3. **Key Insights**: The gap assessment provides key findings and insights into the state of broadband connectivity, helping the Taskforce and other stakeholders understand the extent of the problem and its implications.
4. **Quick Wins Candidate**: It identifies the fewest remaining locations without adequate broadband access, enabling the Taskforce to measure and quantify the success of what a Quick Win may look like.
5. **Competition and Landscape**: The assessment offers an overview of the existing broadband providers and their coverage areas, enabling the county to understand the competitive landscape and potential areas for collaboration or expansion.

Overall, a comprehensive broadband gap assessment serves as a valuable tool for data informed decision-making, resource allocation, and strategic planning to expand broadband in un(der)served areas.

The purpose of the gap assessment is to explore the current estimates of un(der)served locations in Dane County, how Dane County compares to surrounding counties and provide key insights in areas that standout as most in need.

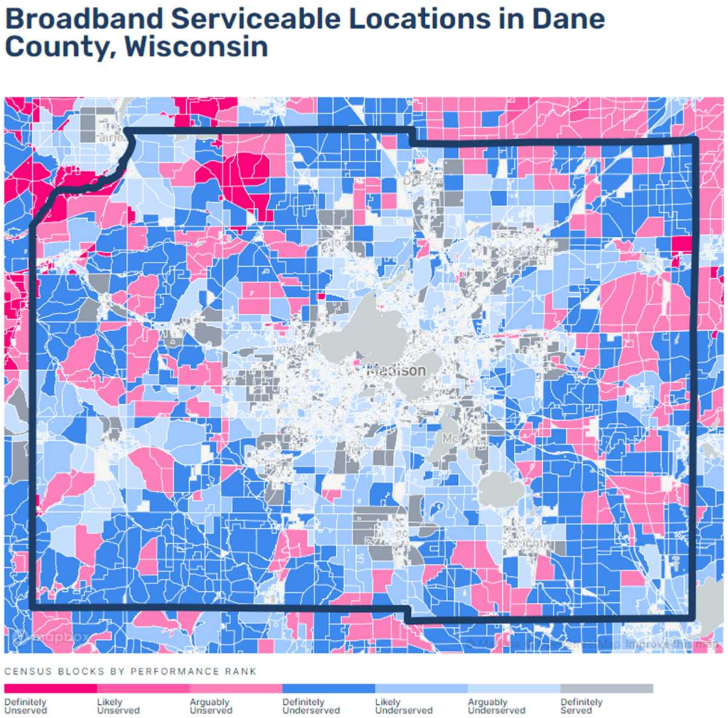
Dane County Un(der)served Comparison

Broadband.money stands as a specialized software platform dedicated to broadband data. Currently, it serves over 800 grant applicants across all fifty states and four territories, facilitating grant applications totaling more than $22 billion. This platform finds utility among various entities, including broadband providers, communities, electric cooperatives, tribal nations, broadband investors, grant writers, and state councils.

The Speed Rank is defined below:

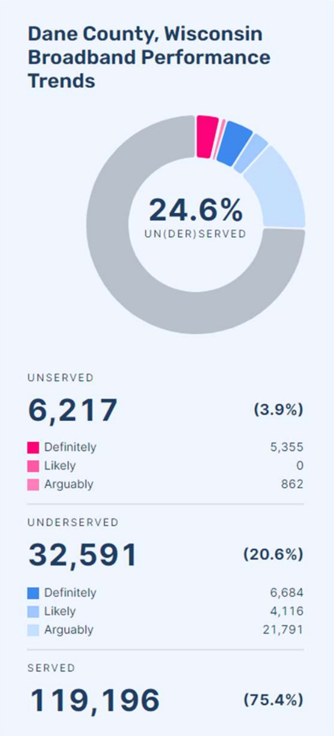
1. Un(der)served is defined by the FCC advertised speeds according the FCC broadband map.
2. “Likely” analyzes the FCC data and if it does not show <25/3Mbps, the analysis then reviews data from M-Lab <25/3Mbps and Ookla <25/3Mbps, if M-Lab and Ookla datasets both show <25/3Mbps, then the locations are noted as “Likely” un(der)served.
3. “Arguably” analyzes the FCC data and if it does not show <25/3Mbps, the analysis then reviews data from M-Lab first, if M-Lab does not show <25/3Mbp, then reviews Ookla data to identify if it is <25/3Mbps, if so it is deemed “Arguably” un(der)served.

According to broadband.money, Dane County is sitting at approximately 7.6% un(der)served. In a best-case scenario, Dane County is arguably un(der)served at a rate of 24.6%.



Broadband Serviceable Locations in Dane County, Wisconsin

Madison
mapbox
Improve this map
CENSUS BLOCKS BY PERFORMANCE RANK
Definitely Unserved
Likely Unserved
Arguably Unserved
Definitely Underserved
Likely Underserved
Arguably Underserved
Definitely Served



Dane County, Wisconsin Broadband Performance Trends

UNSERVED

6,217 (3.9%)

🟥 Definitely	5,355
🟥 Likely	0
🟥 Arguably	862

UNDERSERVED

32,591 (20.6%)

🟦 Definitely	6,684
🟦 Likely	4,116
🟦 Arguably	21,791

SERVED

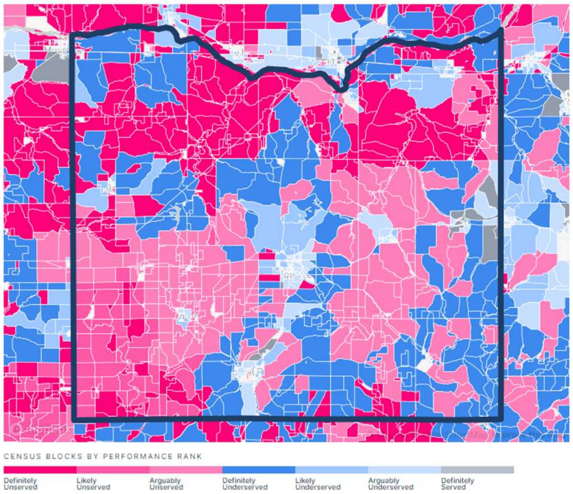
119,196 (75.4%)

Based on the FCC definition and according to the FCC broadband map as of July 31, 2023, there are approximately a total of 11,048 un(der)served locations throughout Dane County. Most of the un(der)served locations reside outside the city limits of Madison.

How does Dane County Compare to Others?

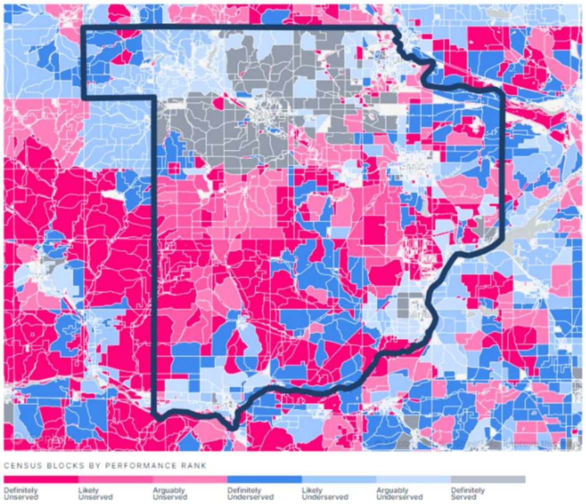
According to broadband.money, here's how Dane County compares to the immediate surrounding counties in terms of un(der)served locations. Out of eight counties, Dane County and the surrounding seven counties below, Dane County ranks #1 out of 8 for total un(der)served locations. Compared to the surrounding counties, Dane County has approximately 1.5 - 2.5 times more un(der)served locations than the surrounding seven counties. Even though Iowa County is considered 45% un(der)served, its total locations are approximately 50% less un(der)served locations than Dane County. What does this mean for Dane County, Dane County may need to combat the perception that it may be adequately served, even though it's percentage of un(der)served may be on the lower side, it's sum total of un(der)served locations are on average 2 times more than the surrounding seven counties.

Iowa County: 45% un(der)served


CENSUS BLOCKS BY PERFORMANCE RANK
Definitely Unserved
Likely Unserved
Arguably Unserved
Definitely Underserved
Likely Underserved
Arguably Underserved
Definitely Served

5,474 un(der)served locations

Sauk County: 15.6% un(der)served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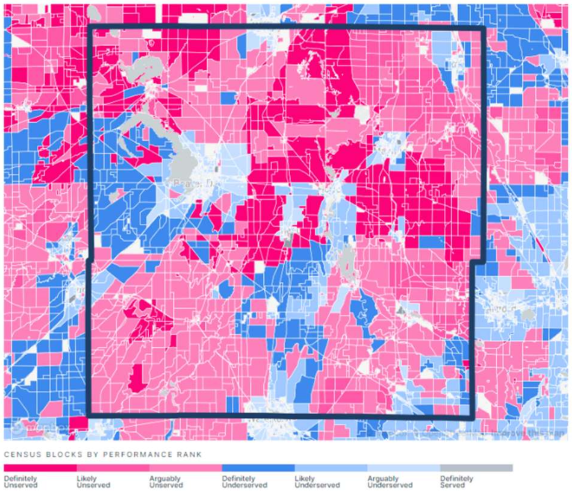
Definitely Unserved
Likely Unserved
Arguably Unserved
Definitely Underserved
Likely Underserved
Arguably Underserved
Definitely Served

4,674 un(der)served locations

Dodge County: 22.6% un(der)served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Definitely Unserved
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Arguably Unserved
Definitely Underserved
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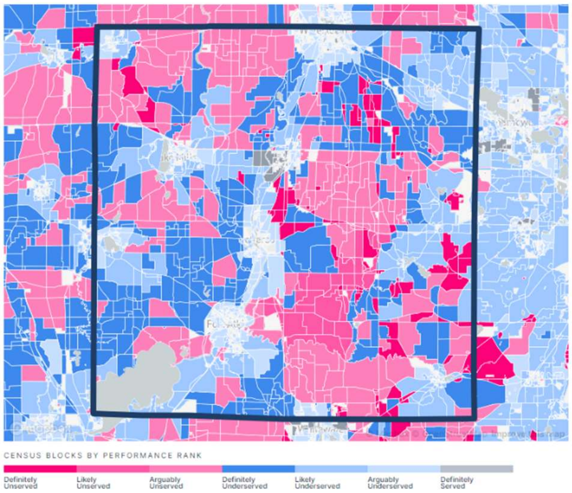
Arguably Underserved
Definitely Served

Jefferson County: 23% un(der)served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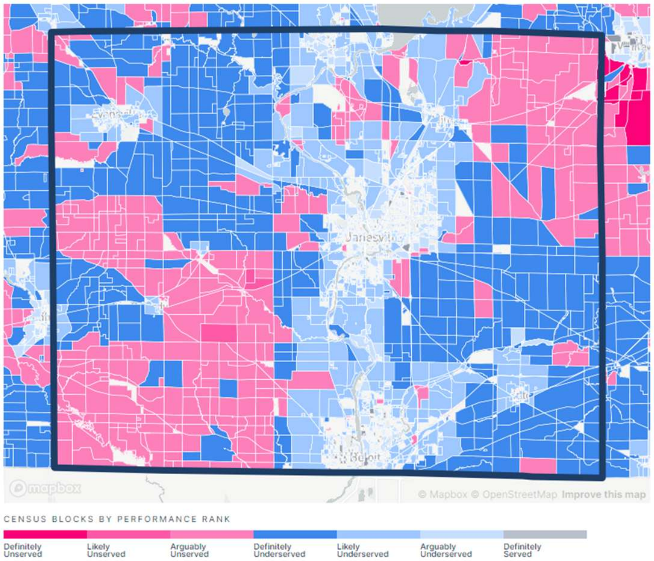
Definitely Unserved
Likely Unserved
Arguably Unserved
Definitely Underserved
Likely Underserved
Arguably Underserved
Definitely Served

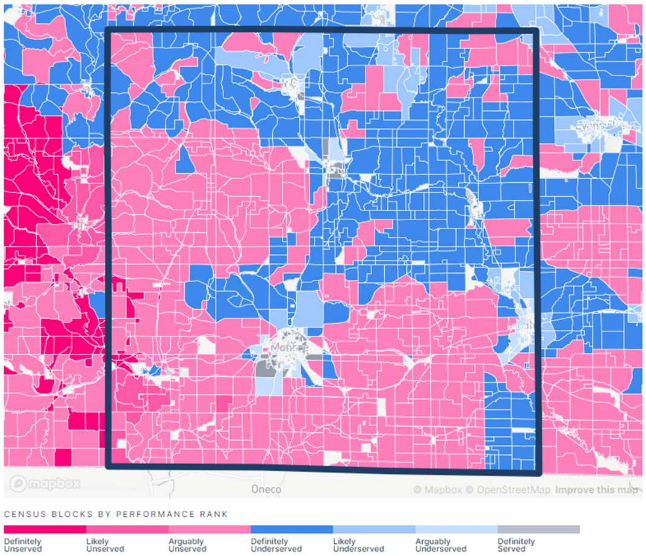
7,866 un(der)served locations

7,947 un(der)served locations

Rock County: 8.5% un(der)served


Janesville
Beloit
mapbox
© Mapbox © OpenStreetMap Improve this map
CENSUS BLOCKS BY PERFORMANCE RANK
Definitely Unserved
Likely Unserved
Arguably Unserved
Definitely Underserved
Likely Underserved
Arguably Underserved
Definitely Served

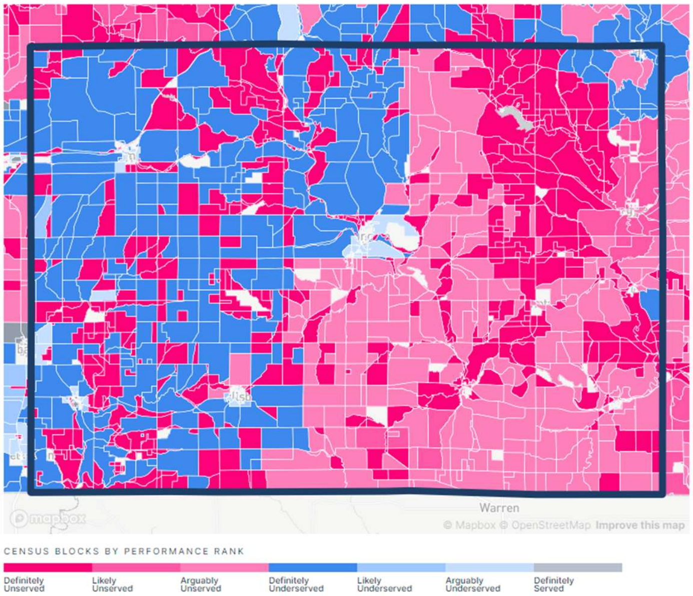
Green County:31.9% un(der)served


Monroe
Oneco
mapbox
© Mapbox © OpenStreetMap Improve this map
CENSUS BLOCKS BY PERFORMANCE RANK
Definitely Unserved
Likely Unserved
Arguably Unserved
Definitely Underserved
Likely Underserved
Arguably Underserved
Definitely Served

5,224 un(der)served locations

5,441 un(der)served locations

Lafayette County: 44.6% un(der)served

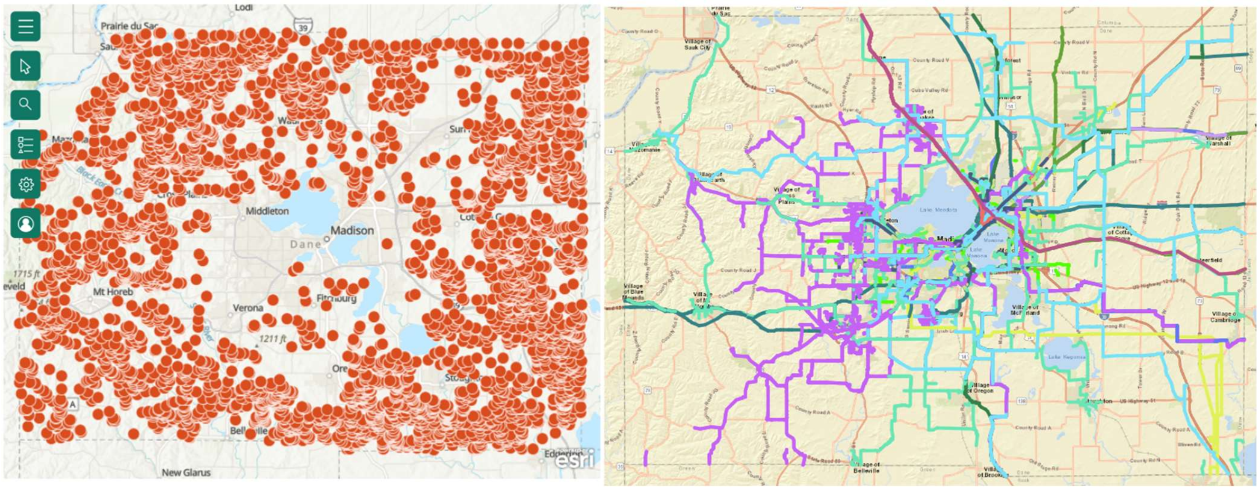

Warren
mapbox
© Mapbox © OpenStreetMap Improve this map
CENSUS BLOCKS BY PERFORMANCE RANK
Definitely Unserved
Likely Unserved
Arguably Unserved
Definitely Underserved
Likely Underserved
Arguably Underserved
Definitely Served

4,049 un(der)served locations

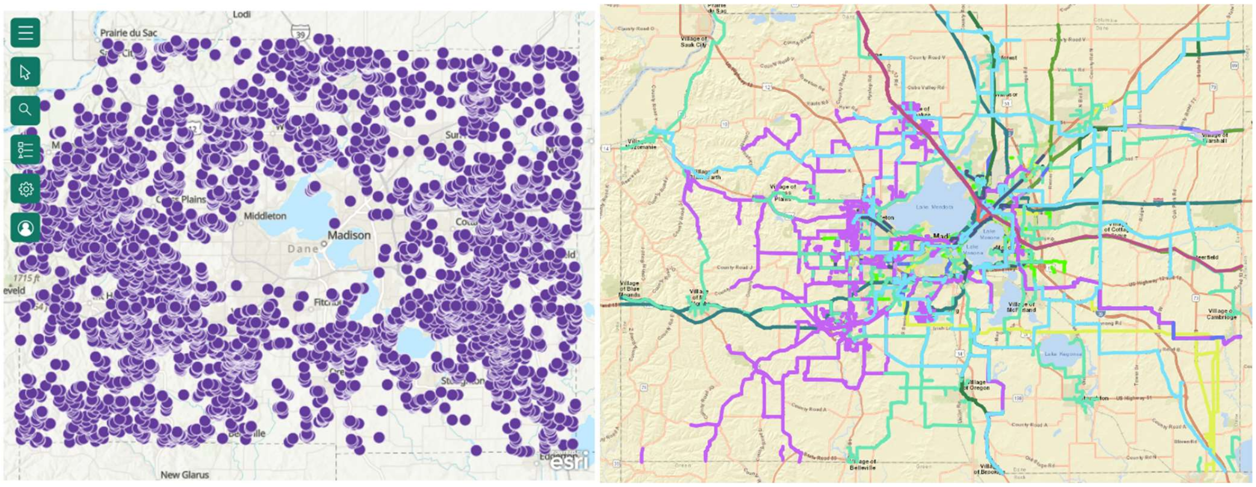
Dane County Un(der)Served Key Findings

The maps below indicate the presence of extensive areas with limited or no broadband service. In simpler terms, a cursory review of the broadband locations and existing infrastructure datasets it could be reasonably concluded that the broadband issue extends across the entire county. There are dense clusters of unserved locations in the east, southeast and northwest regions and dense clusters of underserved located in eastern and western parts of Dane County. When comparing these clusters (un(der)served), they correspond with the lack of density in the existing infrastructure in those same areas.

● **Unserved (Below 25Mbps - Red)**


Lodi
Prairie du Sac
Middleton
Madison
Dane
Mt Horeb
Verona
Fitchburg
1715 ft
1211 ft
Belleville
New Glarus
esri
Lake Mendota
Village of Sauk City
Village of Cambridge
Village of Oregon
Village of Belleville

● **Underserved (Below 100Mbps - Purple)**


Lodi
Prairie du Sac
Middleton
Madison
Dane
Plains
1715 ft
Belleville
New Glarus
esri
Lake Mendota
Village of Sauk City
Village of Cambridge
Village of Oregon
Village of Belleville

Further analysis within the Municipality-by-Municipality focused on areas within a half-mile of existing broadband infrastructure. This review is significant as these areas present "low hanging fruit" opportunities for connectivity. Notably, about 80% of the un(der)served locations in Dane County fall within this half-mile distance of an existing service provider.

For more information on the "Municipality-by-Municipality" breakdown see the "Municipality-by-Municipality Assessment" section of the Final Report.

5 Most Un(der)served Municipalities in Dane County:

The "Top 5" municipalities noted as un(der)served, make up approximately 24% (2,646 locations) of all un(der)served locations within Dane County and average roughly 17.26 miles from Madison. As per the Census Bureau's 2019 data, the average one-way commute time in the U.S. was about 27.6 minutes. It's reasonable to assume that the "Top 5" un(der)served towns are all situated within a standard one-way drive time commute to Madison.

In the town of Springfield, 46% of the total eligible locations are considered un(der)served locations within a half-mile of the nearest provider represent.

In the town of Rutland, 36% of the total eligible locations are considered un(der)served locations within a half-mile of the nearest provider represent.

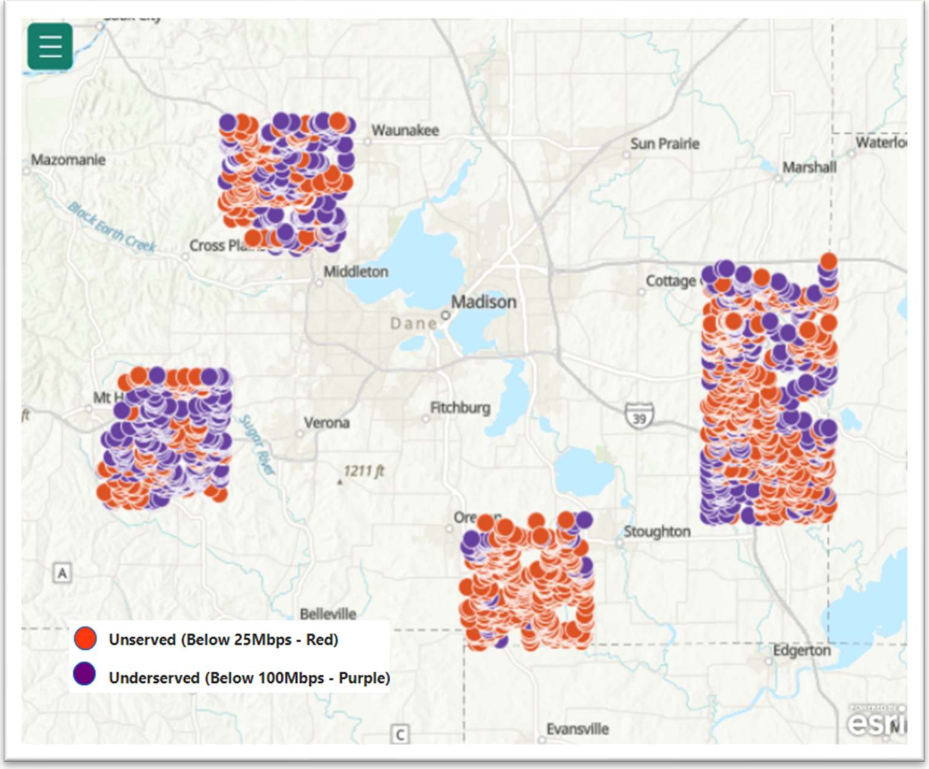
In the town of Deerfield, 69% of the total eligible locations are considered un(der)served locations within a half-mile of the nearest provider represent.

In the town of Springdale, 57% of the total eligible locations are considered un(der)served locations within a half-mile of the nearest provider represent.

In the town of Christiana, 74% of the total eligible locations are considered un(der)served locations within a half-mile of the nearest provider represent.

Top 5

Town or Village	Notable Data		
	Miles from Madison	Unserved/Underserved Totals	Number of Nearest Providers
Town of Springfield	16	562	3
Town of Rutland	14.5	538	4
Town of Deerfield	19.3	531	5
Town of Springdale	15.7	518	3
Town of Christiana	20.8	497	4
Average	**17.26**		**3.8**

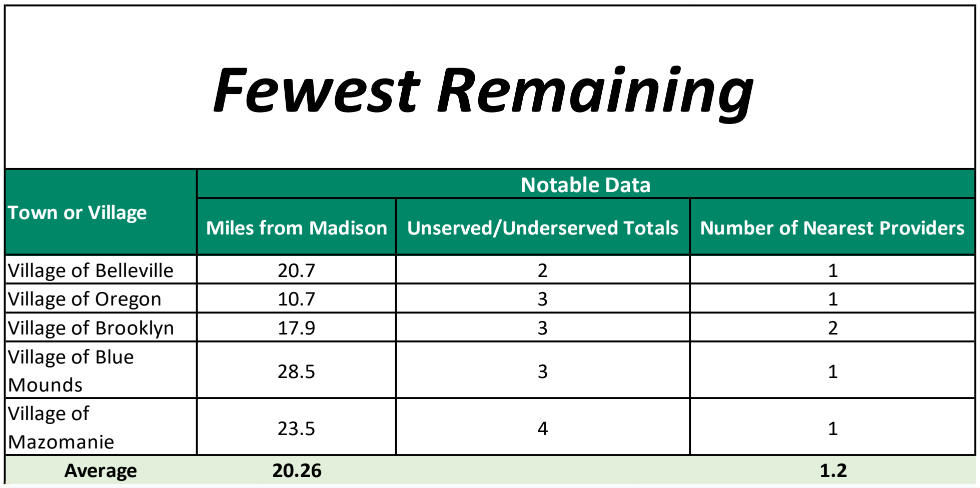

Waunakee
Mazomanie
Sun Prairie
Marshall
Waterlo
Black Earth Creek
Cross Pl
Middleton
Madison
Dane
Cottage
Mt H
Verona
Fitchburg
39
Sugar River
1211 ft
Ore
Stoughton
A
Belleville
Edgerton
C
Evansville
🟥 Unserved (Below 25Mbps - Red)
🟪 Underserved (Below 100Mbps - Purple)
esri

Within a ½ mile of the nearest provider, there are 2,343 un(der)served locations in the Top 5, averaging 3.8 providers within that ½ mile. When it comes to the “Top 5” un(der)served areas, there are 303 un(der)served locations positioned greater than a ½ mile out from the nearest provider. This equates to 87% of un(der)served locations within the Top 5 are within ½ mile from multiple service providers. The estimated cost is approximately $6,37 per location. The lack of broadband service providers is not the sole determinant of why there is an issue with broadband coverage. The lack of middle mile infrastructure diversity, density of homes, aging or legacy infrastructure and lack of residential service provider competition are all factors that need to be calculated in understanding why there is a lack of reliable broadband service.

Estimated Cost to Reach 5 Most Un(der)served Municipalities: $14,894,588

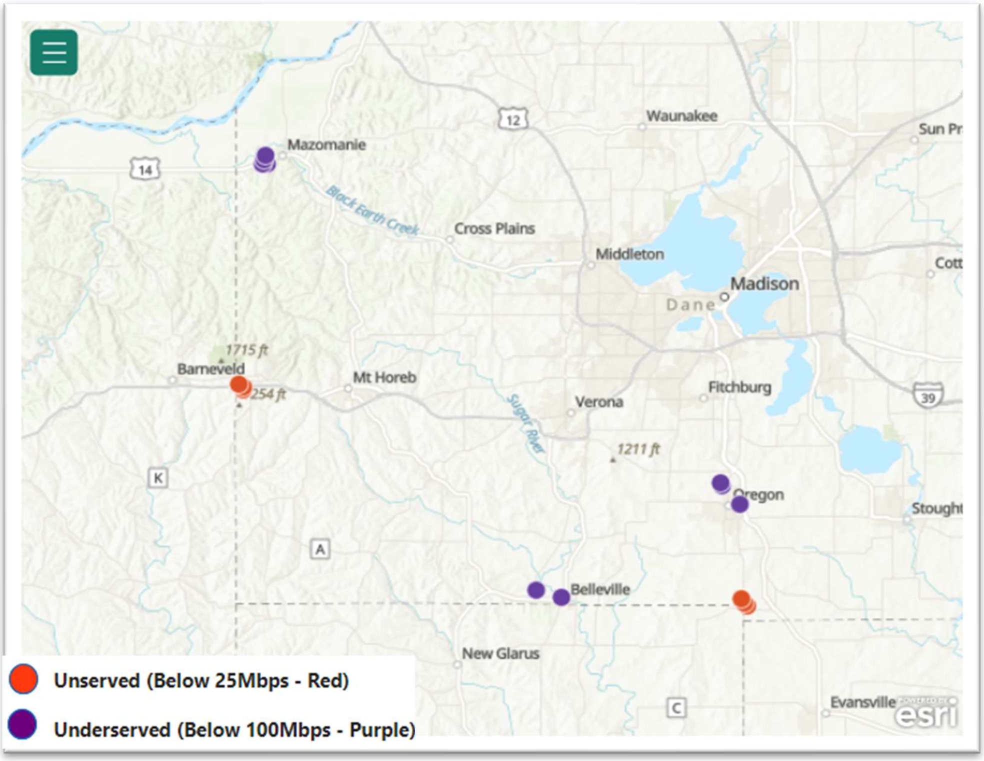
The 5 Fewest Municipalities with the Fewest Remaining Un(der)served Locations:

In examining the “Fewest Remaining” un(der)served municipalities in Dane County are within the villages of Belleville, Oregon, Brooklyn, Blue Mounds and Mazomanie. One of the commonalities among the relative handful of un(der)served locations within these municipalities, is the presence of just a single nearby provider.



Fewest Remaining

Town or Village	Notable Data		
	Miles from Madison	Unserved/Underserved Totals	Number of Nearest Providers
Village of Belleville	20.7	2	1
Village of Oregon	10.7	3	1
Village of Brooklyn	17.9	3	2
Village of Blue Mounds	28.5	3	1
Village of Mazomanie	23.5	4	1
Average	**20.26**		**1.2**


Waunakee
Sun Pr
Mazomanie
12
14
Black Earth Creek
Cross Plains
Middleton
Madison
Dane
Cott
1715 ft
Barneveld
254 ft
Mt Horeb
Verona
Fitchburg
Sugar River
39
1211 ft
K
Oregon
Stought
A
Belleville
New Glarus
C
Evansville
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

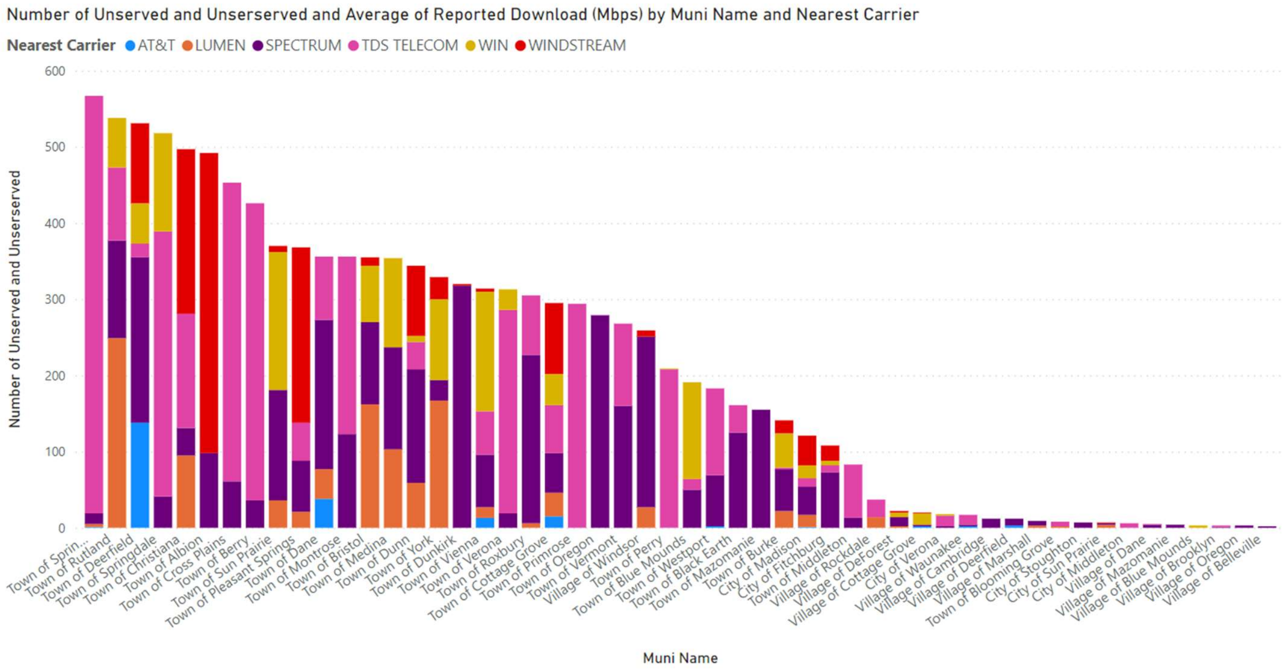
In the Village of Brooklyn, the nearest service provider for residential service is Spectrum and its pathway does not traverse through the village and in the Village of Blue Mounds, two of the three are unserved businesses <100 feet from the one provider and < 300 feet from the same provider, while the third is < 1,000 feet.

Estimated cost to reach last 5 remaining un(der)served municipalities: $75,626

Municipality-by-Municipality Existing Service Provider Breakdown:

The image below represents a municipality-by-municipality breakdown of each service provider along with the total number of un(der) locations. The image also highlights the existing providers that are situated nearest to the un(der)served locations with each municipality.

The two main service providers who have the most unserved locations within a ½ mile from their infrastructure are Spectrum (1,252) and TDS Telecom (1,448) and for underserved locations within a ½ mile from their infrastructure, it is also Spectrum (1,297) and TDS Telecom (1,874).

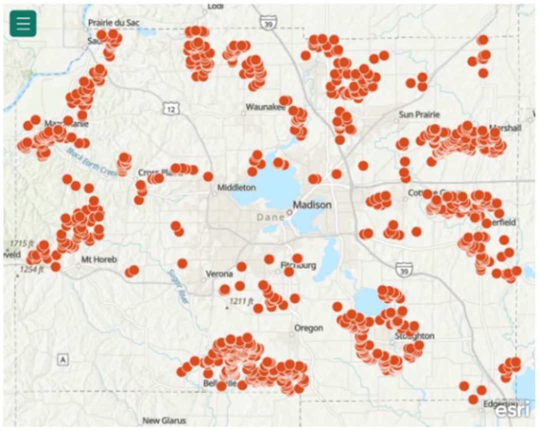


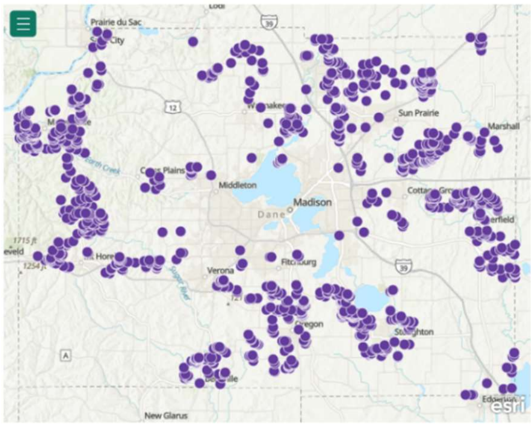
Spectrum Clusters of Unserved and Underserved Locations:

For Spectrum, approximately 62% of unserved locations and 83% of underserved locations are within a ½ mile of their infrastructure. Clusters of un(der)served are spread throughout Dane County, excluding the southwestern portion of the county. The dense clusters of unserved locations are incredibly similar to the underserved locations, meaning, Spectrum could experience economies of scale when planning to serve those higher priority areas and for every unserved location passed, they would likely pass an underserved location.

● Unserved (Below 25Mbps - Red)

● Underserved (Below 100Mbps - Purple)


Prairie du Sac
Lodi
Waunakee
Sun Prairie
Marshall
Mazomanie
Cross Plains
Middleton
Madison
Dane
Cottage Grove
Deerfield
Mt Horeb
Verona
Fitchburg
1715 ft
1254 ft
1211 ft
Oregon
Stoughton
Belleville
New Glarus
Edgerton
esri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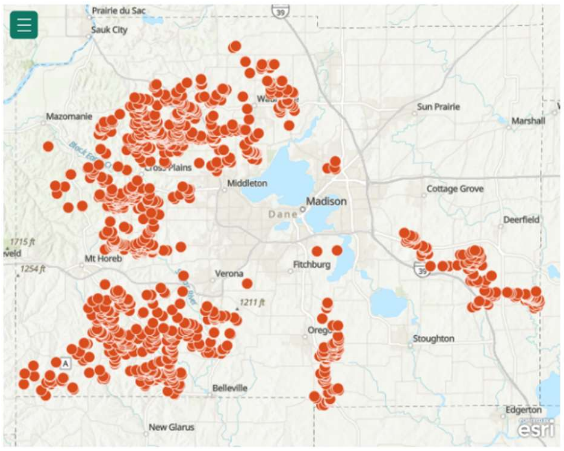
Waunakee
Sun Prairie
Marshall
Cross Plains
Middleton
Madison
Dane
Cottage Grove
Deerfield
1715 ft
1254 ft
Verona
Fitchburg
Oregon
Stoughton
Belleville
New Glarus
Edgerton
esri

TDS Telecom Clusters of Unserved and Underserved Locations:

For TDS Telecom, a much larger ratio persists where approximately 87% of unserved locations and 91% of underserved locations are within a ½ mile of their infrastructure. The clusters of un(der)served locations are contained to mainly four separate areas, east and due south of Madison and nearly the entire western part of Dane County. The dense clusters of unserved locations are practically a mirror of the underserved locations and TDS Telecom could also experience economies of scale when planning to serve those higher priority areas and for every unserved location passed, they would likely pass an underserved location.

● Unserved (Below 25Mbps - Red)

● Underserved (Below 100Mbps - Purple)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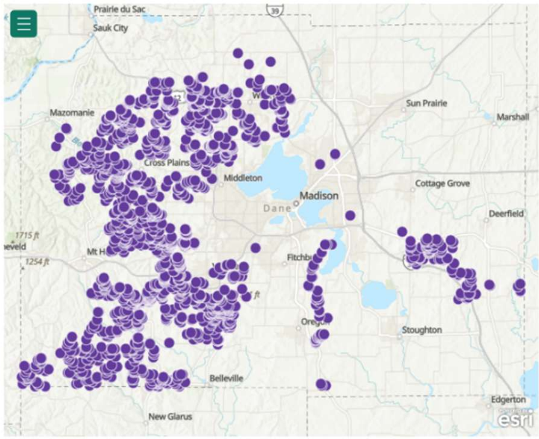
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Sun Prairie
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Fitchburg
Oregon
Stoughton
Belleville
New Glarus
Edgerton
esri

MUNICIPALITY-BY-MUNICIPALITY PRIORITY LOCATIONS GAP ASSESSMENT

The gaps assessment methodology identified high-impact locations defined and pulled from the FCC's broadband map that remain to be served and reflect their proximity to the nearest service provider. The Municipality-by-Municipality assessment was conducted using AECOM's powerBI tool which integrated the FCC's data on un(der)served locations across Dane County. Dane County has the option to utilize this tool for more comprehensive evaluation and analysis. Next, the Assessment project team overlaid the existing service provider infrastructure mapping inventory to determine the distance from the un(der)served locations to the nearest service provider within Dane County. By using this tool, Dane County can zoom in on specific municipalities to gain a more detailed understanding of street-level coverage and the proximity of un(der)served locations to service providers.

The municipality-by-municipality high impact gap assessment was analyzed on several criteria:

Criteria 1: Location was identified and defined as unserved by the FCC.

Criteria 2: Location was identified and defined as underserved by the FCC.

Criteria 3: Un(der)served locations nearest a service provider offering residential or business internet service. The existing infrastructure being so close can make it relatively more cost-effective to extend or upgrade service.

Cost Estimate Methodology

To quantify the network distance diverging from the linear distance to the closest fiber network, our team applied a precise mathematical computation. This evaluation was conducted across three distinct regions within the county, factoring in multiple variables including population density, road composition, and geographical terrain.

Our methodology incorporated the following steps:

1. Identification of Demand Points: We first pinpointed all the demand points that were situated more than 500 feet away from the existing fiber network.
2. Application of a Multiplier to the Straight-Line Distance: Recognizing the complexity introduced by various influencing factors, we applied a factor of 20% to the actual straight-line distance for each identified demand point. This percentage represents an approximation of the additional network distance that may be required beyond the linear measurement.
3. Calculation of the Construction Cost: The adjusted distances were then multiplied by a rate of $19.50 per foot. This figure constitutes a blended cost, integrating various elements that contribute to the overall expense of constructing the network.
4. Compilation of a Comparative Budget: The culmination of these calculations produced a budget that serves as a preliminary comparative guide. It must be noted that this budget is not final or binding for construction and financial commitments.
5. Recommendation for Further Design Analysis: We underscore the necessity of conducting a more comprehensive, low-level design analysis. This in-depth investigation must be completed to accurately define the final budget and construction parameters, thereby providing a robust and reliable framework for the project's execution.

This approach leverages both spatial analysis and financial modeling to generate an informed estimate, yet it remains a preliminary evaluation. The derived budget should be utilized with an understanding of its comparative nature, pending further refinement through detailed, low-level design work, which will solidify the project's financial and construction planning.

Prioritizing Gaps

A prioritization approach could be centered on closing the gaps in broadband infrastructure by pinpointing factors that Dane County could focus on the following items:

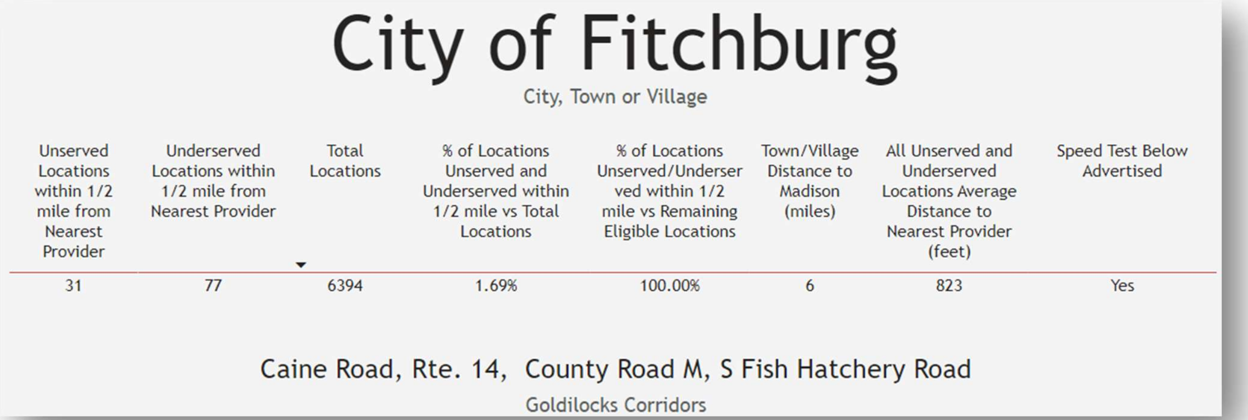
- Location is defined and confirmed by the FCC data as shown below 25/3Mbps.
- Location is defined and confirmed by the FCC data as shown below 100/20Mbps.
- Location is located within ½ mile from the nearest service provider.

This data can potentially be utilized by Dane County to assign scores to cities, towns, or villages according to prioritization models and objectives. The method and process outlined in this report are designed to aid Dane County in making well-informed decisions about expanding broadband access. Both Dane County and its individual municipalities have the option to tailor the prioritization approach, assigning importance to various factors based on county and local goals. They may even opt to prioritize collaboration with service providers situated nearby or those with the highest number of unserved/underserved locations in their coverage areas.

The detailed breakdown for each city, town and village analysis of ISPs nearest to the un(der)served locations can be accessed through Dane County's PowerBI portal. The portal and dashboard is currently in development and will soon be available on broadband.countyofdane.com. Within this portal, you can select a city, town, or village, and it will exhibit the count of un(der)served locations, the proximity to the nearest provider, and the estimated costs to reach these areas. The breakdown can be segmented based on various criteria: within half a mile of unserved, within half a mile of underserved, all unserved within half a mile, all unserved regardless of distance, all underserved regardless of distance, and all underserved regardless of distance to the nearest providers. The data for this analysis was drawn from sources including the FCC, NTIA, WBO, Dane County, and the GeoTel subscription database.

The analysis found that some of the county's more rural communities would be costly to serve with fiber. Further study may be warranted to determine the most suitable way of providing a "last mile" solution for the hardest to serve locations.

Estimated Cost to Buildout Dane County to each Un(der)served Location: **$76,562,217 (an average cost of $6,929 per eligible un(der)served location)**



City of Fitchburg

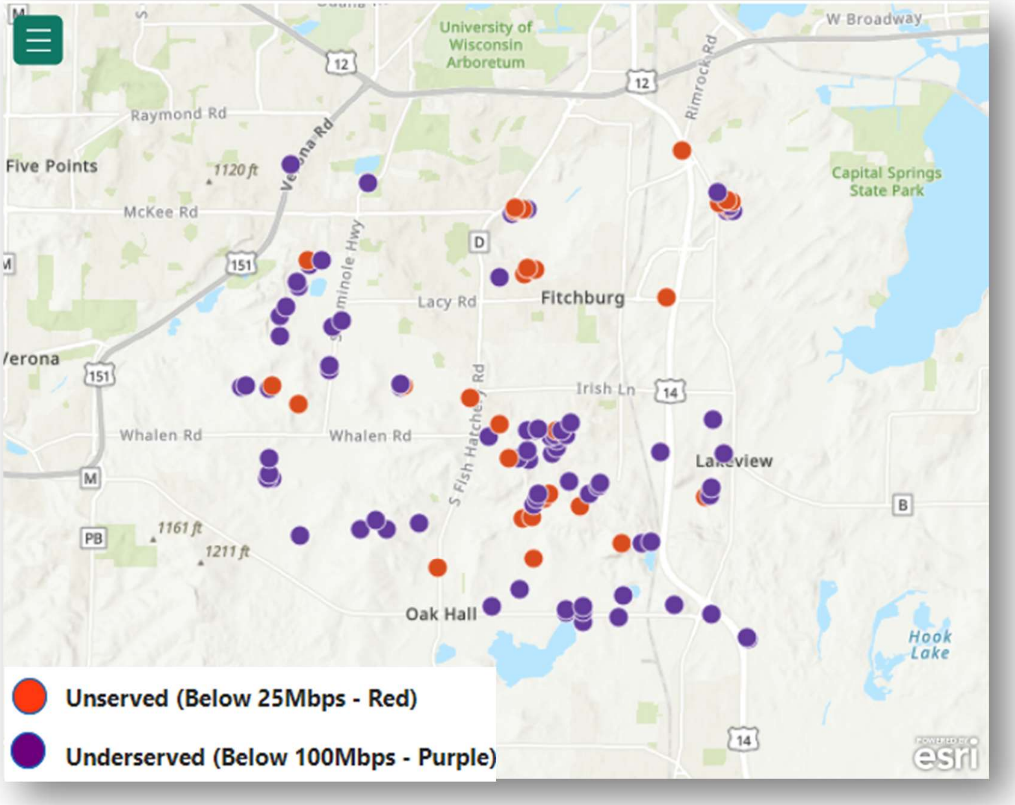
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
31	77	6394	1.69%	100.00%	6	823	Yes

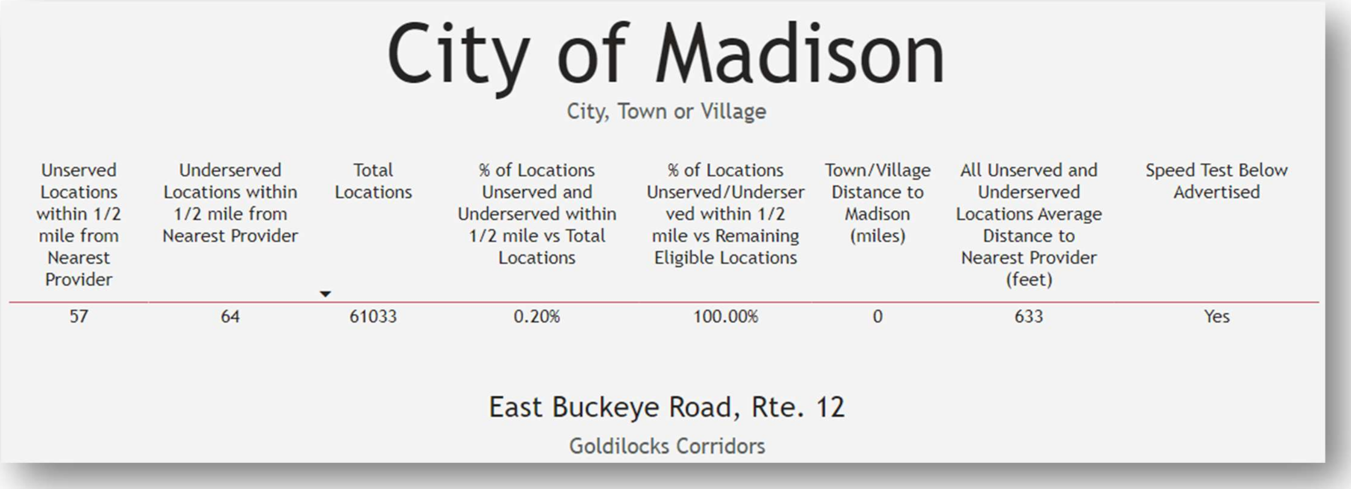
Caine Road, Rte. 14, County Road M, S Fish Hatchery Road

Goldilocks Corridors

The highlighted locations provide ideal starting positions for initiating the expansion of broadband within the city. If these locations would be served, they account for 100% of the remaining un(der)served locations in the City of Fitchburg. The average distance to the nearest provider sits at approximately 823 feet. To facilitate this connectivity, the county can engage with Spectrum, Windstream and TDS Telecom to identify and coordinate infrastructure nearest the Goldilocks corridors of Caine Road, Rte. 14, County Road M and S Fish Hatchery Road.


University of Wisconsin Arboretum
W Broadway
12
Rimrock Rd
Raymond Rd
Verona Rd
Five Points
1120 ft
McKee Rd
Capital Springs State Park
D
151
Seminole Hwy
Lacy Rd
Fitchburg
Verona
151
Irish Ln
14
S Fish Hatchery Rd
Whalen Rd
Whalen Rd
M
Lakeview
B
PB
1161 ft
1211 ft
Oak Hall
Hook Lake
14
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $527,785



City of Madison

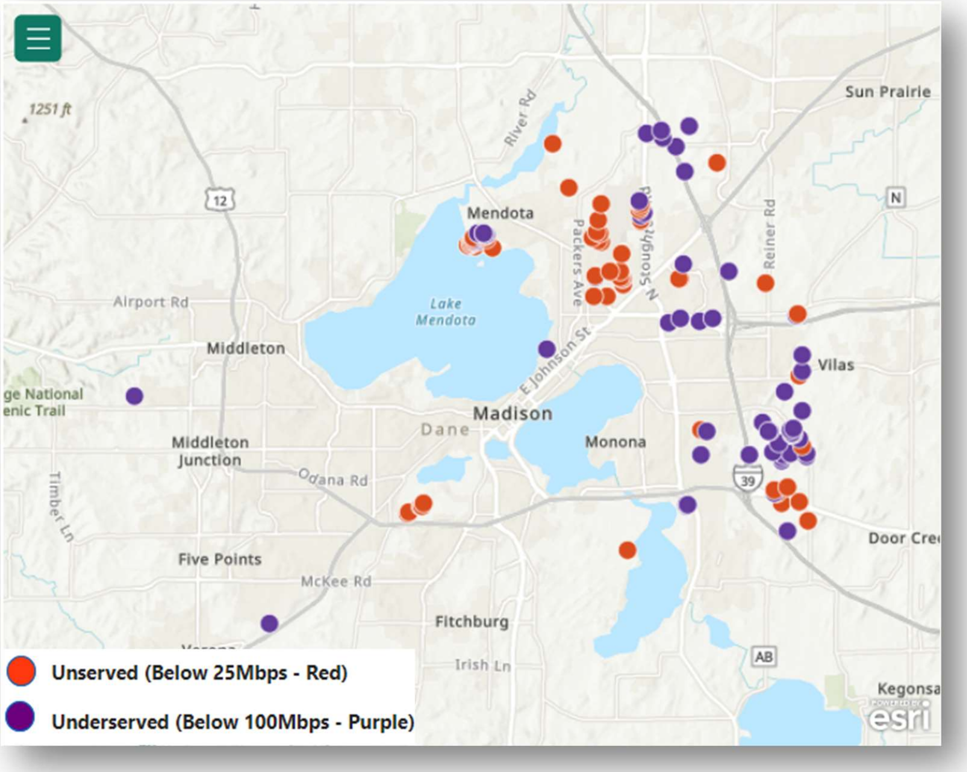
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
57	64	61033	0.20%	100.00%	0	633	Yes

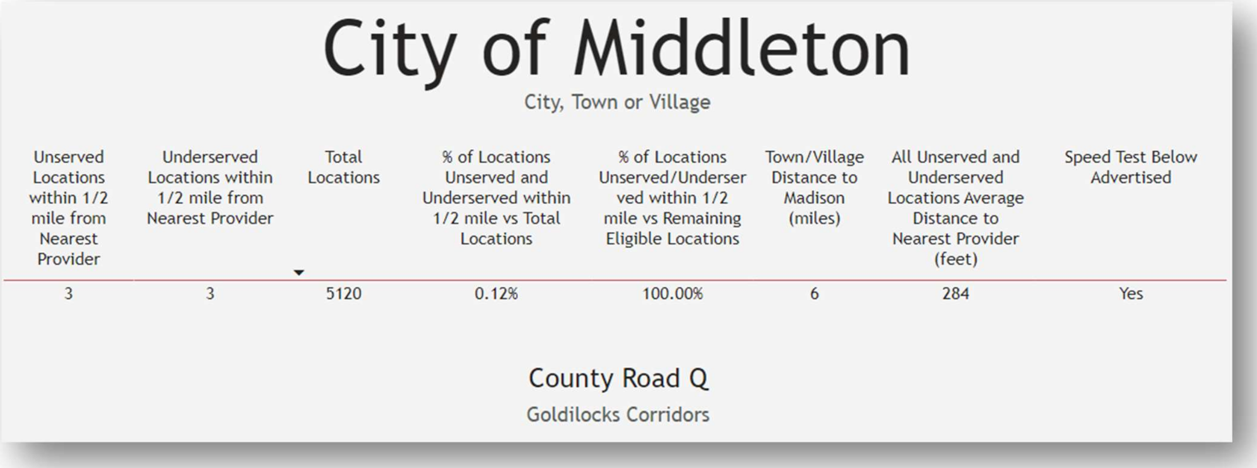
East Buckeye Road, Rte. 12

Goldilocks Corridors

Despite its proximity to existing broadband infrastructure, the City of Madison has close to 60 locations without internet service. These unserved areas are characterized by lower ACP enrollment, and over 20% of the population in this area lives below the poverty line. Focused initiative to boost enrollment could lead to improvements in the unserved situation.


Sun Prairie
1251 ft
River Rd
12
Mendota
Packers Ave
Stoughton Rd
N
Reiner Rd
N
Airport Rd
Middleton
Lake Mendota
E Johnson St
Vilas
ge National
enic Trail
Madison
Dane
Monona
Middleton Junction
Odana Rd
39
Timber Ln
Five Points
McKee Rd
Door Cre
Fitchburg
Irish Ln
AB
Kegonsa
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $521,555



City of Middleton

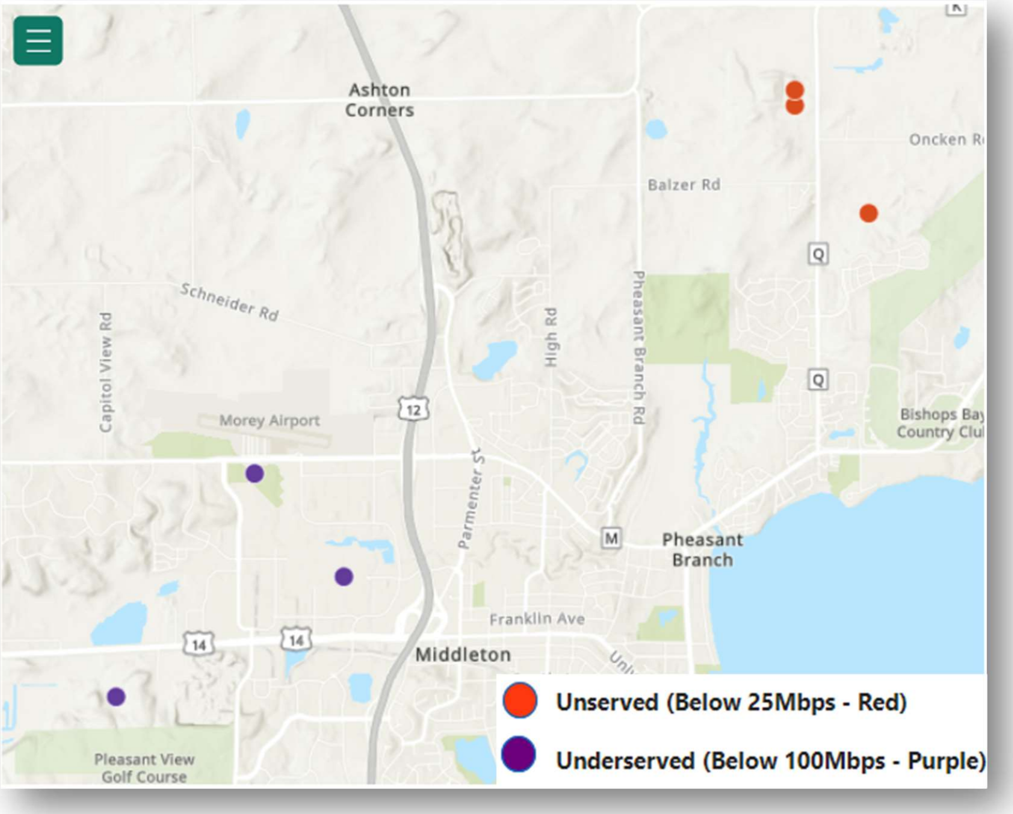
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
3	3	5120	0.12%	100.00%	6	284	Yes

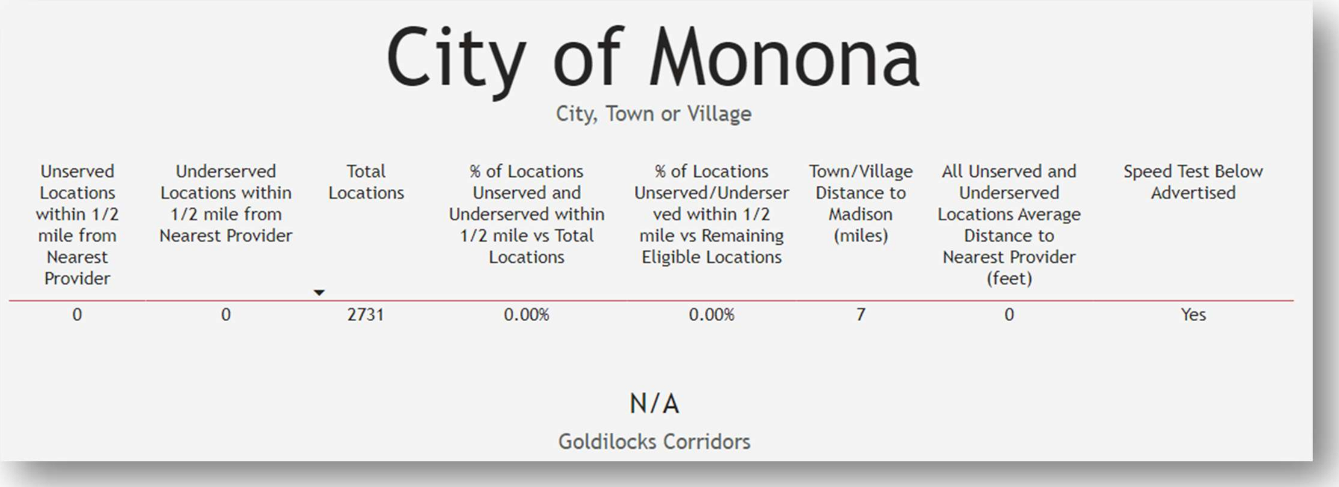
County Road Q

Goldilocks Corridors

Ensuring the last few locations in the City of Middleton are served adequately and brought up to the desired speed level might present some challenges. With only 0.12% of eligible locations left, the positive aspect is that these locations are on average just about 284 feet away from the nearest provider. Addressing this situation will require effective collaboration with the nearby carrier, TDS Telecom, to ensure these final locations are properly connected and achieve the desired speed levels.


Ashton Corners
Ockchen Rd
Balzer Rd
Q
Schneider Rd
Capitol View Rd
High Rd
Pheasant Branch Rd
12
Morey Airport
Bishops Bay Country Club
Parmenter St
M
Pheasant Branch
Franklin Ave
14
14
Middleton
Pleasant View Golf Course
Unserved (Below 25Mbps - Red)
Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $33,242



City of Monona

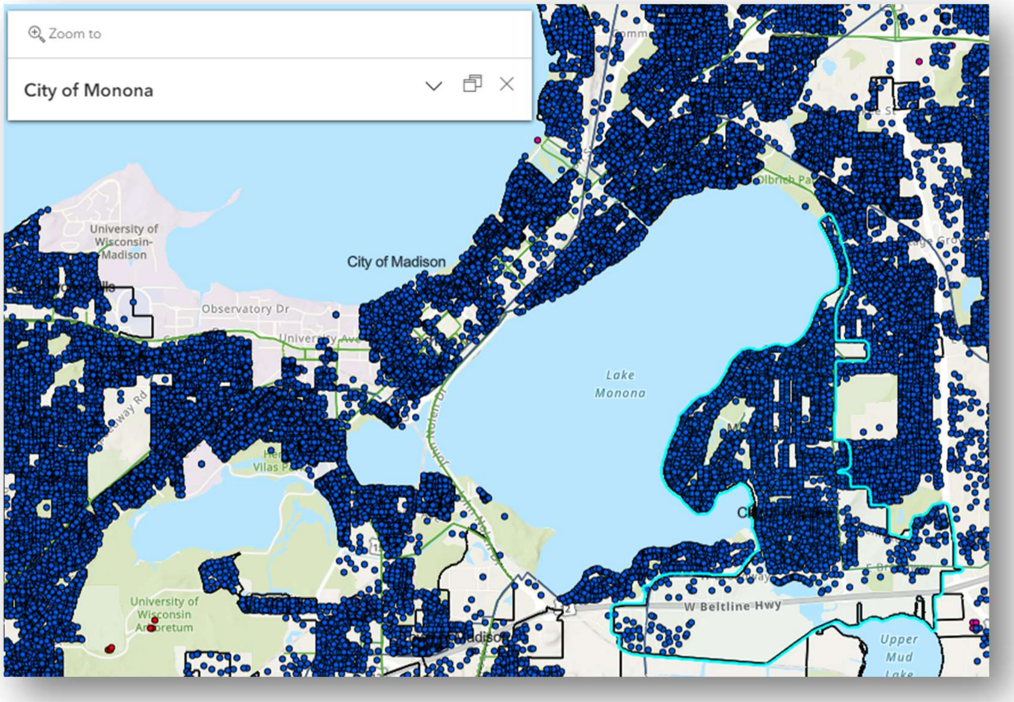
City, Town or Village

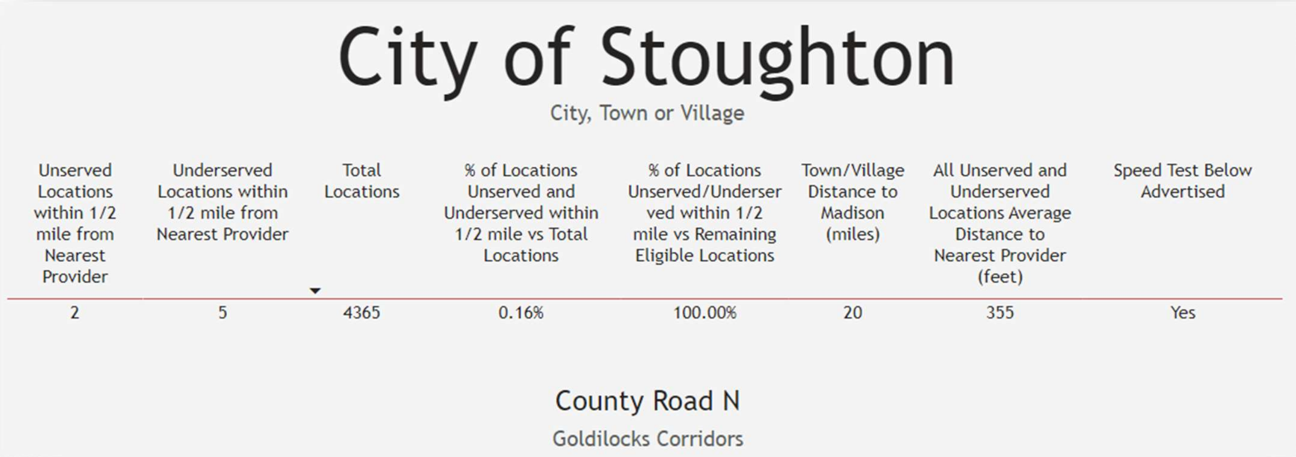
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
0	0	2731	0.00%	0.00%	7	0	Yes

N/A

Goldilocks Corridors

The City of Monona, highlighted in turquoise blue, is considered served based on the FCC data. There are 2,731 eligible locations and all are currently shown as served and to the adequate speeds.


Zoom to
City of Monona
University of Wisconsin-Madison
Observatory Dr
University Ave
City of Madison
Lake Monona
Vilas Pa
University of Wisconsin Arboretum
Olbrich Pa
W Beltline Hwy
Upper Mud Lake



City of Stoughton

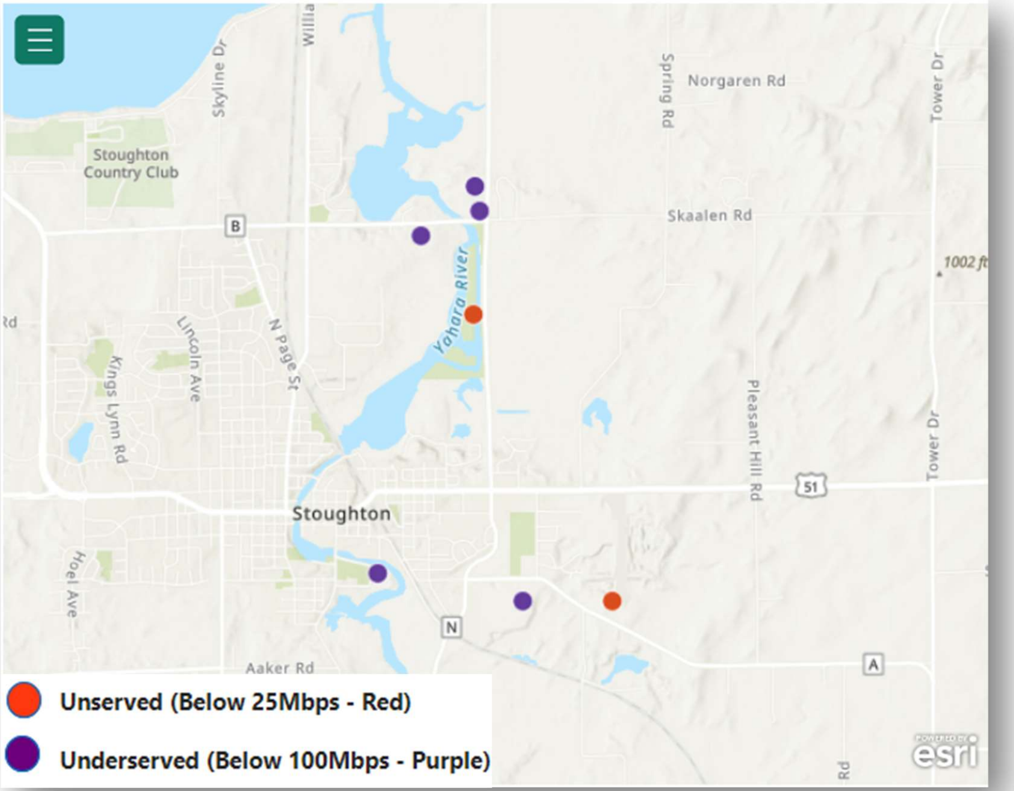
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
2	5	4365	0.16%	100.00%	20	355	Yes

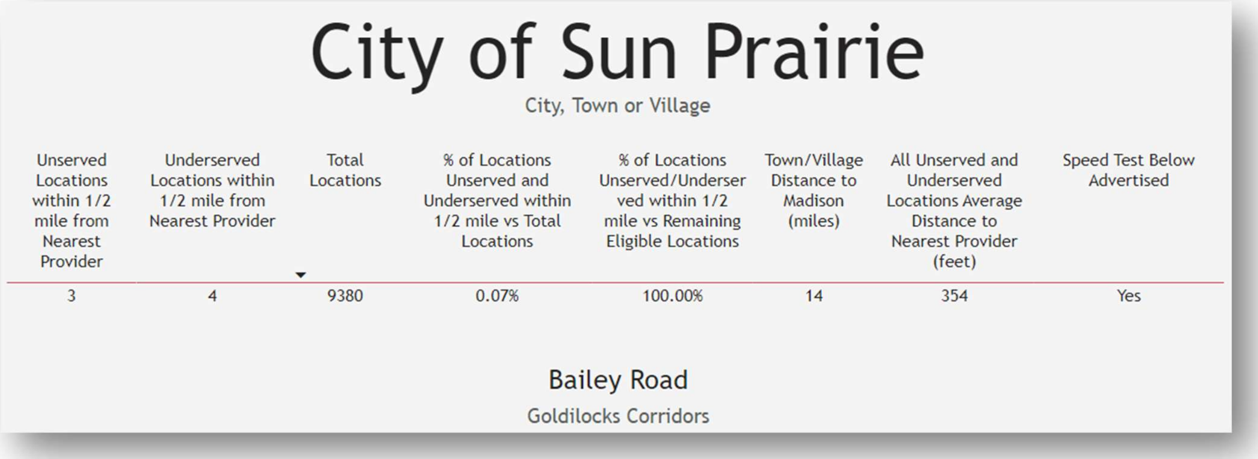
County Road N

Goldilocks Corridors

The City of Stoughton faces a situation where a very small section of the city, around 0.16%, remains un(der)served. However, Stoughton encounters two primary challenges: at the outset, the existing infrastructure is situated to the west of the remaining locations, and next, Spectrum is the sole provider available. Resolving this requires precise collaboration with Spectrum to devise a service solution. On a positive note, the un(der)served locations are on average just about 355 feet away from Spectrum's infrastructure.


Skyline Dr
Willia
Spring Rd
Norgaren Rd
Tower Dr
Stoughton Country Club
B
Skaalen Rd
1002 ft
Yahara River
Rd
Lincoln Ave
N Page St
Kings Lynn Rd
Pleasant Hill Rd
51
Stoughton
Hoel Ave
N
A
Aaker Rd
Rd
esri
🟥 Unserved (Below 25Mbps - Red)
🟪 Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $37,242



City of Sun Prairie

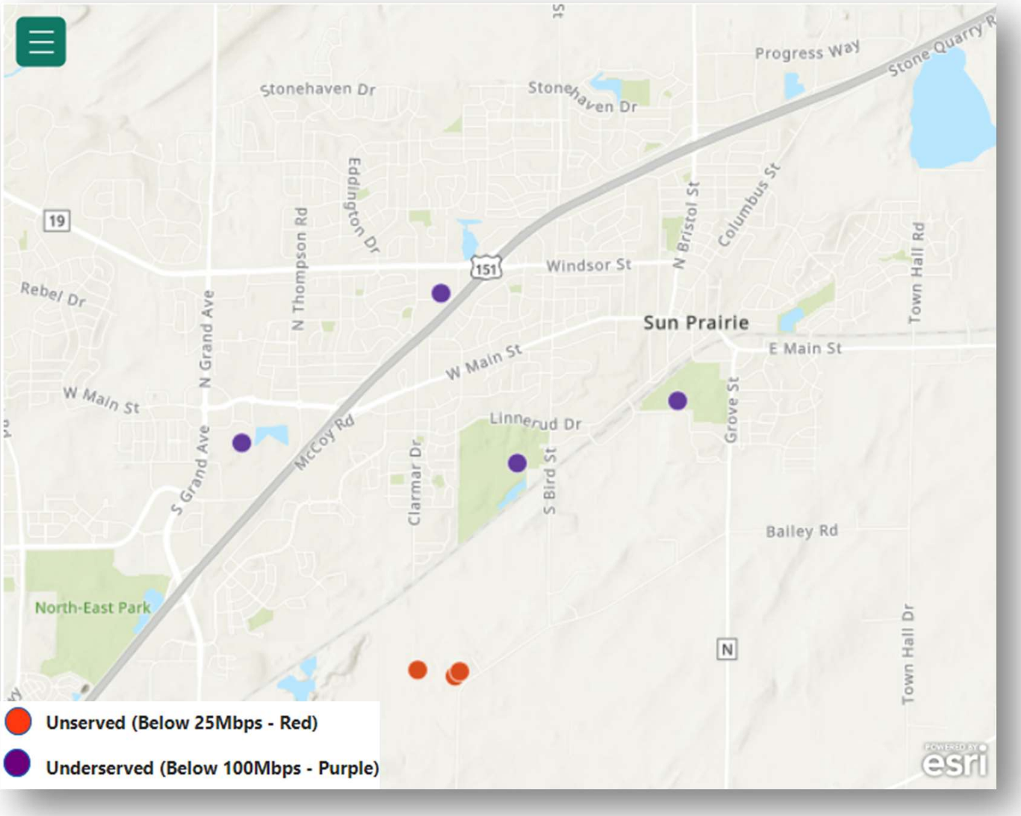
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
3	4	9380	0.07%	100.00%	14	354	Yes

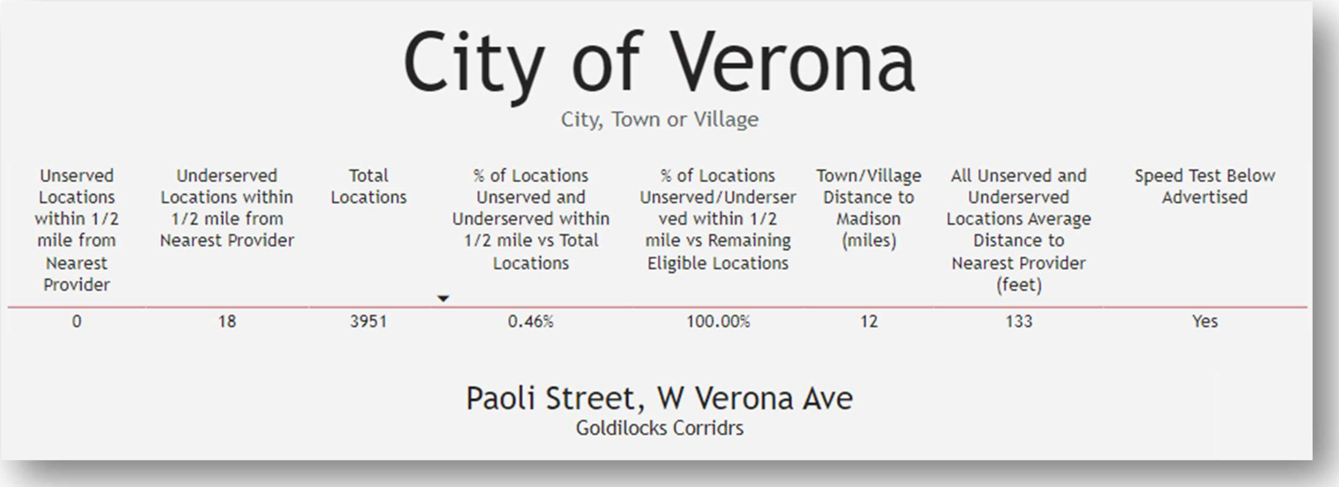
Bailey Road

Goldilocks Corridors

Sun Prairie City has a limited number of locations awaiting service. Interestingly, there are two service options available: Windstream and Lumen's (CenturyLink) infrastructure. The unserved locations that remain are situated near Bailey Road and are only around 354 feet away from connectivity. In addition, there are four underserved locations that present a challenge—identifying the obstacles to improving service for these specific areas. Dane County should engage with the providers in the area to address the service offering barriers.


Progress Way
Stone Quarry Rd
Stonehaven Dr
Stonehaven Dr
Eddington Dr
N Thompson Rd
N Bristol St
Columbus St
Town Hall Rd
19
151
Windsor St
Rebel Dr
N Grand Ave
Sun Prairie
E Main St
W Main St
W Main St
McCoy Rd
Linnerud Dr
Grove St
S Grand Ave
Clarmar Dr
S Bird St
Bailey Rd
North-East Park
N
Town Hall Dr
🟥 Unserved (Below 25Mbps - Red)
🟪 Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $27,447



City of Verona

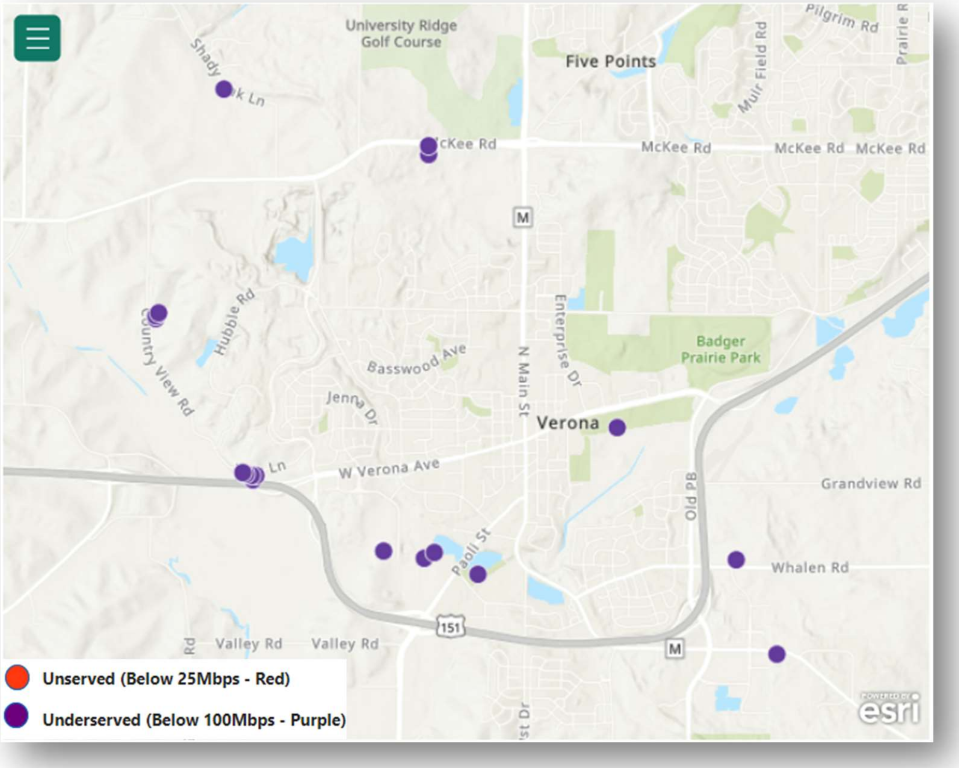
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
0	18	3951	0.46%	100.00%	12	133	Yes

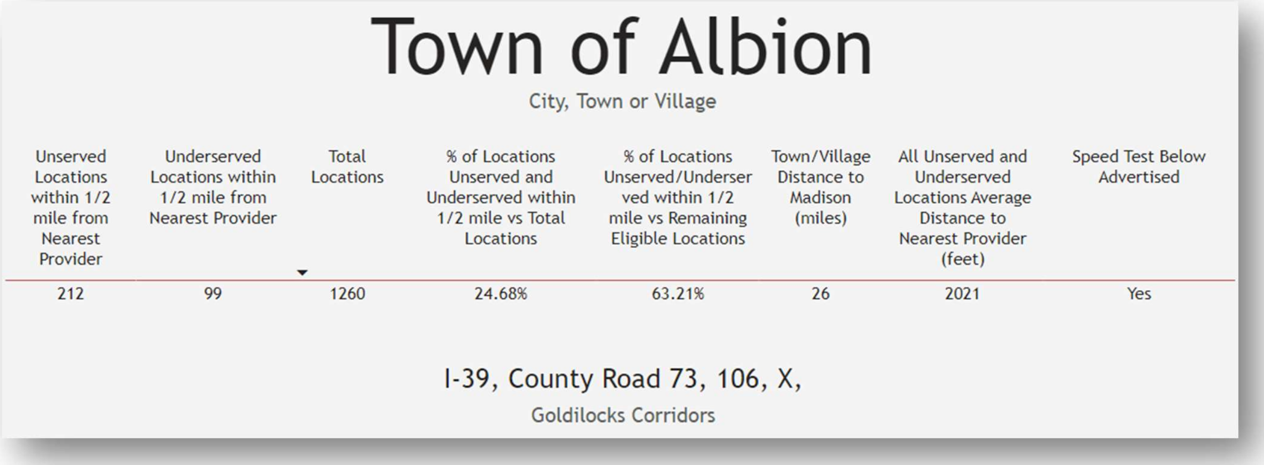
Paoli Street, W Verona Ave

Goldilocks Corridrs

A prevalent pattern across the 'cities' within Dane County is the presence of a small proportion of remaining locations that are yet to be served sufficiently. In the case of the City of Verona, the challenge pertains to underserved locations. The primary focus for the City of Verona is to understand the reasons behind the inadequate speeds experienced by these locations. In this area, there are three providers: Spectrum and TDS Telecom for residential and business service, and WIN Telecom for business service only. Most of the underserved locations are businesses. Collaborative efforts involving all three companies to identify the barriers affecting speed availability will facilitate the resolution of this issue, given that these locations are already connected.


University Ridge Golf Course
Five Points
Pilgrim Rd
Muir Field Rd
Prairie R
Shady
k Ln
cKee Rd
McKee Rd
McKee Rd
McKee Rd
M
Hubble Rd
Country View Rd
Basswood Ave
Enterprise Dr
N Main St
Badger Prairie Park
Jenna Dr
Verona
Ln
W Verona Ave
Old PB
Grandview Rd
Paoli St
Whalen Rd
151
Rd
Valley Rd
Valley Rd
M
St Dr
esri
Unserved (Below 25Mbps - Red)
Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $32,996



Town of Albion

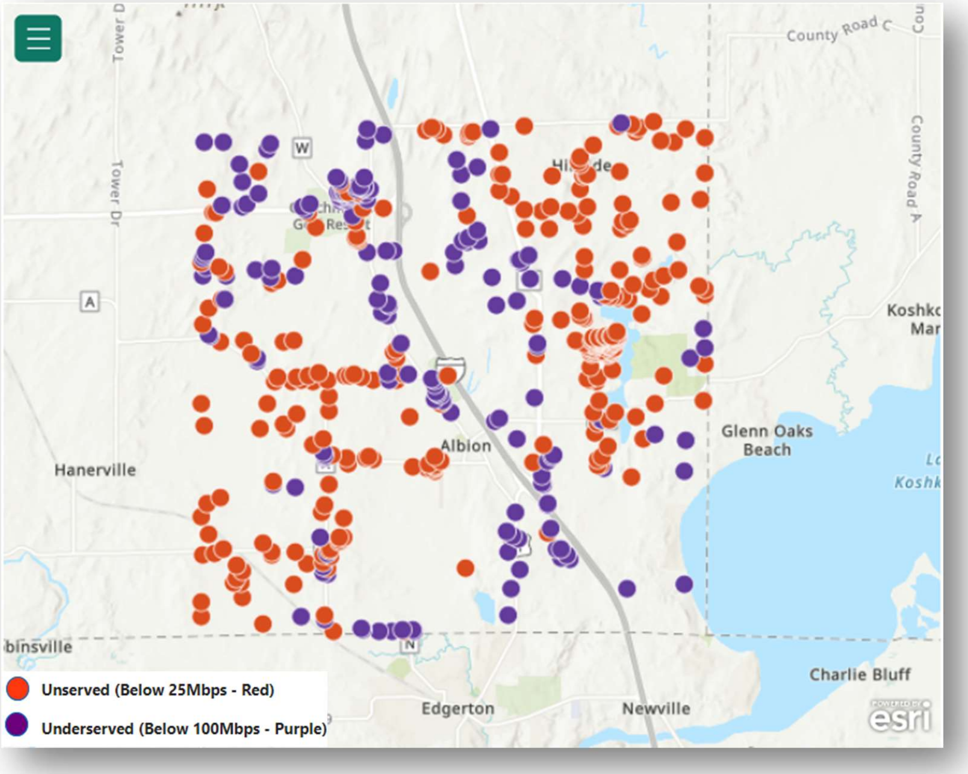
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
212	99	1260	24.68%	63.21%	26	2021	Yes

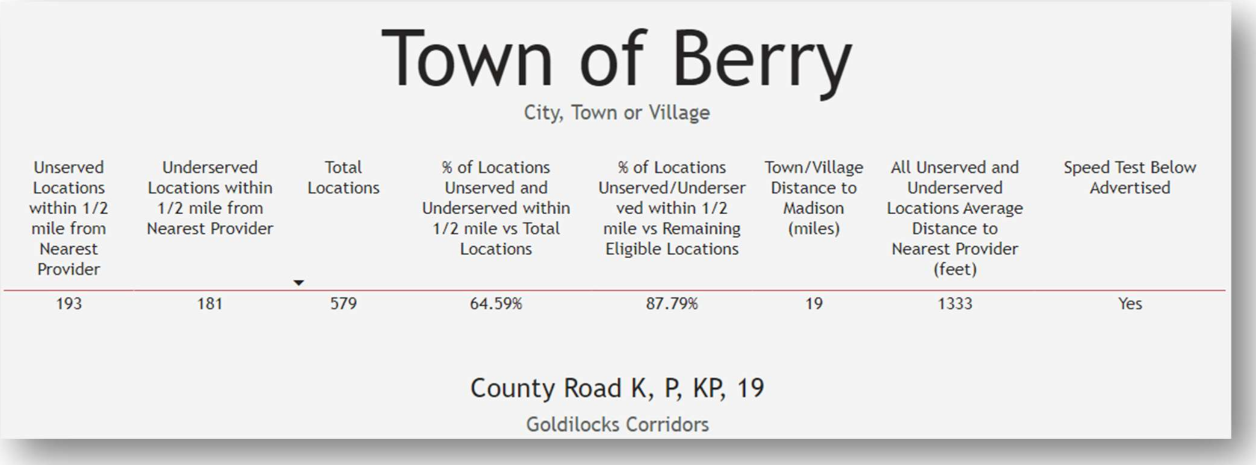
I-39, County Road 73, 106, X,

Goldilocks Corridors

The town of Albion is situated approximately 26 miles away from Madison. It stands out with one of the highest numbers of unserved locations in Dane County, totaling 315. Among these locations, 63% of the un(der)served places are located within a half-mile radius from the nearest service provider. According to Ookla's speed testing data, the entire town's internet speeds fall below the advertised 940Mbps threshold. However, the average speed test results vary between 5Mbps and 60Mbps. In terms of service providers, Albion has a limited selection, with Windstream and Spectrum being the two available options. Notably, there are Goldilocks corridors spread across the town, strategically positioned to potentially cover most of the unserved locations if connectivity is extended to these areas. Working closely with Windstream and Spectrum to identify a solution for service extension along with upgrading their infrastructure should be at the forefront to close the gap within the town.



Estimated Cost to Reach Un(der)served Locations: $4,133,106



Town of Berry

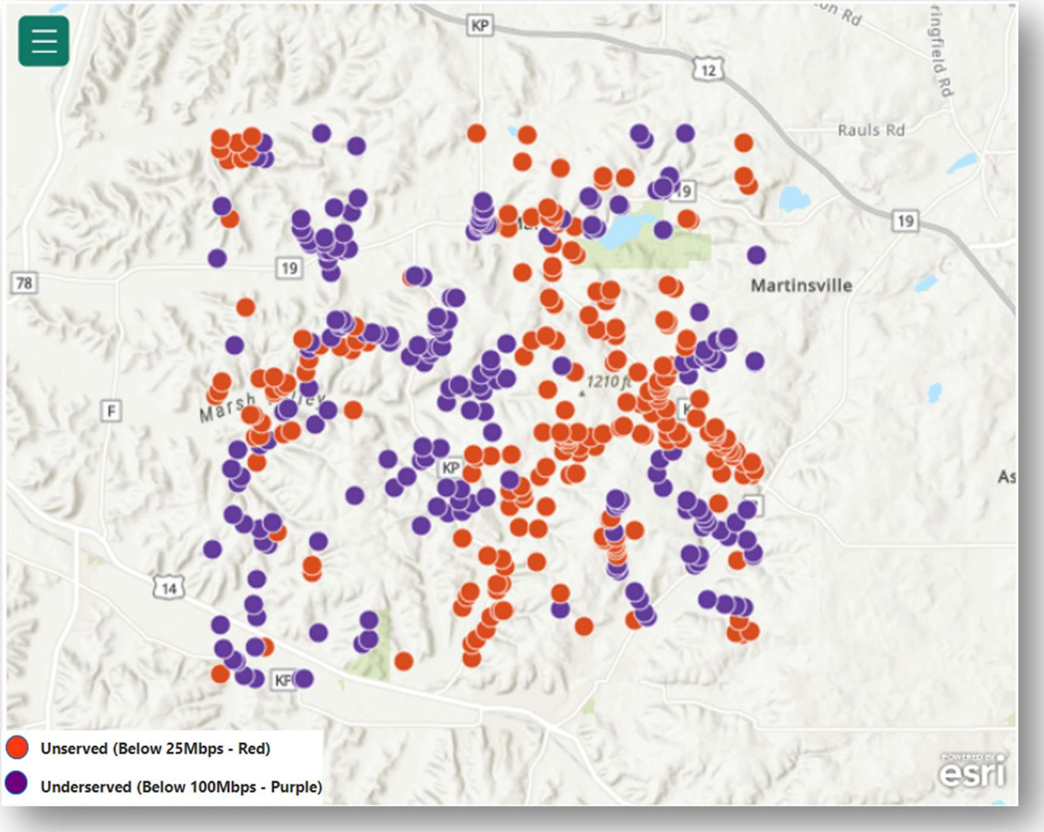
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
193	181	579	64.59%	87.79%	19	1333	Yes

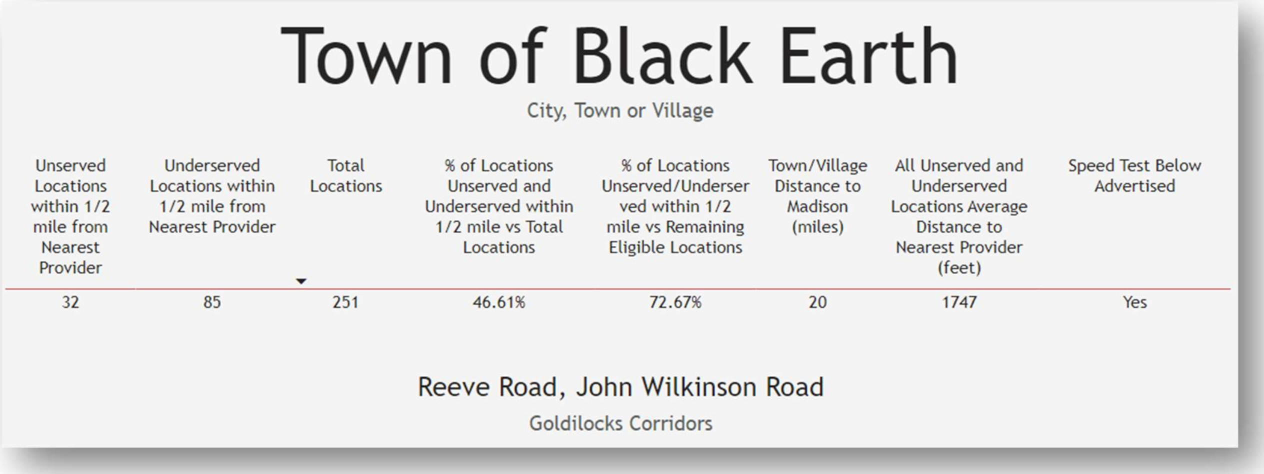
County Road K, P, KP, 19

Goldilocks Corridors

Within the town of Berry, there exists a concentrated cluster of unserved areas positioned along County Road K, Otto Kerl Road, and Schuman Road. The strategic enhancement of infrastructure within these specific Goldilocks corridors holds the promise of considerably diminishing the prevalence of unserved locations. This initiative could also present a viable prospect for enhancing service in areas currently classified as underserved. Notably, a significant portion—approximately 90%—of these unserved locations are located within a half-mile distance from existing infrastructure. TDS Telecom predominantly serves the town, and interestingly, nearly 90% of the locations fall in close proximity to TDS Telecom's network. This geographical concentration highlights the potential for targeted improvements to bring connectivity to these un(der)served pockets within the town of Berry.


KP
12
Rauls Rd
19
19
78
Martinsville
1210 ft
F
Marsh
KP
14
KF
As
Unserved (Below 25Mbps - Red)
Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $2,508,712



Town of Black Earth

City, Town or Village

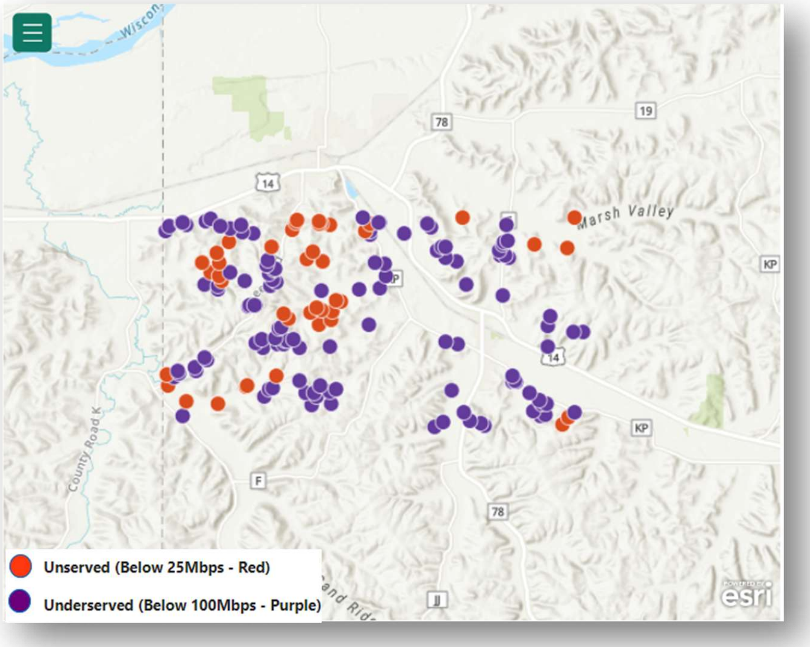
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
32	85	251	46.61%	72.67%	20	1747	Yes

Reeve Road, John Wilkinson Road

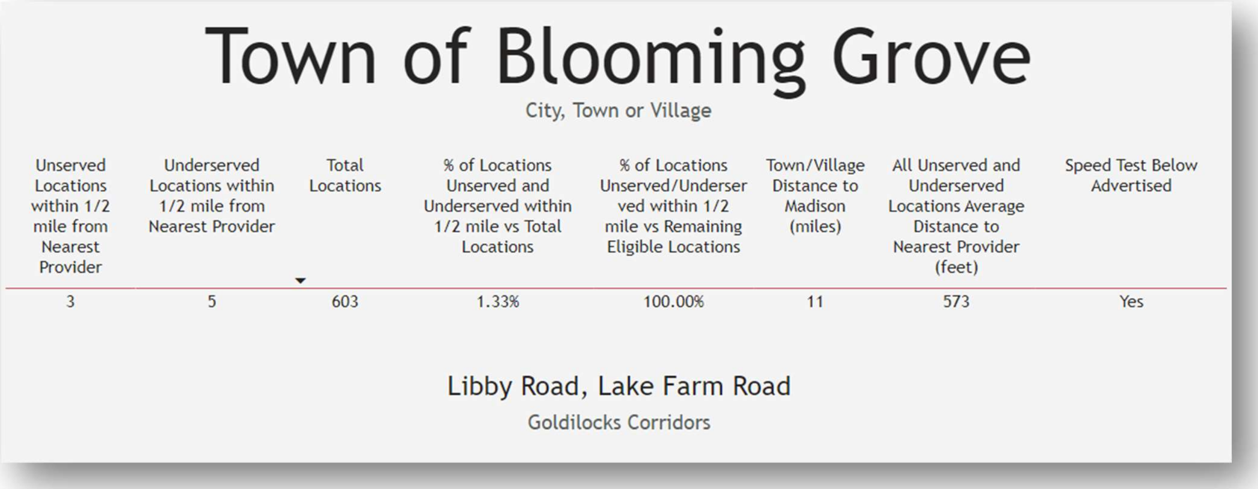
Goldilocks Corridors

The Town of Black Earth experiences a situation where the number of underserved locations surpasses that of unserved ones by more than double. A sizable portion of the unserved areas is concentrated to the direct south of Spectrum's existing infrastructure and extends due west from TDS Telecom's network. The primary challenge lies in the distances from the backbone of each service provider, as well as addressing the remaining unserved pockets located in the northeast quadrant of the town.

Notably, both Mahocker and Reeve Roads intersect with Spectrum's backbone, and in a similar vein, John Wilkinson Road intersects with W Midland, where clusters of underserved locations are situated. In the context of the northeast quadrant, there are three locations positioned notably far from the nearest underserved areas. These locations are likely to require high-cost investments for last-mile connectivity. In this scenario, strategic focus by Dane County becomes essential to target and address these high-cost last-mile locations effectively and in close coordination with both providers.


Wiscon
78
19
14
KP
Marsh Valley
KP
14
KP
County Road K
F
78
JJ
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $1,221,950



Town of Blooming Grove

City, Town or Village

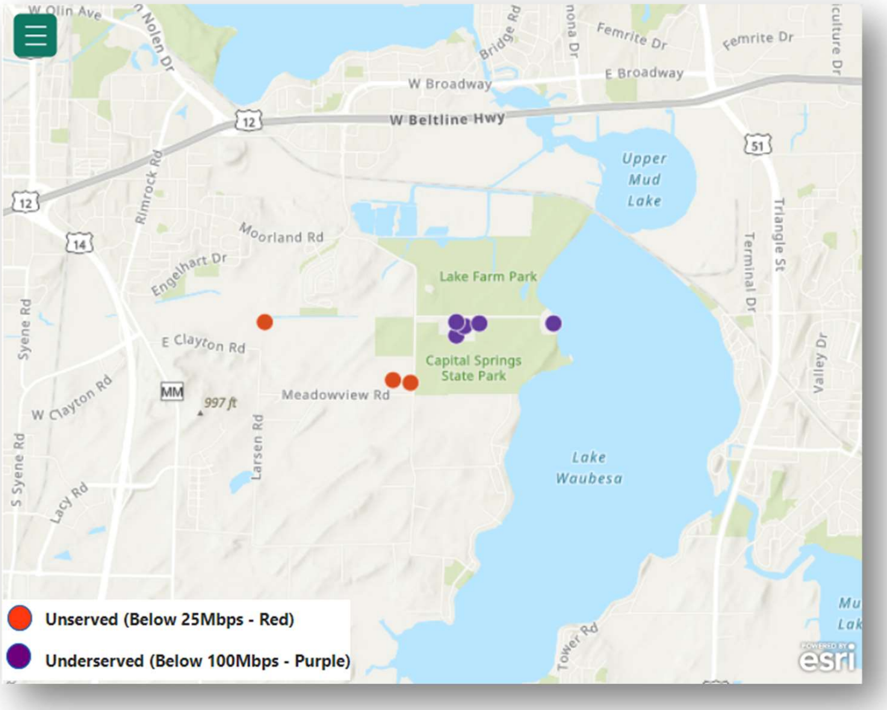
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
3	5	603	1.33%	100.00%	11	573	Yes

Libby Road, Lake Farm Road

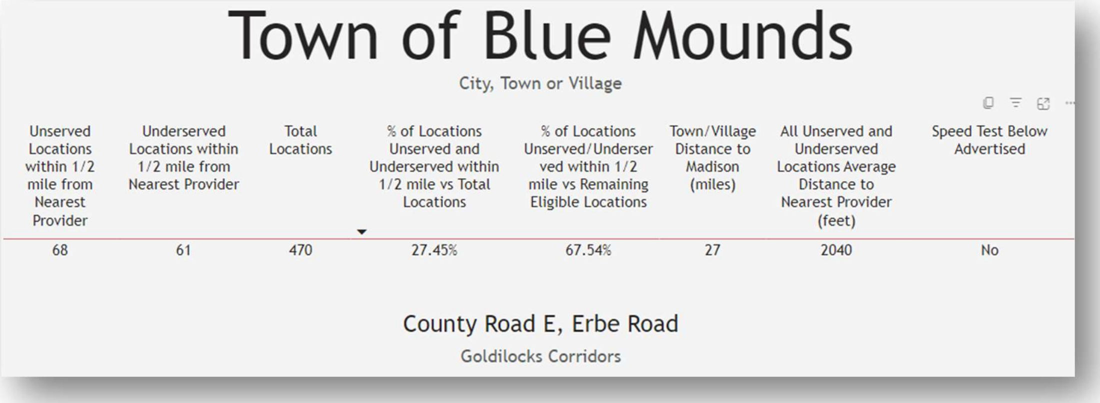
Goldilocks Corridors

The Town of Blooming Grove is faced with a limited number of both un(der)served locations. With the established infrastructure of TDS Telecom along Lake Farm Road, connecting the two unserved locations should pose no significant challenge for the existing provider. Libby Road, which links to Lake Farm Road, serves as the hub for all underserved locations and intersects with TDS Telecom's main line.

However, a remaining unserved location lies in between the two primary providers, TDS Telecom and Spectrum. The likely culprit for this unserved spot is the distance from the existing infrastructure. In cases where a business is unable to financially contribute to the expansion of service (high-cost last mile build), providers might tend to overlook such locations if they do not anticipate a substantial return on investment (ROI), particularly if the requested service does not align with a higher-tier service offering.


W Olin Ave
Nolen Dr
Bridge Rd
nona Dr
Femrite Dr
Femrite Dr
W Broadway
E Broadway
iculture Dr
12
W Beltline Hwy
51
Upper Mud Lake
12
Rimrock Rd
14
Moorland Rd
Engelhart Dr
Lake Farm Park
Terminal Dr
Triangle St
Syene Rd
E Clayton Rd
Capital Springs State Park
Valley Dr
MM
997 ft
Meadowview Rd
W Clayton Rd
Larsen Rd
S Syene Rd
Lacy Rd
Lake Waubesa
Mu Lak
Tower Rd
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $35,348



Town of Blue Mounds

City, Town or Village

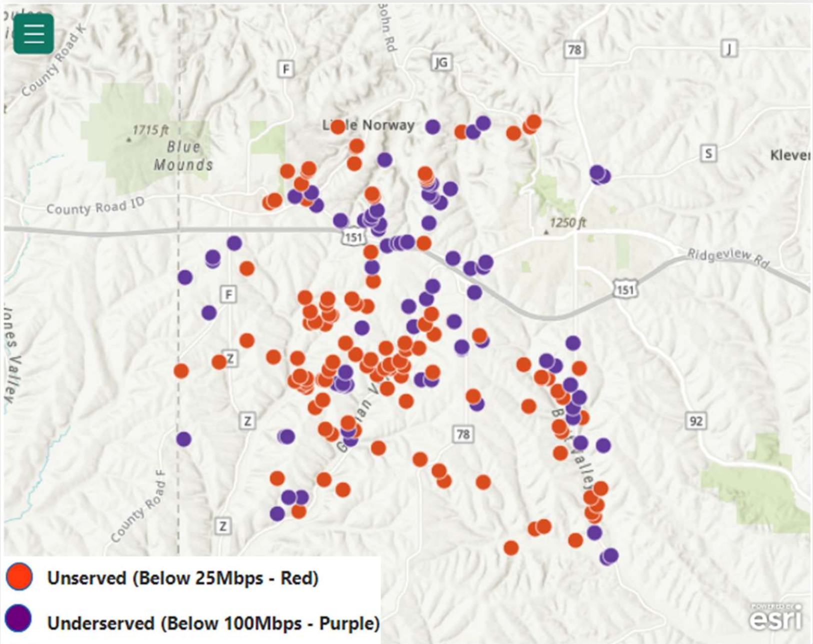
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
68	61	470	27.45%	67.54%	27	2040	No

County Road E, Erbe Road

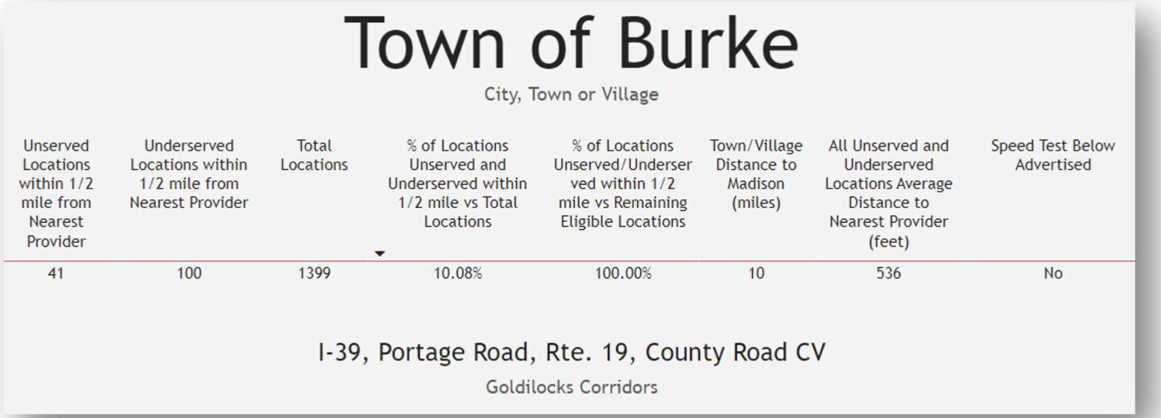
Goldilocks Corridors

Situated approximately 27 miles from Madison, the Town of Blue Mounds faces a higher number of unserved locations compared to underserved ones. Spectrum stands as the sole terrestrial provider within the town, with its existing infrastructure spanning east-west along Rte. 151. However, the town's "north-south" infrastructure is notably limited. The closest alternative provider, TDS Telecom, stops its coverage just east of the town. The challenge becomes evident with the constrained range of provider options and, even more pronounced, the scarcity of infrastructure available to address the 68 unserved locations, primarily situated to the south of Rte. 151.

County Road E and Erbe Road hold potential as strategic corridors, often referred to as Goldilocks corridors, capable of extending service to the majority of unserved locations in the southern part of the town. Interestingly, a significant portion of these unserved locations are positioned in close proximity to underserved areas. Remarkably, approximately 68 of the un(der)served locations are located within half a mile from the nearest service provider.


County Road K
F
JG
78
J
Sohn Rd
Little Norway
1715 ft
Blue Mounds
S
Klever
County Road ID
151
1250 ft
Ridgeview Rd
151
F
Jones Valley
Z
Z
78
92
County Road F
Z
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $4,368,686



Town of Burke

City, Town or Village

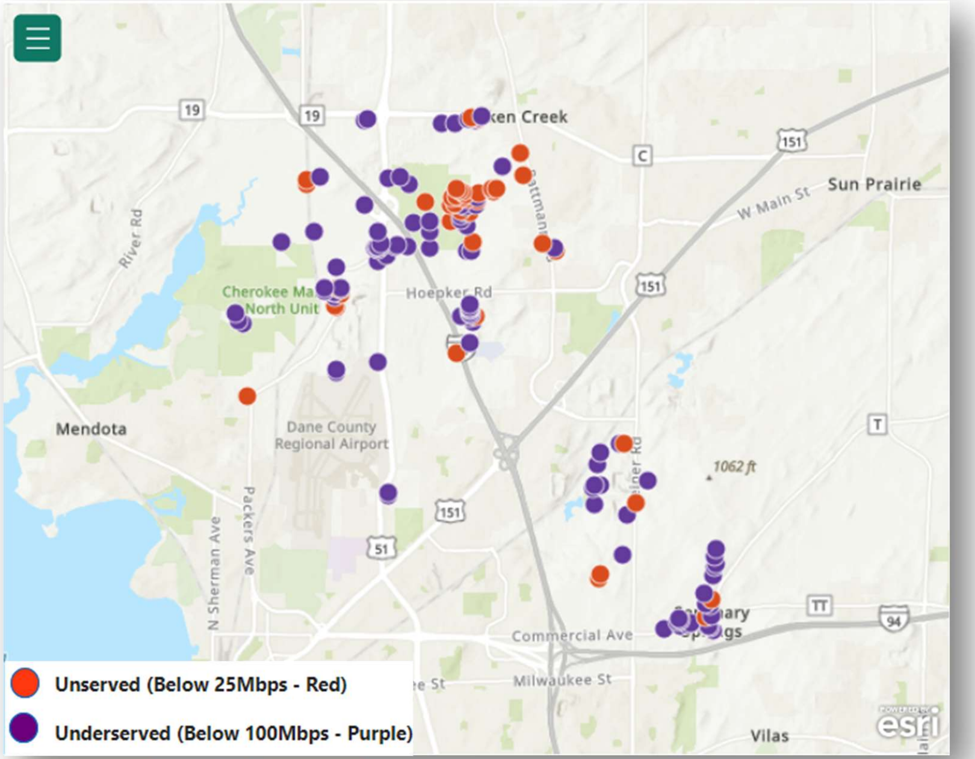
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
41	100	1399	10.08%	100.00%	10	536	No

I-39, Portage Road, Rte. 19, County Road CV

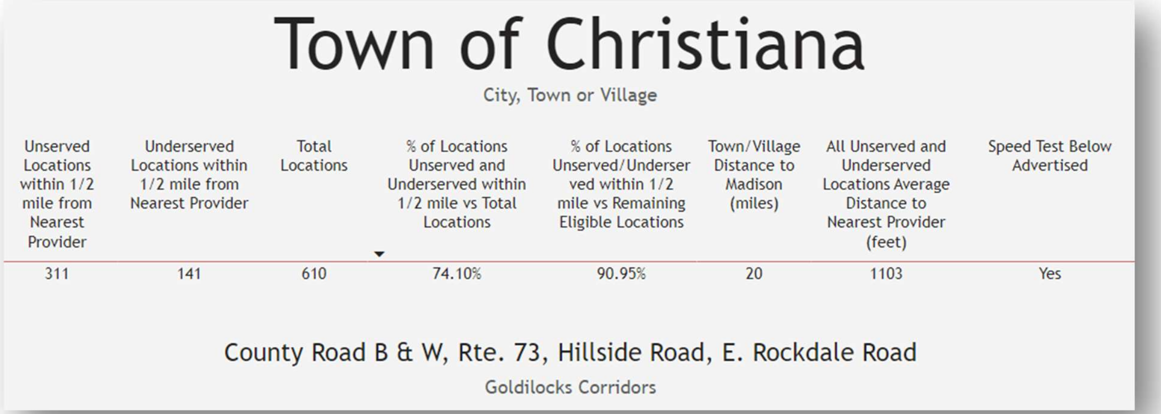
Goldilocks Corridors

The Town of Burke is divided by Rte. 151 and I-39, with a noticeable concentration of unserved locations situated on the northern side, while clusters of underserved areas are found on the southern side. Additional service could supplement the presence of Windstream and Spectrum as service providers in the area, particularly in establishing infrastructure that can cover the north-south routes in the surrounding regions. Despite the reasonable proximity to the existing infrastructure, all the remaining eligible locations that could potentially be served still fall into the un(der)served category.

I-39 holds the potential to function as a strategic Goldilocks and Dig Smart corridor, effectively aiding in bringing additional service providers into the area, particularly in establishing infrastructure that can cover the north-south routes in the surrounding regions. This initiative could potentially alleviate the current connectivity challenges faced by the Town of Burke.


19
19
ken Creek
151
C
Sun Prairie
W Main St
River Rd
Cherokee Marsh North Unit
Hoepker Rd
151
Mendota
Dane County Regional Airport
T
1062 ft
Packers Ave
N Sherman Ave
151
51
TT
94
Commercial Ave
Milwaukee St
Vilas
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $506,083



Town of Christiana

City, Town or Village

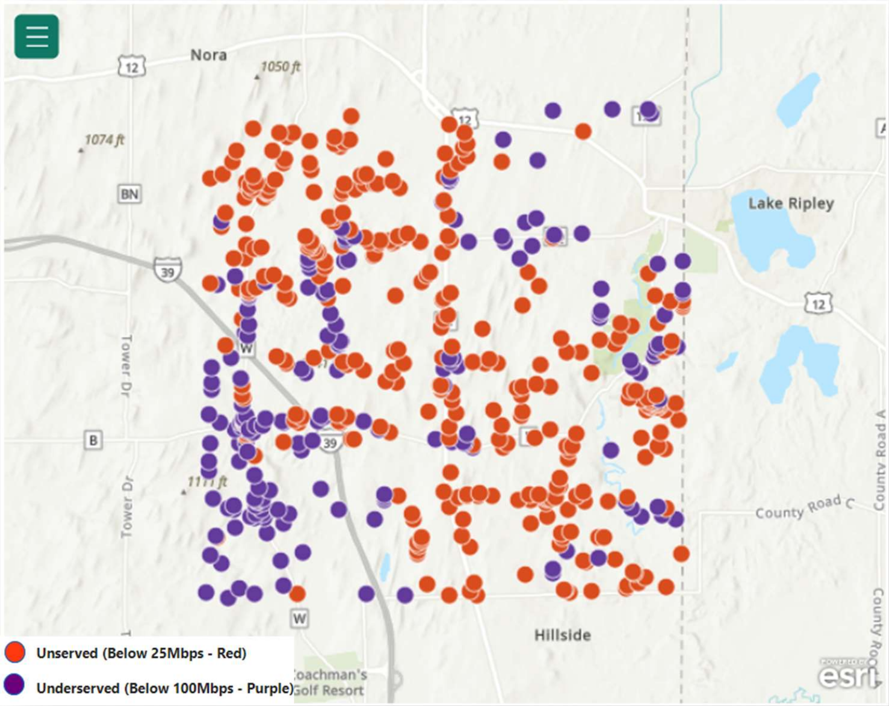
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
311	141	610	74.10%	90.95%	20	1103	Yes

County Road B & W, Rte. 73, Hillside Road, E. Rockdale Road

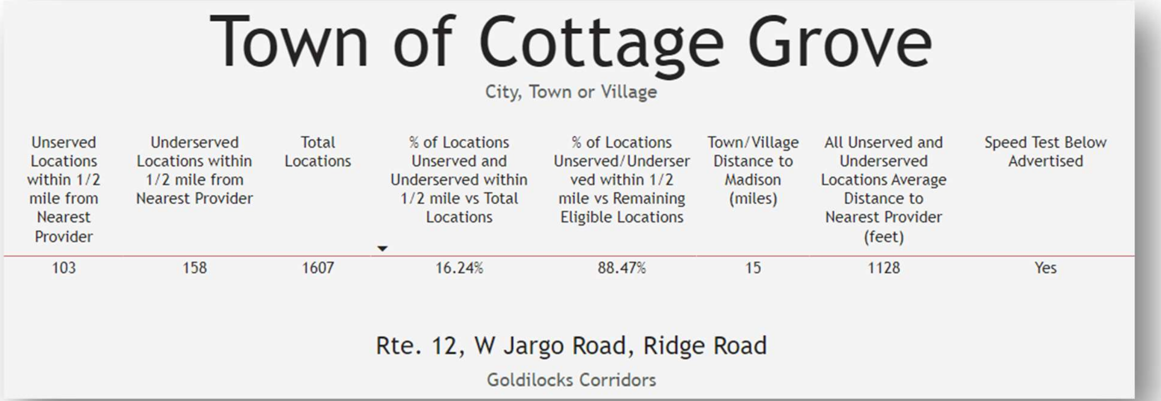
Goldilocks Corridors

The Town of Christiana is marked by one of the highest concentrations of un(der)served locations within Dane County. With a staggering count of 497 locations, a remarkable 74% of these falls within a half-mile radius, primarily clustered to the east of I-39. The remaining locations are prominently positioned between Rte. 12 and I-39.

Currently, the town is served by TDS Telecom, Windstream, and Spectrum. However, a noticeable infrastructure gap persists between the interstate and Rte. 12. A strategic approach could involve a concentrated effort on establishing connectivity along routes that bridge these corridors. This approach holds the potential to create essential north-south pathways, effectively extending coverage and reaching a sizable portion of the unserved locations within the Town of Christiana. Regarding the majority of underserved locations, they appear to be found in closest proximity to Windstream's existing infrastructure. Therefore, directing attention towards enhancing and upgrading Windstream's infrastructure should be a primary focus to effectively address this challenge.



Estimated Cost to Reach Un(der)served Locations: $2,642,667



Town of Cottage Grove

City, Town or Village

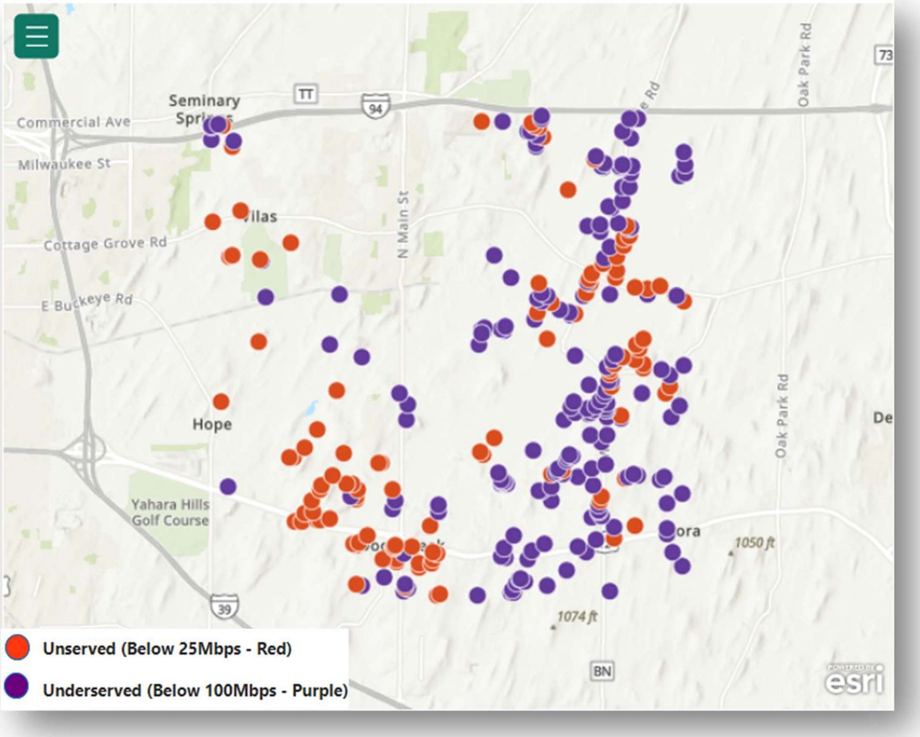
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
103	158	1607	16.24%	88.47%	15	1128	Yes

Rte. 12, W Jargo Road, Ridge Road

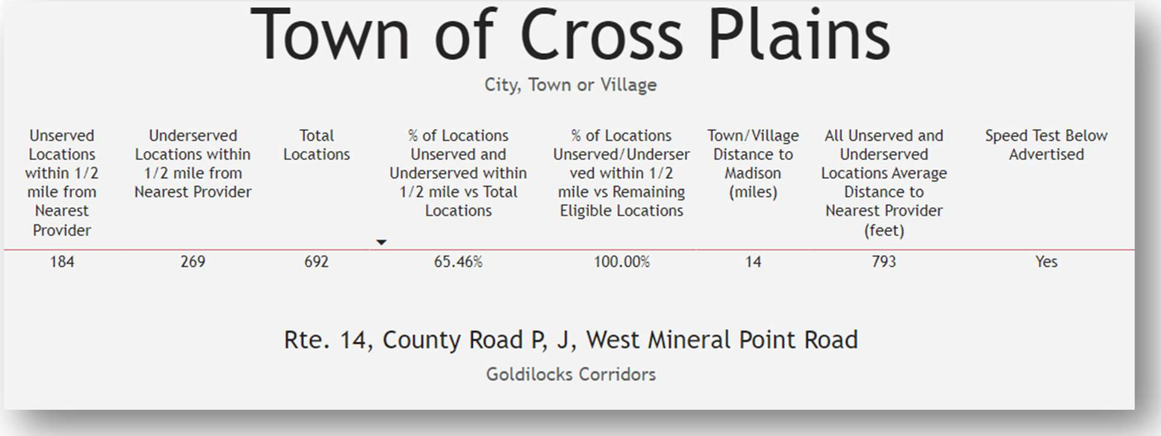
Goldilocks Corridors

The Town of Cottage Grove is marked by a situation where 60% of its locations continue to be underserved. Remarkably, 88% of these locations lie within half a mile's reach from the nearest service providers. Notably, Cottage Grove stands out as one of the rare areas in Dane County boasting the presence of more than three service providers.

For instance, Ridge Road, with the necessary infrastructure investment, could serve as a conduit to cover a substantial cluster of both un(der)served locations. Similarly, Jargo Road and Rte. 12 have the potential to encompass the majority of another cluster of unserved and underserved areas. The absence of sufficient infrastructure investment between the existing providers accentuates the locations of gaps and clusters throughout the town, pinpointing the areas that require specific attention.


Commercial Ave
Seminary Springs
TT
94
73
Milwaukee St
Vilas
Cottage Grove Rd
E Buckeye Rd
N Main St
Oak Park Rd
Hope
De
Yahara Hills Golf Course
ora
1050 ft
1074 ft
39
BN
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $1,601,726



Town of Cross Plains

City, Town or Village

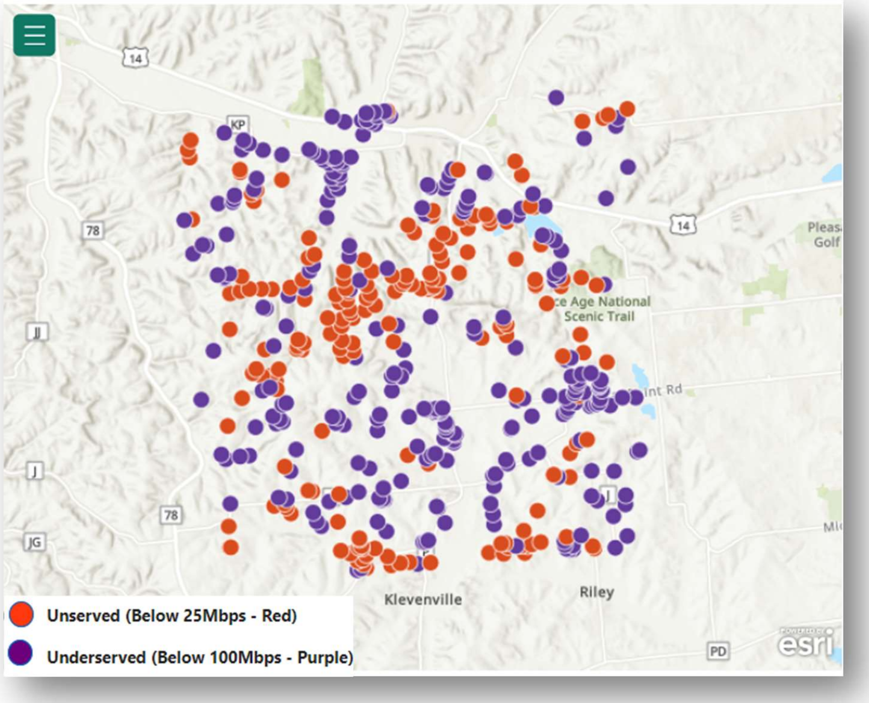
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
184	269	692	65.46%	100.00%	14	793	Yes

Rte. 14, County Road P, J, West Mineral Point Road

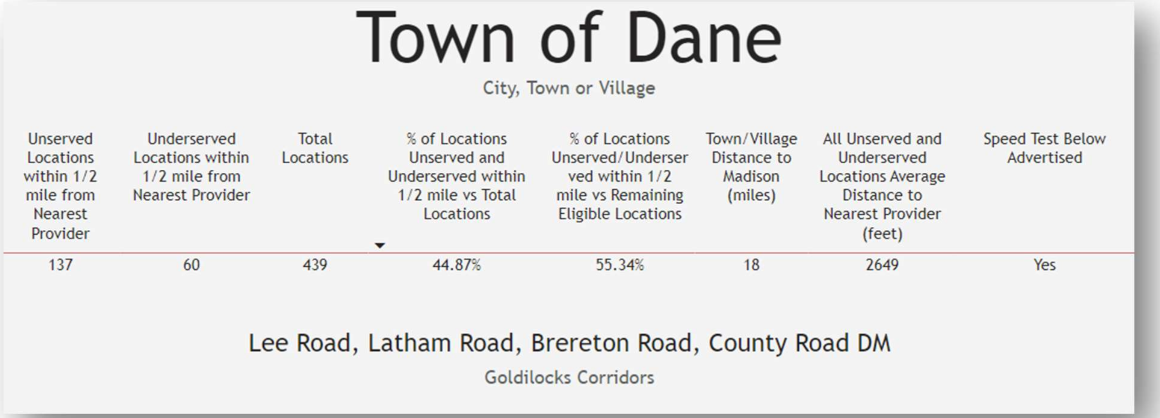
Goldilocks Corridors

The Town of Cross Plains presents a remarkable figure of 453 remaining locations that are categorized as un(der)served. Astonishingly, the entirety of these locations, totaling 100%, falls within a half-mile distance from the nearest service provider. Within this area, the offerings are provided by two companies: TDS Telecom and Spectrum. Interestingly, around 87% of these locations are situated in closest proximity to TDS Telecom.

The reason behind the town's status of being un(der)served becomes evident when considering the limited extent of extended infrastructure. The existing infrastructure is thinly distributed across the region, resulting in notable clusters positioned in between the networks of both providers. There is a minor extension of infrastructure along Garfoot Road, although it terminates quickly and fails to extend down Braun Road. This omission is significant, as Braun Road is home to a substantial cluster of unserved households. Strikingly, many of these clusters are merely around 1,000 feet away from existing infrastructure; however, they remain unserved by the current providers.



Estimated Cost to Reach Un(der)served Locations: $1,982,932



Town of Dane

City, Town or Village

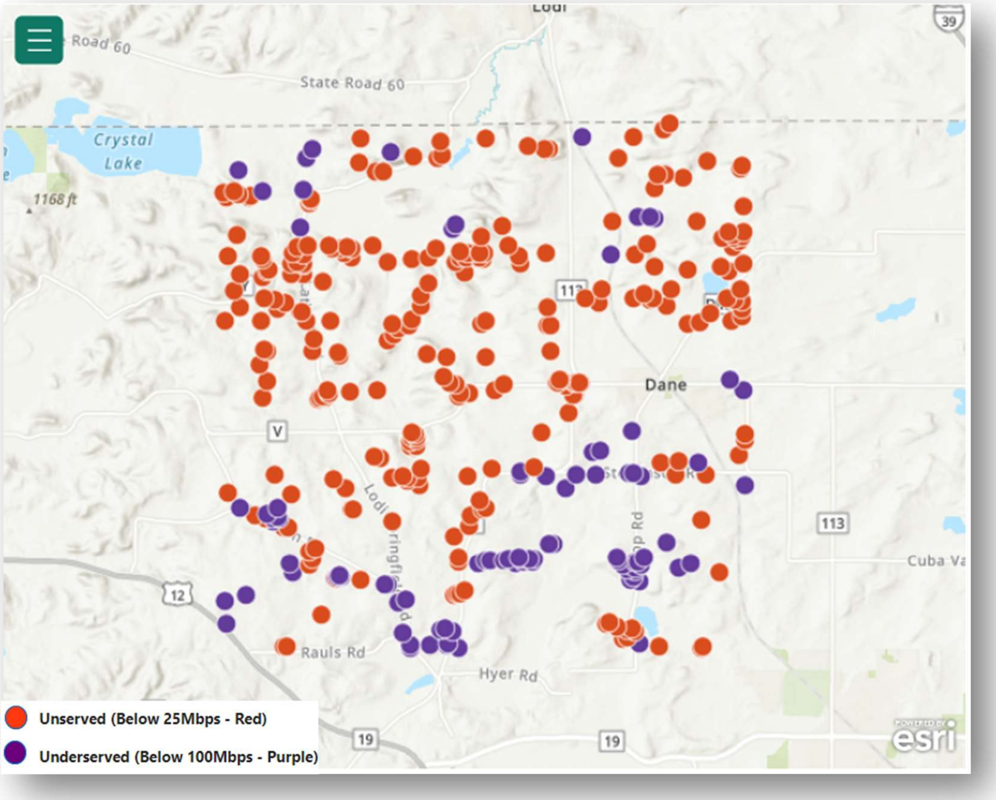
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
137	60	439	44.87%	55.34%	18	2649	Yes

Lee Road, Latham Road, Brereton Road, County Road DM

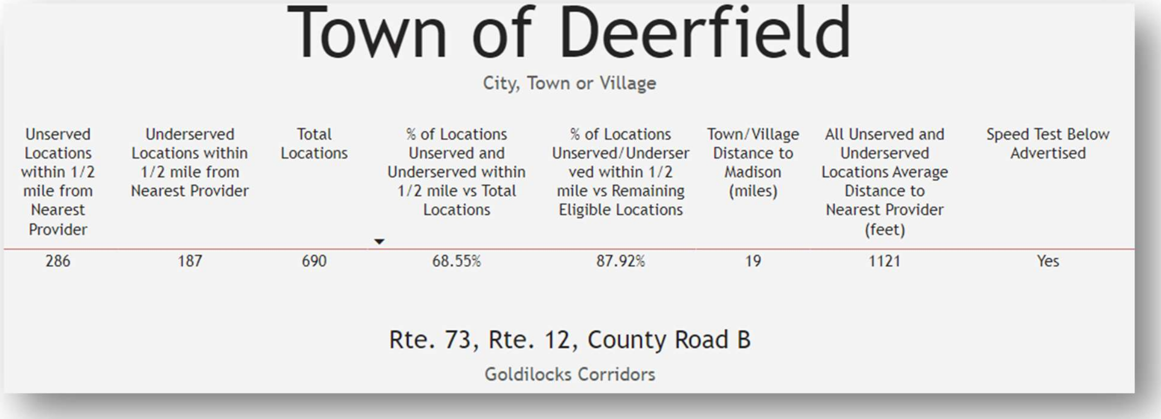
Goldilocks Corridors

The Town of Dane faces a substantial imbalance in its remaining eligible locations, with an overwhelming 70% falling under the category of unserved. The town's existing infrastructure is notably restricted, primarily following Rte. 113 and the railroad right-of-way, with scarce provision for east-west connectivity across the region.

The challenge becomes evident when examining the need for significant investment on multiple corridors to effectively reach the unserved locations. These locations are dispersed across the town, forming clusters in the western, central, and eastern areas. Consequently, considerable distances will separate these locations from the nearest infrastructure, rendering the task of providing adequate service to the town a notably expensive undertaking.


Lodi
39
Road 60
State Road 60
Crystal Lake
1168 ft
113
Dane
V
Lodi-Springfield Rd
113
Cuba Va
12
Rauls Rd
Hyer Rd
19
19
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $3,859,544



Town of Deerfield

City, Town or Village

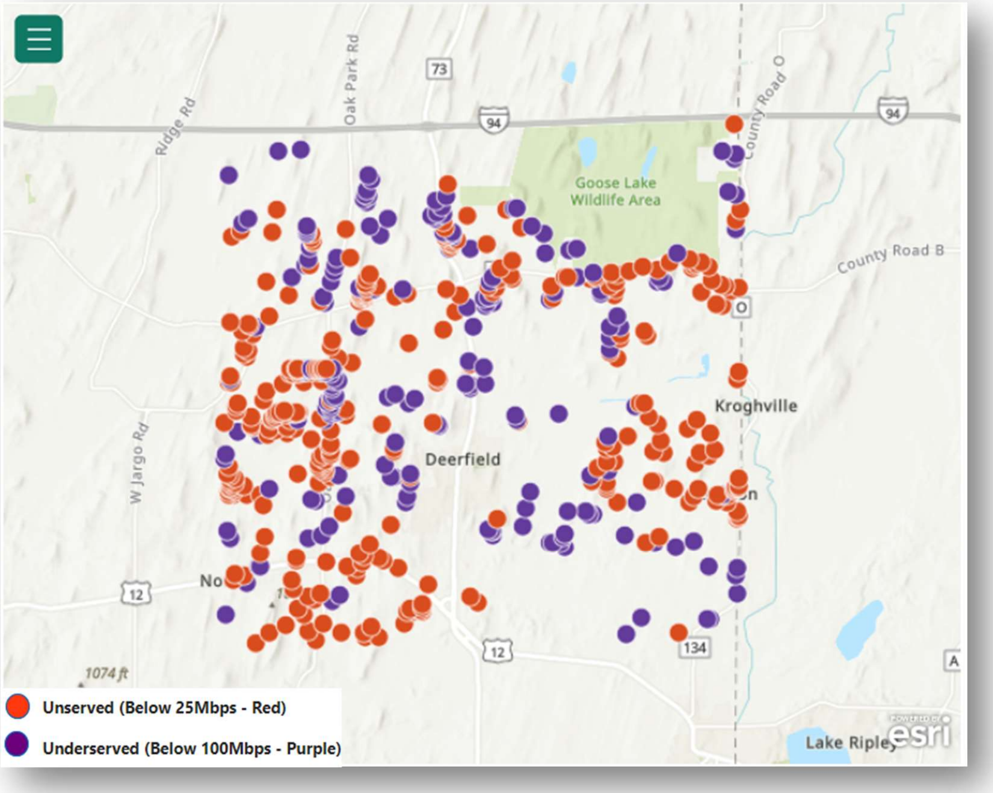
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
286	187	690	68.55%	87.92%	19	1121	Yes

Rte. 73, Rte. 12, County Road B

Goldilocks Corridors

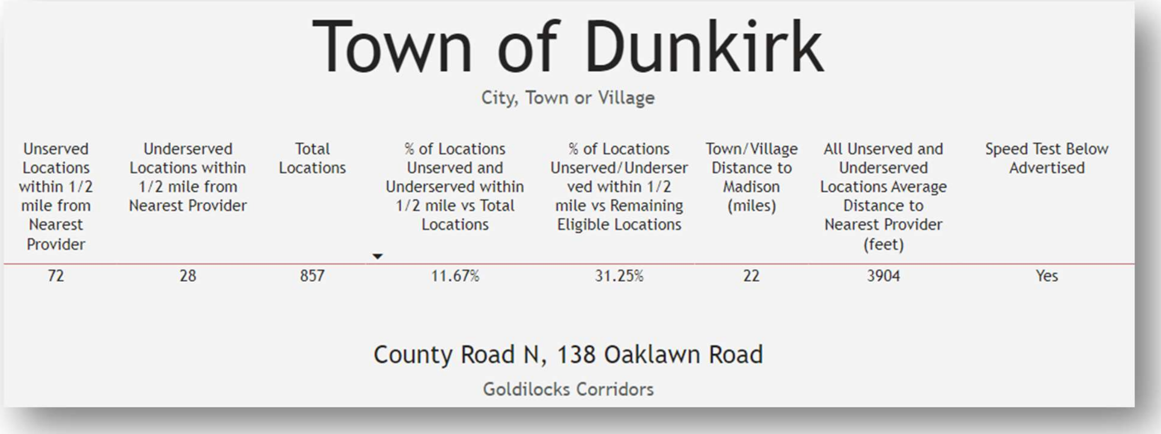
The Town of Deerfield holds the notable distinction of being ranked as the third highest in terms of un(der)served locations within Dane County. Compounding these challenges is the absence of established infrastructure between County Road BB and Rte. 12, as well as between County Road O and Oak Park Road. The infrastructure that follows Rte. 73 concludes its reach in proximity to Rte. 12. Currently, the sole east-west infrastructure comprises AT&T and Zayo, which trace their paths along the railroad right-of-way.

The notable absence of varied infrastructure and service providers underscores a common theme that resonates throughout Dane County. Specifically, the limitation in cascading infrastructure by service providers significantly curtails their ability and capacity to meet the needs that extend beyond major roadways in the various cities, towns, and villages situated across Dane County.



Oak Park Rd
73
94
Ridge Rd
County Road O
Goose Lake Wildlife Area
County Road B
O
Kroghville
W Jargo Rd
Deerfield
12
134
A
1074 ft
Lake Ripley
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $3,030,532



Town of Dunkirk

City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
72	28	857	11.67%	31.25%	22	3904	Yes

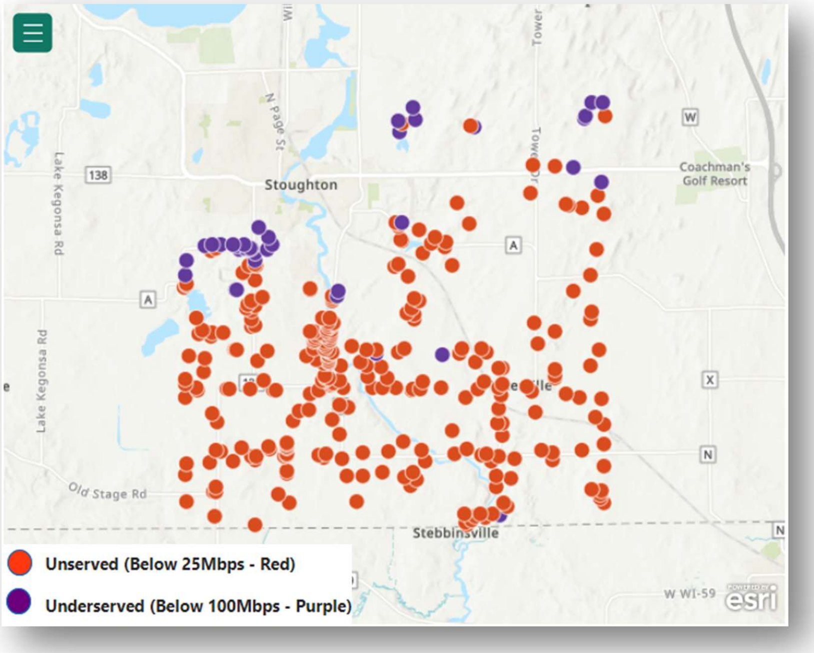
County Road N, 138 Oaklawn Road

Goldilocks Corridors

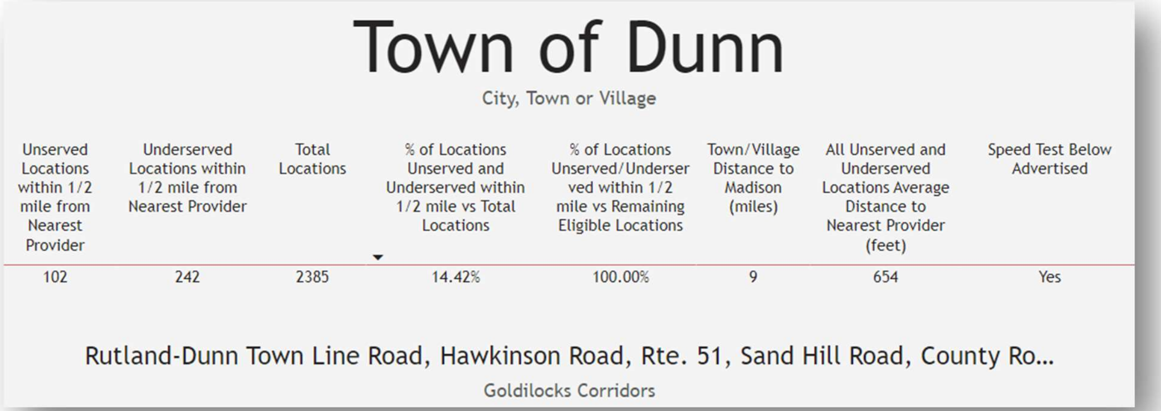
A notable majority of the remaining eligible sites within the Town of Dunkirk continue to be categorized as unserved locations. Specifically, around 72% of these remaining locations fall within the un(der)served spectrum and are positioned near the infrastructure provided by Spectrum, which serves as the primary and nearest provider.

This underscores a significant array of challenges faced by the town, which include the scarcity of infrastructure, limited competitive options, and the elevated expenses involved in reaching the unserved locations. A potential solution could arise from the primary provider in the area, Spectrum, extending their existing infrastructure along County Road 138 and County Road N. Such an expansion could notably reduce the overall costs required to extend service to the remaining unserved locations.

The Town of Dunkirk stands as an illustrative example of how public subsidy investment can play a pivotal role in mitigating the substantial costs associated with constructing the crucial last-mile infrastructure necessary to bring connectivity to these unserved areas.



Estimated Cost to Reach Un(der)served Locations: $4,872,61



Town of Dunn

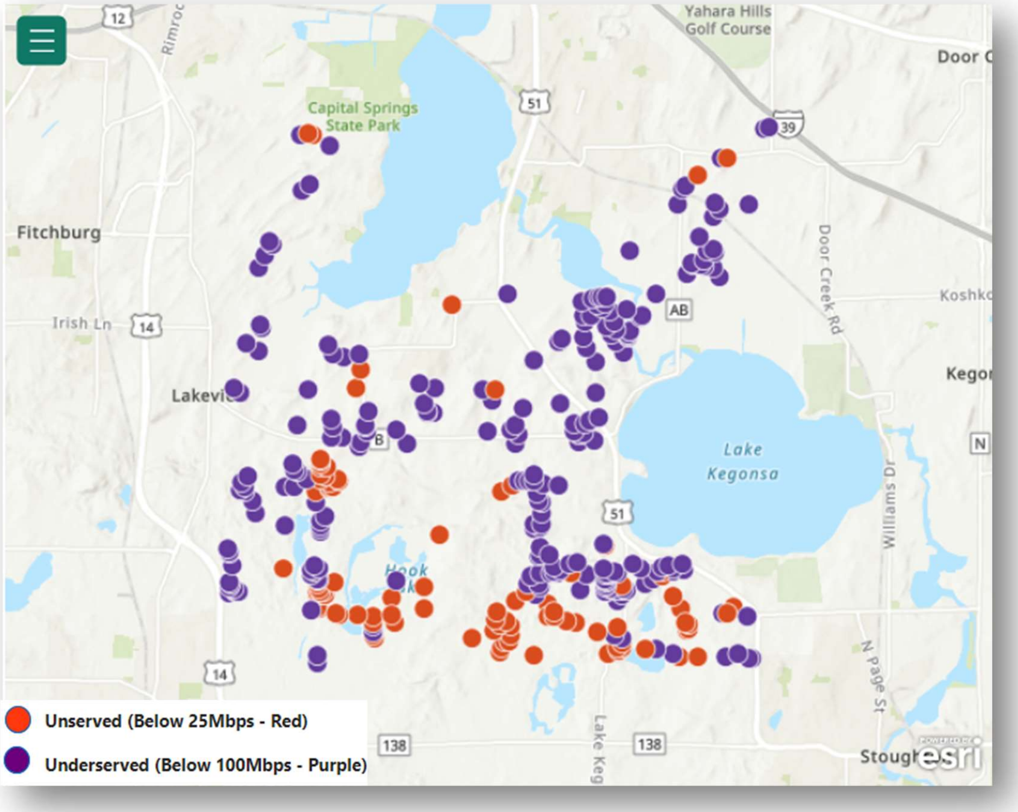
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
102	242	2385	14.42%	100.00%	9	654	Yes

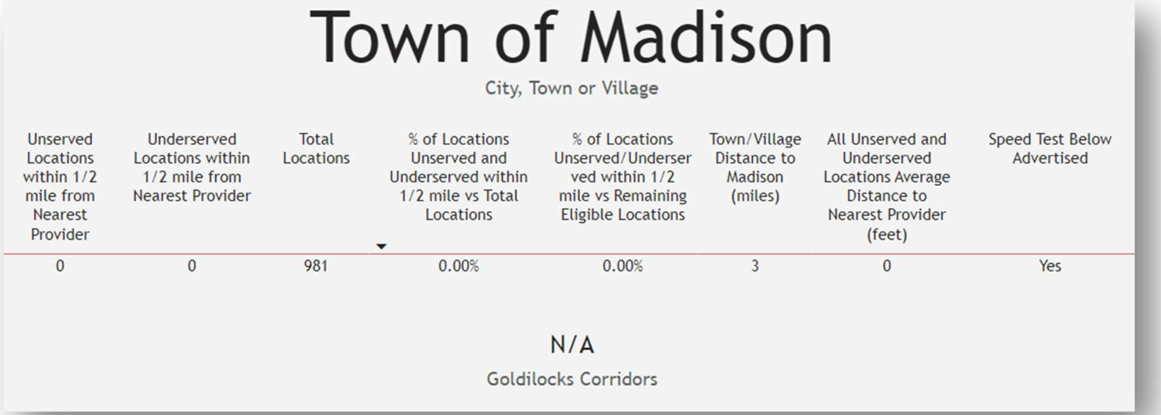
Rutland-Dunn Town Line Road, Hawkinson Road, Rte. 51, Sand Hill Road, County Ro...

Goldilocks Corridors

The Town of Dunn predominantly experiences underserved conditions across the majority of its locations. This reality exists even though there is a presence of approximately five terrestrial infrastructure providers in the region, which is also reflected in the higher ratio of underserved locations compared to those that remain unserved. Among these providers, namely Windstream, Spectrum, TDS Telecom, and WIN, their infrastructure predominantly aligns with the main roads encircling the area. However, the persistence of unserved locations and the absence of infrastructure along Hawkinson Road and Bonner Trail play a pivotal role in creating clusters of connectivity gaps in the southern part of the town.


Yahara Hills Golf Course
Capital Springs State Park
Fitchburg
Irish Ln
Lakevi
Door C
Door Creek Rd
Koshk
Kegon
Lake Kegonsa
Williams Dr
N Page St
Lake Keg
Stough
12
14
51
39
AB
B
N
138
🟥 Unserved (Below 25Mbps - Red)
🟪 Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $1,419,304



Town of Madison

City, Town or Village

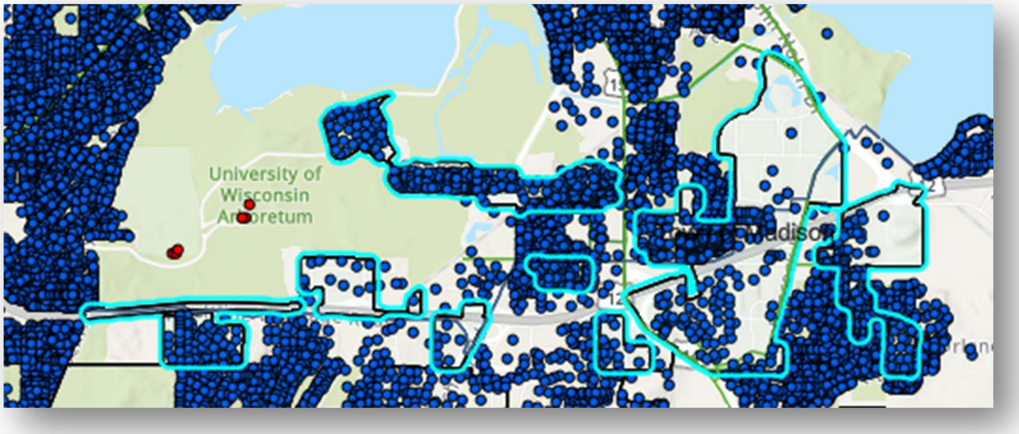
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
0	0	981	0.00%	0.00%	3	0	Yes

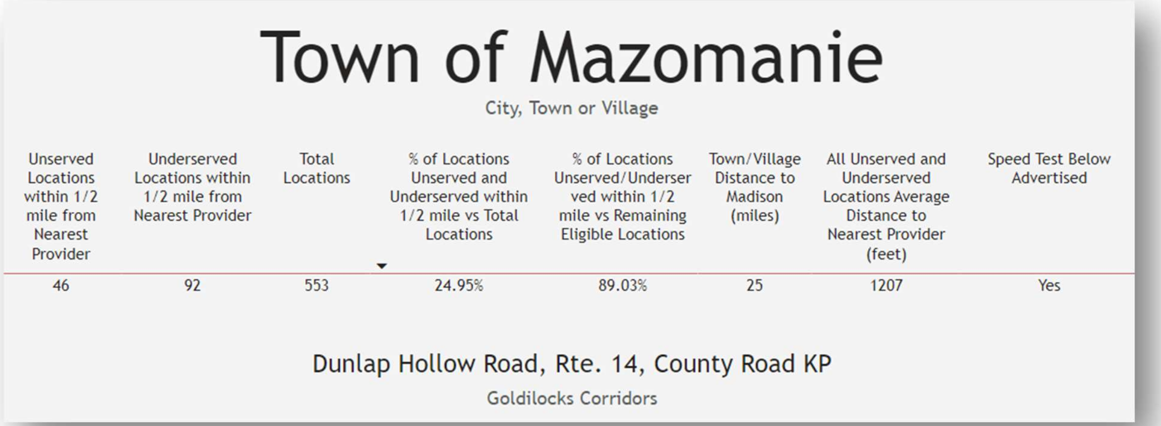
N/A

Goldilocks Corridors

The Town of Madison, outlined in turquoise blue, is classified as "served" according to the FCC's definition. The area encompasses roughly 981 eligible locations, all of which are indicated as served through blue dots. To ensure comprehensive coverage, it will be crucial for Dane County to maintain consistent monitoring of FCC data and cross-reference it with the data provided by the WBO. This diligence aims to identify any locations that may emerge as unserved or underserved over time.

Moreover, an equally vital undertaking for Dane County will be to consistently monitor, assess, and take appropriate measures regarding ACP enrollment. This effort ensures that those in need of financial assistance can continue to enjoy the classification of "served." Furthermore, based on Ookla's speed test data, there are instances where the town faces challenges with speed tests registering below the advertised speeds.





Town of Mazomanie

City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
46	92	553	24.95%	89.03%	25	1207	Yes

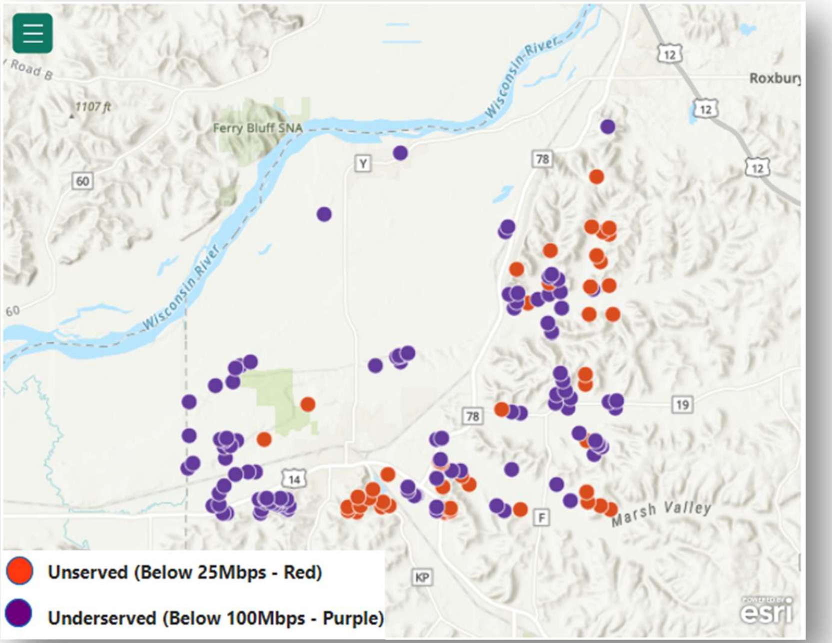
Dunlap Hollow Road, Rte. 14, County Road KP

Goldilocks Corridors

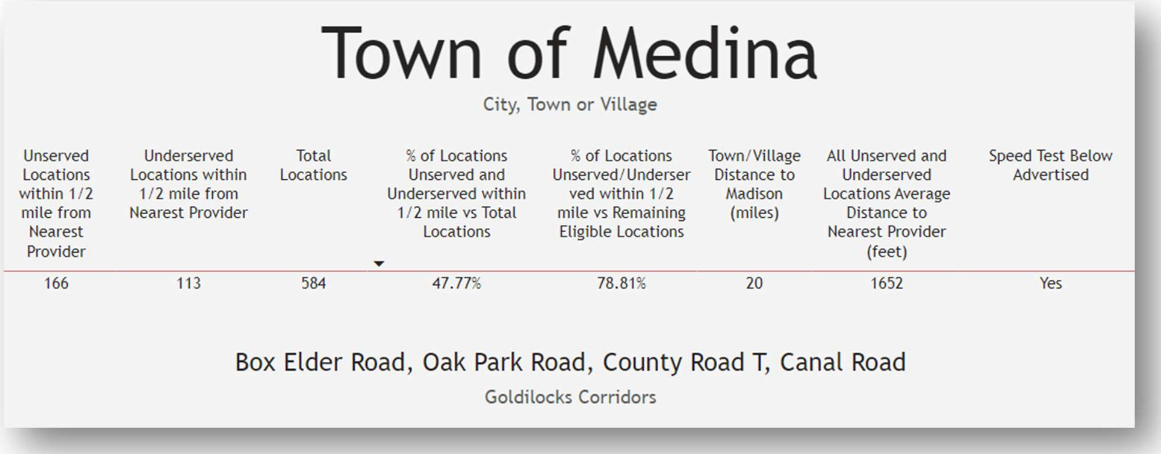
Situated about 25 miles from Madison, the Town of Mazomanie is dependent on a solitary service provider that operates in proximity to the un(der)served areas, namely Spectrum. Currently, the existing infrastructure follows the path of Rte. 78, with a significant concentration of unserved and underserved locations positioned in close proximity to this route. A potential solution could involve extending the backbone infrastructure through several offshoots, which could enable access to the unserved locations, particularly those clustered near Rte. 78.

Furthermore, this approach could also effectively serve a smaller cluster of locations positioned to the south of Rte. 14, which also remains near Spectrum's established infrastructure. By strategically expanding the network backbone, Spectrum has the opportunity to bridge the connectivity gap for these unserved areas.

The scarcity of available service providers can contribute to a diminished incentive for organizations to invest in providing coverage to the 46 unserved locations.



Estimated Cost to Reach Unserved and Underserved Locations: $926,039



Town of Medina

City, Town or Village

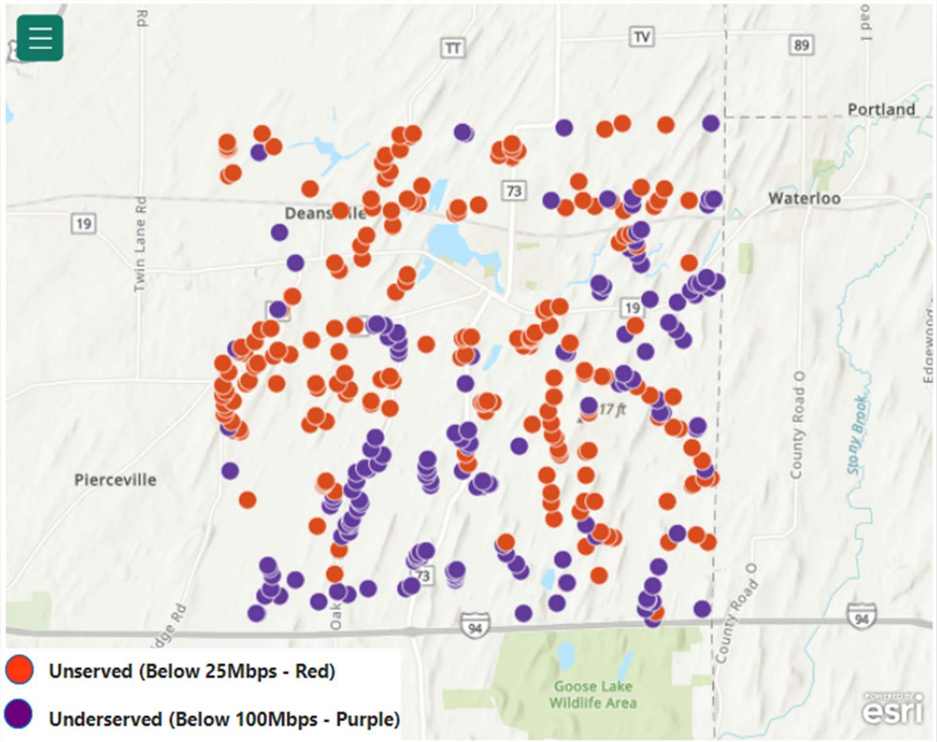
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
166	113	584	47.77%	78.81%	20	1652	Yes

Box Elder Road, Oak Park Road, County Road T, Canal Road

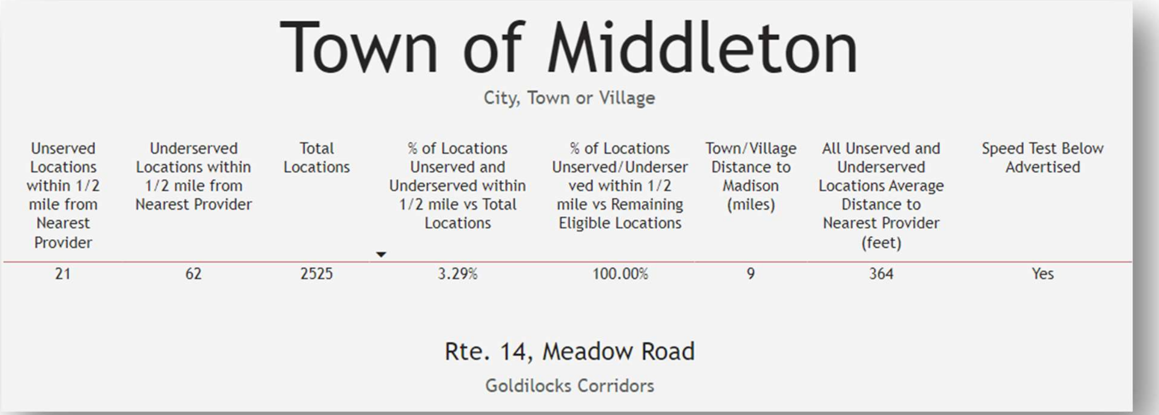
Goldilocks Corridors

The Town of Medina poses another challenge for increased competition and expanding the current infrastructure provided by Spectrum. A considerable portion of the un(der)served locations are positioned between I-94 and the railroad right-of-way, with minimal to no service provider infrastructure extending in a north-south direction to reach or cover these un(der)served areas.

Several potential Goldilocks corridors stand out as strategically valuable, as they could effectively encompass a noteworthy proportion of the un(der)served locations located between I-94 and Rte. 19. Notably, County Road TT, Hubbell Street, and Canal Road emerge as key routes that could significantly bridge the gap in the northern region of Medina, thus improving connectivity in that area.


TT
TV
89
Portland
Waterloo
73
Deansville
19
Twin Lane Rd
19
17 ft
County Road O
Stony Brook
Edgewood
Pierceville
73
94
94
County Road O
Goose Lake Wildlife Area
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $2,491,507



Town of Middleton

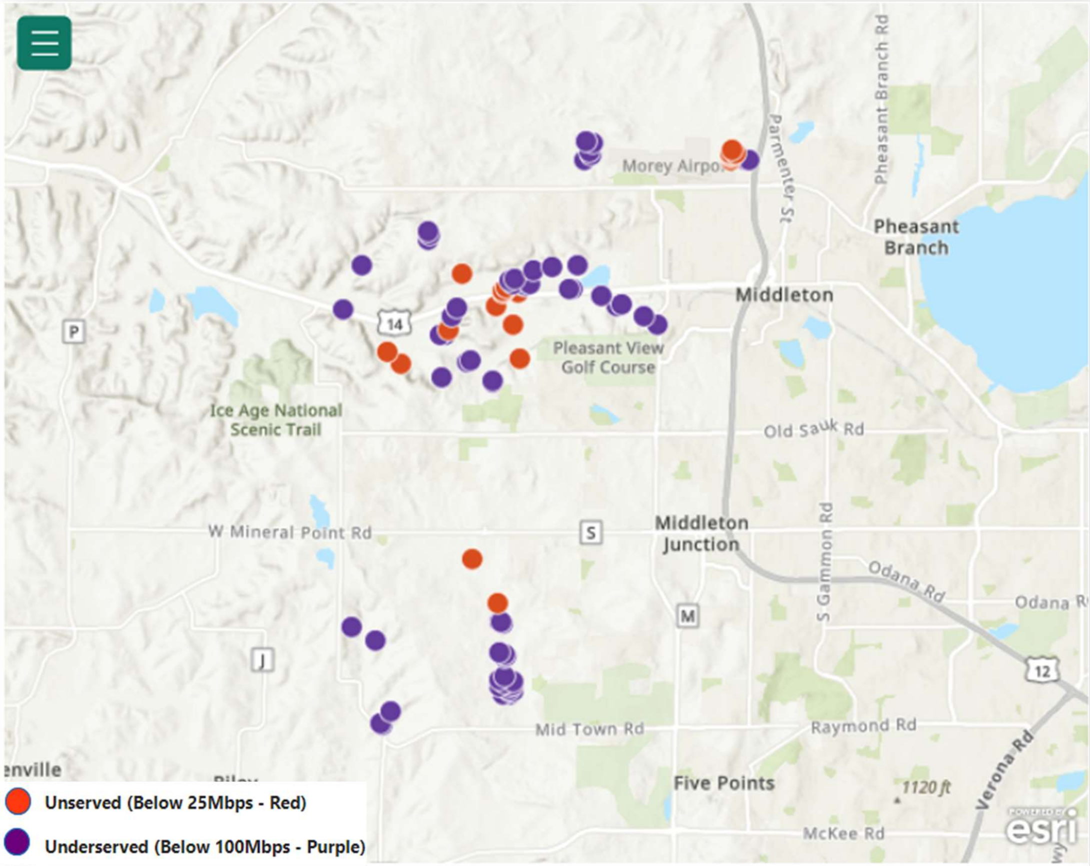
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
21	62	2525	3.29%	100.00%	9	364	Yes

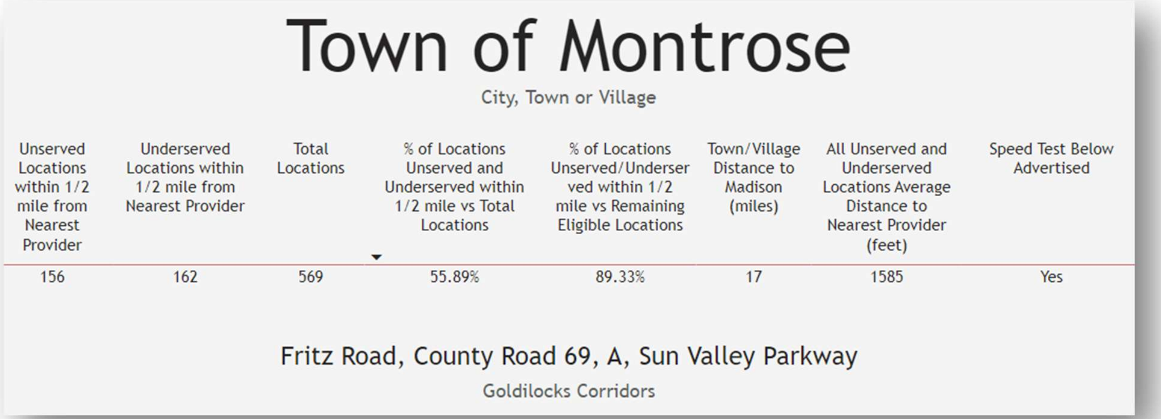
Rte. 14, Meadow Road

Goldilocks Corridors

The Town of Middleton's un(der)served areas are primarily concentrated in two key zones. The first area lies adjacent to Rte. 14, while the second area is situated near Meadow and Pioneer Roads. A significant density of infrastructure is observed between TDS Telecom and Spectrum, leading to an average distance of approximately 364 feet to the nearest provider. Through targeted investment from either provider and proactive advocacy efforts by Dane County, there is a promising opportunity to elevate the Town of Middleton from its current status of being un(der)served to achieving the designation of being "served."


Morey Airpo
Parmenter St
Pheasant Branch Rd
Pheasant Branch
Middleton
14
P
Pleasant View Golf Course
Ice Age National Scenic Trail
Old Sauk Rd
W Mineral Point Rd
S
Middleton Junction
S Gammon Rd
Odana Rd
Odana R
M
J
12
Mid Town Rd
Raymond Rd
Five Points
1120 ft
Verona Rd
McKee Rd
enville
esri
Unserved (Below 25Mbps - Red)
Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $2,491,507



Town of Montrose

City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
156	162	569	55.89%	89.33%	17	1585	Yes

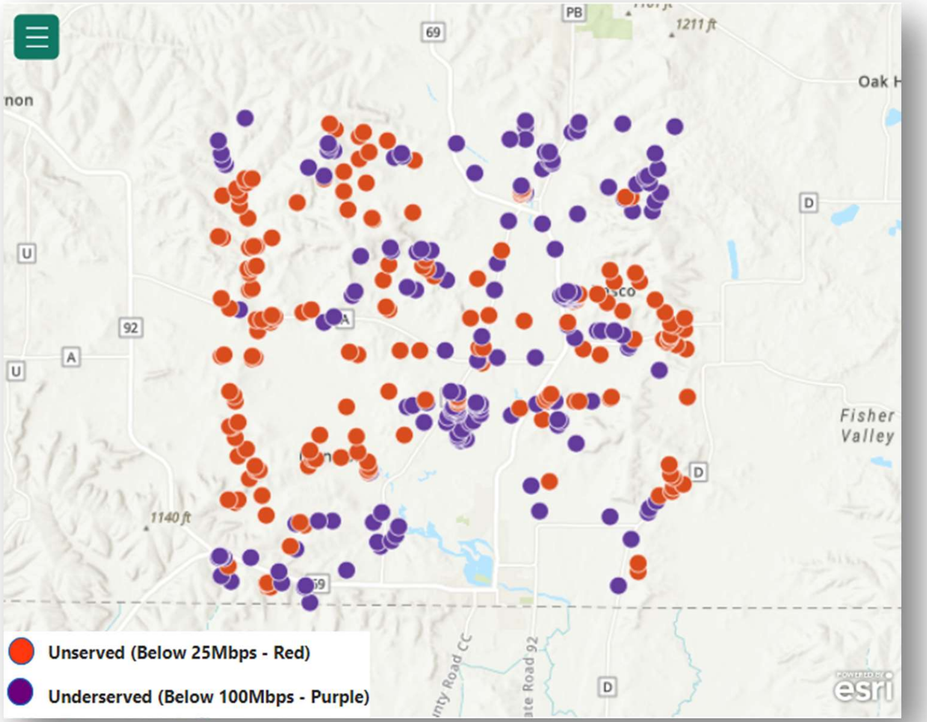
Fritz Road, County Road 69, A, Sun Valley Parkway

Goldilocks Corridors

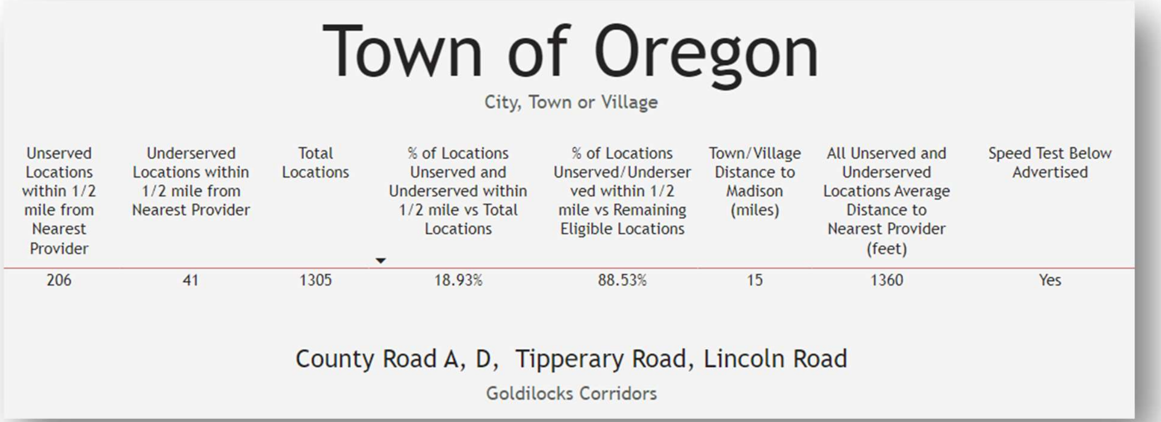
The Town of Montrose is characterized by a near equal count of un(der)served locations. A thorough examination of the existing infrastructure reveals that both TDS Telecom and Spectrum envelop the town's perimeter; however, they do not extend their presence into crucial areas that could alleviate the issue of unserved locations.

For instance, Fritz Road emerges as a Goldilocks corridor housing a notable concentration of unserved locations. Remarkably, this corridor is positioned adjacent to Rte. 92, where TDS Telecom's infrastructure is situated. Furthermore, County Road A serves as a connecting route between Rte. 92 and County Road 69, presenting another significant opportunity to address a substantial portion of the unserved locations.

Despite these key corridors, the region's "in-between" corridors still lack the essential infrastructure and requisite investment from the current service providers to bridge the gap effectively at this time.



Estimated Cost to Reach Un(der)served Locations: $2,386,741



Town of Oregon

City, Town or Village

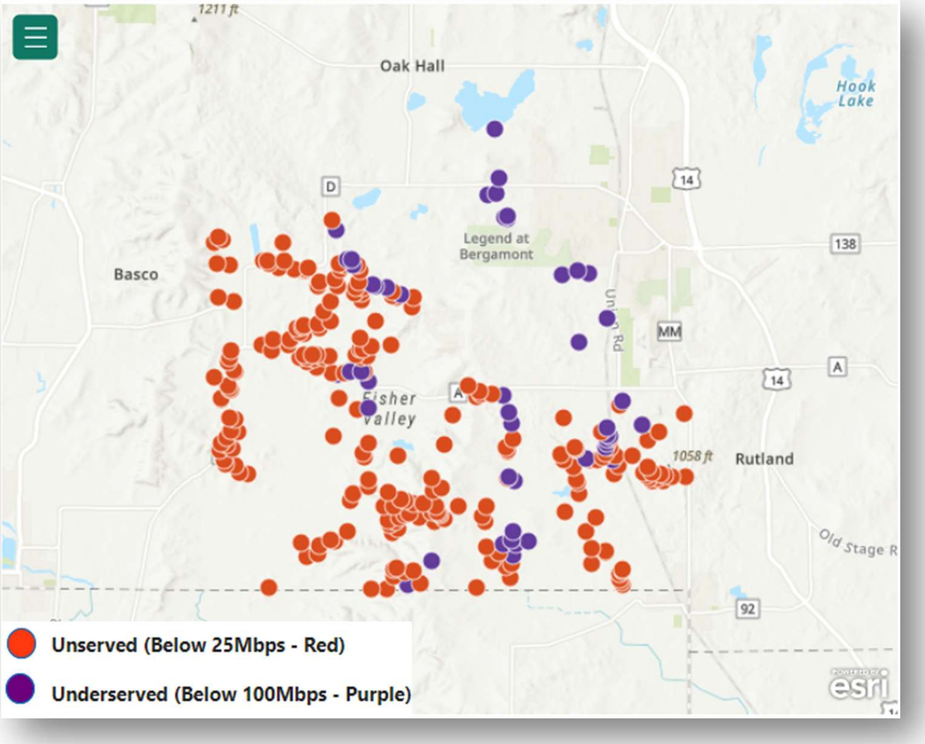
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
206	41	1305	18.93%	88.53%	15	1360	Yes

County Road A, D, Tipperary Road, Lincoln Road

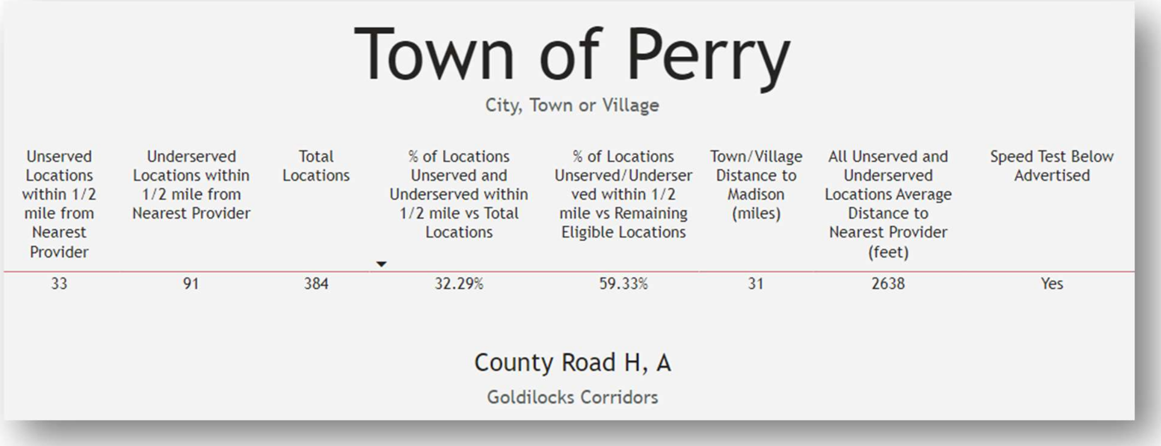
Goldilocks Corridors

The Town of Oregon stands out with the highest proportion of unserved locations, accounting for approximately 84% of the remaining sites, of which roughly 89% are positioned within a half-mile distance from the nearest provider. The town faces the current reality of being nearest to one service provider, Spectrum. TDS Telecom serves as the next available provider, and their nearest infrastructure is situated along Rte. 69 near Montrose.

The recurring theme of being surrounded by limited infrastructure, primarily provided by a single service provider, persists for the Town of Oregon. Addressing this challenge could involve investments in establishing east-west routes across the southern part of Oregon. However, the absence of competition can deter such investments, as providers might hesitate until a more business-friendly metric, such as "homes per mile passed," becomes more appealing. An incentive to other providers could encourage new entrants to consider entering the market.



Estimated Cost to Reach Un(der)served Locations: $1,633,490



Town of Perry

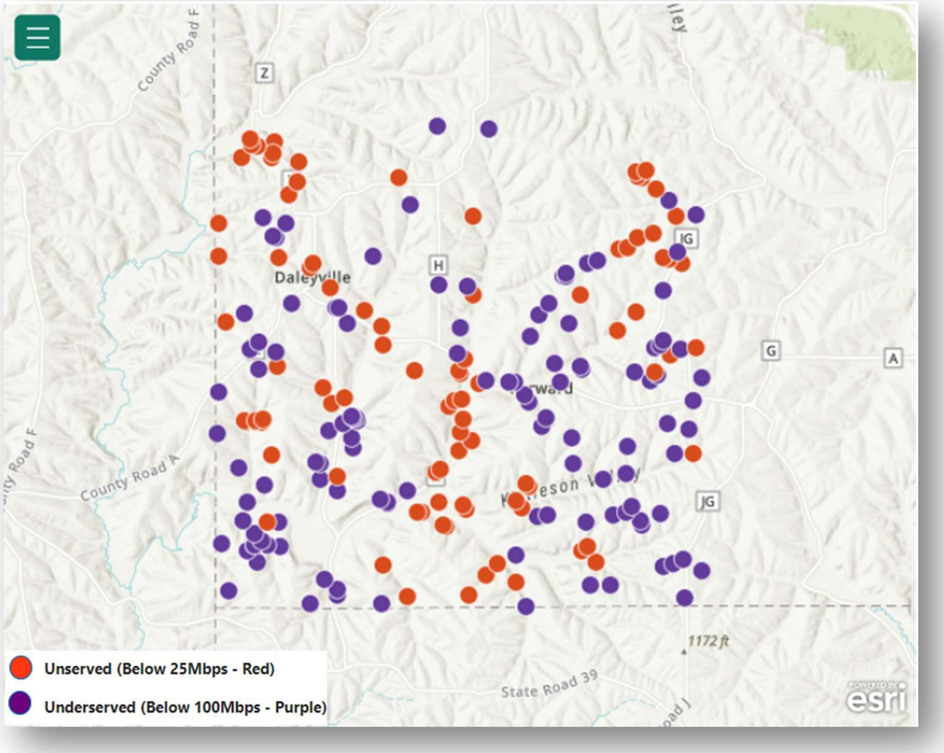
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
33	91	384	32.29%	59.33%	31	2638	Yes

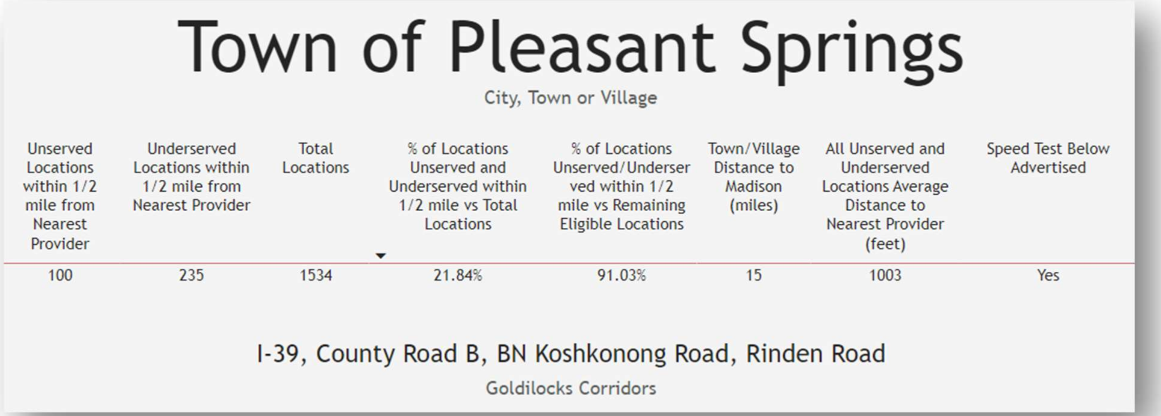
County Road H, A

Goldilocks Corridors

The Town of Perry, situated nearly 30 miles from Madison, finds itself serviced by a single provider, TDS Telecom. Two primary challenges characterize Perry's connectivity landscape: the exclusive presence of one service provider and the substantial distance to access its services, with an average span exceeding 2,000 feet. Adding to the complexity, the nearest alternative provider, Spectrum, is located either in the Village of Mount Horeb (approximately 10 miles away) or in the Village of Belleville (approximately 15 miles away). The Town of Perry exemplifies a scenario of limited competition, a circumstance that could lead to provider complacency and higher entry costs for potential newcomers in the market. Furthermore, the absence of middle-mile infrastructure impedes the extension of connectivity to the outer regions of Dane County. This limitation hinders the emergence of more competition by inhibiting an ineffective business model for new entrants seeking to establish themselves in the market.


County Road F
Z
Daleyville
H
IG
G
A
JG
County Road A
1172 ft
State Road 39
🟥 Unserved (Below 25Mbps - Red)
🟪 Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $2,205,146



Town of Pleasant Springs

City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
100	235	1534	21.84%	91.03%	15	1003	Yes

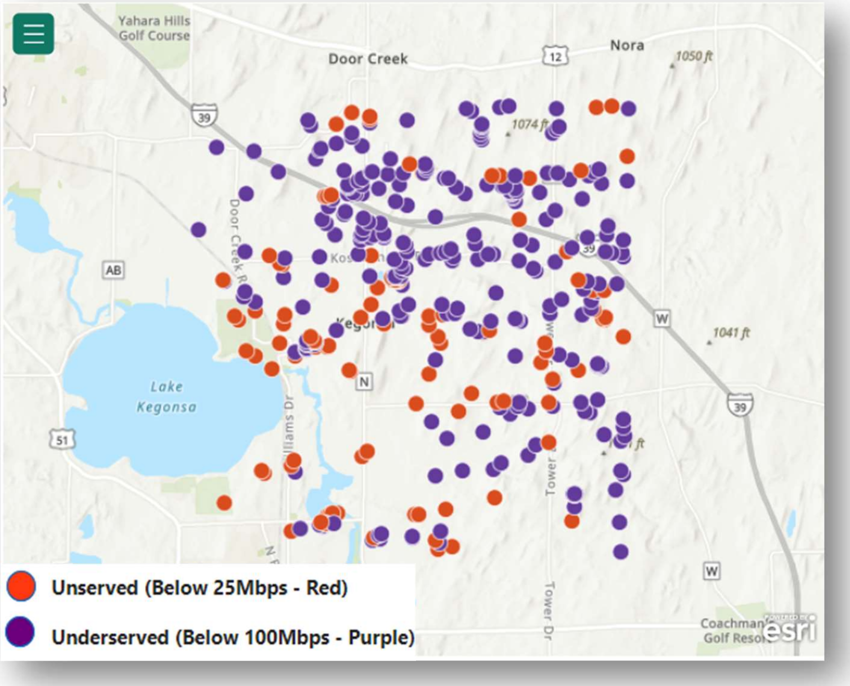
I-39, County Road B, BN Koshkonong Road, Rinden Road

Goldilocks Corridors

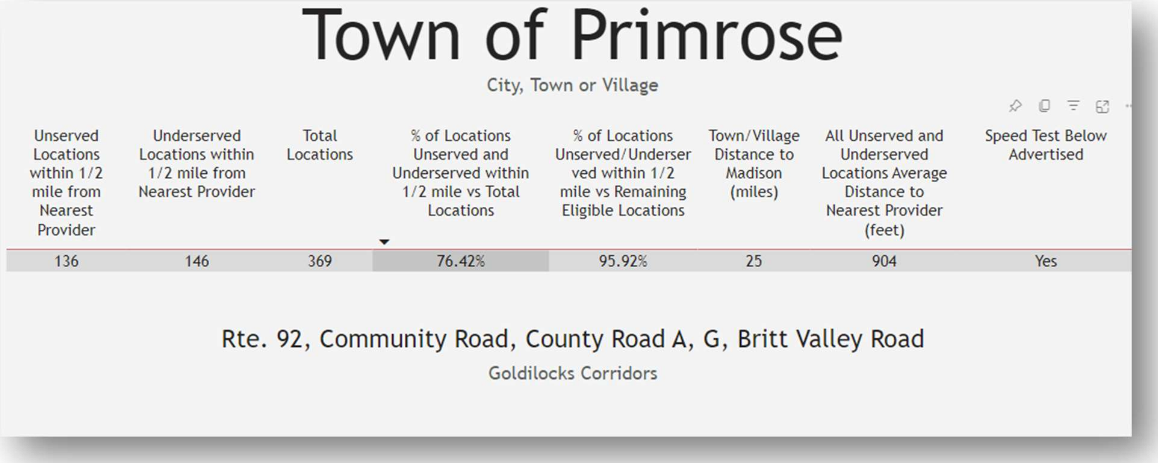
The Town of Pleasant Springs encompasses an approximate count of 368 locations that remain un(der)served. Within this area, three providers operate: Windstream, Spectrum, and TDS Telecom. The un(der)served locations of the town are positioned in-between the routes of these providers, with the lack of robust service provider infrastructure density contributing to the prevalence of these connectivity gaps.

Primarily concentrated in the southern part of town, a substantial number of unserved locations are situated. Addressing this issue entails identifying a few key routes that hold the potential to mitigate the gap and cover a substantial number of these locations. Prominent among these routes are Koshkonong Road, Rinden Road, and County Road BN.

Although there exist three providers in the region, Pleasant Springs still contends with the challenge of having several hundred un(der)served locations. This underscores the complexity of ensuring comprehensive coverage despite the presence of multiple service providers.


Yahara Hills Golf Course
Door Creek
Nora
12
1050 ft
39
1074 ft
Door Creek Rd
AB
Kos
Kegon
W
1041 ft
Lake Kegonsa
N
39
51
Williams Dr
Tower
Tower Dr
W
Coachman's Golf Resort
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $1,950,769



Town of Primrose

City, Town or Village

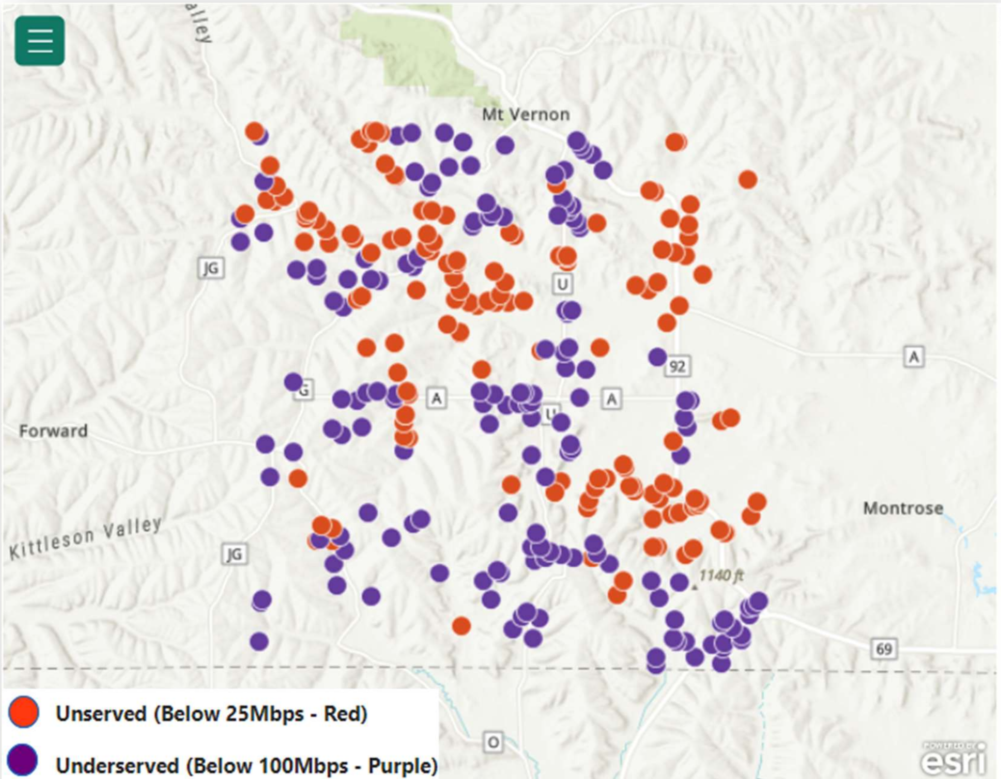
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
136	146	369	76.42%	95.92%	25	904	Yes

Rte. 92, Community Road, County Road A, G, Britt Valley Road

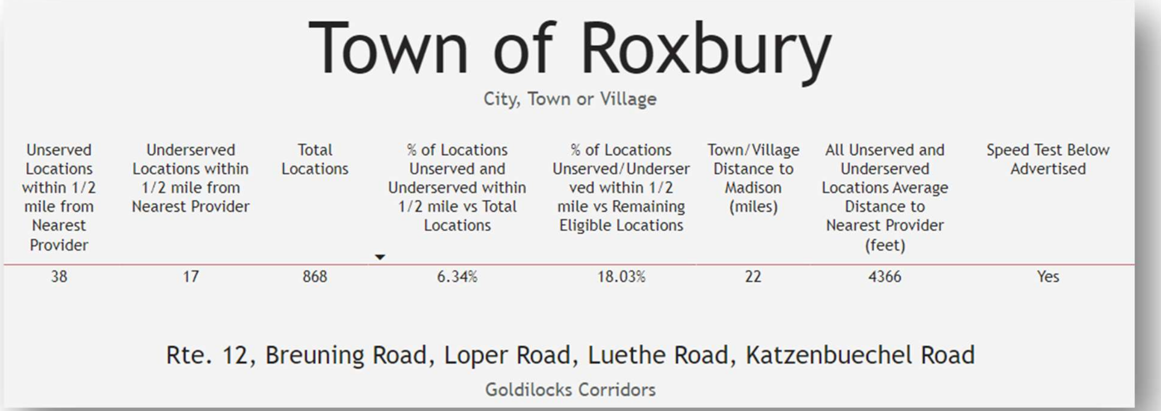
Goldilocks Corridors

The Town of Primrose grapples with the task of addressing nearly an equivalent number of un(der)served locations. Approximately 96% of the remaining sites fall within a half-mile radius from a provider. Moreover, the distance to reach this provider averages slightly above 900 feet. Despite the presence of TDS Telecom's infrastructure along County Road G and County Road A, a notable cluster of unserved locations is situated in close proximity.

The core issue persists in the form of limited competition and a lack of diversity within the existing provider's infrastructure. This combination contributes significantly to the town's substantial count of un(der)served locations that are yet to be addressed.



Estimated Cost to Reach Un(der)served Locations: $1,370,849



Town of Roxbury

City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
38	17	868	6.34%	18.03%	22	4366	Yes

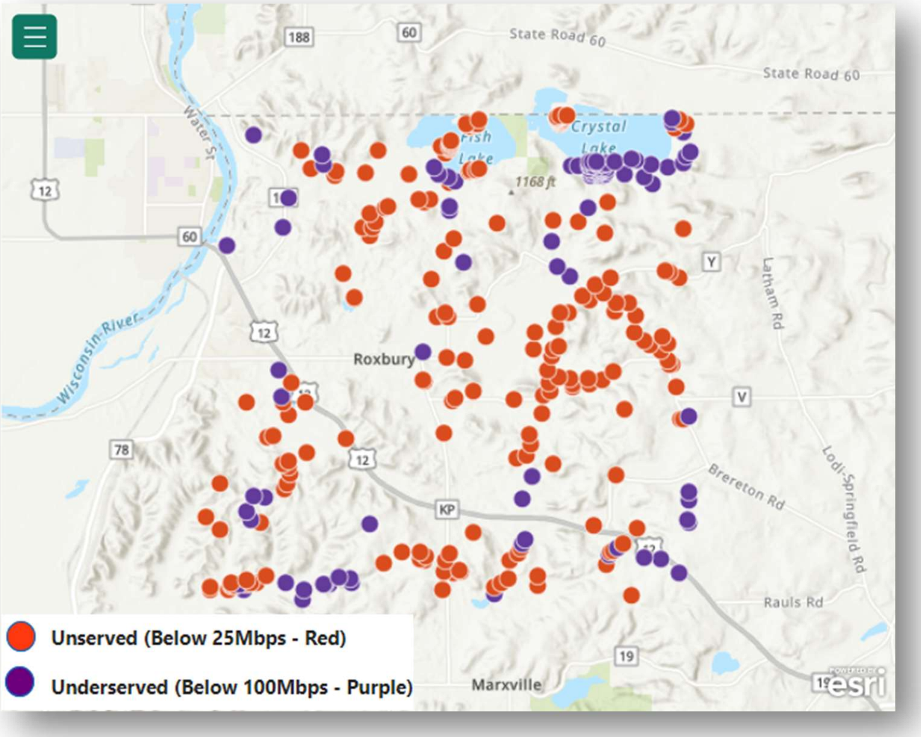
Rte. 12, Breuning Road, Loper Road, Luethe Road, Katzenbuechel Road

Goldilocks Corridors

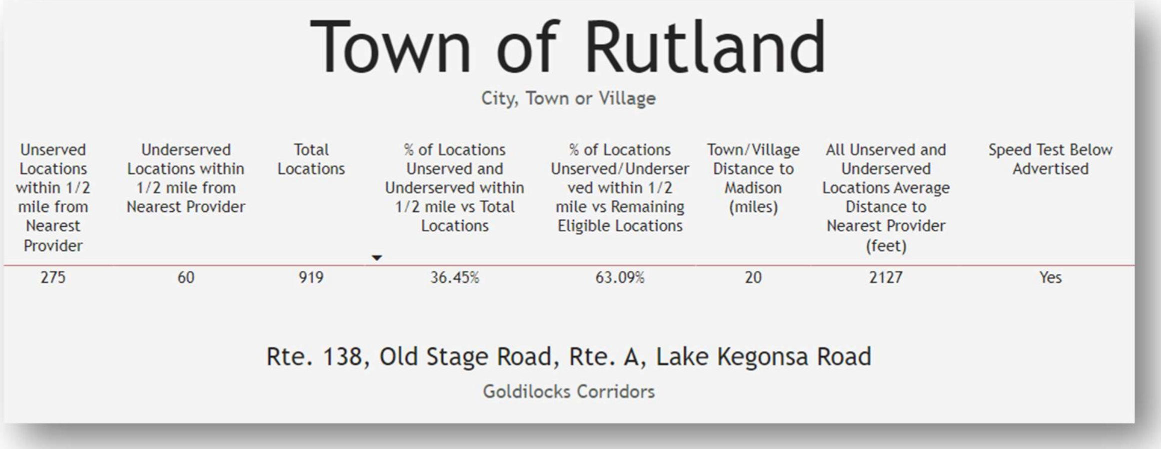
The Town of Roxbury faces a significant disparity between un(der)served locations, with approximately 70% of the remaining eligible sites falling into the unserved category. In this context, the town has limited options, primarily consisting of Spectrum and TDS Telecom, both of which have infrastructure located miles away.

The closest infrastructure can be found along Rte. 78, County Road 19 near Indian Lake Park, or extending east towards the Town of Dane. Illustrating the challenge, the average distance to the nearest infrastructure stands at nearly 1 mile. Notably, around 167 unserved locations are situated beyond a half-mile radius from the nearest infrastructure, marking the highest count within Dane County.

Effectively addressing this issue in Roxbury will require careful coordination and active engagement with the nearest providers. The town is likely to encounter higher cost thresholds for last-mile connectivity solutions, further emphasizing the complexities involved in ensuring comprehensive coverage.


188
60
State Road 60
State Road 60
Crystal Lake
Fish Lake
1168 ft
Water St
12
60
Y
Latham Rd
Wisconsin River
12
Roxbury
V
78
12
Brereton Rd
Lodi-Springfield Rd
KP
Rauls Rd
19
Marxville
esri
🔴 Unserved (Below 25Mbps - Red)
🟣 Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $5,214,726



Town of Rutland

City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
275	60	919	36.45%	63.09%	20	2127	Yes

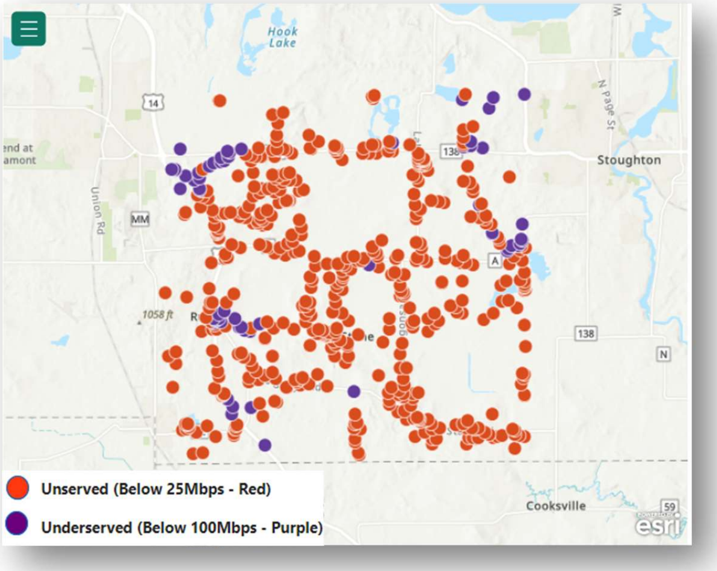
Rte. 138, Old Stage Road, Rte. A, Lake Kegonsa Road

Goldilocks Corridors

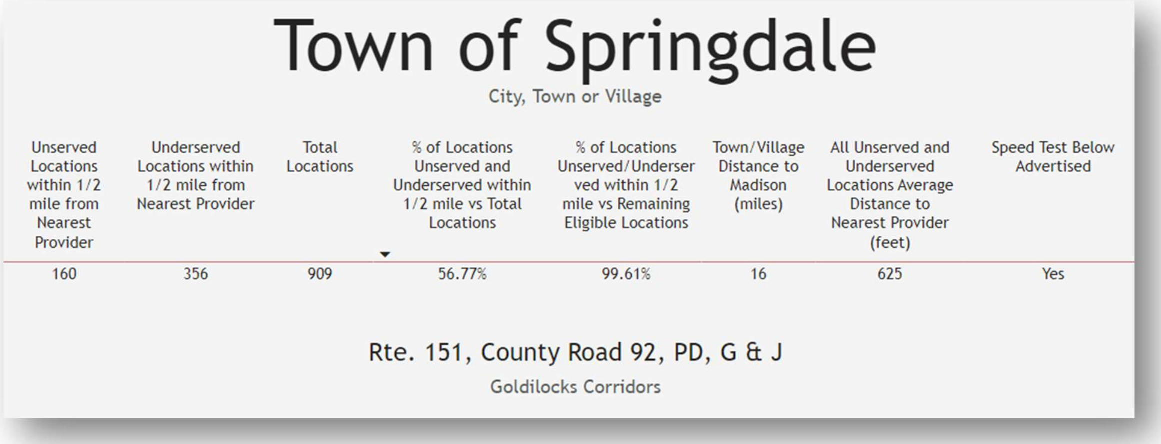
The Town of Rutland secures the second position for having the highest count of eligible locations in Dane County that are still un(der)served. This places the town at an exceptionally elevated level of unserved locations in comparison to those that are considered underserved. Despite the presence of three service providers within the vicinity and its positioning between the Village of Oregon and the City of Stoughton, Rutland possesses minimal to nonexistent infrastructure that traverses through its area.

While connectivity is available at the outer edges of Rutland from nearby providers, substantial portions in-between lack the necessary infrastructure density, leading to significant clusters of unserved locations. Rte. 138 presents a potential Goldilocks corridor, yet Spectrum's infrastructure ends just outside the city limits of Stoughton. The absence of north-south and east-west connectivity underscores how the absence of provider choices and infrastructure compounds the existing connectivity gap.

Furthermore, Rutland contends with one of the lengthier distances between its closest and nearest providers, with this distance extending slightly over 2,000 feet. Notably, around 40% of the unserved locations in Rutland are positioned beyond a half-mile from the nearest provider. This multifaceted landscape exemplifies the complex challenges posed by inadequate provider options and infrastructure in Rutland's quest for comprehensive connectivity.



Estimated Cost to Reach Un(der)served Locations: $4,736,800



Town of Springdale

City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
160	356	909	56.77%	99.61%	16	625	Yes

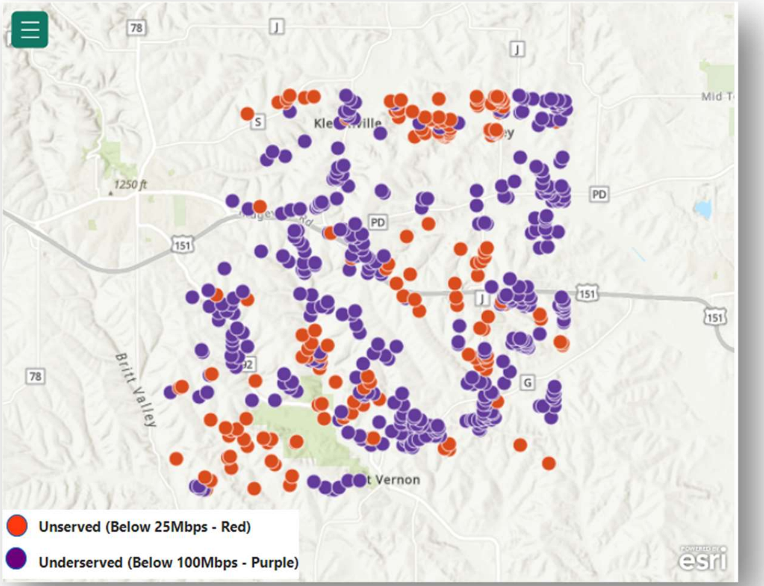
Rte. 151, County Road 92, PD, G & J

Goldilocks Corridors

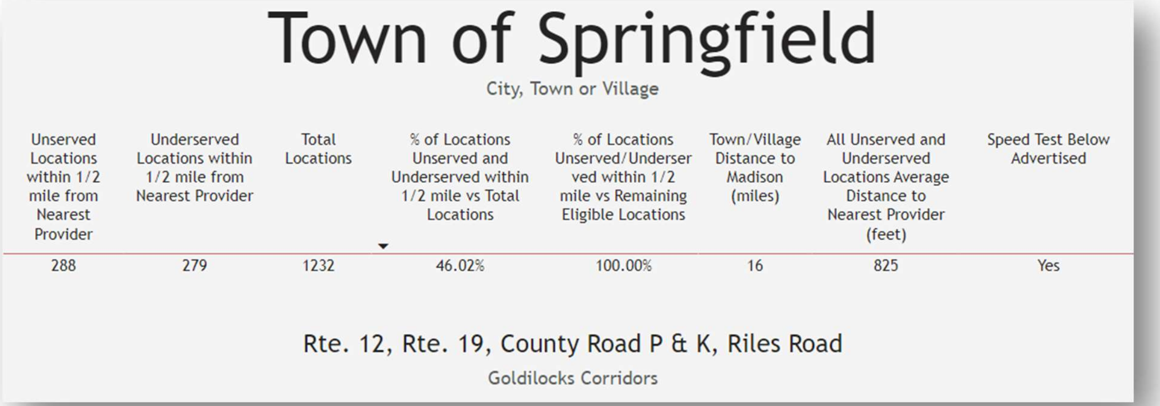
Ranked fourth among areas with the highest count of un(der)served locations, the Town of Springdale faces this challenge of overcoming large numbers of locations yet to be served adequately. One of the upsides is that the majority of these locations fall into the category of underserved, maintaining a slightly more than 2:1 ratio. Spectrum and TDS Telecom serve as the nearest providers, with their coverage extending along routes such as Rte. 151, County Road G, County Road 62, and County Road PD.

Although providers do enter the area through east-west routes, the lack of north-south infrastructure limits the diversity of connectivity options for the town. Notably, while a substantial cluster of unserved locations aligns closely with TDS Telecom's infrastructure on County Road 92, there still remains a portion of unserved locations in the southern segment of the town. On the northern end, TDS Telecom's infrastructure travels along Klevenville-Riley Road, yet a considerable cluster of unserved residences persists.

Considering the clustering of unserved locations and the proximity of existing infrastructure to these underserved areas, addressing the unserved locations within Springdale should not entail as costly an effort as we've evaluated in other areas of Dane County.


78
J
J
S
Mid T
1250 ft
PD
PD
151
151
151
J
Britt Valley
78
92
G
t Vernon
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $2,158,301



Town of Springfield

City, Town or Village

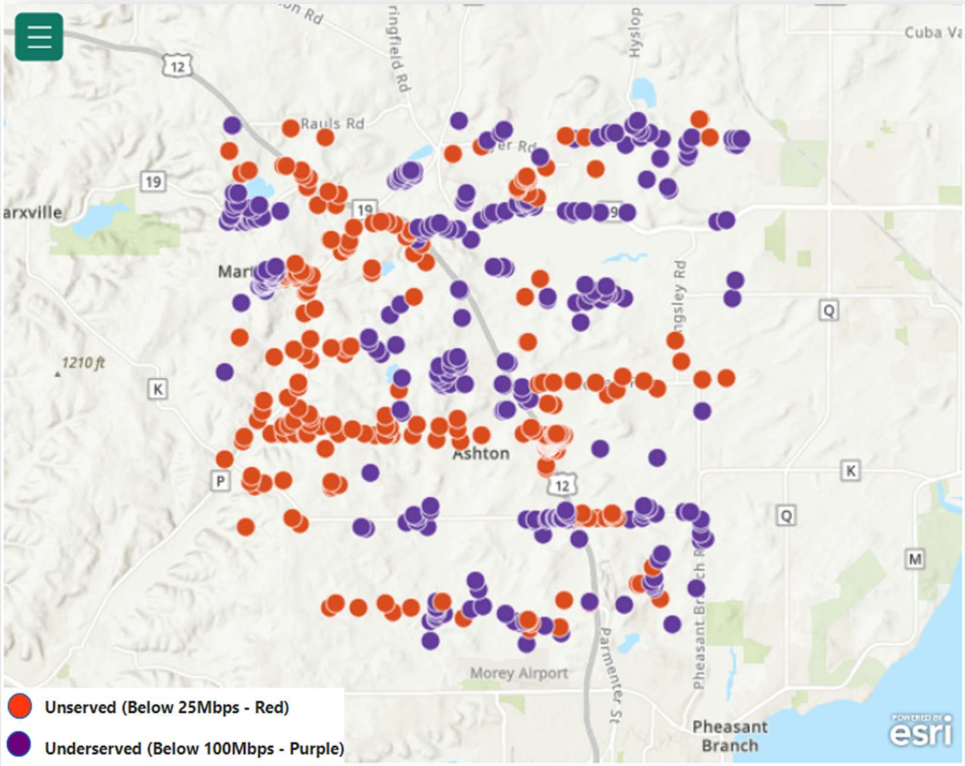
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
288	279	1232	46.02%	100.00%	16	825	Yes

Rte. 12, Rte. 19, County Road P & K, Riles Road

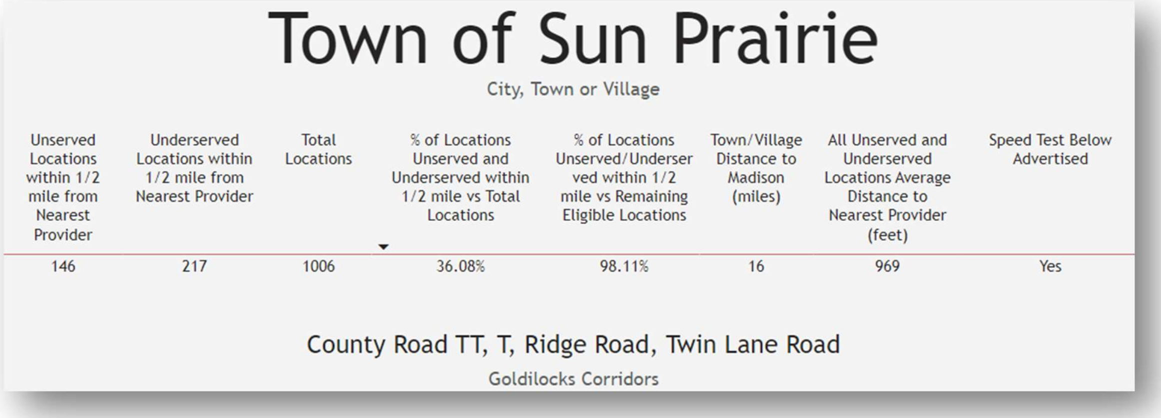
Goldilocks Corridors

Occupying the top position in Dane County with regards to unserved and underserved locations, this locale represents a circumstance where 100% of the remaining sites are situated within a half-mile radius of a provider. A notable 97% of these locations are in closest proximity to TDS Telecom. In terms of existing infrastructure, Rte. 12—a road that bisects the town—holds minimal infrastructure currently.

Duly recognized as a Goldilocks corridor, in tandem with County Road K, these routes offer the potential to extend connectivity closer to end-users. While certain connectivity gaps are evident, these gaps seem to present less formidable challenges than those witnessed in other areas. The associated costs to bridge these gaps are projected to be notably lower, alleviating the situation and contributing to improved connectivity.


Rauls Rd
Springfield Rd
Hyslop
Cuba Va
12
19
arxville
Mar
1210 ft
K
Q
Kingsley Rd
Ashton
P
12
K
Q
M
Morey Airport
Parmenter St
Pleasant Branch Rd
Pheasant Branch
esri
Unserved (Below 25Mbps - Red)
Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $2,326,288



Town of Sun Prairie

City, Town or Village

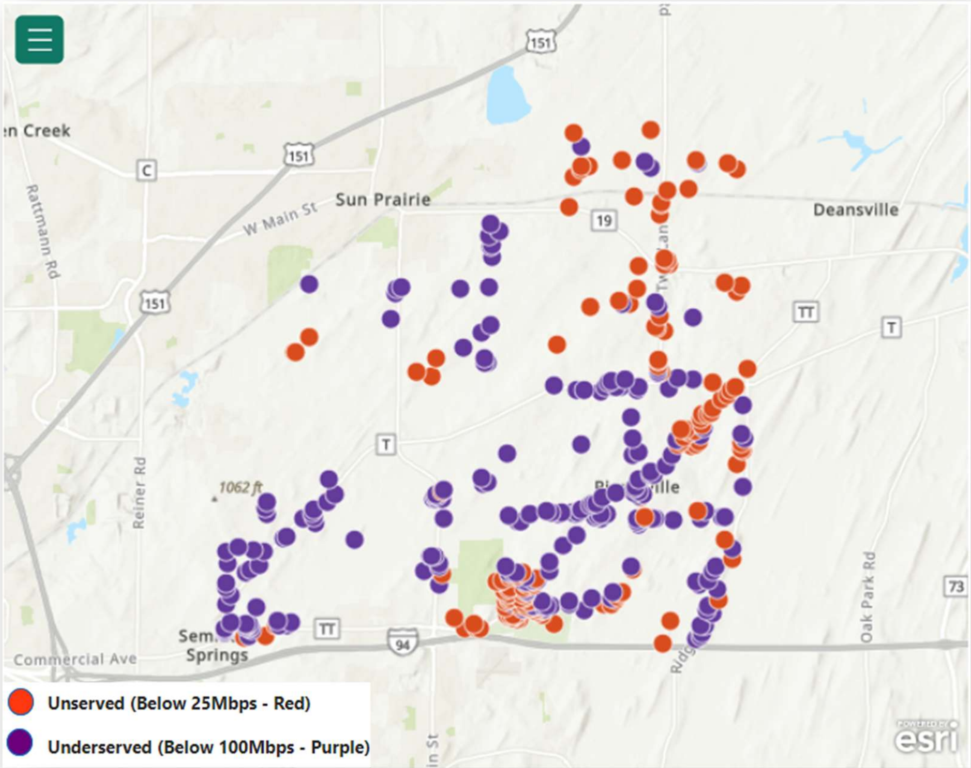
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
146	217	1006	36.08%	98.11%	16	969	Yes

County Road TT, T, Ridge Road, Twin Lane Road

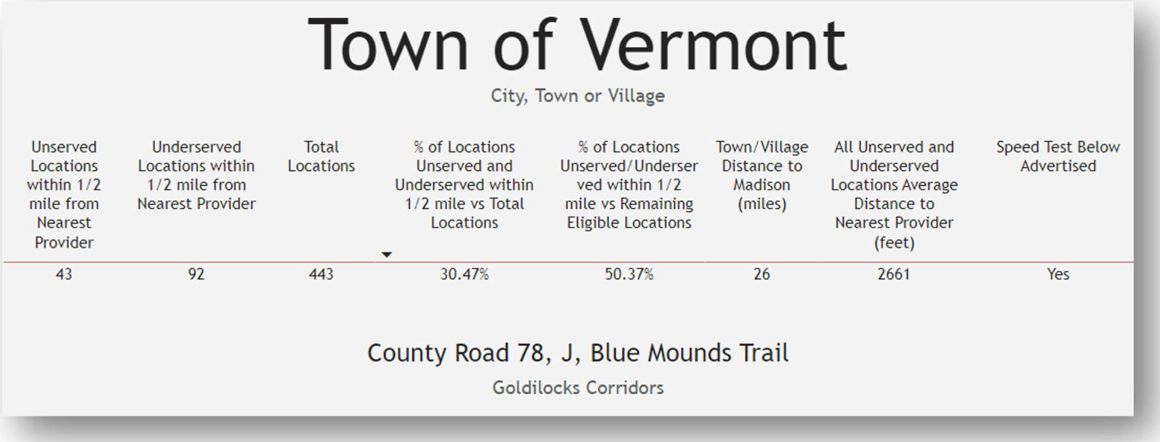
Goldilocks Corridors

At present, Sun Prairie confronts a situation where 98% of its un(der)served locations are positioned within a half-mile radius of the nearest providers, including Spectrum, TDS Telecom, Windstream, and WIN. While providers do indeed traverse through parts of the town, their coverage lacks substantial depth and diversity.

Predominantly, the locations are concentrated in close proximity to key routes like County Road T, TT, and Twin Lane Road. Efforts to establish infrastructure within these identified Goldilocks corridors hold the potential to make significant strides in addressing the un(der)served locations. This focus would not only narrow the gap for these areas but also bring connectivity even closer to those residing in proximity to these strategically targeted corridors.


151
n Creek
C
151
Sun Prairie
W Main St
Rattmann Rd
19
Deansville
151
TT
T
T
1062 ft
Reiner Rd
TT
94
Sem... Springs
Commercial Ave
Oak Park Rd
73
Ridge
Twin Lane
in St
🟥 Unserved (Below 25Mbps - Red)
🟪 Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $1,806,127



Town of Vermont

City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
43	92	443	30.47%	50.37%	26	2661	Yes

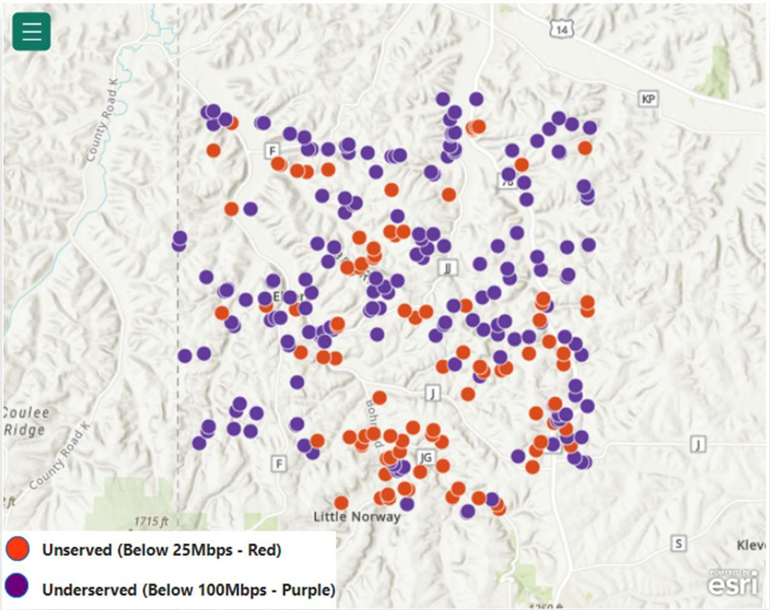
County Road 78, J, Blue Mounds Trail

Goldilocks Corridors

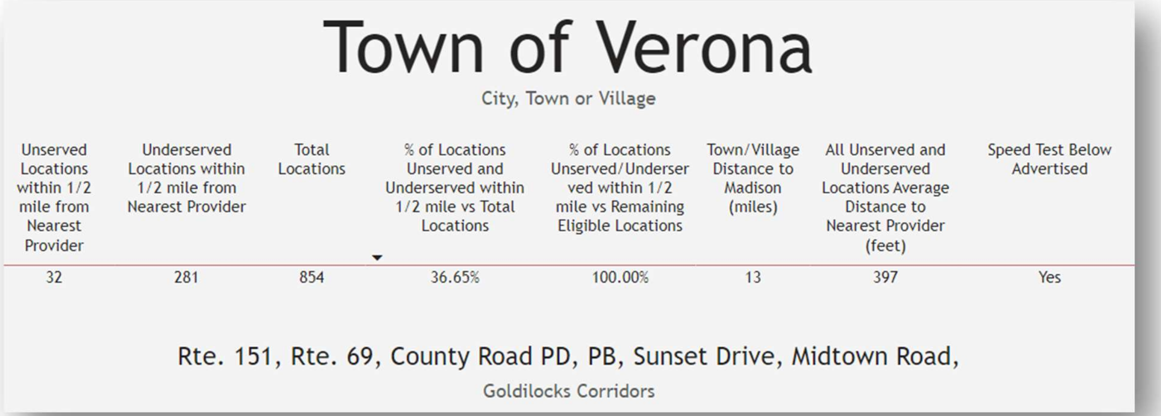
The Town of Vermont finds itself with un(der)served locations dispersed rather evenly across the region. Coupled with limited provider options, namely Spectrum and TDS Telecom, addressing the remaining locations efficiently could potentially pose a challenge. Upon evaluating the existing infrastructure, a notable hurdle becomes apparent: the nearest providers follow the path of Rte. 78, without extending any infrastructure in an east-west direction into the region.

To overcome this challenge, it becomes imperative to focus on key corridors such as County Road JG, F, and JJ. Establishing connectivity along these routes will be essential to achieve the necessary depth and diversity within the town. This strategic approach holds the promise of effectively addressing a substantial number of these un(der)served locations.

The average distance to the nearest provider hovers just over a half-mile, suggesting that the cost thresholds for the last mile solution are likely to be on the higher side. This underscores the potential for greater investment requirements to bridge the connectivity gap effectively within the Town of Vermont.



Estimated Cost to Reach Un(der)served Locations: $2,961,347



Town of Verona

City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
32	281	854	36.65%	100.00%	13	397	Yes

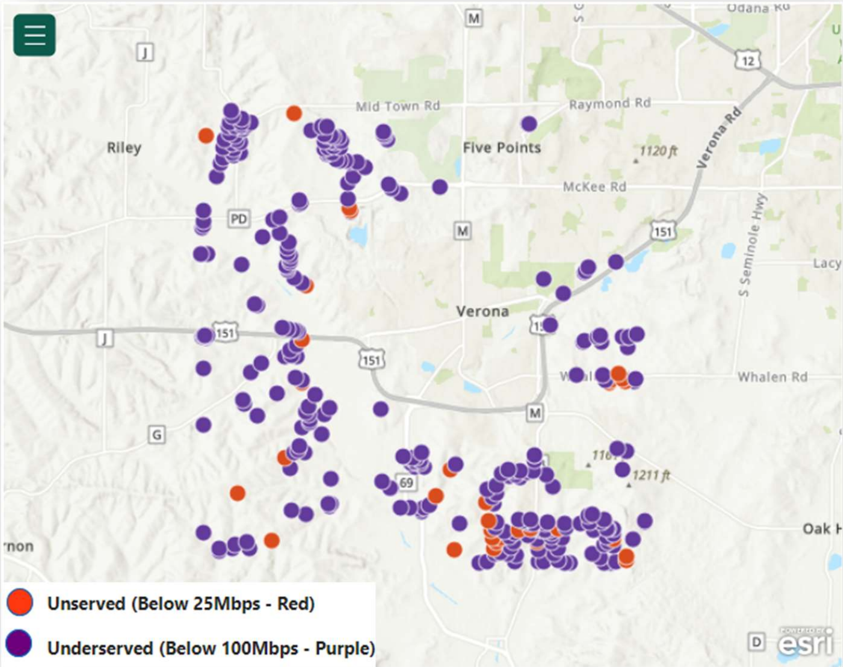
Rte. 151, Rte. 69, County Road PD, PB, Sunset Drive, Midtown Road,

Goldilocks Corridors

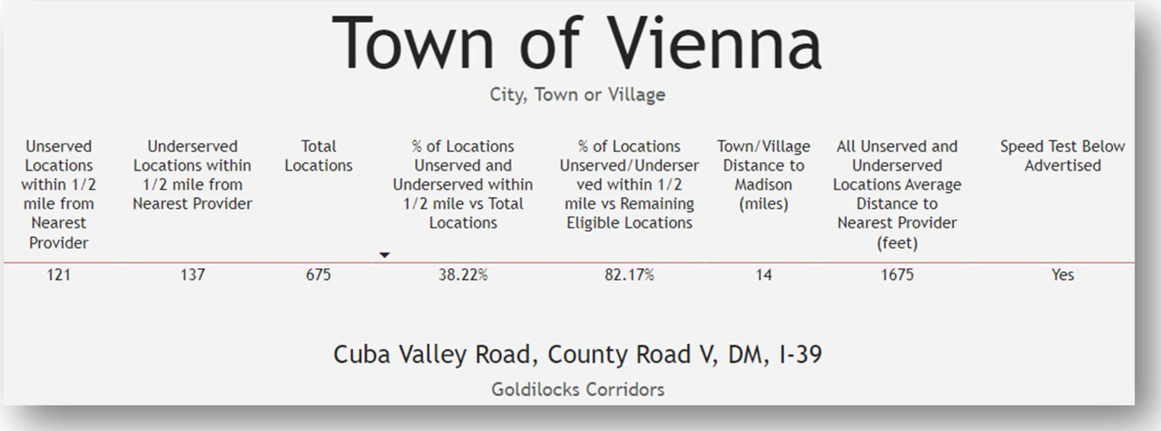
The Town of Verona is currently characterized by the fact that 100% of its remaining un(der)served locations are positioned within a half-mile radius of the nearest provider. Predominantly, the town grapples with an underserved issue, with roughly 90% of the remaining eligible sites falling into this category. Among these, a significant majority of locations, approximately 85%, are in closest proximity to TDS Telecom.

While TDS Telecom's infrastructure follows County Road PB and County Road 69, it's noteworthy that a substantial number of un(der)served locations in the southern part of the town are situated near Range Trail. Conversely, in the northern region of the town, Spectrum and TDS Telecom are well positioned to address clusters of un(der)served locations.

Despite the presence of infrastructure that spans both east-west and north-south directions, the challenge lies in the absence of connectivity along the specific corridors required to effectively close the existing gaps.


Odana Rd
M
J
12
Mid Town Rd
Raymond Rd
Riley
Five Points
1120 ft
Verona Rd
McKee Rd
PD
M
151
S Seminole Hwy
Lacy
Verona
J
151
151
Whalen Rd
M
G
69
1211 ft
Oak H
rnon
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $1,067,569



Town of Vienna

City, Town or Village

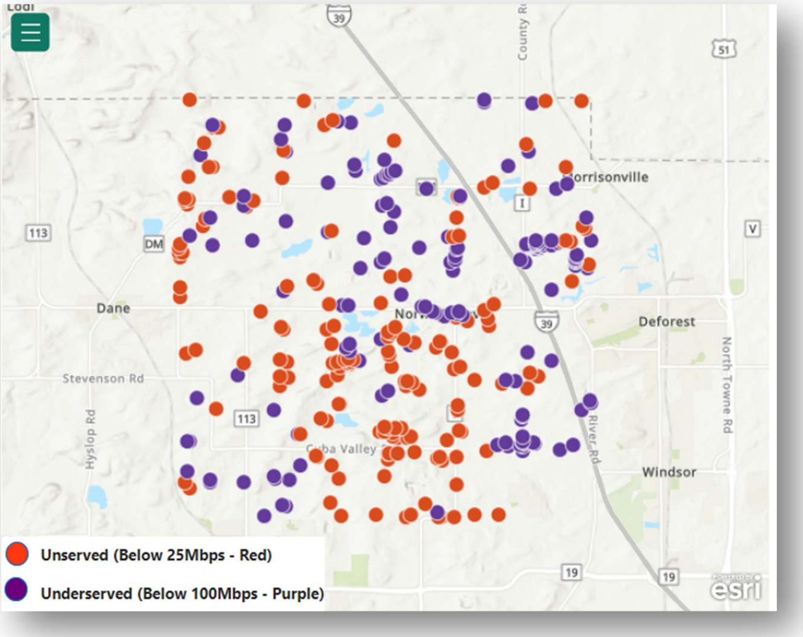
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
121	137	675	38.22%	82.17%	14	1675	Yes

Cuba Valley Road, County Road V, DM, I-39

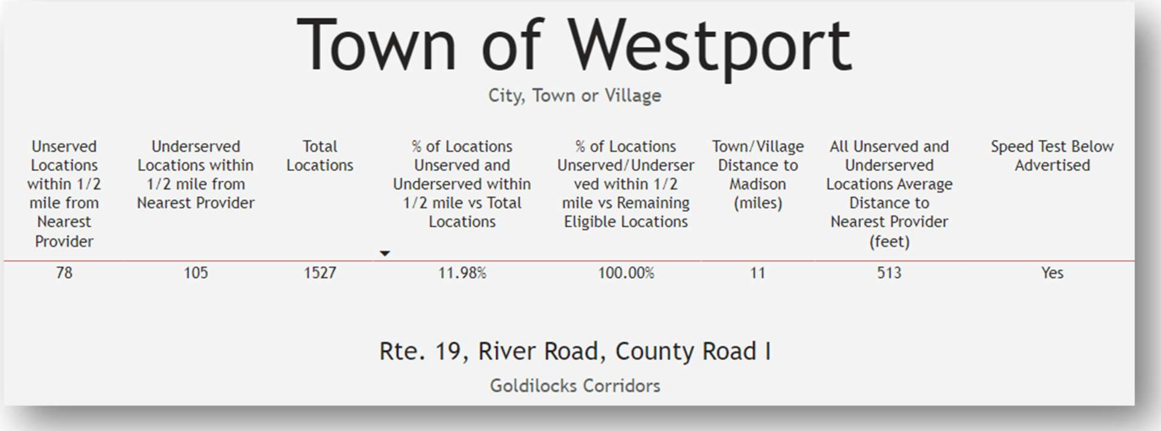
Goldilocks Corridors

The Town of Vienna faces a nearly balanced ratio of un(der)served locations, hovering around a 1:1 proportion. Although providers are present within the vicinity, the challenge lies in the fact that many of them serve businesses. Conversely, the service providers that extend their services to households are situated at a considerable distance. This geographic gap can hinder some providers from finding a viable rationale to invest in the necessary infrastructure to connect the remaining locations.

The absence of east-west infrastructure underscores the crucial nature of extending coverage to the outer regions, essential to attain the required depth to reach the unserved locations. To effectively address this challenge, leveraging Goldilocks corridors such as Cuba Valley Road and County Road V can prove advantageous. These corridors intersect with existing infrastructure while also passing a substantial portion of the remaining unserved locations. Prioritizing these corridors, in addition to County Road DM, holds the potential to alleviate the connectivity gap within the town of Vienna.



Estimated Cost to Reach Un(der)served Locations: $2,215,607



Town of Westport

City, Town or Village

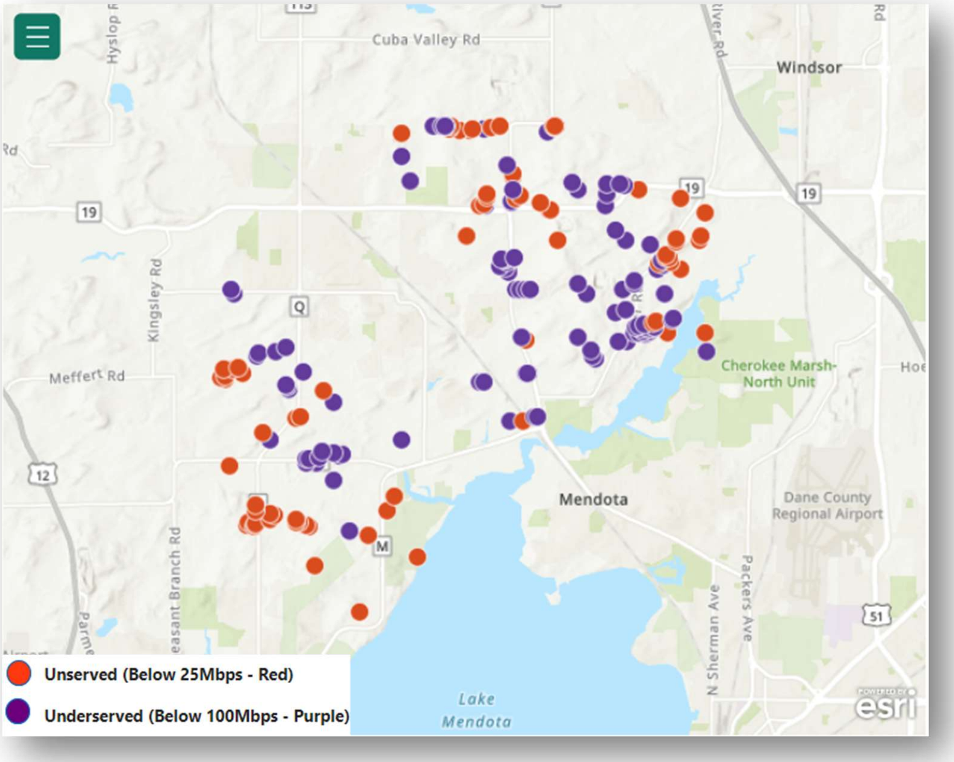
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
78	105	1527	11.98%	100.00%	11	513	Yes

Rte. 19, River Road, County Road I

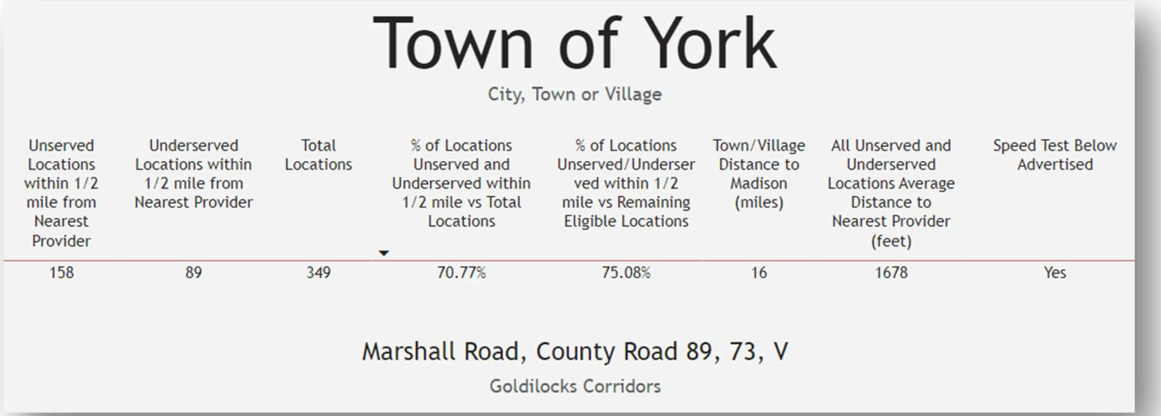
Goldilocks Corridors

Sitting on the north side of Lake Mendota, the Town of Westport currently presents a scenario where 100% of the remaining locations are situated approximately half a mile away from the nearest providers, namely Spectrum and TDS Telecom. Notably, both TDS Telecom and Spectrum have their infrastructure in relative proximity to these unserved locations, with an average distance of around 500 feet.

Given this spatial alignment and the density of locations, extending connectivity to these areas should not entail significant challenges. The western cluster aligns closely with TDS Telecom's infrastructure, while the northeastern cluster boasts proximity to both TDS Telecom and Spectrum's infrastructure. By fostering focused engagement and proactive advocacy with both providers, the prospect of closing the connectivity gap within the Town of Westport appears promising.


Cuba Valley Rd
Windsor
Hyslop Rd
19
19
19
Kingsley Rd
Q
Meffert Rd
12
Cherokee Marsh-North Unit
Mendota
Dane County Regional Airport
M
Pleasant Branch Rd
N Sherman Ave
Packers Ave
51
Lake Mendota
🔴 Unserved (Below 25Mbps - Red)
🟣 Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $702,410



Town of York

City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
158	89	349	70.77%	75.08%	16	1678	Yes

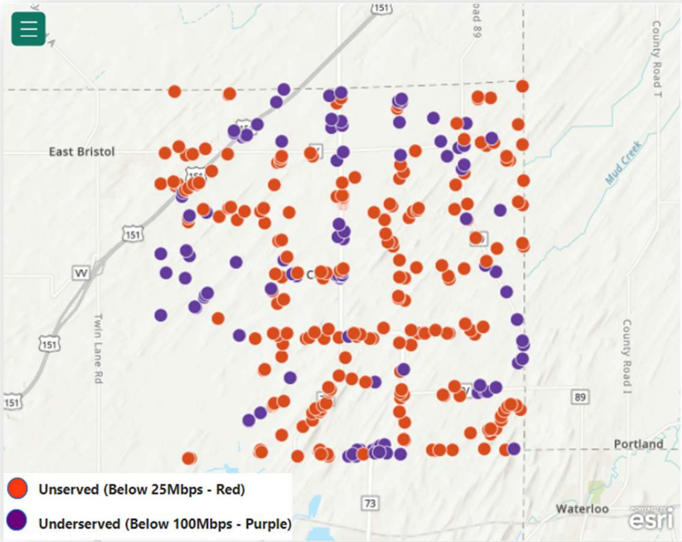
Marshall Road, County Road 89, 73, V

Goldilocks Corridors

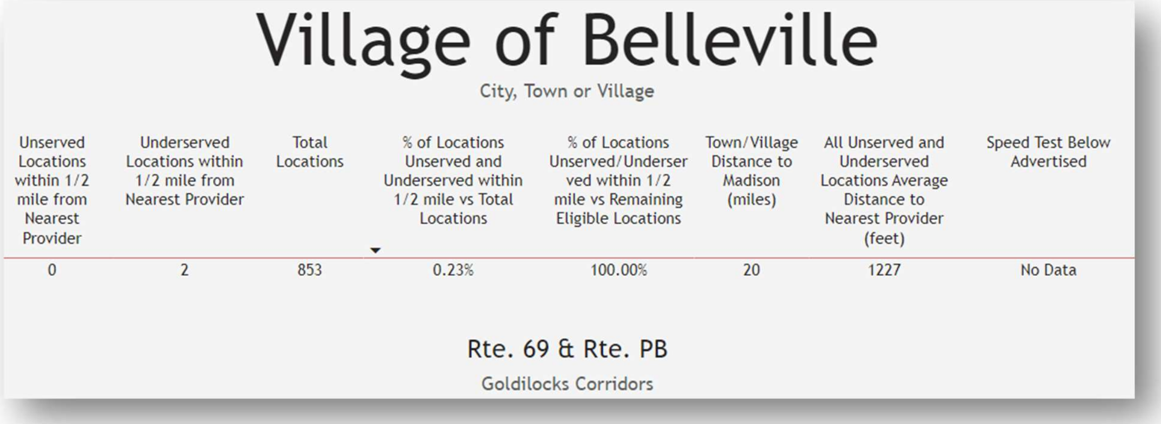
The Town of York contains locations dispersed across its footprint. A notable majority leans towards unserved locations, edging close to a 2:1 ratio when compared to underserved locations. Competition remains limited both on the residential and business fronts, featuring just two providers serving to each segment. However, the existing provider reach into the town is restricted, largely enveloping the town rather than traversing through essential roads such as Sun Prairie Road, York Center Road, and County Road TT.

The absence of infrastructure along these critical corridors poses a significant obstacle in extending coverage to the remaining locations. Unserved locations are spread out, rendering cost-effective accessibility to these sites potentially challenging. Notably, the average distance to the nearest provider hovers at approximately 1,700 feet.

To bridge this gap, it becomes imperative to establish spurs extending from existing infrastructure. This underscores the broader issue of inadequate middle-mile infrastructure, hampering the financial viability of the last mile for service providers. This multifaceted landscape emphasizes the challenges faced by the Town of York in achieving comprehensive connectivity.



Estimated Cost to Reach Un(der)served Locations: $2,350,984



Village of Belleville

City, Town or Village

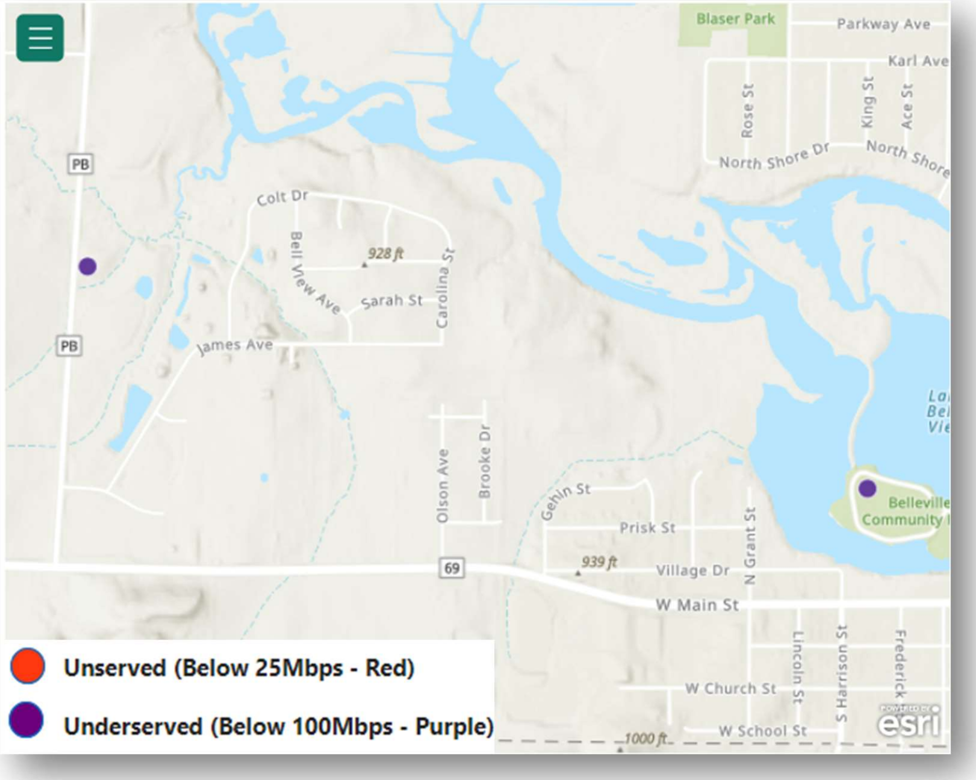
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
0	2	853	0.23%	100.00%	20	1227	No Data

Rte. 69 & Rte. PB

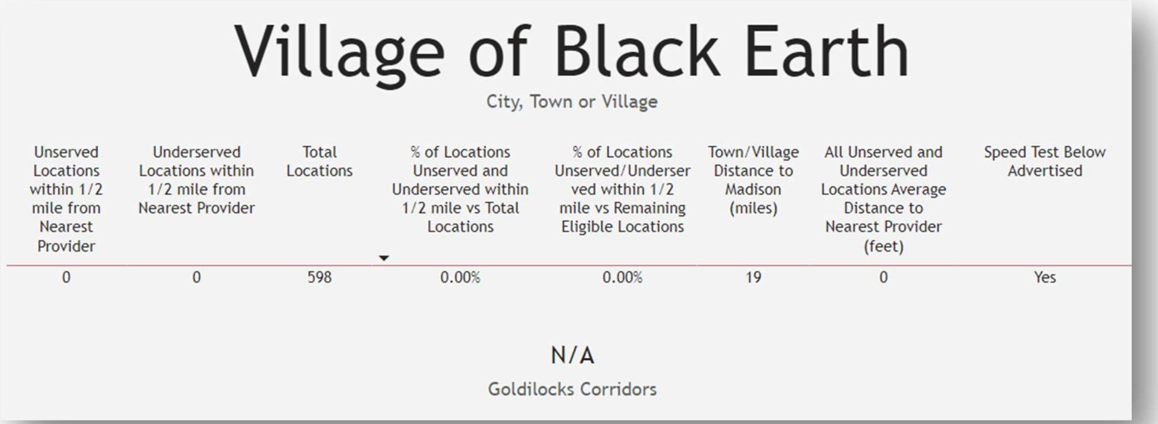
Goldilocks Corridors

Within the Village of Belleville, only two locations fall under the category of underserved—comprising a solitary residential site and a lone business. While there is a service provider in close vicinity, it is situated to the east of both locations. The site positioned on County Road PB is at an approximate distance of 2,000 feet from Spectrum.

A noteworthy aspect is that Spectrum's infrastructure does not extend along Main Street, thereby leaving a substantial gap in coverage for reaching the location along County Road PB. This scenario presents a distinct challenge for ensuring comprehensive connectivity within the village.


Blaser Park
Parkway Ave
Karl Ave
Rose St
King St
Ace St
North Shore Dr
North Shore
PB
Colt Dr
Bell View Ave
928 ft
Sarah St
Carolina St
PB
James Ave
Olson Ave
Brooke Dr
Gehin St
Prisk St
Belleville Community
69
939 ft
Village Dr
N Grant St
W Main St
Lincoln St
S Harrison St
Frederick
W Church St
W School St
1000 ft
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $16,012



Village of Black Earth

City, Town or Village

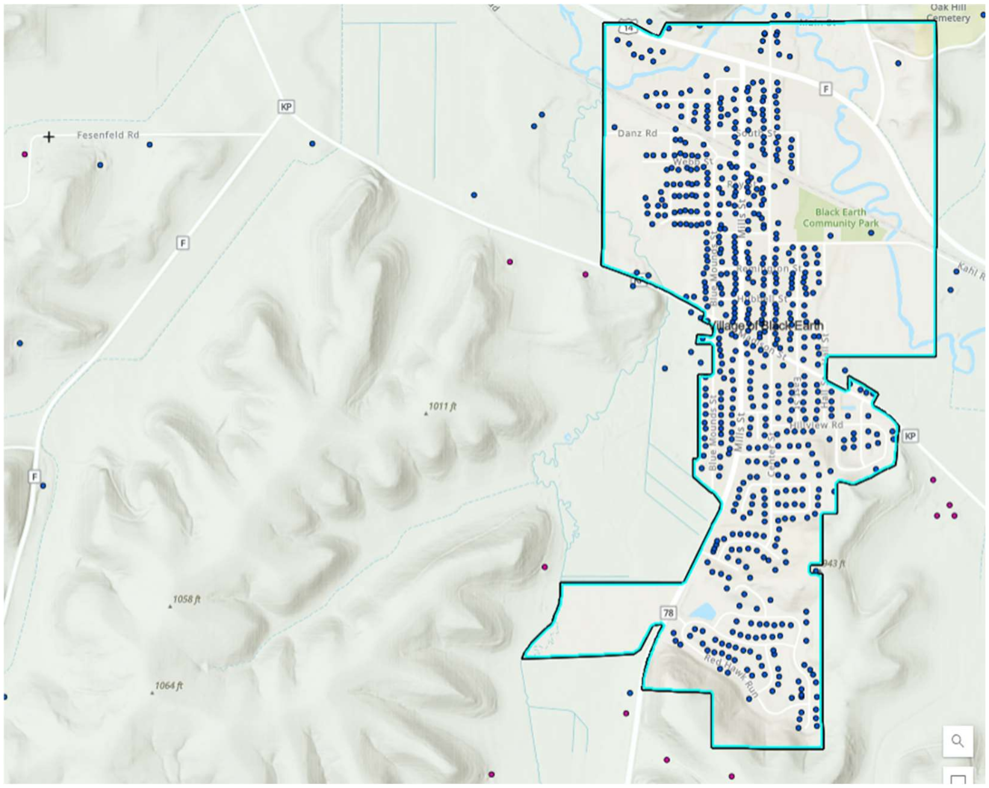
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
0	0	598	0.00%	0.00%	19	0	Yes

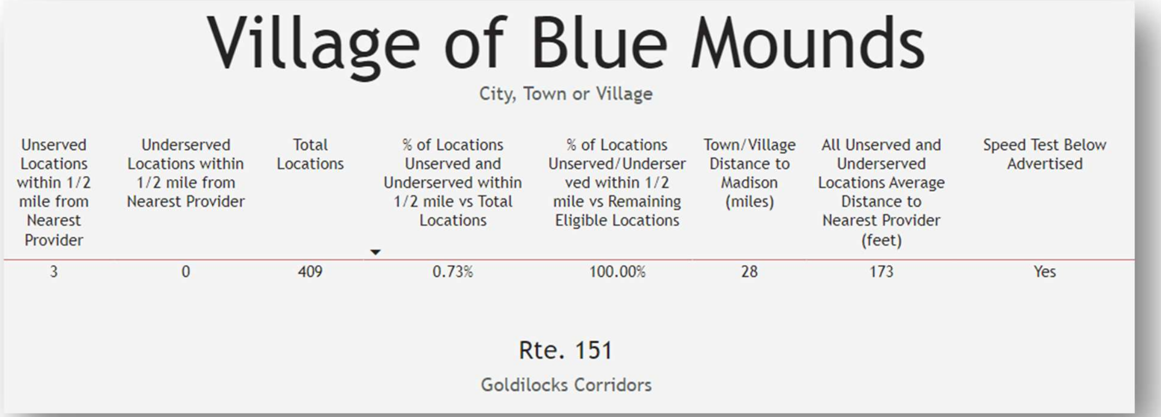
N/A

Goldilocks Corridors

The Village of Black Earth, delineated by a turquoise blue outline, bears the designation of "served" as per the criteria laid out by the FCC. This area spans around 598 eligible locations, all of which are depicted by blue dots indicating their served status. Upholding comprehensive coverage mandates continuous monitoring from Dane County. This entails an ongoing assessment of FCC data, cross-referenced with information furnished by the WBO. This proactive approach serves to detect any emerging locations that might transition into the un(der)served categories over time.

Of equal importance is Dane County's maintaining a steady oversight of ACP enrollment. This action will help facilitate that individuals seeking financial assistance remain within the purview of the "served" classification. Additionally, as discerned from Ookla's speed test data, certain areas within the village encounter issues where speed tests record values falling below the advertised speeds. This serves as a reminder of the importance of consistently striving for optimal connectivity standards.





Village of Blue Mounds

City, Town or Village

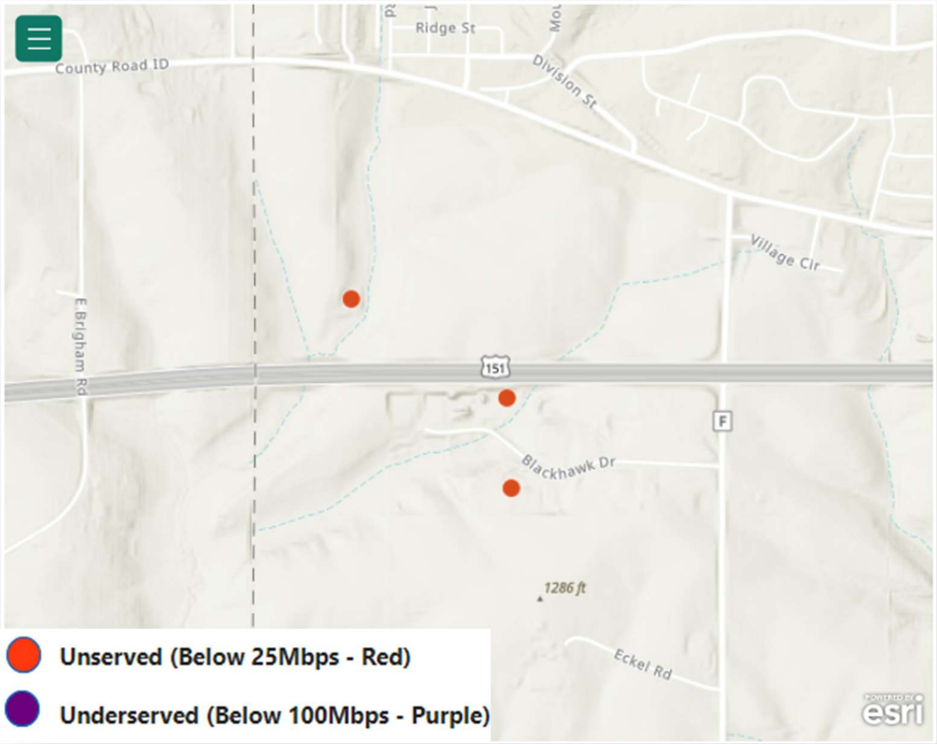
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
3	0	409	0.73%	100.00%	28	173	Yes

Rte. 151

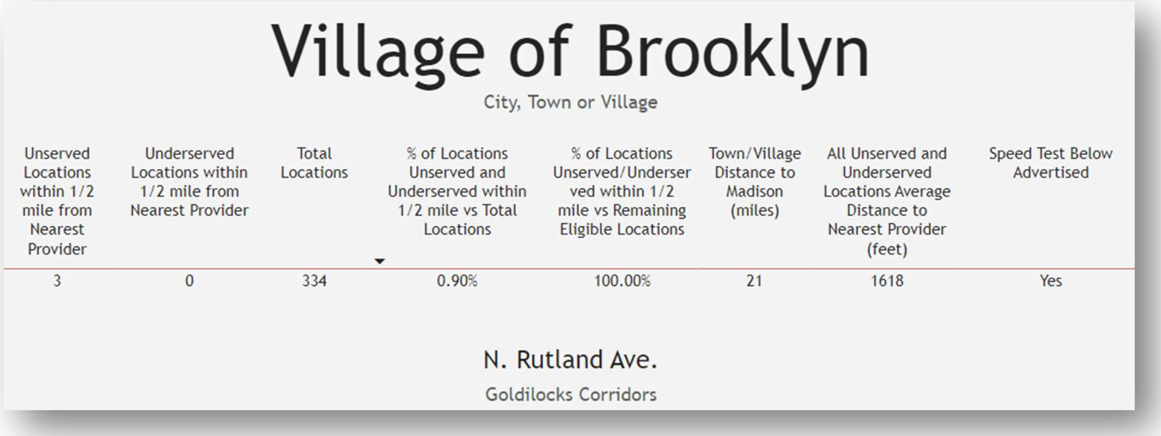
Goldilocks Corridors

Within the Village of Blue Mounds, a trio of unserved locations remains, comprising one residential and two businesses. Interestingly, both businesses are located a few hundred feet away from WIN's infrastructure, while the residential site lies within a distance of fewer than 1,000 feet from Spectrum's infrastructure.

Addressing these three remaining locations presents a task that could potentially be challenging, contingent upon their proximity to a provider's coverage. However, a promising aspect is that these three locations are situated within reasonable distances. By effectively coordinating efforts with both Spectrum and WIN, there lies the potential to successfully conclude the task of extending coverage to these remaining locations.



Estimated Cost to Reach Un(der)served Locations: $10,130



Village of Brooklyn

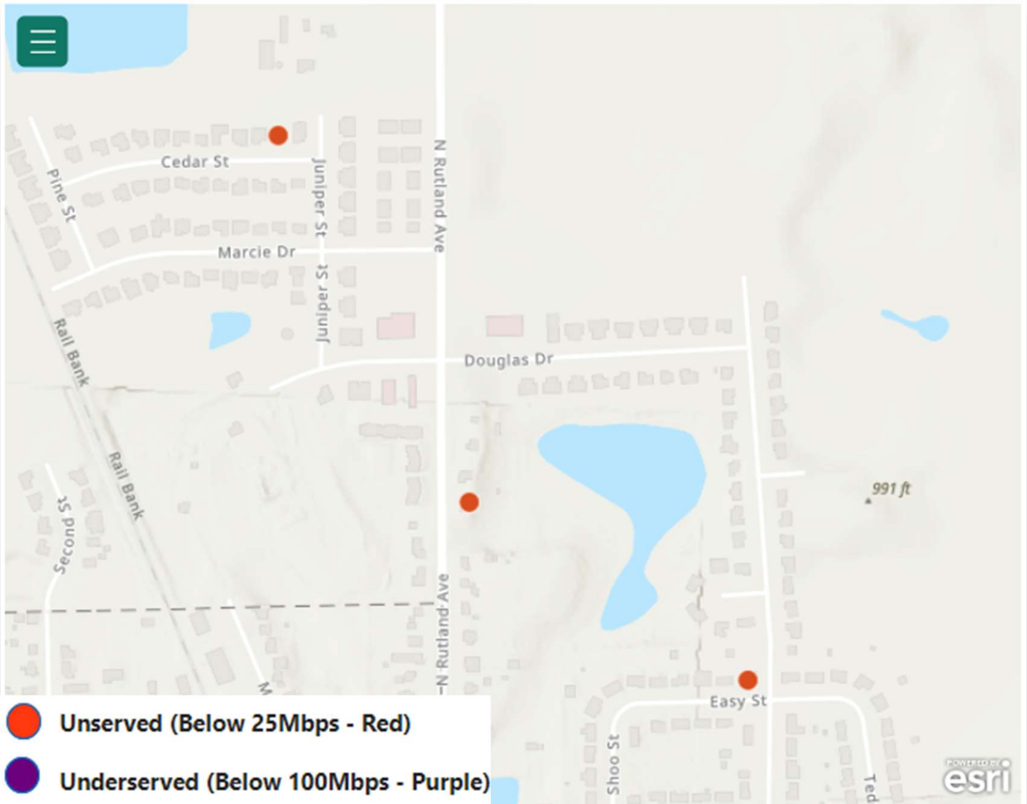
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
3	0	334	0.90%	100.00%	21	1618	Yes

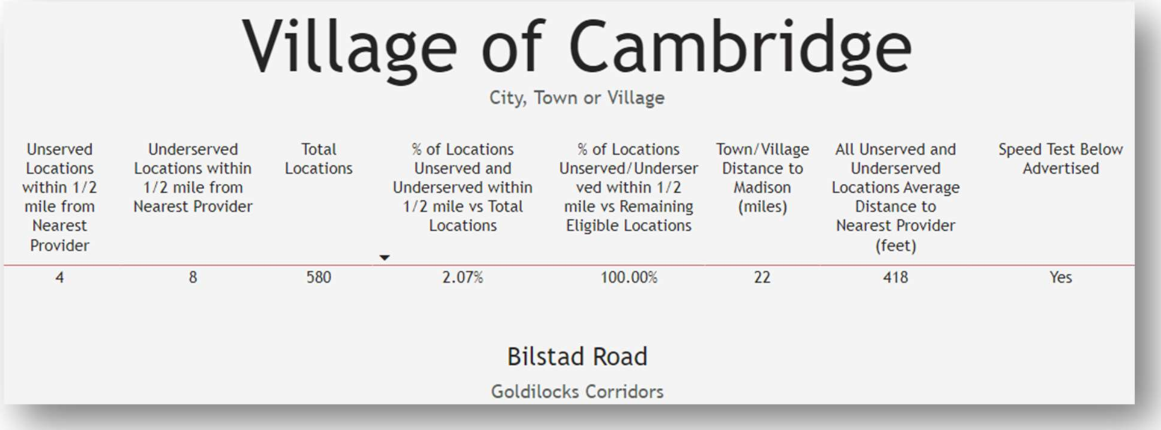
N. Rutland Ave.

Goldilocks Corridors

Located within the Village of Brooklyn, three unserved locations remain, exclusively residential households. These three sites are situated at distances ranging between 1,400 and 1,700 feet from the closest provider. Notably, the infrastructure of Spectrum ends before reaching the village, terminating on County Road MM. Meanwhile, TDS Telecom's infrastructure resides to the west, yet neither provider's network traverses through the village in the vicinity of these three remaining locations.


Cedar St
Pine St
Juniper St
N Rutland Ave
Marcie Dr
Juniper St
Douglas Dr
Rail Bank
Rail Bank
Second St
991 ft
N Rutland Ave
Easy St
Shoo St
Ted
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $18,932



Village of Cambridge

City, Town or Village

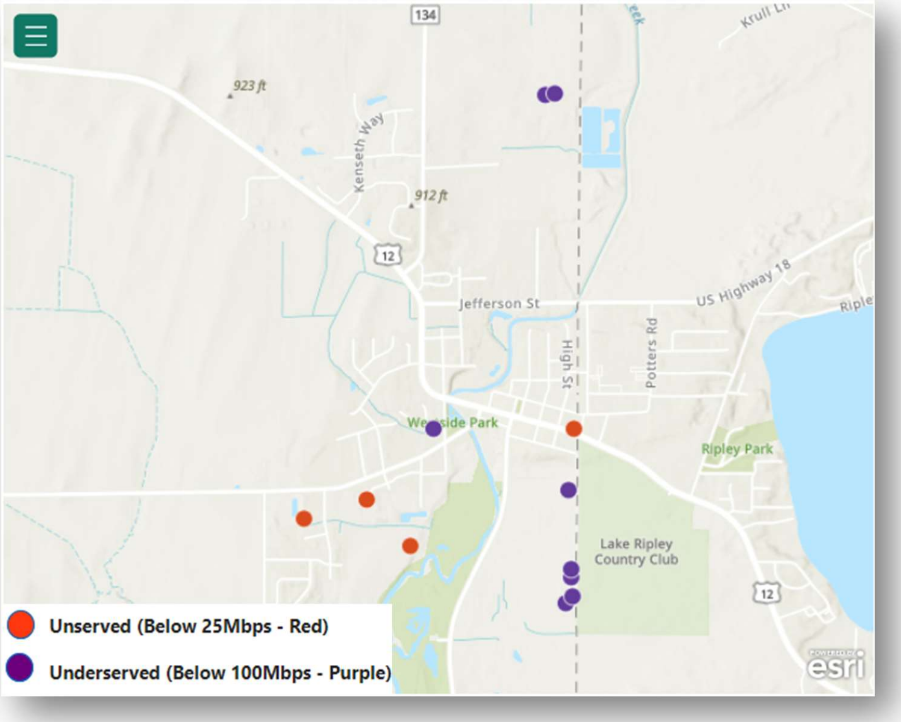
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
4	8	580	2.07%	100.00%	22	418	Yes

Bilstad Road

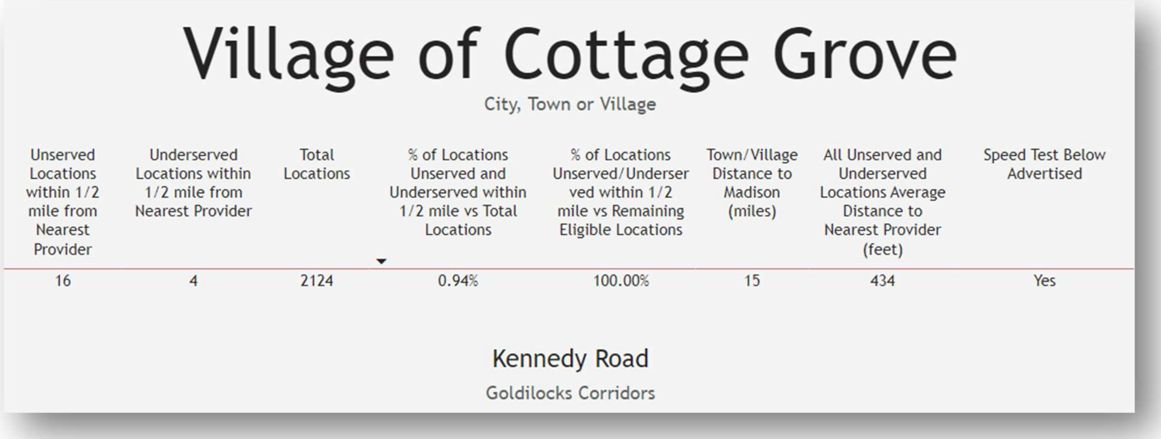
Goldilocks Corridors

In the Village of Cambridge, a total of four unserved locations and eight underserved locations remains. All these remaining sites are conveniently positioned well within a half-mile radius of the nearest provider. Interestingly, all of these locations align with Spectrum, with the majority of the locations merely a couple hundred feet away from Spectrum's infrastructure, particularly evident in the case of the unserved locations.

Engaging collaboratively with Spectrum to pinpoint a viable solution for extending coverage to the remaining four locations should be financially feasible. The proximity of these locations to existing infrastructure minimizes the anticipated costs associated with this expansion effort.


134
Krull Ln
923 ft
Kenseth Way
912 ft
12
Jefferson St
US Highway 18
Riple
High St
Potters Rd
Westside Park
Ripley Park
Lake Ripley Country Club
12
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $35,433



Village of Cottage Grove

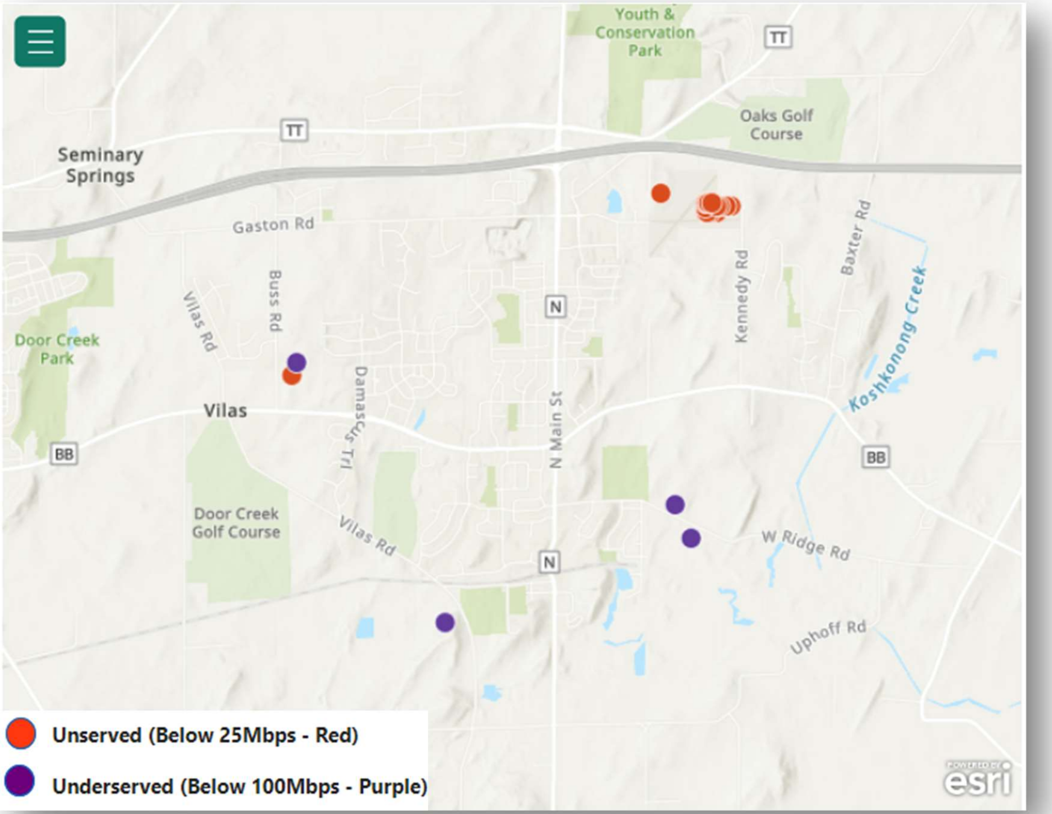
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
16	4	2124	0.94%	100.00%	15	434	Yes

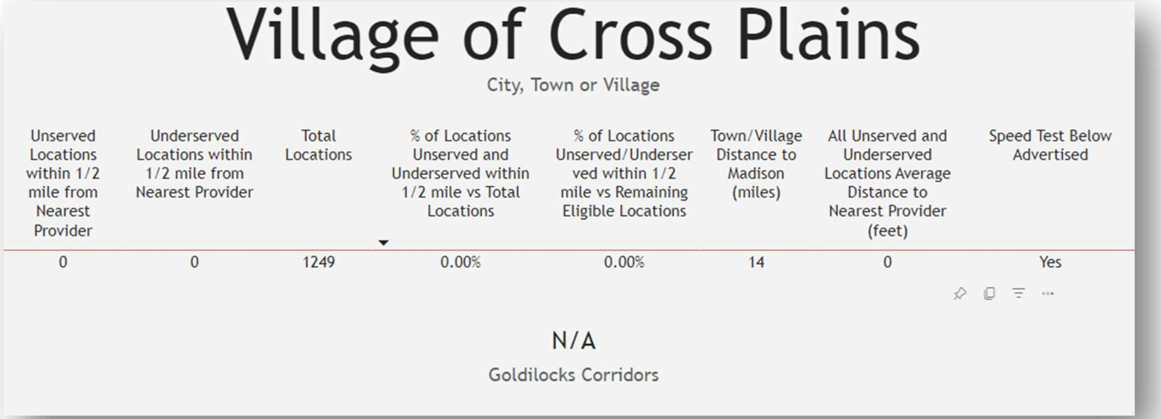
Kennedy Road

Goldilocks Corridors

Situated within the Village of Cottage Grove, a cluster of unserved locations is concentrated in close proximity to the airfield. Predominantly comprising businesses, this cluster of locations boasts an average distance of slightly below 500 feet from the nearest provider. Notably, the northern cluster, which is co-located within the same “campus,” presents a unique advantage. By capitalizing on economies of scale and focusing on a local provider's ability to construct infrastructure for multiple sites within the same location, efficiency gains and streamlined service delivery can be realized.


Youth & Conservation Park
TT
Oaks Golf Course
TT
Seminary Springs
Gaston Rd
Baxter Rd
Kennedy Rd
Buss Rd
Vilas Rd
N
Koshkonong Creek
Door Creek Park
Damascus Trl
N Main St
Vilas
BB
BB
Door Creek Golf Course
Vilas Rd
W Ridge Rd
N
Uphoff Rd
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $160,322



Village of Cross Plains

City, Town or Village

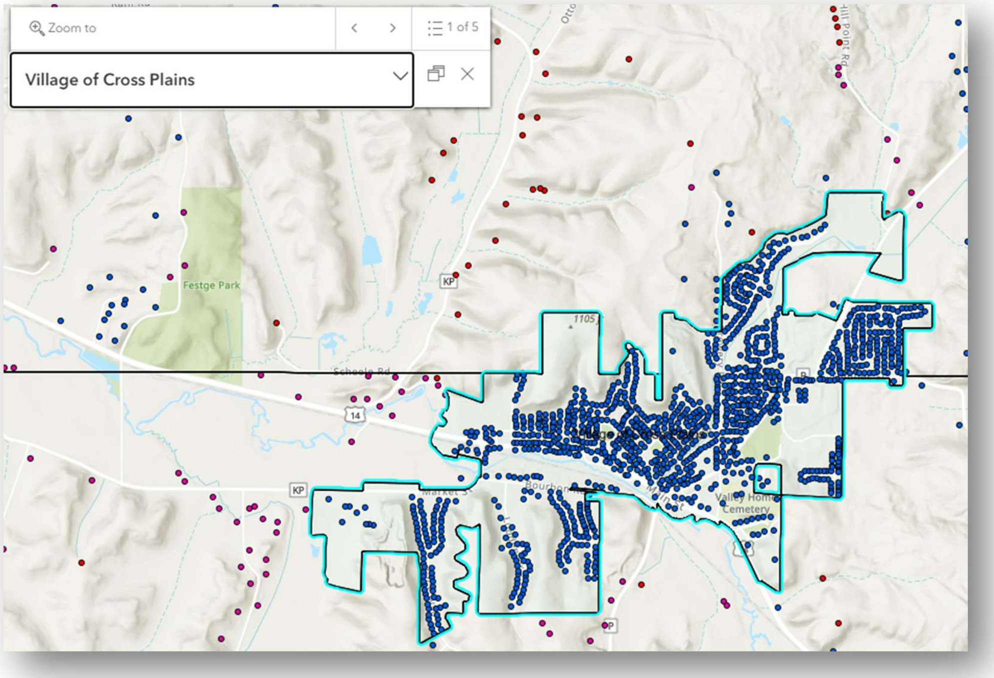
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
0	0	1249	0.00%	0.00%	14	0	Yes

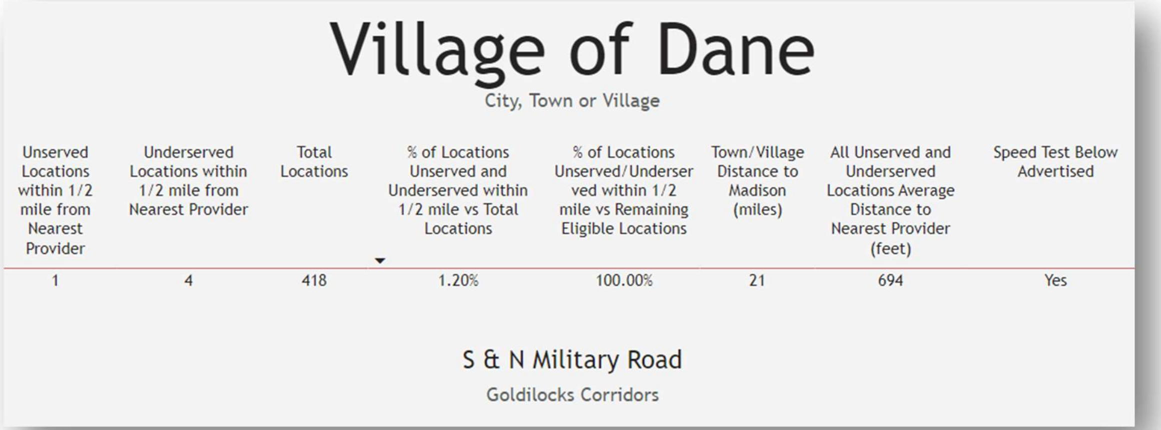
N/A

Goldilocks Corridors

The Village of Cross Plains, demarcated with a defining turquoise blue outline, carries the official "served" designation as outlined by the FCC's criteria. This encompassing region encompasses approximately 1,249 eligible locations, each depicted by a blue dot signifying their served status. To ensure a robust coverage landscape, Dane County must engage in monitoring efforts. This involves a continuous evaluation of FCC data, cross-referenced with insights from the WBO and soliciting ongoing feedback from the community. This proactive approach is instrumental in identifying any emerging sites that might transition into the unserved or underserved categories over time.

Equally important is Dane County's dedication to upholding consistent awareness of ACP enrollment. This strategic action plays a pivotal role in facilitating the inclusion of individuals seeking financial aid within the realm of the "served" classification. Furthermore, as deduced from Ookla's speed test data, certain sectors within the village grapple with issues where speed tests record values falling below the advertised speeds. This serves as a reminder to maintain ongoing efforts towards attaining optimal affordability and connectivity standards.





Village of Dane

City, Town or Village

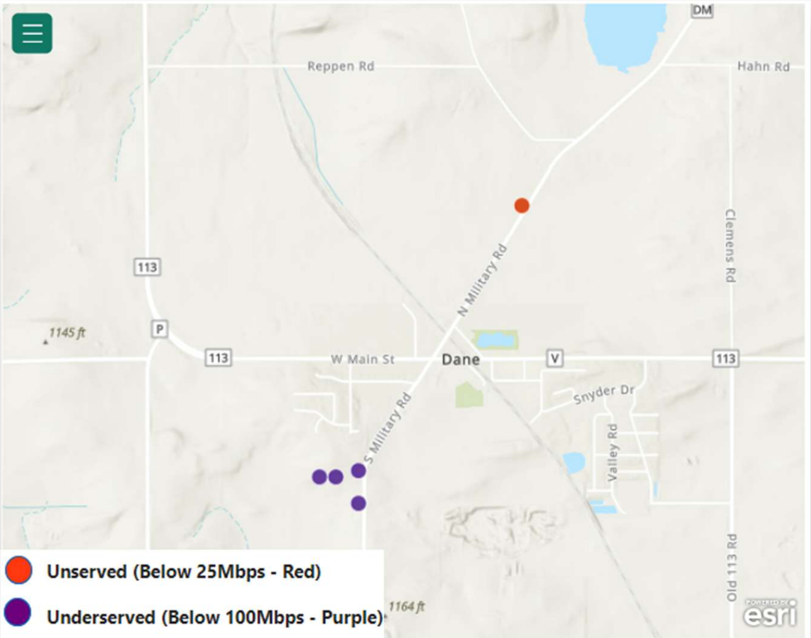
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
1	4	418	1.20%	100.00%	21	694	Yes

S & N Military Road

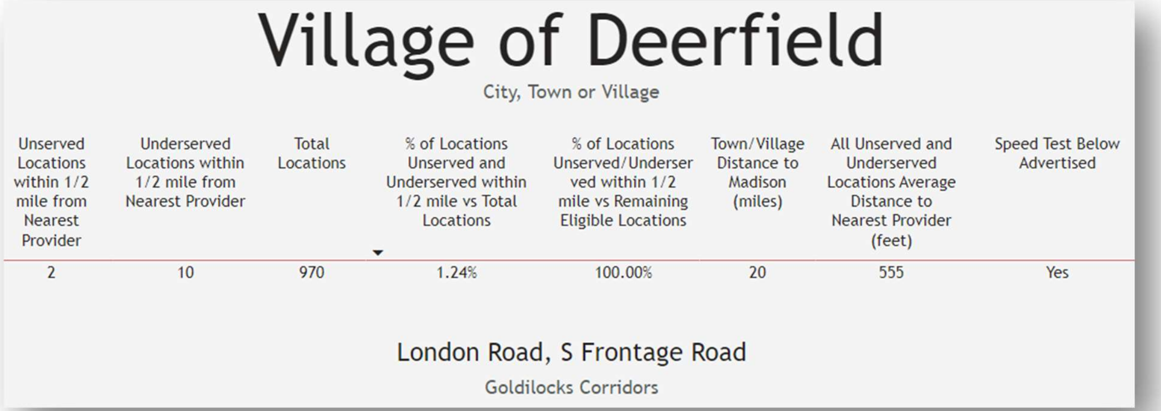
Goldilocks Corridors

Within the Village of Dane, there are five remaining locations that hold the designations of both un(der)served. Specifically, a single unserved business occupies the northern part of the village, while four households and businesses are situated in the southern area. Notably, Spectrum and TDS Telecom stand as the closest service providers to this area, with their infrastructure running along W Main Street. A mere few hundred feet are required to bridge the gap and extend coverage to the unserved location, thereby enhancing connectivity speeds for the remaining four underserved sites.

Efficient and strategic coordination with both providers will be essential in navigating the gap. Fortunately, the cost considerations are likely to remain within reasonable bounds due to the close proximity of these locations to the available infrastructure. This proximity minimizes the anticipated cost thresholds and renders the task of extending coverage to these remaining locations more attainable.


DM
Reppen Rd
Hahn Rd
Clemens Rd
N Military Rd
113
113
113
P
1145 ft
W Main St
Dane
V
Snyder Dr
S Military Rd
Valley Rd
Old 113 Rd
1164 ft
esri
Unserved (Below 25Mbps - Red)
Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $13,545



Village of Deerfield

City, Town or Village

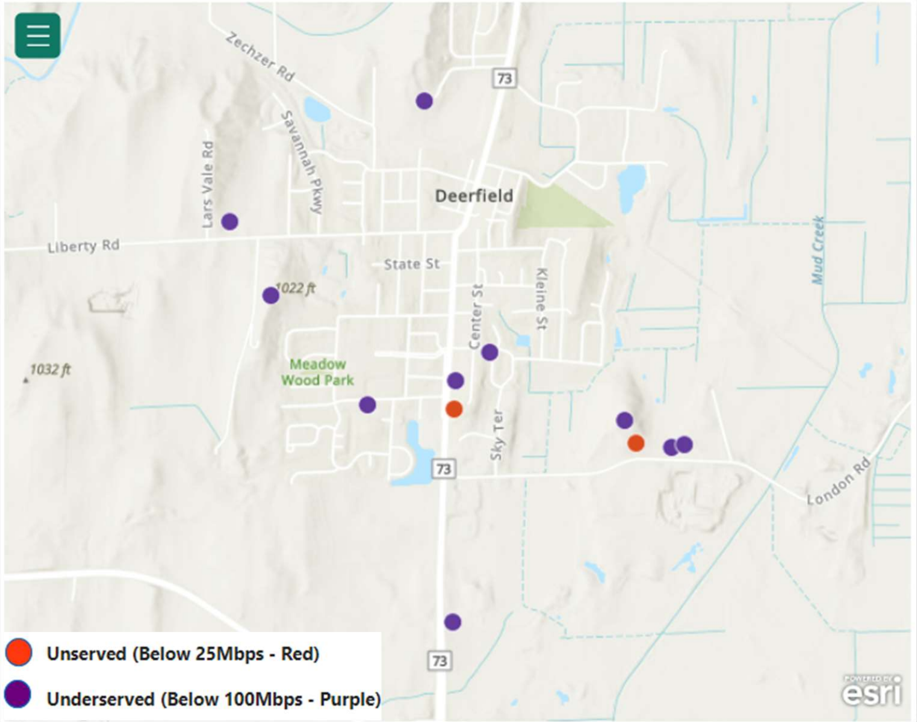
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
2	10	970	1.24%	100.00%	20	555	Yes

London Road, S Frontage Road

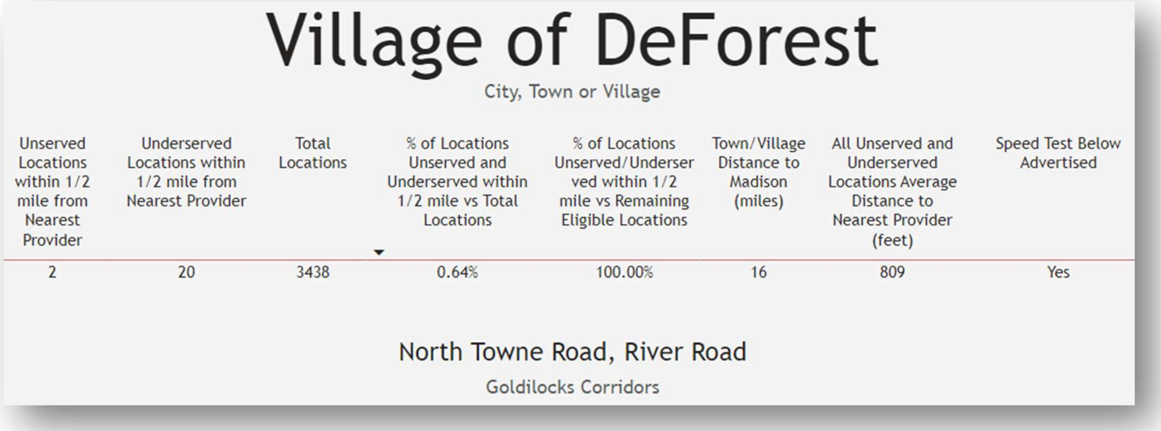
Goldilocks Corridors

In the Village of Deerfield, a total of twelve locations still stands as un(der)served. These sites exhibit an average distance of approximately 550 feet from the nearest provider, which is Spectrum. Notably, these locations are clustered in close proximity to Rte. 73. An extension along London Road could effectively encompass the unserved location, thereby offering a potential solution.

However, despite this proposed extension, a notable challenge persists concerning the inadequate speeds and limited infrastructure options present within the village. Addressing these concerns will be pivotal in ensuring comprehensive and satisfactory connectivity for the affected locations.


Zechzer Rd
73
Savannah Pkwy
Lars Vale Rd
Deerfield
Liberty Rd
State St
1022 ft
Kleine St
Center St
Mud Creek
1032 ft
Meadow Wood Park
Sky Ter
73
London Rd
73
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $32,976



Village of DeForest

City, Town or Village

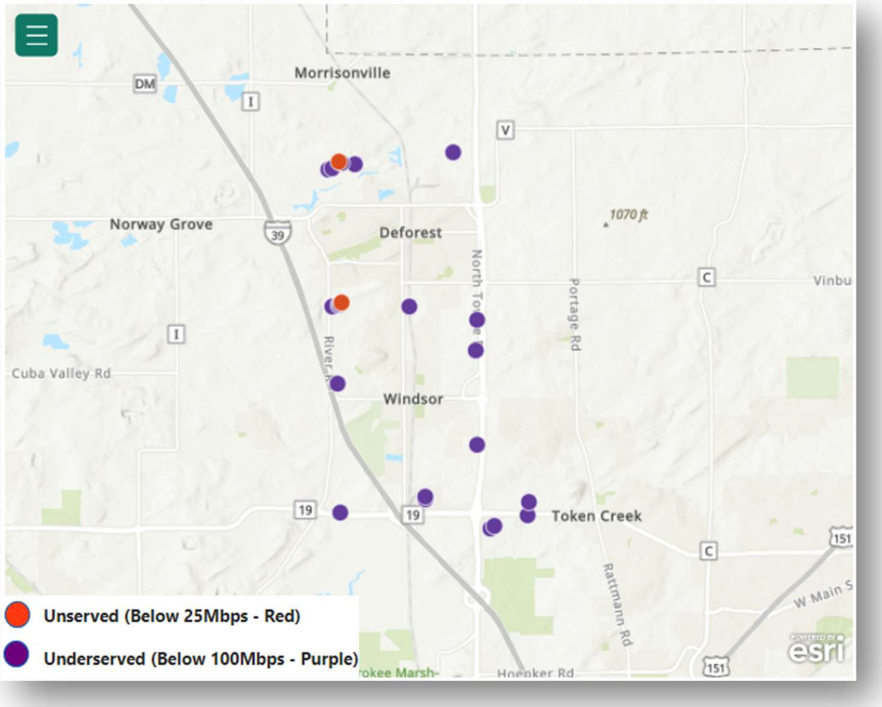
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
2	20	3438	0.64%	100.00%	16	809	Yes

North Towne Road, River Road

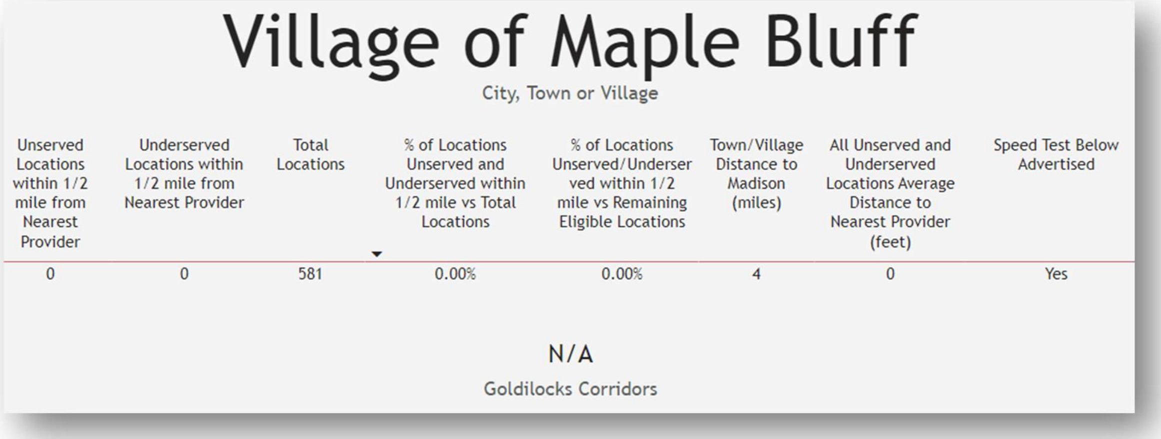
Goldilocks Corridors

Within the Village of DeForest, a total of 22 locations still lacks adequate service, rendering them both un(der)served. While connectivity options with Spectrum are viable, the landscape lacks competition beyond this single provider. Notably, the majority of these locations are positioned within a few hundred feet of Spectrum's reach. However, it's apparent that DeForest grapples with limitations in terms of terrestrial service alternatives.

To address this situation, the implementation of multiple line extensions becomes imperative. These extensions not only aim to bring connectivity to the remaining unserved locations but also hold the potential to enhance the availability of improved connection speeds. By diversifying service options and extending coverage, the Village of DeForest can pave the way for a more comprehensive and robust connectivity infrastructure.


Morrisonville
DM
I
V
Norway Grove
39
Deforest
1070 ft
North Towne Rd
Portage Rd
C
Vinbu
I
River Rd
Cuba Valley Rd
Windsor
19
19
Token Creek
151
C
W Main S
Rattmann Rd
151
Hoepker Rd
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $91,406



Village of Maple Bluff

City, Town or Village

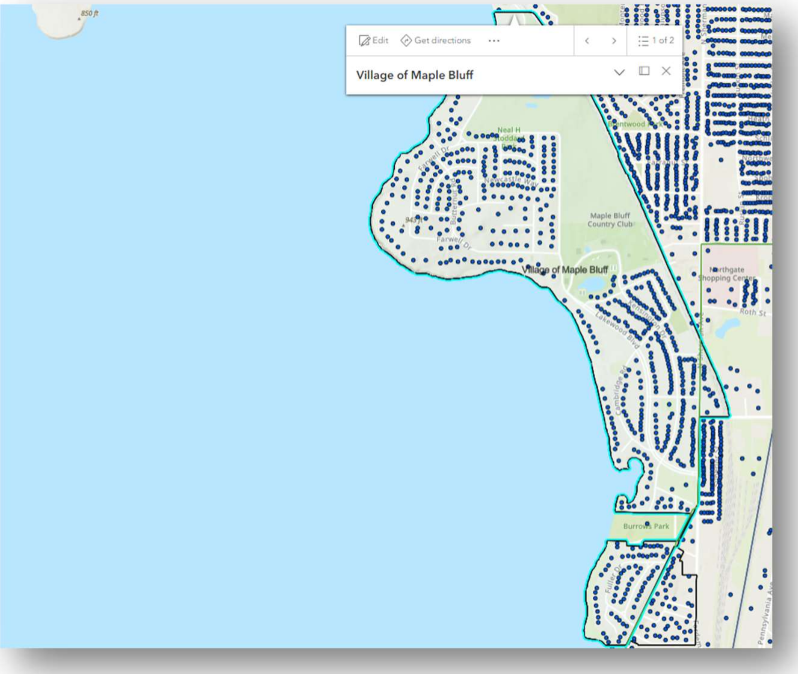
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
0	0	581	0.00%	0.00%	4	0	Yes

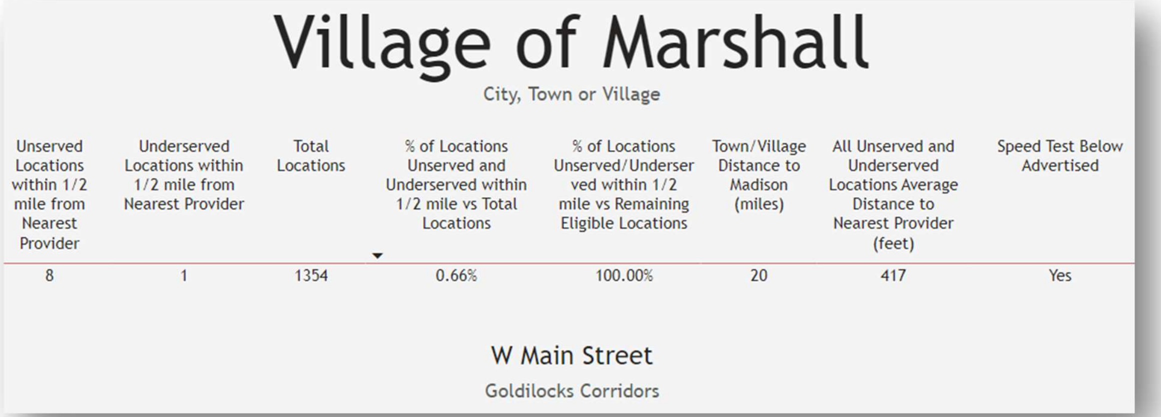
N/A

Goldilocks Corridors

The Village of Maple Bluff, represented by a turquoise blue outline border, is considered "served" in accordance with the FCC's criteria. This area encapsulates around 581 eligible locations, each represented by a blue dot symbolizing their served status. To ensure a resilient coverage landscape, it is of utmost importance for Dane County to actively engage in monitoring activities. This entails an ongoing evaluation of FCC data, thoughtfully cross-referenced with insights furnished by the WBO, while consistently seeking input from the community. This forward-looking approach plays a critical role in identifying any emerging locales that may transition into the un(der)served categories over time.

Equally paramount is Dane County's commitment to maintaining an awareness of ACP enrollment. This strategic initiative holds a central role in facilitating the inclusion of individuals seeking financial assistance within the realm of the "served" classification. Furthermore, as gleaned from Ookla's speed test data, specific sectors within the village grapple with challenges, whereby speed tests record values that fall short of the advertised speeds. This serves as an important reminder to persistently channel efforts towards achieving optimal affordability and connectivity benchmarks.





Village of Marshall

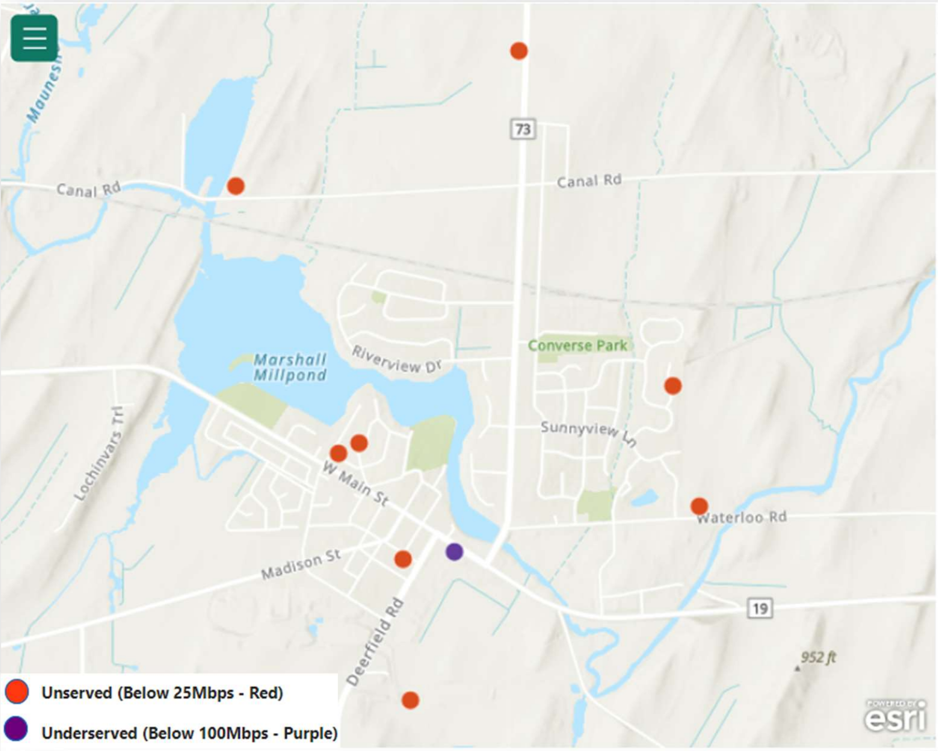
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
8	1	1354	0.66%	100.00%	20	417	Yes

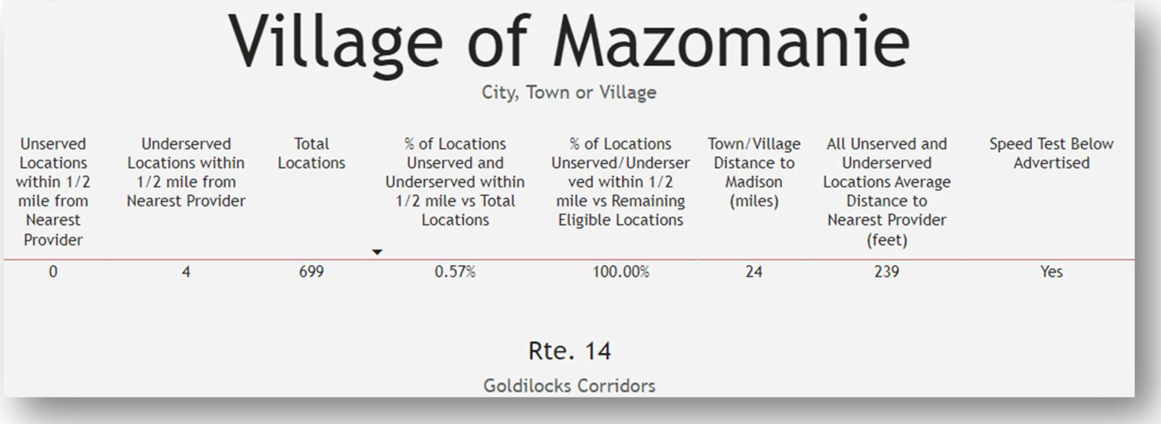
W Main Street

Goldilocks Corridors

In the Village of Marshall, there exists a total of nine locations that continue to lack sufficient service, with eight out of the nine falling under the category of unserved. The array of service options is constrained, as the area is served by just two providers, namely Windstream and Spectrum. Although Spectrum covers a substantial portion of these locations, they predominantly remain unserved within the confines of the village. Meanwhile, the remaining locations are situated within a short distance from the existing infrastructure. Given the relatively manageable scenario, addressing the connectivity gap for the un(der)served locations within the village is poised to be a relatively feasible endeavor.


Maunesha
Canal Rd
73
Canal Rd
Converse Park
Marshall Millpond
Riverview Dr
Sunnyview Ln
Lochinvars Trl
W Main St
Waterloo Rd
Madison St
Deerfield Rd
19
952 ft
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $30,737



Village of Mazomanie

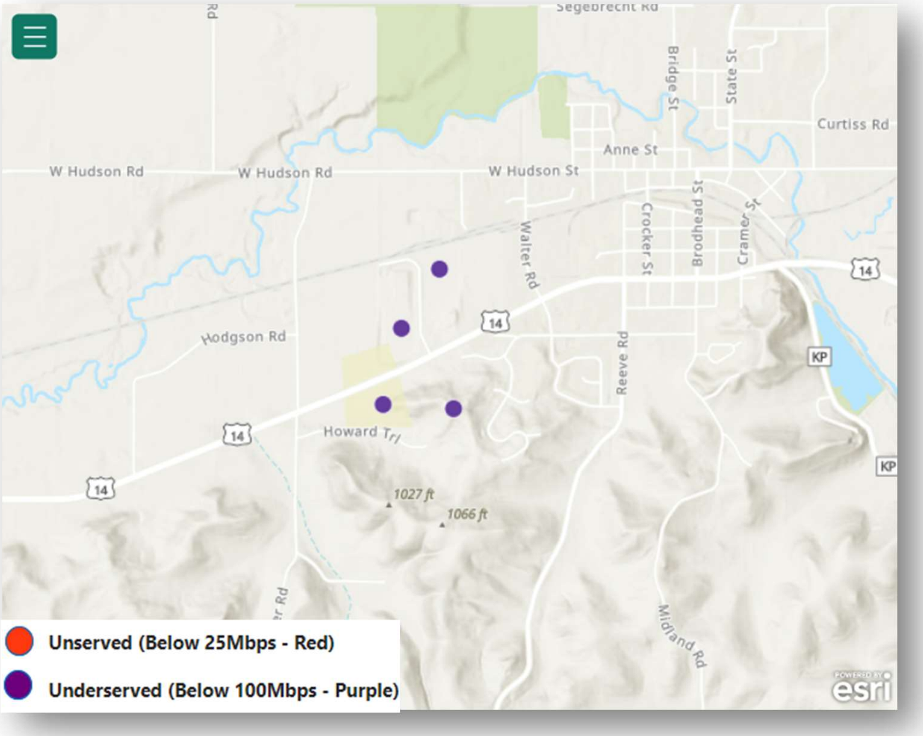
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
0	4	699	0.57%	100.00%	24	239	Yes

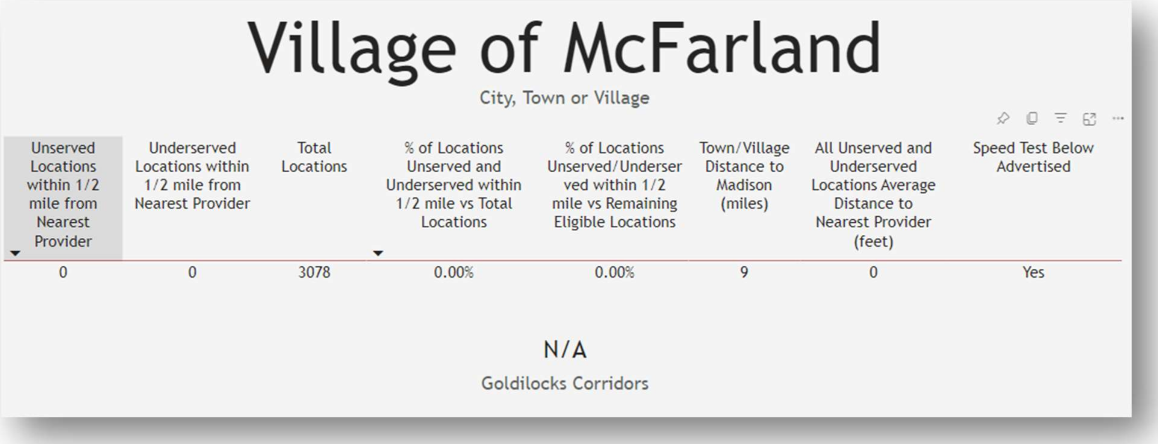
Rte. 14

Goldilocks Corridors

The primary concern in the Village of Mazomanie revolves around the attainment of satisfactory service speeds. Within this context, four locations persist as underserved, all of which are business establishments situated adjacent to Rte. 14. A common thread among them is the challenge of insufficient service speeds. This challenge can be attributed to two main factors: the absence of healthy competition and inadequate service provisions by the provider community. Collaborating with Spectrum to identify and overcome the barriers to speed upgrades should not entail a significant financial burden.


Segebrecht Rd
Bridge St
State St
Curtiss Rd
Anne St
W Hudson Rd
W Hudson Rd
W Hudson St
Crocker St
Brodhead St
Cramer St
Walter Rd
14
14
Hodgson Rd
KP
Reeve Rd
14
Howard Trl
14
KP
1027 ft
1066 ft
Midland Rd
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $18,617



Village of McFarland

City, Town or Village

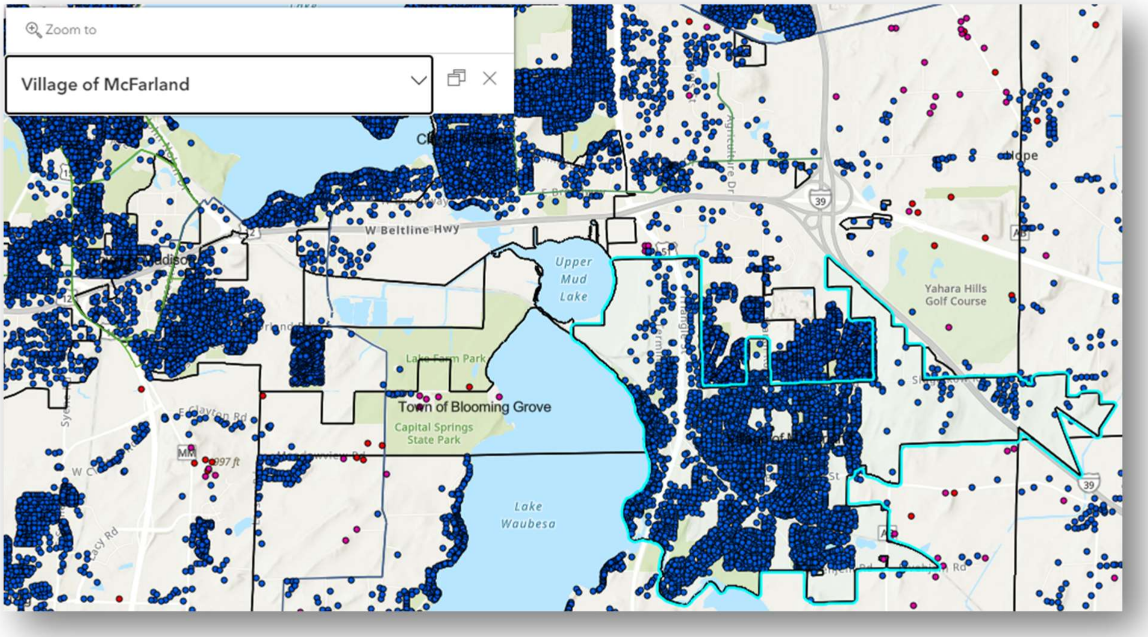
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
0	0	3078	0.00%	0.00%	9	0	Yes

N/A

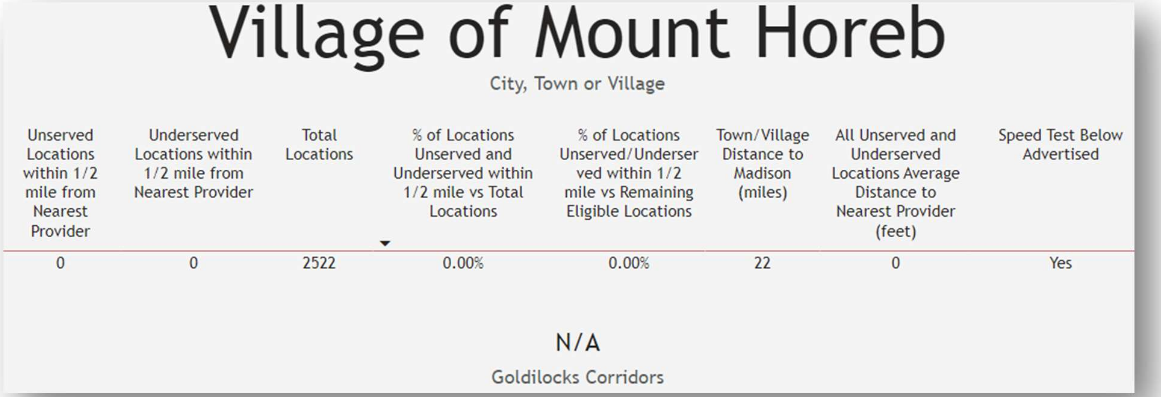
Goldilocks Corridors

The Village of McFarland, outlined by a distinct turquoise border, holds the classification of "served" according to the FCC's established criteria. Encompassing approximately 3,078 eligible locations, each represented by a blue dot indicating their served status, the village's coverage landscape requires constant vigilance. Dane County's proactive engagement in monitoring activities is paramount. This involves a continuous assessment of FCC data, cross-referenced with insights provided by the WBO, and ongoing community engagement. This proactive stance is instrumental in detecting emerging areas that could potentially transition into the un(der)served categories over time.

Equally crucial is Dane County's commitment to maintaining awareness of ACP enrollment. This strategic measure plays a pivotal role in ensuring that individuals seeking financial assistance are encompassed within the "served" classification. Furthermore, based on Ookla's speed test data, certain segments within the village encounter challenges where speed test results fall below the advertised speeds. This underscores the importance of maintaining consistent efforts to attain optimal affordability and connectivity standards.



Village of McFarland



Village of Mount Horeb

City, Town or Village

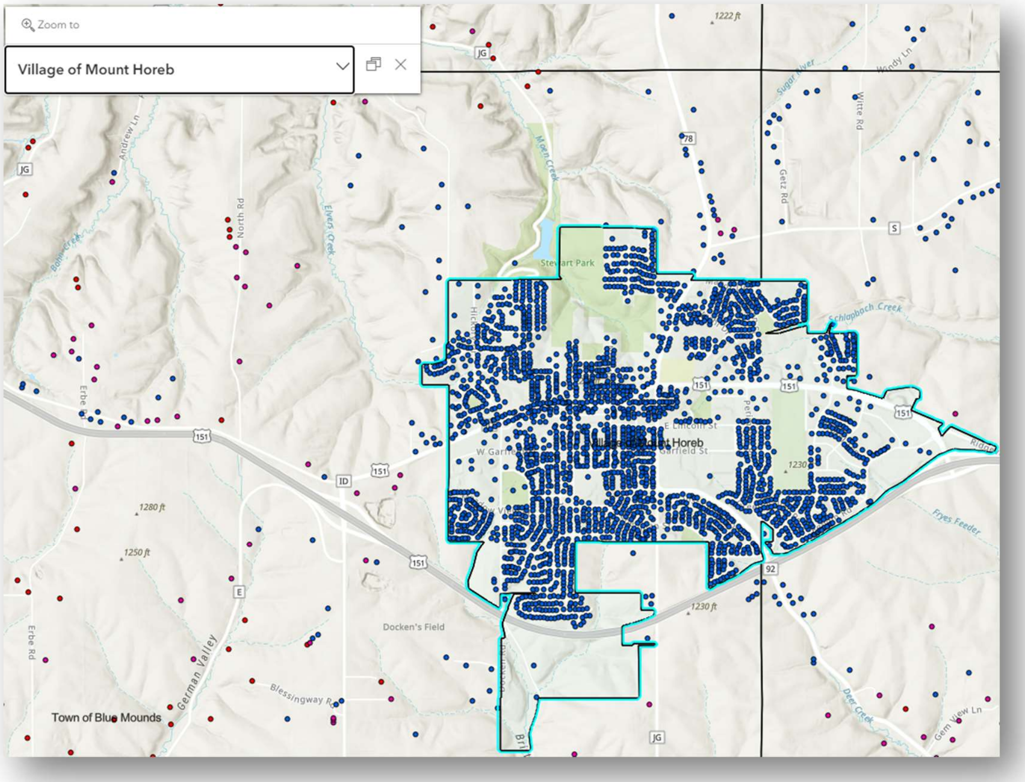
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
0	0	2522	0.00%	0.00%	22	0	Yes

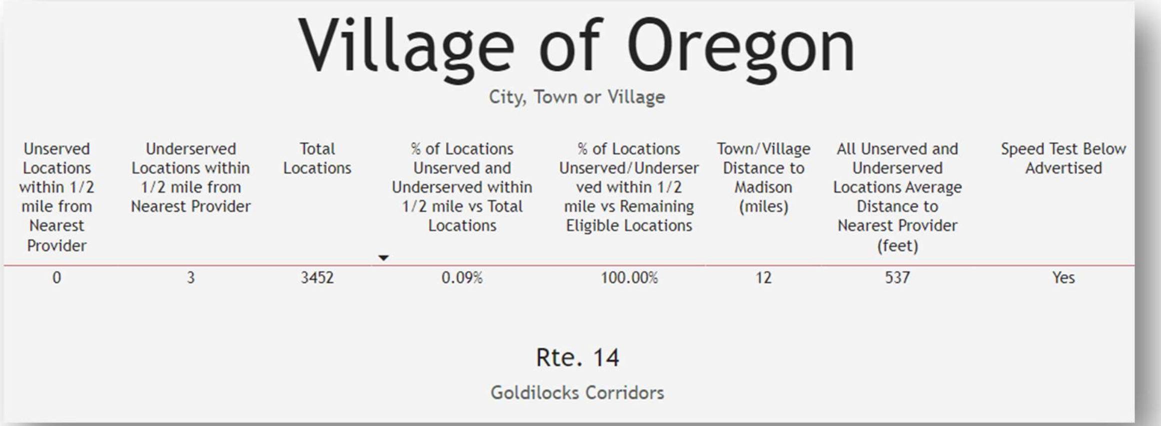
N/A

Goldilocks Corridors

The Village of Mount Horeb, defined by a distinctive turquoise border, is classified as "served" in accordance with the FCC's established criteria. Encompassing approximately 2,522 eligible locations, each depicted by a blue dot denoting their served status, the village's coverage landscape requires continuous attention. Dane County's proactive involvement in monitoring activities is essential. This entails an ongoing evaluation of FCC data, coupled with insights from the WBO and continuous community engagement. This proactive approach is pivotal in identifying emerging areas that could potentially transition into the unserved or underserved categories over time.

Equally paramount is Dane County's dedication to maintaining awareness of ACP enrollment. This strategic measure plays a pivotal role in ensuring that individuals seeking financial assistance are included within the "served" classification. Furthermore, based on Ookla's speed test data, specific sections within the village face challenges where speed test results fall short of the advertised speeds. This reinforces the significance of sustained efforts to achieve optimal affordability and connectivity benchmarks.


Zoom to
Village of Mount Horeb
1222 ft
JG
Sugar River
Windy Ln
Witte Rd
78
Getz Rd
Andrew Ln
North Rd
Elvers Creek
Moen Creek
S
Stewart Park
Schlappbach Creek
151
E Lincoln St
Village of Mount Horeb
Garfield St
W Garfield
1230 ft
Ridge
Fryes Feeder
ID
92
1280 ft
1250 ft
E
Erbe Rd
Dockens Field
German Valley
Blessingway Rd
Town of Blue Mounds
Dee Creek
Gem View Ln



Village of Oregon

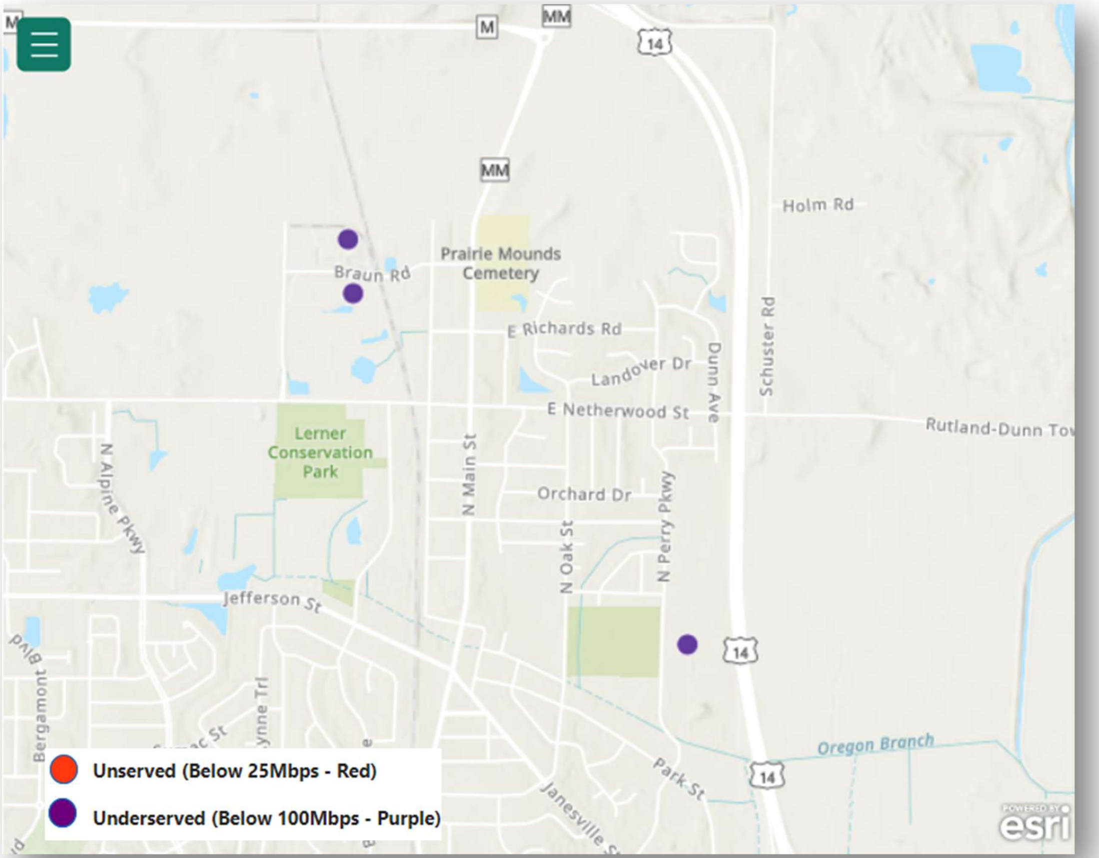
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
0	3	3452	0.09%	100.00%	12	537	Yes

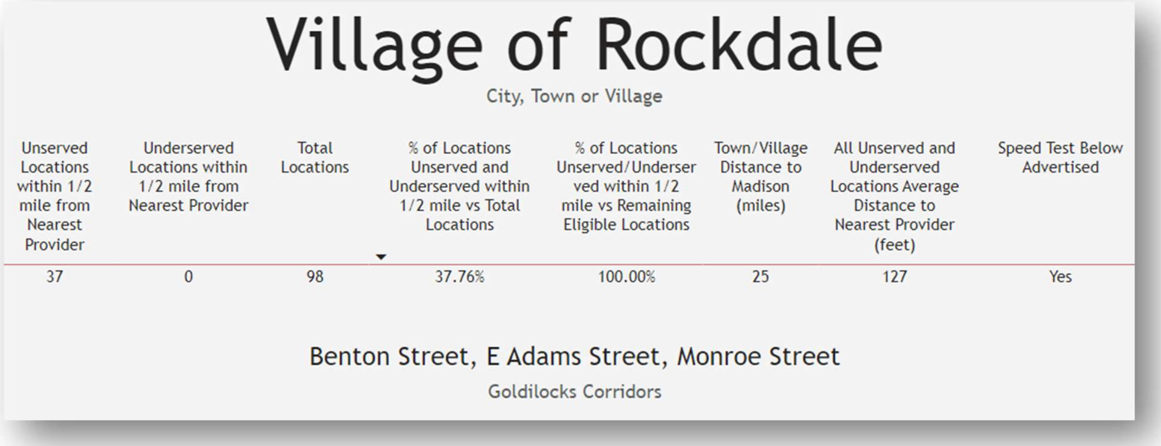
Rte. 14

Goldilocks Corridors

In the Village of Oregon, there are three locations that continue to grapple with insufficient speeds. Even though Spectrum's infrastructure encompasses these areas, the challenge of inadequate speeds persists. Moreover, the village suffers from a lack of competitive service options, with the nearest service provider situated to the south along Rte. 14. These three locations are all commercial establishments, underscoring the critical need for improved service options and faster speeds.


MM
M
14
MM
Holm Rd
Braun Rd
Prairie Mounds Cemetery
E Richards Rd
Landover Dr
Dunn Ave
Schuster Rd
E Netherwood St
Rutland-Dunn Tov
Lerner Conservation Park
N Alpine Pkwy
N Main St
Orchard Dr
N Oak St
N Perry Pkwy
Jefferson St
Bergamont Blvd
14
Oregon Branch
Park St
Janesville St
14
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)
esri

Estimated Cost to Reach Un(der)served Locations: $11,935



Village of Rockdale

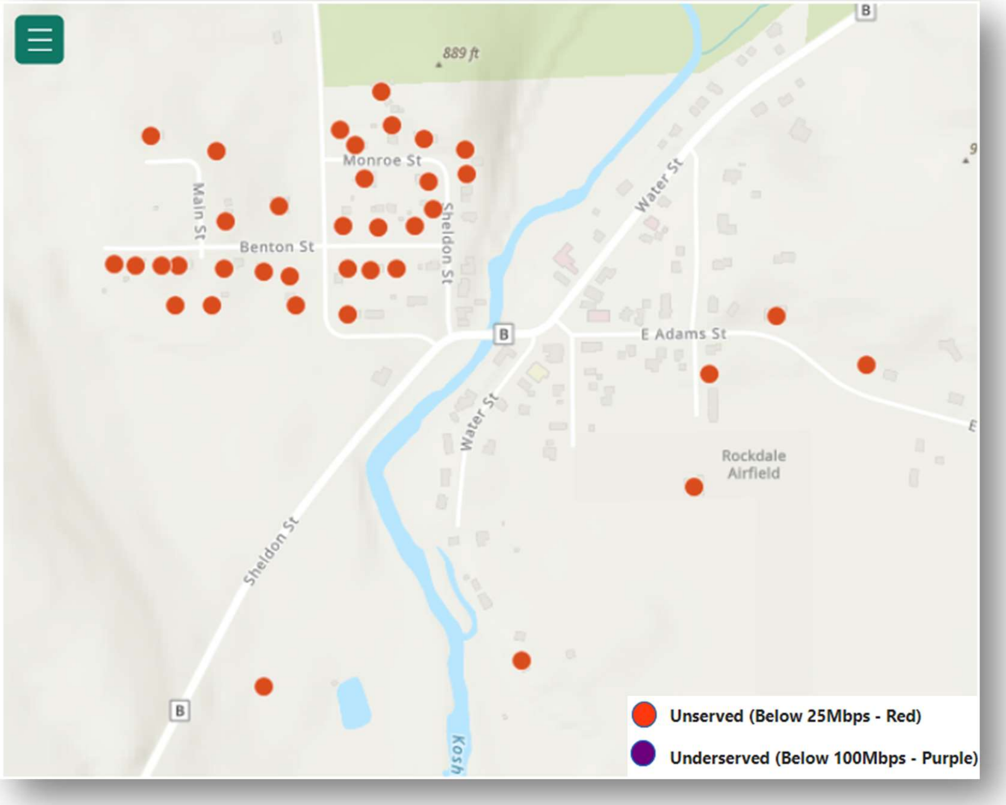
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
37	0	98	37.76%	100.00%	25	127	Yes

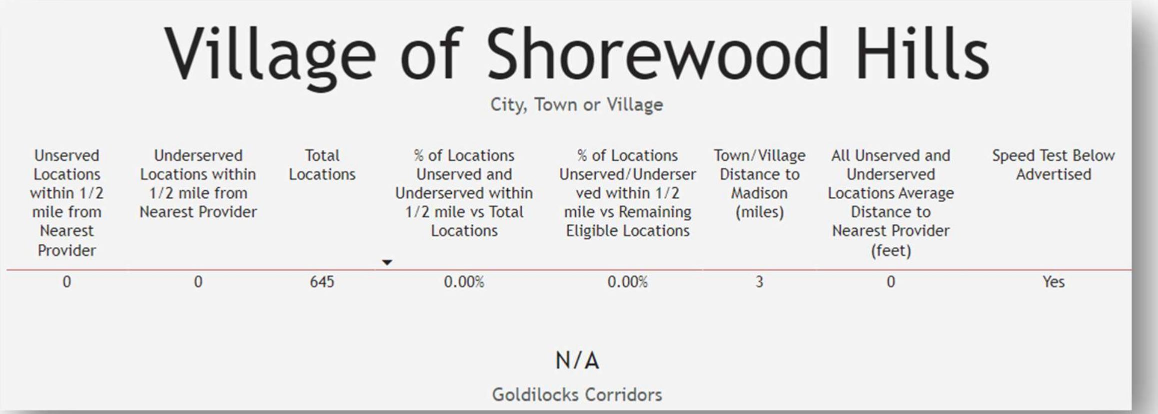
Benton Street, E Adams Street, Monroe Street

Goldilocks Corridors

In the Village of Rockdale, all remaining locations are categorized as unserved. A total of 37 locations are awaiting connectivity. The closest service provider, TDS Telecom, divides the unserved areas and is just a few hundred feet away from each unserved location. Strategic collaboration with TDS Telecom is crucial to ensure the provision of service to these remaining locations. Moreover, the cost associated with reaching these areas should fall within a lower last mile cost threshold.


889 ft
Monroe St
Main St
Benton St
Sheldon St
Water St
B
E Adams St
Rockdale Airfield
Water St
Sheldon St
B
Kosh
Unserved (Below 25Mbps - Red)
Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $92,311



Village of Shorewood Hills

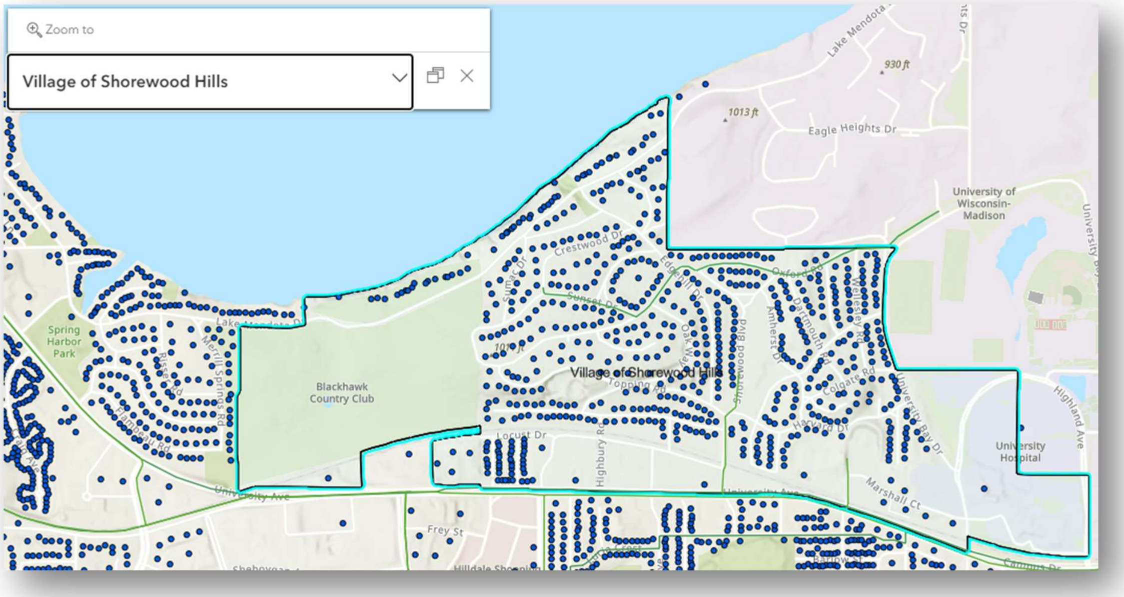
City, Town or Village

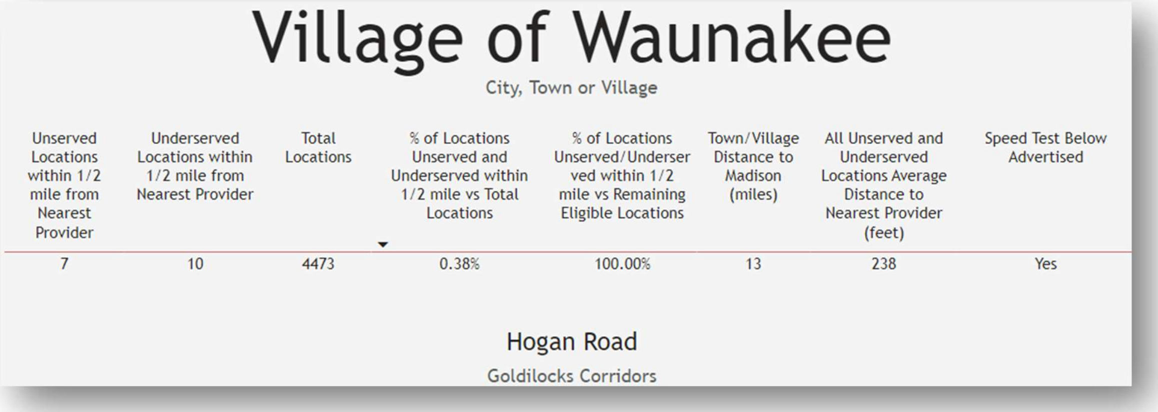
Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
0	0	645	0.00%	0.00%	3	0	Yes

N/A

Goldilocks Corridors

The Village of Shorewood Hills, outlined with a distinct turquoise border, holds the status of being "served" in accordance with the FCC's established criteria. Encompassing approximately 645 eligible locations, each marked by a blue dot indicating their served status, the village's coverage landscape necessitates ongoing attention. Dane County's proactive engagement in monitoring activities remains vital. This involves a continuous assessment of FCC data, complemented by insights from the WBO and consistent community involvement. This proactive approach is pivotal in identifying emerging areas that could potentially transition into the un(der)served categories over time. Equally crucial is Dane County's commitment to maintaining awareness of ACP enrollment. This strategic measure plays a pivotal role in ensuring that individuals seeking financial assistance are encompassed within the "served" classification. Furthermore, based on Ookla's speed test data, specific sectors within the village encounter challenges where speed test results fall below the advertised speeds. This underscores the importance of sustained efforts to attain optimal affordability and connectivity standards.


Zoom to
Village of Shorewood Hills
Lake Mendota
930 ft
1013 ft
Eagle Heights Dr
University of Wisconsin-Madison
University Bay Dr
Crestwood Dr
Oxford Rd
Spring Harbor Park
Blackhawk Country Club
Village of Shorewood Hills
Locust Dr
Highbury Rd
University Ave
Frey St
Marshall Ct
University Hospital
Highland Ave
Campus Dr



Village of Waunakee

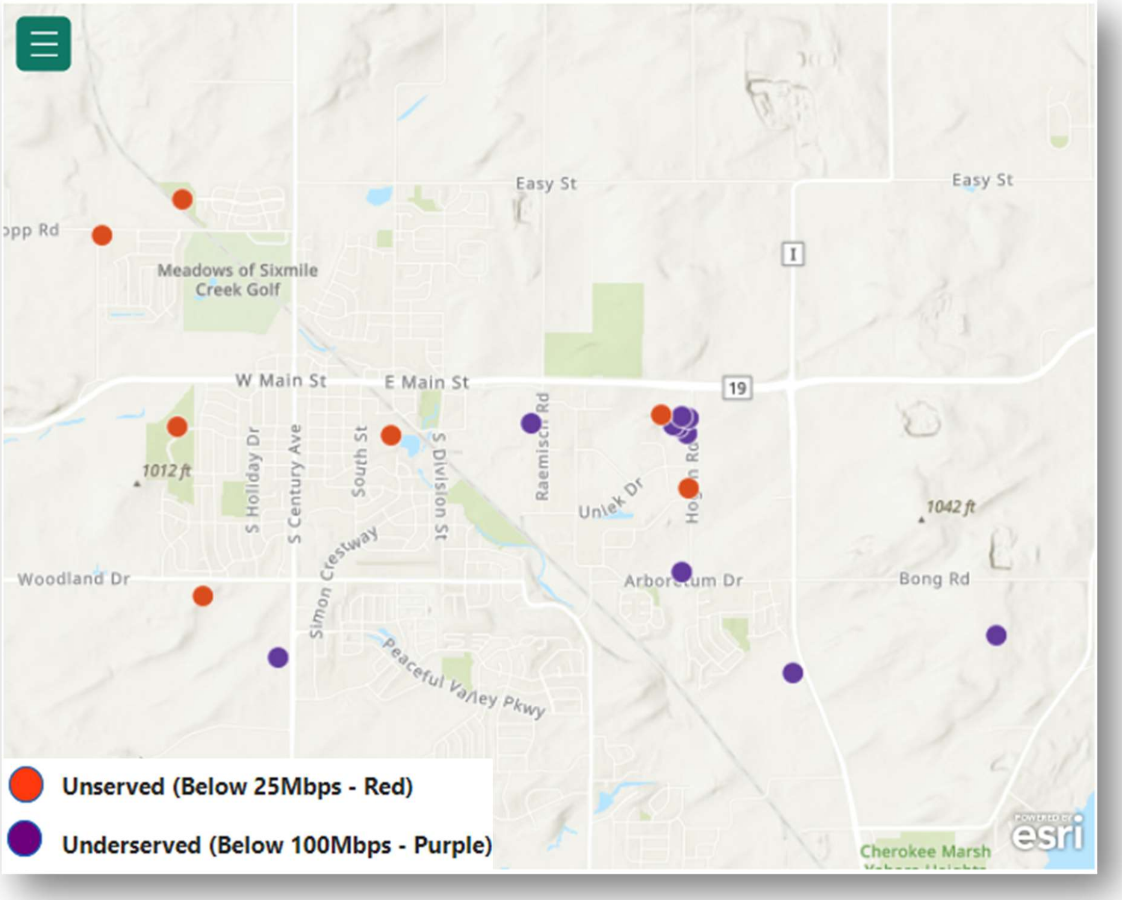
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
7	10	4473	0.38%	100.00%	13	238	Yes

Hogan Road

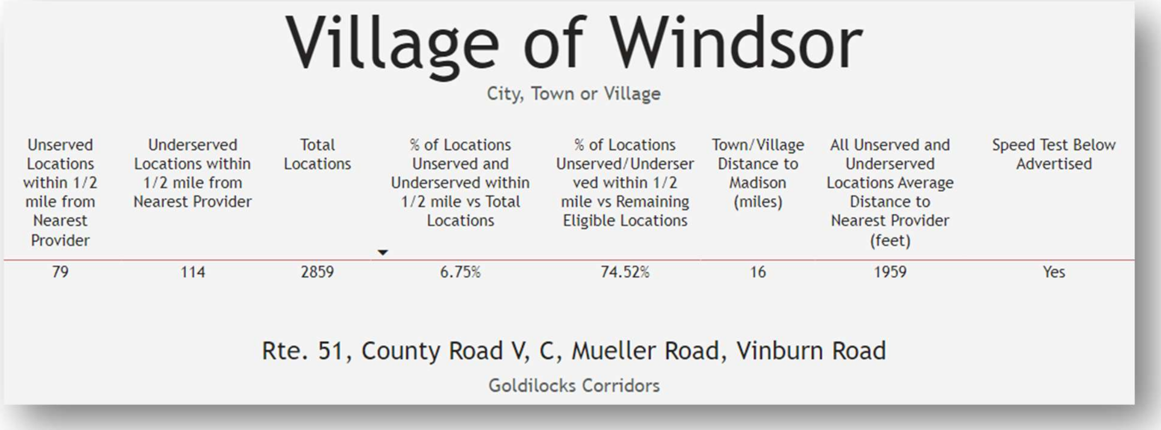
Goldilocks Corridors

Within the Village of Waunakee, there are 17 remaining locations classified as un(der)served. TDS Telecom and Spectrum have infrastructure located in very close proximity to all the locations mentioned. The average distance from the nearest service provider is less than 300 feet. Closing the gap to the unserved locations and upgrading speeds should not entail a financially exorbitant cost.



Easy St
Easy St
opp Rd
Meadows of Sixmile Creek Golf
I
W Main St
E Main St
19
Raemisch Rd
Hogan Rd
S Holiday Dr
S Century Ave
South St
S Division St
1012 ft
Unlek Dr
1042 ft
Simon Crestway
Woodland Dr
Arboretum Dr
Bong Rd
Peaceful Valley Pkwy
Cherokee Marsh
esri
Unserved (Below 25Mbps - Red)
Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $58,490



Village of Windsor

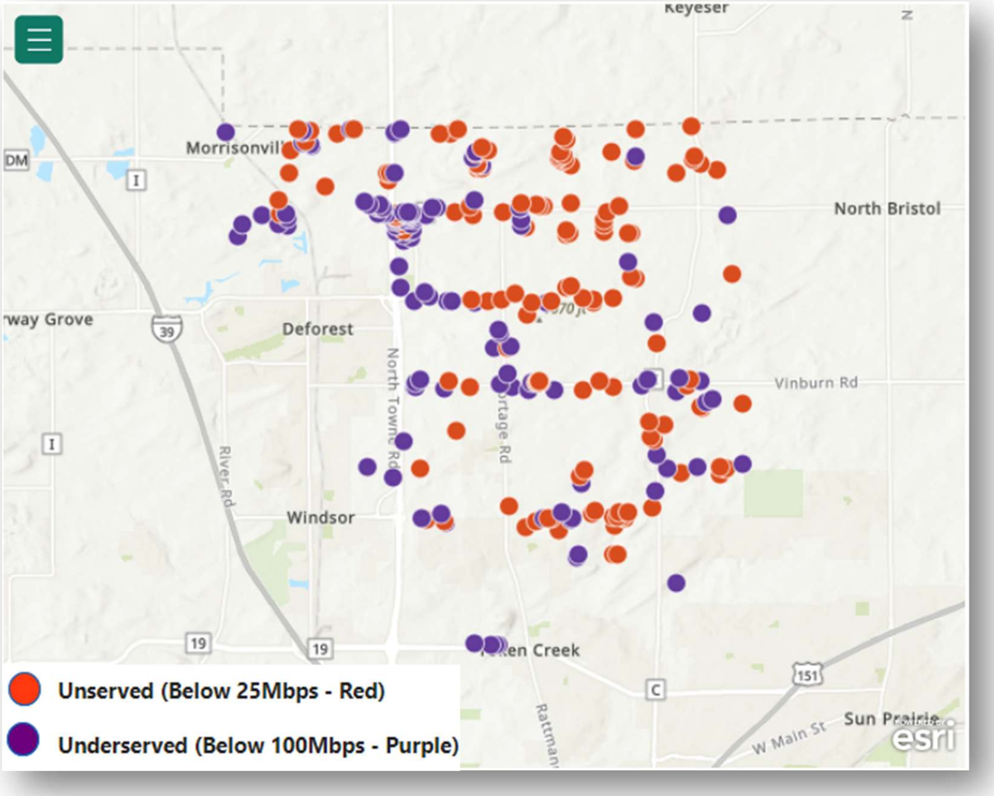
City, Town or Village

Unserved Locations within 1/2 mile from Nearest Provider	Underserved Locations within 1/2 mile from Nearest Provider	Total Locations	% of Locations Unserved and Underserved within 1/2 mile vs Total Locations	% of Locations Unserved/Underserved within 1/2 mile vs Remaining Eligible Locations	Town/Village Distance to Madison (miles)	All Unserved and Underserved Locations Average Distance to Nearest Provider (feet)	Speed Test Below Advertised
79	114	2859	6.75%	74.52%	16	1959	Yes

Rte. 51, County Road V, C, Mueller Road, Vinburn Road

Goldilocks Corridors

Spanning a significant area, the Village of Windsor encompasses 259 locations that remain un(der)served. Competition is constrained to Spectrum and Windstream, with their infrastructure primarily following a north-south trajectory through the village. Vital infrastructure is required to bridge the gaps between Portage Road and Rte. 51, as well as between Portage Road and County Road C. The primary clusters of unserved locations are situated within these "in-between" routes, with additional clusters on the northern side near County Road DM. While around 75% of the remaining locations are within a ½ mile of the nearest provider, the sheer volume of un(der)served locations will likely necessitate a substantial investment to bridge these gaps.


Keyeser
Morrisonvil
DM
I
North Bristol
way Grove
39
Deforest
North Towne Rd
Portage Rd
Vinburn Rd
I
River Rd
Windsor
19
19
en Creek
C
151
Rattman
W Main St
Sun Prairie
esri
● Unserved (Below 25Mbps - Red)
● Underserved (Below 100Mbps - Purple)

Estimated Cost to Reach Un(der)served Locations: $2,100,341

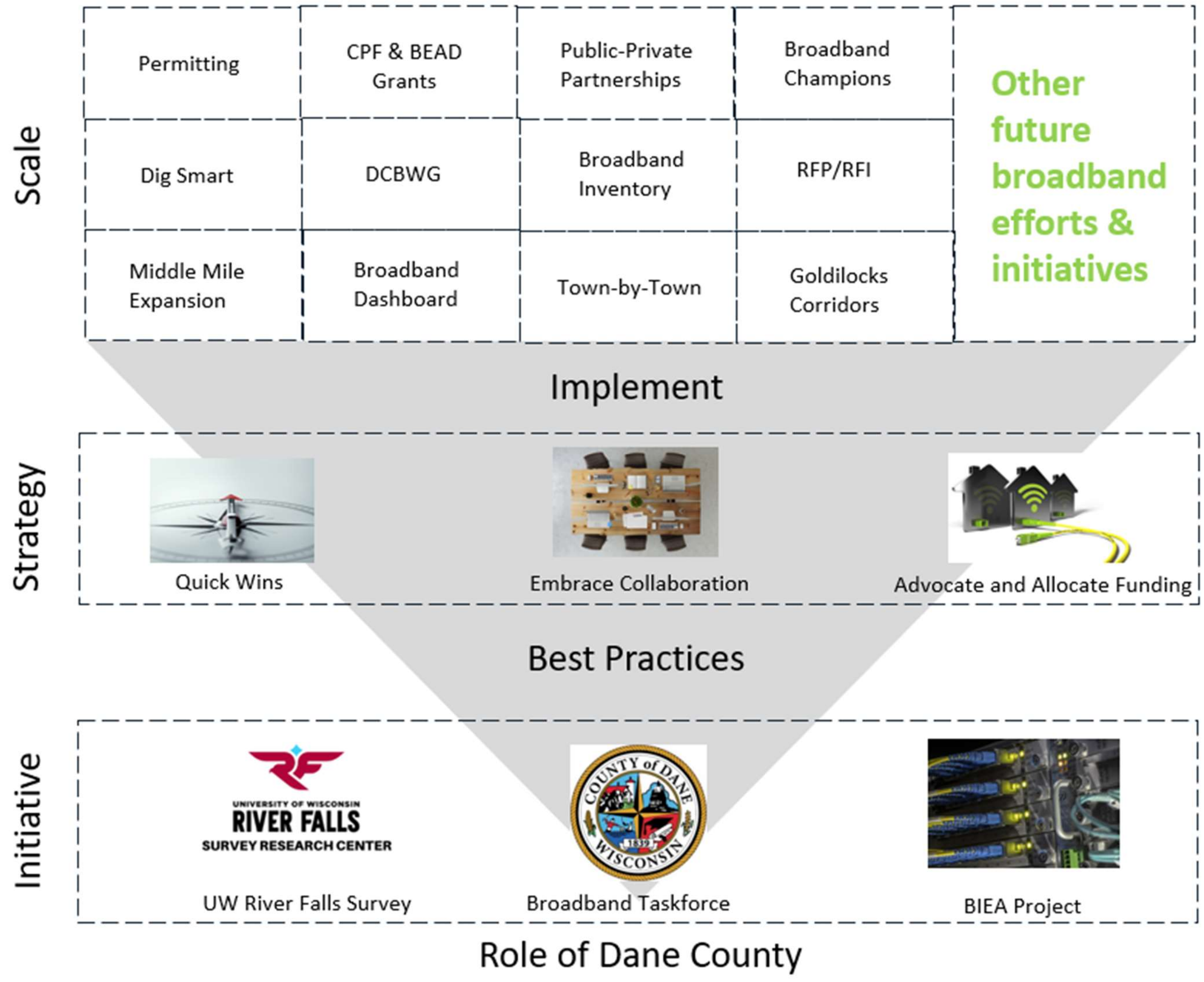
RECOMMENDATIONS & NEXT STEPS

Universal connectivity aims to ensure that every individual, regardless of their geographical location, socioeconomic status, or other distinguishing factors, can access reliable and affordable high-speed internet services. The more specific objective is to close the existing digital divide within Dane County and establishing an equitable platform that enables universal participation in the economy. Narrowing the broadband disparity serves as the foundational step in addressing the digital divide.

The insights gleaned from this report can guide Dane County as it moves forward with its broadband expansion and facilitation efforts. Although the immediate recommendations are distinct, they are interconnected and could be pursued simultaneously. Given the complex nature of broadband availability in the county and the aspiration for universal connectivity, a multifaceted and comprehensive approach is essential.

Dane County can assume the lead role in the equitable expansion of broadband infrastructure, continue the coordination and communication efforts across different municipalities, foster the ongoing policy changes, and advocate and direct state and federal funding to the most needed areas of the county. This Assessment report has established the subsequent actions for Dane County to move forward with and systematically prioritize the recommendations, enabling the county to advance cohesively towards making broadband accessible as outlined in the Assessment Report.

DANE COUNTY BROADBAND EXPANSION MODEL


Scale
Permitting
CPF & BEAD Grants
Public-Private Partnerships
Broadband Champions
Dig Smart
DCBWG
Broadband Inventory
RFP/RFI
Middle Mile Expansion
Broadband Dashboard
Town-by-Town
Goldilocks Corridors
Other future broadband efforts & initiatives
Implement
Strategy
Quick Wins
Embrace Collaboration
Advocate and Allocate Funding
Best Practices
Initiative
UNIVERSITY OF WISCONSIN RIVER FALLS SURVEY RESEARCH CENTER
UW River Falls Survey
COUNTY of DANE WISCONSIN 1839
Broadband Taskforce
BIEA Project
Role of Dane County

1. **Middle Mile Expansion:** As noted in other sections of this report, rural areas in Dane County are facing a lack of middle mile infrastructure. To address this issue, it is advisable for Dane County to support the development and/or expansion of an open access middle mile infrastructure in these peripheral regions. Various approaches can be considered, including setting up an open access middle mile network akin to the Metropolitan Unified Fiber Network (MUFN), collaborating with existing middle mile infrastructure owners to explore partnerships with last mile ISPs, or examining the potential for forming cooperatives.

   This expansion of the middle mile could introduce an open access framework that encourages increased competition in the underserved outer regions. By enabling local and regional providers to extend their services at a lower cost threshold and improved last mile business model, an open access middle mile infrastructure could foster a more competitive landscape. Typically, local and regional providers would face significant obstacles in entering the market if they were required to independently fund and construct the middle mile infrastructure from scratch. The current lack of competition in many areas of Dane County may inadvertently foster a monopoly or oligopoly, granting control over pricing, service offerings, and deployment timelines.

   According to Fierce Telecom, as recent as October 30, 2023, open access networks are gaining traction in the U.S., noting the deal between the California Department of Transportation and Lumen to build out 1,900 miles of open access middle mile infrastructure. That sentiment is echoed by Zayo's Chief Product Officer, Bill Long, who describes their upcoming 2,100, multi-state middle mile project to be transformative for marginalized and rural communities. Zayo's project is built on partnerships with government entities and local ISPs to ensure broadband connectivity for un(der)served areas.

   Furthermore, collaborative endeavors involving public entities like the Wisconsin Department of Transportation, and Dane County Highway & Transportation could drive the emergence of "Dig Smart" initiatives across the county. Dane County could also utilize this middle mile infrastructure to connect with neighboring county infrastructure, thereby utilizing it for diversity and resilience solutions, such as offsite backups, storage, and even data center infrastructure.

   Identified Goldilocks corridors in each city, town, or village, where un(der)served locations are situated, could serve as strategic middle mile infrastructure routes or last mile corridors that extend from the middle mile infrastructure and pass significant portions of these un(der)served locations. A common theme prevalent in the middle and outer tiers of Dane County is the absence of broadband infrastructure along the north-south or east-west corridors, compounded by the significant lack of competition due to deficiencies in the middle mile.

   Various funding mechanisms utilized by counties across the nation to finance an open access middle mile infrastructure include grants, P3s, bond financing, tax increment financing, and the allocation or reallocation of capital project funds. Opting to allocate or reallocate capital project funds, rather than relying solely on federal grant funds, would afford the flexibility to construct in any area, irrespective of federal funding guidelines or exclusionary zones.

   Highlighted below is what an expanded open access middle mile infrastructure could look like along with the associated costs to build this infrastructure.

   Total Mileage: 247 miles

   Estimated Total Budget: $60.5M

   - Outer Ring: $25M
     1. Town of Roxbury
     2. Town of Dane
     3. Village of Dane
     4. Town of Vienna
     5. Village of DeForest
     6. Village of Windsor
     7. Town of Bristol
     8. Town of York
     9. Village of Marshall
     10. Town of Medina
     11. Village of Deerfield
     12. Town of Christiana
     13. Town of Albion
     14. Town of Dunkirk

15. City of Stoughton
16. Town of Rutland
17. Village of Oregon
18. Town of Oregon
19. Town of Montrose
20. Village of Belleville
21. Town of Primrose
22. Town of Perry
23. Town of Blue Mounds
24. Village of Blue Mounds
25. Village of Mount Horeb
26. Town of Vermont
27. Town of Black Earth
28. Village of Black Earth
29. Village of Mazomanie
30. Town of Mazomanie

- Southeast Extension: $6.6M
    1. Town of Blooming Grove
    2. Village of McFarland
    3. Town of Dunn
    4. City of Stoughton
    5. Town of Albion

- Route 151 Connector: $6.7M
    1. City of Madison
    2. City of Verona
    3. Town of Verona
    4. Town of Springdale
    5. Village of Mount Horeb
    6. Town of Blue Mounds
    7. Village of Blue Mounds

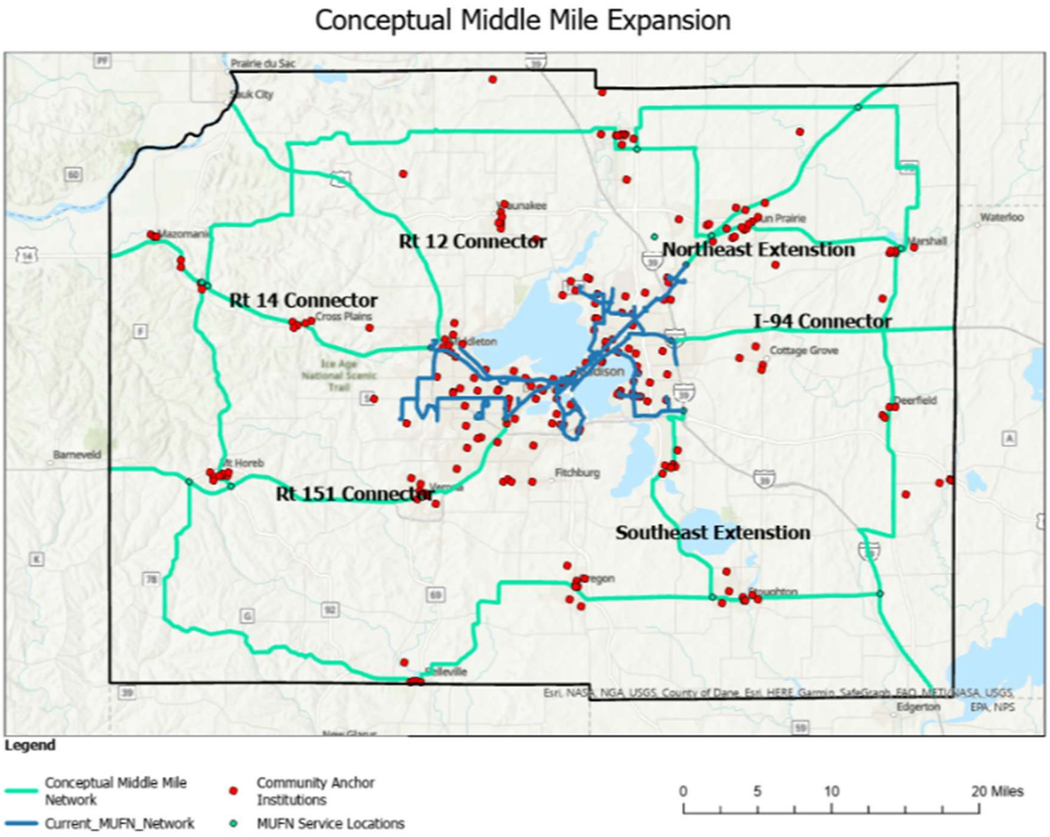
- Route 14 Connector: $4.5M
    1. City of Middleton
    2. Town of Cross Plains
    3. Village of Cross Plains
    4. Town of Berry
    5. Village of Black Earth
    6. Town of Black Earth
    7. Village of Mazomanie
    8. Town of Mazomanie

- Northeast Extension: $9.8M
    1. City of Madison
    2. City of Sun Prairie
    3. Town of Bristol
    4. Town of York
    5. Village of DeForest
    6. Village of Windsor
    7. Town of Burke
    8. City of Sun Prairie
    9. Town of Sun Prairie
    10. Town of Medina
    11. Village of Marshall

- Route 12 Connector: $4.4M
    1. City of Middleton
    2. Town of Springfield
    3. Town of Dane
    4. Town of Roxbury

- I-94 Connector: $3.5M
    1. Town of Cottage Grove

2. Village of Cottage Grove
3. Town of Deerfield
4. Town of Medina


Conceptual Middle Mile Expansion
Prairie du Sac
Sauk City
Mazomanie
Waunakee
Rt 12 Connector
Northeast Extenstion
Sun Prairie
Marshall
Waterloo
Rt 14 Connector
Cross Plains
Ice Age National Scenic Trail
Middleton
Madison
I-94 Connector
Cottage Grove
Deerfield
Barneveld
Mt Horeb
Rt 151 Connector
Verona
Fitchburg
Southeast Extenstion
Oregon
Stoughton
Belleville
Edgerton
New Glarus
Esri, NASA, NGA, USGS, County of Dane, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS
Legend
Conceptual Middle Mile Network
Current_MUFN_Network
Community Anchor Institutions
MUFN Service Locations
0
5
10
20 Miles

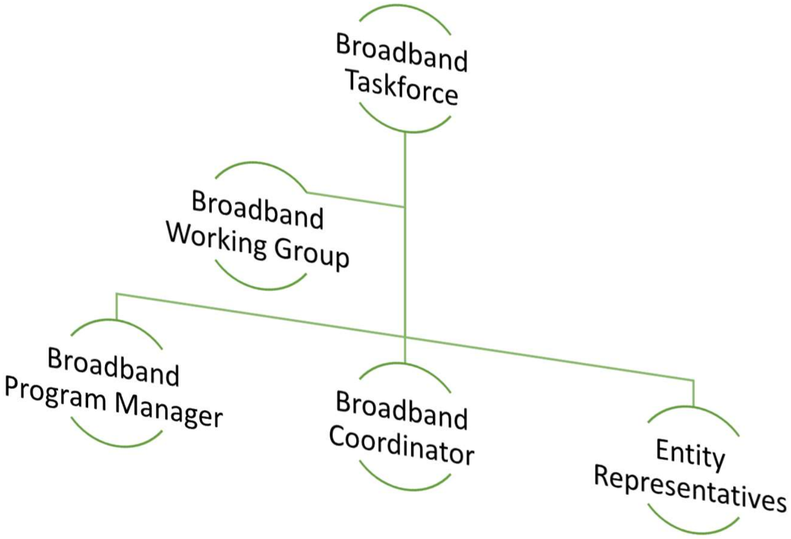
2. **Policy Review & Action:** Implementing "Dig Smart" policies can account for conduits to be planned and built during local or middle mile construction projects, such as new business parks, new housing developments or new road construction. Creating new housing development and business park standards as part of the permitting process are practical examples of where action can take place to future proof land development in a more forward looking way. When it comes to land use planning, providing access to the online broadband inventory assets can help direct where land use decisions can be made when appropriate and applicable.

   Champion policies that promote broadband accessibility at both the county and state levels, including endorsing legislation that encourages greater flexibility for publicly owned infrastructure and reduces regulatory obstacles. When contributing public funds to broadband buildouts, require, for any project area that is funded, that service must be available to each home passed within a 12-month timeframe. Require that those who receive funding must submit electronically their inventory of broadband infrastructure so it can be added to Dane County's Broadband Asset Inventory. Review and implement policies that are broadband friendly to more local private service providers, such as developing a loan program designed to assist local ISP providers to help offset high-cost matching funds needed for grants and to support public-private partnerships.

   The process of obtaining permissions for the establishment of new broadband infrastructure requires refinement to accelerate project timelines. Collaboration between Dane County and the local municipalities, including cities, towns and villages, must occur to achieve uniformity in the permitting process. This harmonization should take place in advance of the initiation of BEAD and CPF projects, thereby facilitating more efficient project rollouts. As a local example in Oshkosh, WI, a 19,000-home project was canceled citing issues with permitting and the cost of repairing the streets and sidewalks after the installation of the underground conduit. As an example, requiring depth of 36” or more for a single broadband conduit may be a little beyond what is needed or required for sufficient depth. By simplifying these processes, Dane County can reduce the cost and time required for companies to expand their services. For instance, when CPF and BEAD projects are in the planning stage, bringing permitting to the Working Group for discussion can help facilitate a common standard application template that can suffice for the county and individual towns to create a "one-stop" permit process and where the cities and villages could adopt the common permit template to help make the process more predictable and routine for both service providers and the public entities. Establishing shared expectations and eliminating as much friction as possible in the process will strengthen Dane County’s approach in permitting, Dane County should (1) accelerate permitting through early cross-agency coordination to help reduce bottlenecks and use the expertise of agency, 3rd parties and region specific teams (2) establish clear timeline goals and track key project information to improve transparency and accountability (3) engage in early and meaningful outreach to service providers and local communities (4) improve county responsiveness and technical assistance to support the navigation of the permitting process (5) adequately resource departments and supplement with technical experts as needed.

3. **Update, Maintain Broadband Asset Inventory:** Subscribe, monitor, update and maintain an existing broadband assets inventory in a single view. Subscription databases such as FiberLocator or GeoTel are examples of databases that contain broadband assets of numerous service providers. This inventory would be updated continually and help to identify who to contact for partnership or infrastructure availability. This can also contribute to a “Dig Smart” policy when projects are being planned and potential joint trench or joint builds present themselves. Once the single view is established, Dane County can better maintain and identify gaps in connectivity and affordability. Along with maintaining a broadband asset inventory, Dane County should capture and maintain information from inbound calls and emails. From the database, the county can review on a regular basis to identify trends in geographic disparities, quality of service issues, demand, digital inclusion, complaints, educational needs and customer satisfaction.

4. **Launch the Dane County Broadband Working Group:** Establish and take the lead in forming the Dane County Broadband Working Group (Working Group), consisting of key members including the Dane County Broadband Program Manager, Dane County Broadband Coordinator, a representative from the Wisconsin Broadband Office (WBO), a University of Wisconsin representative, private service provider representatives, and a representative from the Towns and Cities & Villages Associations. The primary objective of the Working Group is to facilitate collaborative efforts for expanding broadband access. By fostering engagement and collaboration among stakeholders across the county, the Working Group aims to enhance awareness and promote joint initiatives. A recent example of success from a working group has come from the Maine Connectivity Authority (MCA). The MCA pulled together a statewide Broadband Working Group and as a result submitted and won a Middle Mile grant award from the NTIA totaling approximately $44M. Several items that were worked on within the working group was how to value the DOT’s right-of-way, network ownership models and which entity would take the lead in the grant application.



The Working Group will be responsible for inventorying, comprehending, and providing regular updates on ongoing projects, such as the CPF and BEAD programs. The Working Group will also identify potential future projects and establish platforms for stakeholders to exchange their challenges, concerns, and successes. It's important to note that the Working Group operates differently from the Taskforce. While the Taskforce encompasses a more diverse range of stakeholders and focuses on analysis, policy, and oversight, the Working Group has a more specific focus. Its role is task-oriented and involves a direct role in executing projects or initiatives. The Listening Session could be viewed as somewhat of a precursor to the standing up of the Working Group. Insight gathered, gaps identified, priorities accumulated, and feedback presented, could all make its way back to the Taskforce to weigh in on decisions that need to be made in a broader sense for the county.

5. **Launch the Broadband Dashboard:** The broadband dashboard should track data on ACP enrollment, grants programs, service providers who are awarded dollars, targeted locations, county matching funds, projects underway and other necessary data or metrics that can be useful to the public. The dashboard can also provide a portal for reporting speeds for end users, launch surveys and help target specific areas when analyzing affordability zones. As an example, a mobile home park in the Town of Springfield accounts for almost 40% of the unserved locations. Having that data at the county's fingertips could home in outreach to those families and begin the ACP enrollment process.

6. **Release a Request for Proposal (RFP)/Request for Information(RFI):** Releasing an RFP or RFI can help identify and prioritize areas where county funds could be used to help offset the high cost of building new infrastructure and could be particularly helpful for smaller, local service providers that may not have the financial capacity of the larger, national service providers. The RFP/RFI and the subsequent provisioning of these funds could be conditional upon meeting certain service standards, project completion thresholds, low-cost service options or mandate minimum service coverage areas. It is recommended that Dane County issue a Request for Information (RFI) at a minimum to solicit public interest from eligible service providers. The RFI will help identify where service providers need public subsidy to serve hard to reach homes and businesses and quantify what that cost would be for both the service providers and the county. Additionally, the areas that are identified can be shared and coordinated with the WBO to confirm inclusion into the BEAD Initial Proposal Volume 1 or 2.

Example of RFI Table:

Census Tract	Town, Municipality or Village	Road Name/Number	Road Point A Start	Road Point B End	Approximate Length (feet)	Number of Unserved Households to be Served	Number of Underserved Households to be Served	Number of Businesses to be Served	Number of CAIs Passed	Installation/Technology Type	Download Speed (Mbps/Gbps)	Upload Speed (Mbps/Gbps)	Town/Village Outreach	Delivery Timeline	Total Build Cost	Requested County Contribution
1.2E+10	Town of Bristol	12345 Perry Center Road	Kittleson Rd	Spring Valley Dr	2,900	20	2	1	1	Fiber	200Mbps	100Mbps	Yes / No	October 2023-March 2024	$ 500,000.00	$ 25,000.00

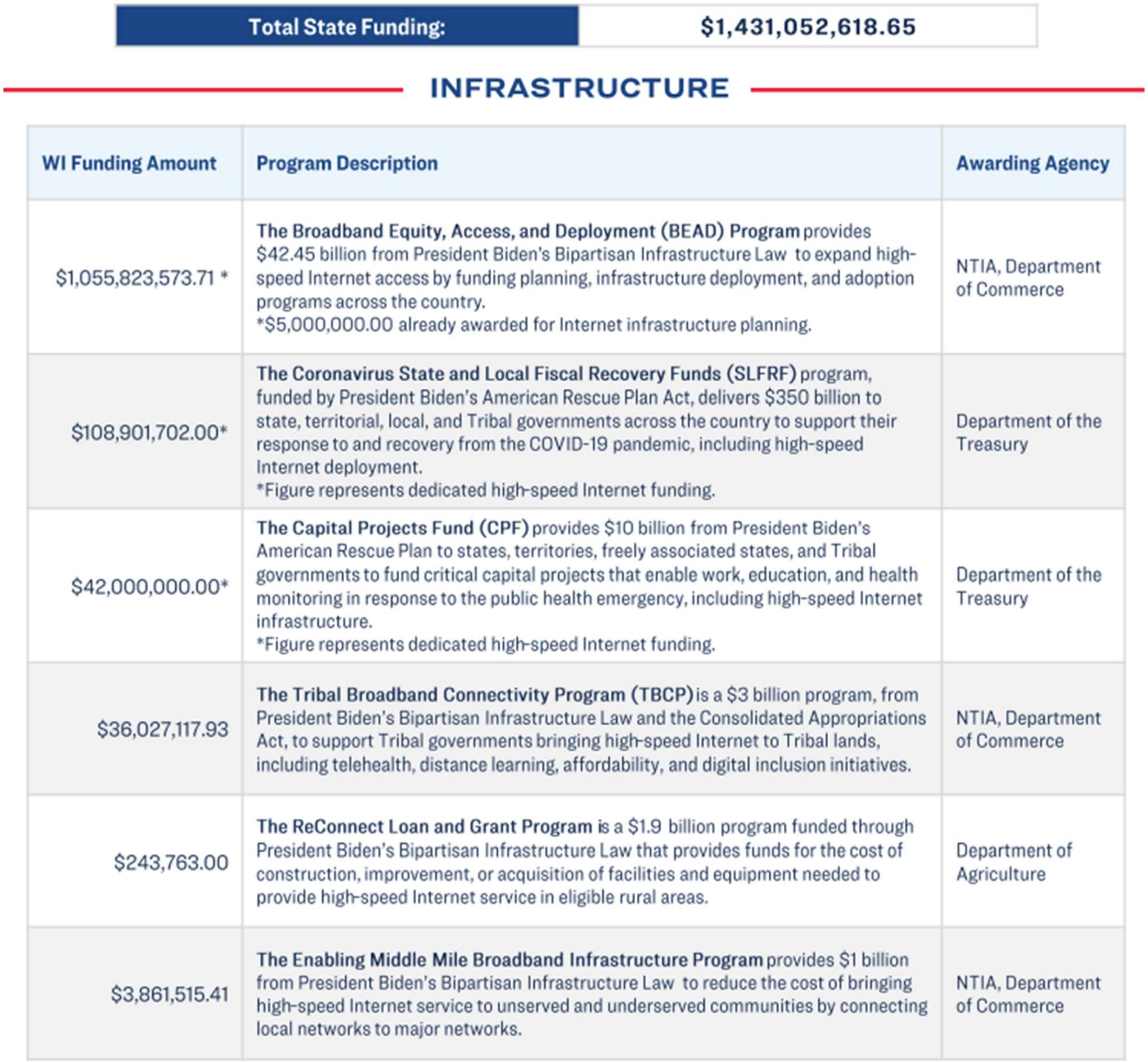
7. **Engage with the Wisconsin Broadband Office (WBO):** Coordinate the expansion of broadband initiatives in alignment with broader state and federal funding programs, such as the CPF and BEAD programs. Through collaborative engagement with the WBO, specific eligible areas for funding can be identified, and proactive advocacy for projects within those areas can be pursued. Local coordination is mandated by the BEAD program, Dane County should collaborate with the WBO to determine suitable last mile thresholds for the BEAD program. To date, Dane County has only received the benefit of approximately 0.104% of the awarded $345M in Wisconsin PSC funds. When comparing Dane County to neighboring counties, Dane County should make it a top priority to combat any perception that it is adequately served. Dane County should also work closely with its federal and state partners and representatives through the WBO and the NTIA local representative to evaluate and potentially seek waivers for areas previously funded by RDOF to help support more effective and future-proof deployments in the CPF and BEAD programs.

   Emphasizing higher last mile thresholds for the BEAD program has the potential to facilitate the deployment of more fiber to additional households, positioning Dane County to adopt a more future-proof technological framework across the region. Setting thresholds at a higher level allows for a broader expansion of broadband services. Conversely, setting the threshold too low may necessitate providers to increase their matching contributions, potentially restricting their participation in the programs. With the impending release of Wisconsin's 5-Year Action Plan, it will be important to offer public comment on the plan, provide Dane County's town-by-town gap assessment to demonstrate needs, gaps and locations, work with the WBO to help advocate for project areas within Dane County and offer evaluation criteria that are specific to the needs of the cities, towns and villages of Dane County.

APPENDICES

A. Grants

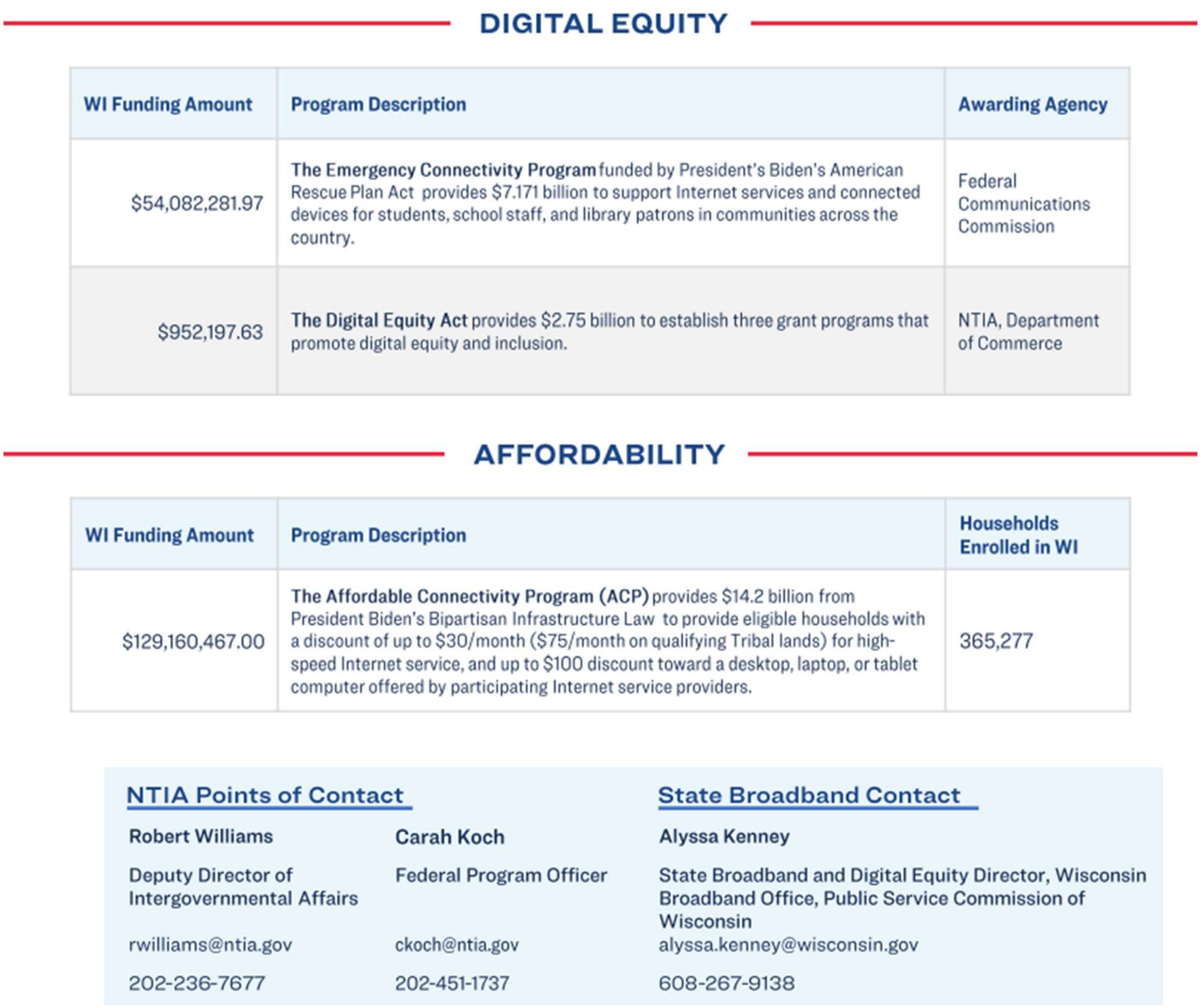
The state of Wisconsin has been awarded just over $1.4B in broadband grants. These funds are awarded directly to the state whereas Rural Digital Opportunity Fund (RDOF) funds are awarded directly to the service provider applicant. A risk to the CPF and BEAD programs and larger risk to Dane County as whole are what is called “federal exclusionary zones.” These “zones” refer to areas that are potentially excluded from eligibility to receive funding from programs such as CPF and BEAD. The goal in establishing these “zones” is to prevent duplication of funding efforts. When eligible entities are applying for grants like CPF and BEAD, applicants will need to demonstrate the proposed projects do not overlap with these “zones” OR provide a justification and seek a waiver from the state and/or NTIA. With this understanding, Dane County should work closely with its federal and state partners and representatives, the WBO and the NTIA local representative to evaluate and potentially seek waivers for areas previously funded by RDOF to help support more effective and future-proof deployments in the CPF and BEAD programs.



Total State Funding:	$1,431,052,618.65

INFRASTRUCTURE

WI Funding Amount	Program Description	Awarding Agency
$1,055,823,573.71 *	**The Broadband Equity, Access, and Deployment (BEAD) Program** provides $42.45 billion from President Biden's Bipartisan Infrastructure Law to expand high-speed Internet access by funding planning, infrastructure deployment, and adoption programs across the country. *$5,000,000.00 already awarded for Internet infrastructure planning.	NTIA, Department of Commerce
$108,901,702.00*	**The Coronavirus State and Local Fiscal Recovery Funds (SLFRF)** program, funded by President Biden's American Rescue Plan Act, delivers $350 billion to state, territorial, local, and Tribal governments across the country to support their response to and recovery from the COVID-19 pandemic, including high-speed Internet deployment. *Figure represents dedicated high-speed Internet funding.	Department of the Treasury
$42,000,000.00*	**The Capital Projects Fund (CPF)** provides $10 billion from President Biden's American Rescue Plan to states, territories, freely associated states, and Tribal governments to fund critical capital projects that enable work, education, and health monitoring in response to the public health emergency, including high-speed Internet infrastructure. *Figure represents dedicated high-speed Internet funding.	Department of the Treasury
$36,027,117.93	**The Tribal Broadband Connectivity Program (TBCP)** is a $3 billion program, from President Biden's Bipartisan Infrastructure Law and the Consolidated Appropriations Act, to support Tribal governments bringing high-speed Internet to Tribal lands, including telehealth, distance learning, affordability, and digital inclusion initiatives.	NTIA, Department of Commerce
$243,763.00	**The ReConnect Loan and Grant Program** is a $1.9 billion program funded through President Biden's Bipartisan Infrastructure Law that provides funds for the cost of construction, improvement, or acquisition of facilities and equipment needed to provide high-speed Internet service in eligible rural areas.	Department of Agriculture
$3,861,515.41	**The Enabling Middle Mile Broadband Infrastructure Program** provides $1 billion from President Biden's Bipartisan Infrastructure Law to reduce the cost of bringing high-speed Internet service to unserved and underserved communities by connecting local networks to major networks.	NTIA, Department of Commerce



DIGITAL EQUITY

WI Funding Amount	Program Description	Awarding Agency
$54,082,281.97	**The Emergency Connectivity Program** funded by President's Biden's American Rescue Plan Act provides $7.171 billion to support Internet services and connected devices for students, school staff, and library patrons in communities across the country.	Federal Communications Commission
$952,197.63	**The Digital Equity Act** provides $2.75 billion to establish three grant programs that promote digital equity and inclusion.	NTIA, Department of Commerce

AFFORDABILITY

WI Funding Amount	Program Description	Households Enrolled in WI
$129,160,467.00	**The Affordable Connectivity Program (ACP)** provides $14.2 billion from President Biden's Bipartisan Infrastructure Law to provide eligible households with a discount of up to $30/month ($75/month on qualifying Tribal lands) for high-speed Internet service, and up to $100 discount toward a desktop, laptop, or tablet computer offered by participating Internet service providers.	365,277

NTIA Points of Contact

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rwilliams@ntia.gov
202-236-7677

Carah Koch
Federal Program Officer
ckoch@ntia.gov
202-451-1737

State Broadband Contact

Alyssa Kenney
State Broadband and Digital Equity Director, Wisconsin Broadband Office, Public Service Commission of Wisconsin
alyssa.kenney@wisconsin.gov
608-267-9138

Rural Digital Opportunity Fund (RDOF):

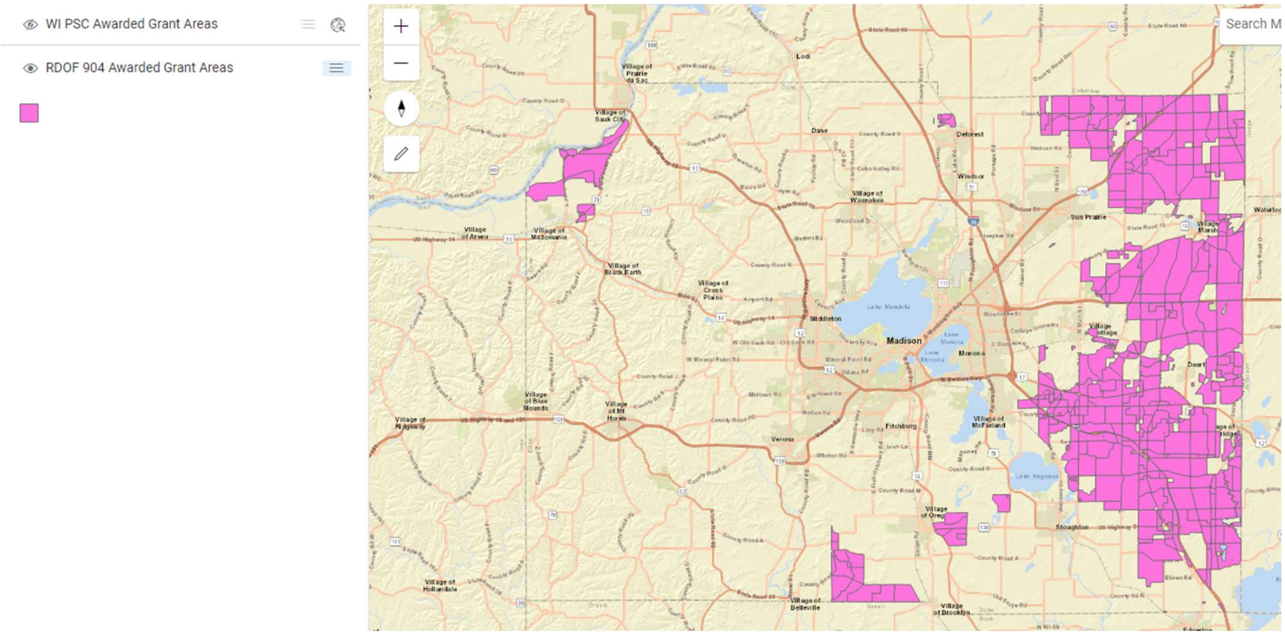
Charter/Spectrum has secured RDOF funding for major portions of eastern Dane County which holds great promise for bridging the broadband divide in the region’s eastern cities, towns and villages. The RDOF program is currently in its second year and according to the FCC’s July 31, 2023 broadband map, approximately 3,299 un(der)served locations still exist just in the eastern portion of the RDOF awarded areas. Dane County should closely monitor the program’s progress, especially considering that around 29% of its un(der)served locations fall within the RDOF-awarded areas.

To gauge Charter/Spectrum’s adherence to their Year 2 and subsequent program requirements, there are specific milestones outlined below. Successfully completing the program means that the last remaining un(der)served locations are not required to receive service until 2027.

RDOF major milestones for carriers to complete are as follows:

- 40% of deployments by end of Year 3
- 60% of deployments by end of Year 4
- 80% of deployments by end of Year 5
- 100% of deployments by end of Year 6

RDOF Awarded Areas


WI PSC Awarded Grant Areas
RDOF 904 Awarded Grant Areas
Search M
Lodi
Village of Prairie du Sac
Village of Sauk City
Dane
Deforest
Windsor
Village of Waunakee
Sun Prairie
Village of Marshall
Waterloo
Village of Arena
Village of Mazomanie
Village of Black Earth
Village of Cross Plains
Middleton
Madison
Monona
Village of Cottage Grove
Deerfield
Village of Blue Mounds
Village of Mt Horeb
Village of Ridgeway
Verona
Fitchburg
Village of McFarland
Lake Mendota
Lake Monona
Lake Kegonsa
Village of Oregon
Stoughton
Village of Hollandale
Village of Belleville
Village of Brooklyn
Edgerton

Broadband Equity, Access and Deployment (BEAD) Program:

The Broadband Equity, Access, and Deployment Program (BEAD) allocates a substantial $42.45 billion to enhance high-speed Internet availability. This funding will support a range of initiatives, including planning, infrastructure deployment, and adoption programs, across all 50 states, Washington D.C., Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

As a result, the state of Wisconsin was awarded $1,055,823,573.71, encompassing 253,097 unserved locations.

BEAD Prioritization

The NTIA has defined specific criteria to give priority to certain types of locations for service expansion, along with the technologies to be implemented. Additionally, individual states will have the chance to contribute their own assessment criteria for locations, technologies, and related projects.

Locations	< Unserved 25/3Mbps
	< Underserved 100/20Mbps
	< CAIs Lacking 1Gbps/1Gbps
	Non-deployment Uses (digital equity, digital skills training, remote learning, telehealth)
Reliable Service	Fiber Optic Cable
	Cable Modem
	Copper/DSL
	Licensed Fixed Wireless (terrestrial)

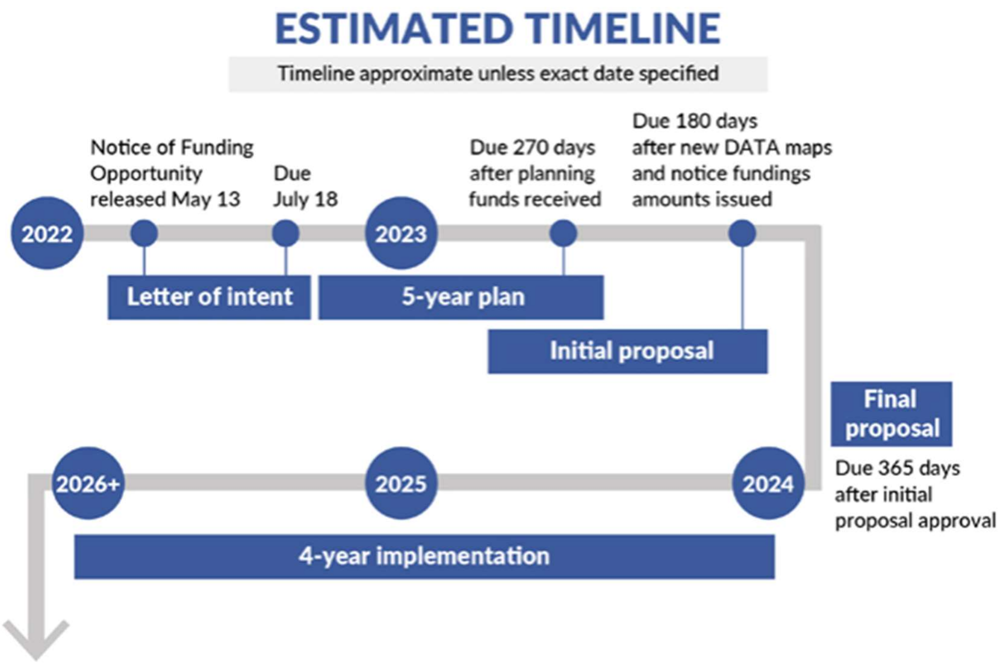
Note: Satellite and unlicensed fixed wireless access will not be eligible for funding. Although, the NTIA is evaluating if both technologies could be allowed in extremely high last mile threshold locations; however, a decision has not been made at this time.

Requirements	100/20Mbps
	No Data Caps
	CAIs Must be 1Gbps/1Gbps
	Use Federal Performance Testing Protocol
	Standard Length Outages and No More Than 48 Hours per 365 Days (99.45% uptime)
	Make Connections to any Customer Passed in the Project Service Area
	Cyber Risk Management Plan
	ACP Enrollment
	Middle Class Affordability
Projects	End-to-End Fiber Solutions (unless the cost exceeds a high-cost threshold mark)
	Then All Others
	Fiber Projects Competing in Other Fiber Projects in Same Area - Greater than 25% match - Costs per location - Affordability - Fair Labor Practices
	Lesser Weight - Speed to deployment - Network speed - Technical capabilities
	States are Allowed to Add Evaluation Criteria

NTIA Timeline Requirements

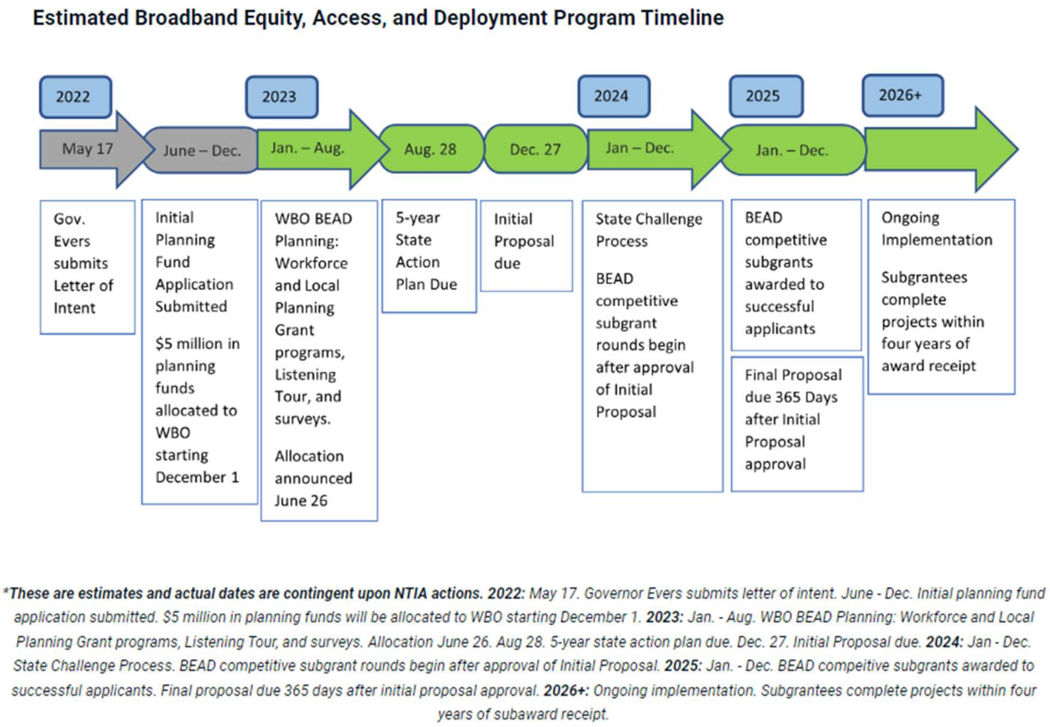
NTIA Expects BEAD Implementation to Take Roughly 4 Years

Estimated timeline for proposal development and funding allocations


ESTIMATED TIMELINE
Timeline approximate unless exact date specified
2022
Notice of Funding Opportunity released May 13
Due July 18
Letter of intent
2023
Due 270 days after planning funds received
5-year plan
Due 180 days after new DATA maps and notice fundings amounts issued
Initial proposal
Final proposal
Due 365 days after initial proposal approval
2024
2025
2026+
4-year implementation

Source: National Telecommunications and Information Administration, "The Broadband Equity, Access, and Deployment Program: Program Details for Applicants" (webinar, May 2022), https://broadbandusa.ntia.doc.gov/sites/default/files/2022-06/June-1-Webinar-Presentation.pdf

State of Wisconsin’s PSC/WBO Timeline



Estimated Broadband Equity, Access, and Deployment Program Timeline

Gov. Evers submits Letter of Intent

Initial Planning Fund Application Submitted

$5 million in planning funds allocated to WBO starting December 1

WBO BEAD Planning: Workforce and Local Planning Grant programs, Listening Tour, and surveys.

Allocation announced June 26

5-year State Action Plan Due

Initial Proposal due

State Challenge Process

BEAD competitive subgrant rounds begin after approval of Initial Proposal

BEAD competitive subgrants awarded to successful applicants

Final Proposal due 365 Days after Initial Proposal approval

Ongoing Implementation

Subgrantees complete projects within four years of award receipt

*****These are estimates and actual dates are contingent upon NTIA actions. 2022:*** *May 17. Governor Evers submits letter of intent. June - Dec. Initial planning fund application submitted. $5 million in planning funds will be allocated to WBO starting December 1.* ***2023:*** *Jan. - Aug. WBO BEAD Planning: Workforce and Local Planning Grant programs, Listening Tour, and surveys. Allocation June 26. Aug 28. 5-year state action plan due. Dec. 27. Initial Proposal due.* ***2024:*** *Jan - Dec. State Challenge Process. BEAD competitive subgrant rounds begin after approval of Initial Proposal.* ***2025:*** *Jan. - Dec. BEAD compeitive subgrants awarded to successful applicants. Final proposal due 365 days after initial proposal approval.* ***2026+:*** *Ongoing implementation. Subgrantees complete projects within four years of subaward receipt.*

(https://psc.wi.gov/Pages/ServiceType/Broadband/InternetForAll.aspx)

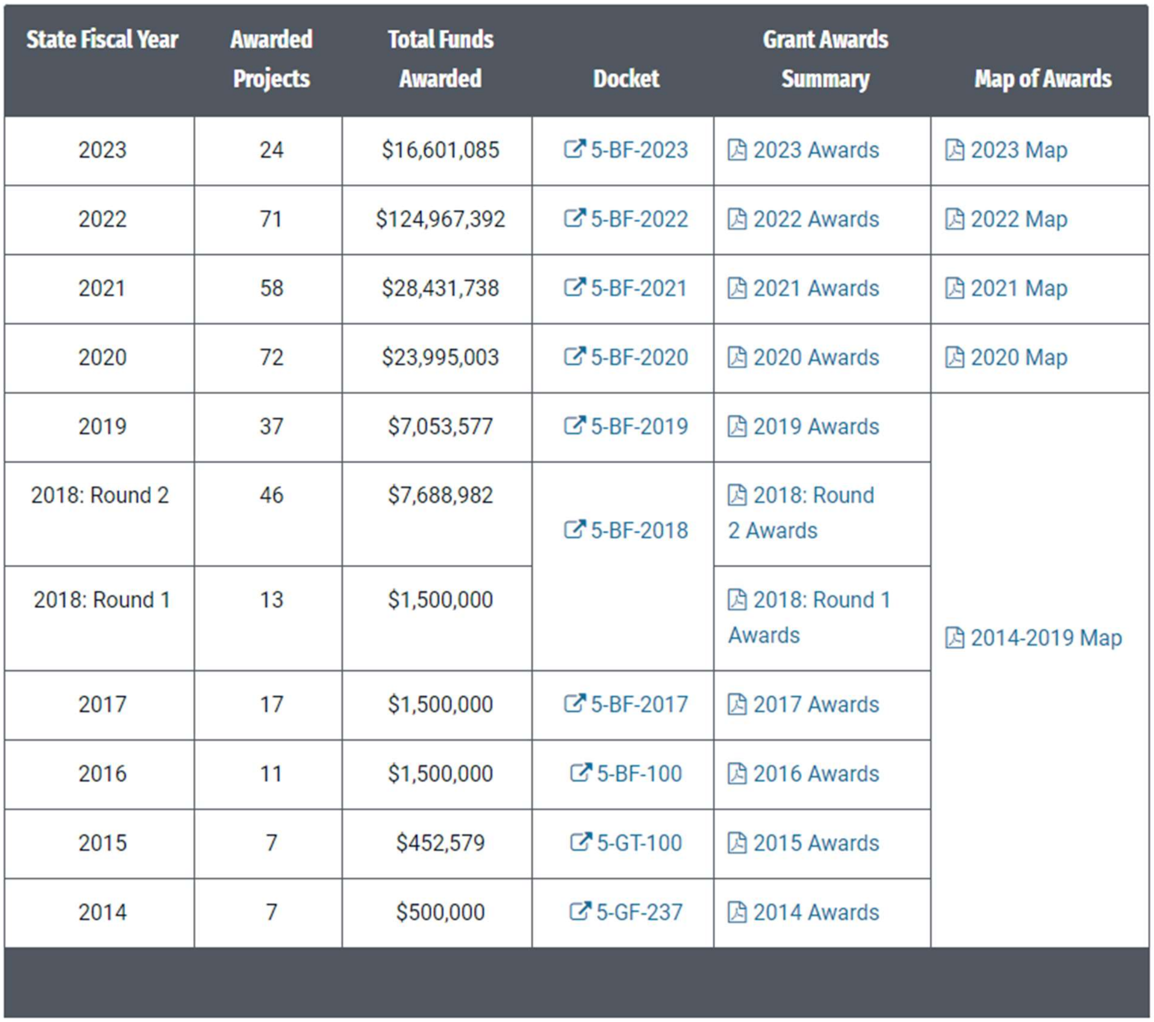
State of Wisconsin's BEAD Next Steps	DRAFT & Release Wisconsin's 5-Year Action Plan (identify needs, gaps, goals and objectives)
	Initial Proposal Volume 1 (identify locations)
	Initial Proposal Volume 2 (identify how WI will select projects)
	State Challenge Process
	Final Proposal to NTIA
	Project Implementation

Wisconsin Public Service Commission (PSC) Broadband Grants:

The Commission and Wisconsin Broadband Office (WBO) award both state and federally funded grants to encourage the deployment of broadband and improve broadband access for Wisconsin residents. Below you will find a table notating the state and federally funded awards from FY2014-FY2023.

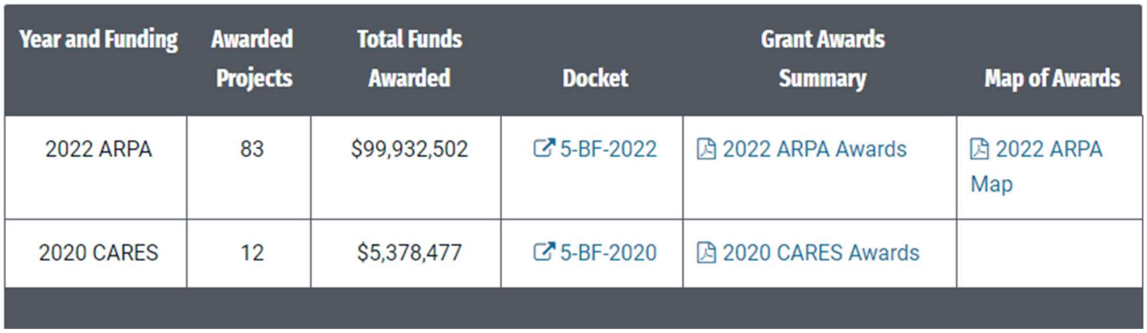
http://psc.wi.gov/Pages/ServiceType/Broadband/GrantPrograms.aspx

State Funded



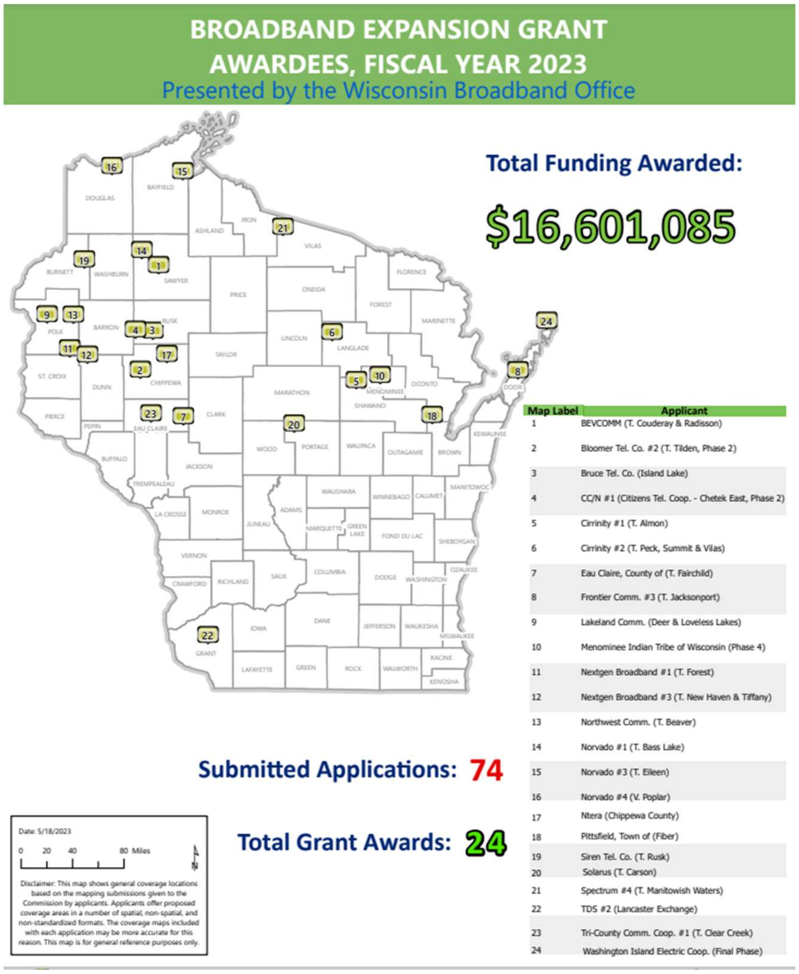
State Fiscal Year	Awarded Projects	Total Funds Awarded	Docket	Grant Awards Summary	Map of Awards
2023	24	$16,601,085	5-BF-2023	2023 Awards	2023 Map
2022	71	$124,967,392	5-BF-2022	2022 Awards	2022 Map
2021	58	$28,431,738	5-BF-2021	2021 Awards	2021 Map
2020	72	$23,995,003	5-BF-2020	2020 Awards	2020 Map
2019	37	$7,053,577	5-BF-2019	2019 Awards	2014-2019 Map
2018: Round 2	46	$7,688,982	5-BF-2018	2018: Round 2 Awards	
2018: Round 1	13	$1,500,000		2018: Round 1 Awards	
2017	17	$1,500,000	5-BF-2017	2017 Awards	
2016	11	$1,500,000	5-BF-100	2016 Awards	
2015	7	$452,579	5-GT-100	2015 Awards	
2014	7	$500,000	5-GF-237	2014 Awards	

Federally Funded



Year and Funding	Awarded Projects	Total Funds Awarded	Docket	Grant Awards Summary	Map of Awards
2022 ARPA	83	$99,932,502	5-BF-2022	2022 ARPA Awards	2022 ARPA Map
2020 CARES	12	$5,378,477	5-BF-2020	2020 CARES Awards	

Broadband Expansion Grant Awardees, FY2023 – WBO. To date approximately $16.6M worth of broadband grants were awarded by the WBO, none were awarded in Dane County.


BROADBAND EXPANSION GRANT AWARDEES, FISCAL YEAR 2023

Presented by the Wisconsin Broadband Office

Total Funding Awarded:

$16,601,085

Submitted Applications: 74

Total Grant Awards: 24

Map Label	Applicant
1	BEVCOMM (T. Couderay & Radisson)
2	Bloomer Tel. Co. #2 (T. Tilden, Phase 2)
3	Bruce Tel. Co. (Island Lake)
4	CC/N #1 (Citizens Tel. Coop. - Chetek East, Phase 2)
5	Cirrinity #1 (T. Almon)
6	Cirrinity #2 (T. Peck, Summit & Vilas)
7	Eau Claire, County of (T. Fairchild)
8	Frontier Comm. #3 (T. Jacksonport)
9	Lakeland Comm. (Deer & Loveless Lakes)
10	Menominee Indian Tribe of Wisconsin (Phase 4)
11	Nextgen Broadband #1 (T. Forest)
12	Nextgen Broadband #3 (T. New Haven & Tiffany)
13	Northwest Comm. (T. Beaver)
14	Norvado #1 (T. Bass Lake)
15	Norvado #3 (T. Eileen)
16	Norvado #4 (V. Poplar)
17	Ntera (Chippewa County)
18	Pittsfield, Town of (Fiber)
19	Siren Tel. Co. (T. Rusk)
20	Solarus (T. Carson)
21	Spectrum #4 (T. Manitowish Waters)
22	TDS #2 (Lancaster Exchange)
23	Tri-County Comm. Coop. #1 (T. Clear Creek)
24	Washington Island Electric Coop. (Final Phase)

Date: 5/18/2023

Disclaimer: This map shows general coverage locations based on the mapping submissions given to the Commission by applicants. Applicants offer proposed coverage areas in a number of spatial, non-spatial, and non-standardized formats. The coverage maps included with each application may be more accurate for this reason. This map is for general reference purposes only.

16
15
DOUGLAS
BAYFIELD
ASHLAND
IRON
21
VILAS
19
14
1
BURNETT
WASHBURN
SAWYER
PRICE
ONEIDA
FLORENCE
FOREST
MARINETTE
9
13
POLK
BARRON
4
3
RUSK
6
LINCOLN
LANGLADE
24
11
12
17
TAYLOR
ST. CROIX
DUNN
2
CHIPPEWA
5
10
MENOMINEE
OCONTO
8
DOOR
MARATHON
SHAWANO
PIERCE
PEPIN
23
EAU CLAIRE
7
CLARK
20
18
KEWAUNEE
WOOD
PORTAGE
WAUPACA
OUTAGAMIE
BROWN
BUFFALO
JACKSON
TREMPEALEAU
WAUSHARA
WINNEBAGO
CALUMET
MANITOWOC
LA CROSSE
MONROE
ADAMS
JUNEAU
MARQUETTE
GREEN LAKE
FOND DU LAC
SHEBOYGAN
VERNON
CRAWFORD
RICHLAND
SAUK
COLUMBIA
DODGE
WASHINGTON
OZAUKEE
22
IOWA
DANE
JEFFERSON
WAUKESHA
MILWAUKEE
GRANT
LAFAYETTE
GREEN
ROCK
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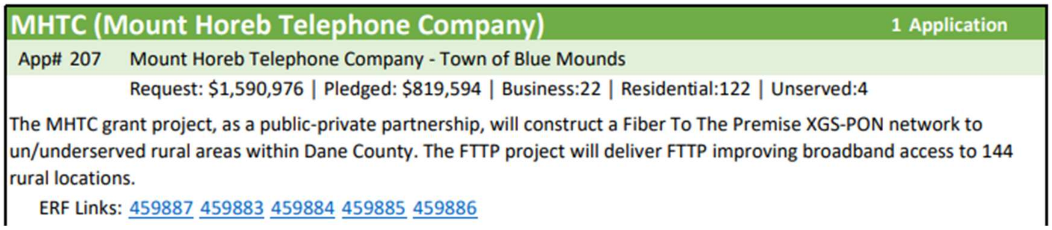
40
80 Miles
N

Below: NOT AWARDED TO DATE

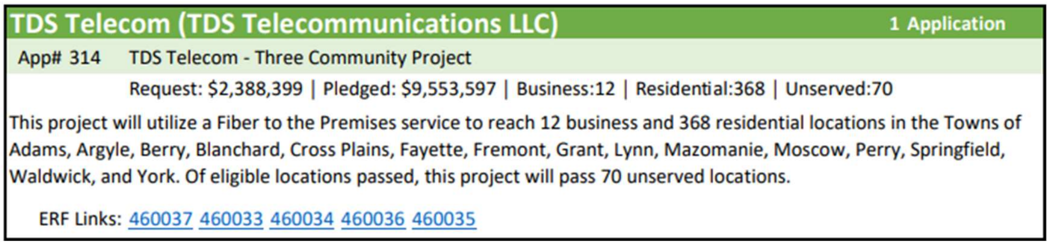

MHTC (Mount Horeb Telephone Company) 1 Application

App# 207 Mount Horeb Telephone Company - Town of Blue Mounds

Request: $1,590,976 | Pledged: $819,594 | Business:22 | Residential:122 | Unserved:4

The MHTC grant project, as a public-private partnership, will construct a Fiber To The Premise XGS-PON network to un/underserved rural areas within Dane County. The FTTP project will deliver FTTP improving broadband access to 144 rural locations.

ERF Links: 459887 459883 459884 459885 459886


TDS Telecom (TDS Telecommunications LLC) 1 Application

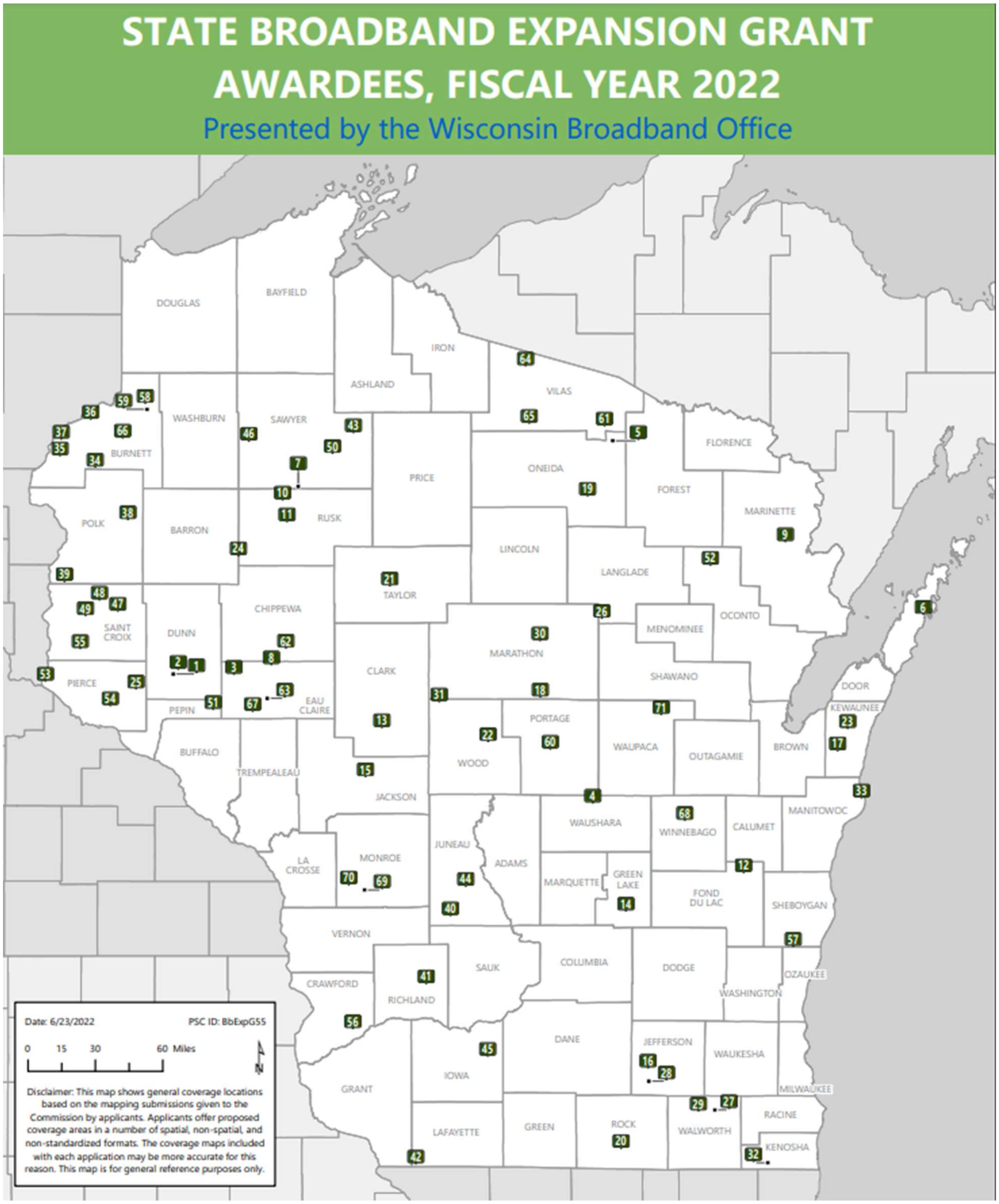
App# 314 TDS Telecom - Three Community Project

Request: $2,388,399 | Pledged: $9,553,597 | Business:12 | Residential:368 | Unserved:70

This project will utilize a Fiber to the Premises service to reach 12 business and 368 residential locations in the Towns of Adams, Argyle, Berry, Blanchard, Cross Plains, Fayette, Fremont, Grant, Lynn, Mazomanie, Moscow, Perry, Springfield, Waldwick, and York. Of eligible locations passed, this project will pass 70 unserved locations.

ERF Links: 460037 460033 460034 460036 460035

Broadband Expansion Grant Awardees, FY2022 – WBO. Approximately $124.9M worth of broadband grants were awarded by the WBO in FY 2022, none in Dane County were awarded.


STATE BROADBAND EXPANSION GRANT AWARDEES, FISCAL YEAR 2022

Presented by the Wisconsin Broadband Office

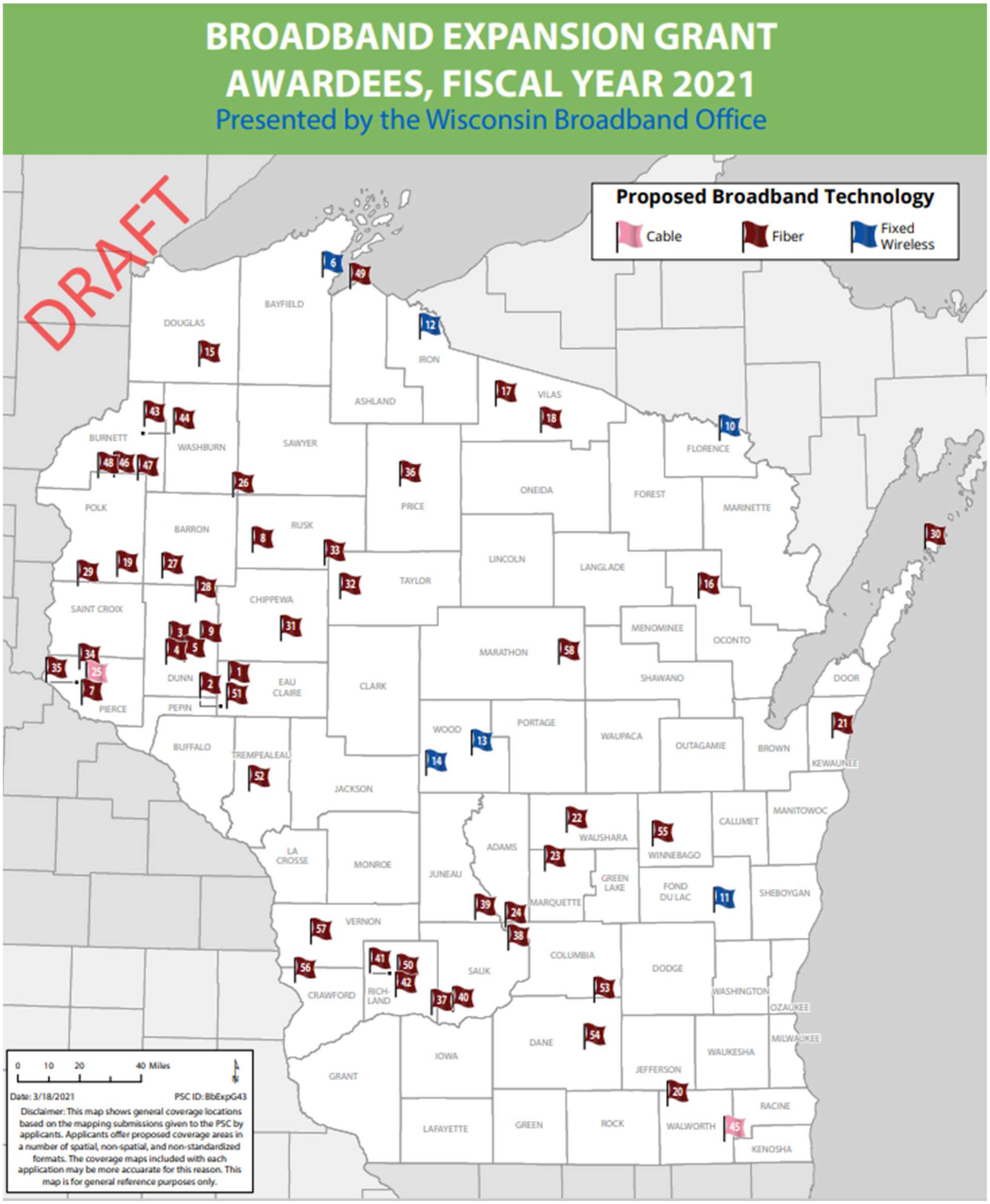
Date: 6/23/2022

PSC ID: BbExpG55

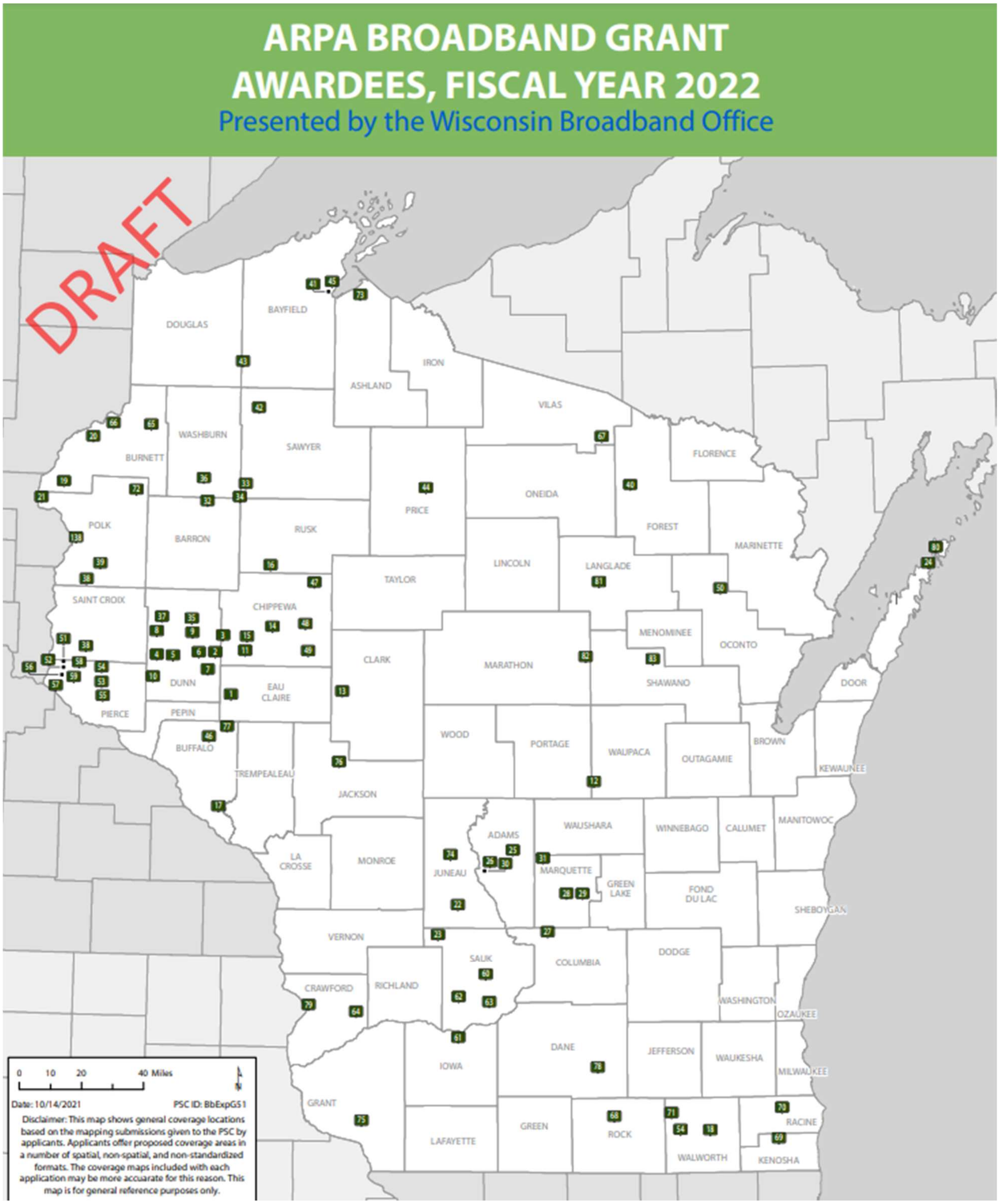
Disclaimer: This map shows general coverage locations based on the mapping submissions given to the Commission by applicants. Applicants offer proposed coverage areas in a number of spatial, non-spatial, and non-standardized formats. The coverage maps included with each application may be more accurate for this reason. This map is for general reference purposes only.

0
15
30
60 Miles
N
DOUGLAS
BAYFIELD
IRON
ASHLAND
VILAS
WASHBURN
SAWYER
BURNETT
FLORENCE
ONEIDA
PRICE
FOREST
MARINETTE
POLK
BARRON
RUSK
LINCOLN
LANGLADE
TAYLOR
CHIPPEWA
SAINT CROIX
DUNN
MARATHON
MENOMINEE
OCONTO
CLARK
SHAWANO
PIERCE
PEPIN
EAU CLAIRE
DOOR
KEWAUNEE
PORTAGE
BUFFALO
WOOD
WAUPACA
OUTAGAMIE
BROWN
TREMPEALEAU
JACKSON
MANITOWOC
WAUSHARA
WINNEBAGO
CALUMET
JUNEAU
LA CROSSE
MONROE
ADAMS
MARQUETTE
GREEN LAKE
FOND DU LAC
SHEBOYGAN
VERNON
SAUK
COLUMBIA
DODGE
OZAUKEE
CRAWFORD
RICHLAND
WASHINGTON
DANE
JEFFERSON
WAUKESHA
GRANT
IOWA
MILWAUKEE
RACINE
LAFAYETTE
GREEN
ROCK
WALWORTH
KENOSHA

Broadband Expansion Grant Awardees, FY2021 – WBO. To date approximately $28.4M worth of broadband grants were awarded by the WBO, two grants were awarded to UpNetWI totaling $269,265 in the towns of Bristol and Cottage Grove.


BROADBAND EXPANSION GRANT
AWARDEES, FISCAL YEAR 2021
Presented by the Wisconsin Broadband Office
DRAFT
Proposed Broadband Technology
Cable
Fiber
Fixed Wireless
DOUGLAS
BAYFIELD
IRON
ASHLAND
VILAS
BURNETT
WASHBURN
SAWYER
FLORENCE
ONEIDA
FOREST
MARINETTE
PRICE
POLK
BARRON
RUSK
LINCOLN
LANGLADE
TAYLOR
CHIPPEWA
SAINT CROIX
MENOMINEE
OCONTO
MARATHON
SHAWANO
DOOR
DUNN
EAU CLAIRE
CLARK
PIERCE
PEPIN
WOOD
PORTAGE
WAUPACA
OUTAGAMIE
BROWN
KEWAUNEE
BUFFALO
TREMPEALEAU
JACKSON
ADAMS
WAUSHARA
WINNEBAGO
CALUMET
MANITOWOC
LA CROSSE
MONROE
JUNEAU
MARQUETTE
GREEN LAKE
FOND DU LAC
SHEBOYGAN
VERNON
SAUK
COLUMBIA
DODGE
WASHINGTON
OZAUKEE
CRAWFORD
RICHLAND
MILWAUKEE
DANE
WAUKESHA
IOWA
GRANT
JEFFERSON
RACINE
LAFAYETTE
GREEN
ROCK
WALWORTH
KENOSHA
0 10 20 40 Miles
N
Date: 3/18/2021
PSC ID: BbExpG43
Disclaimer: This map shows general coverage locations based on the mapping submissions given to the PSC by applicants. Applicants offer proposed coverage areas in a number of spatial, non-spatial, and non-standardized formats. The coverage maps included with each application may be more accuarate for this reason. This map is for general reference purposes only.

ARPA Broadband Grants FY2022 – WBO. To date approximately $125M worth of ARPA broadband grants were awarded by the WBO, one grant was awarded to UpNetWI totaling $90,346 in the Town of Pleasant Springs.



ARPA BROADBAND GRANT AWARDEES, FISCAL YEAR 2022

Presented by the Wisconsin Broadband Office

Date: 10/14/2021

PSC ID: BbExpG51

Disclaimer: This map shows general coverage locations based on the mapping submissions given to the PSC by applicants. Applicants offer proposed coverage areas in a number of spatial, non-spatial, and non-standardized formats. The coverage maps included with each application may be more accuarate for this reason. This map is for general reference purposes only.

DRAFT
DOUGLAS
BAYFIELD
IRON
ASHLAND
VILAS
BURNETT
WASHBURN
SAWYER
FLORENCE
PRICE
ONEIDA
FOREST
POLK
BARRON
RUSK
MARINETTE
LINCOLN
LANGLADE
TAYLOR
SAINT CROIX
CHIPPEWA
MENOMINEE
OCONTO
CLARK
MARATHON
SHAWANO
DUNN
EAU CLAIRE
DOOR
PIERCE
PEPIN
WOOD
PORTAGE
WAUPACA
OUTAGAMIE
BROWN
BUFFALO
KEWAUNEE
TREMPEALEAU
JACKSON
WAUSHARA
WINNEBAGO
CALUMET
MANITOWOC
ADAMS
LA CROSSE
MONROE
JUNEAU
MARQUETTE
GREEN LAKE
FOND DU LAC
SHEBOYGAN
VERNON
SAUK
COLUMBIA
DODGE
CRAWFORD
RICHLAND
WASHINGTON
OZAUKEE
DANE
JEFFERSON
WAUKESHA
IOWA
MILWAUKEE
GRANT
GREEN
ROCK
RACINE
LAFAYETTE
WALWORTH
KENOSHA
0
10
20
40 Miles
N

Since FY 2020, service providers within Dane County have received around $359,611 in awarded grant funds, out of a total of $345M available in statewide broadband grant funds.

The $359,611 represents approximately 0.104% of the available $345M in funds.

Capital Project Funds (CPF):

The newly released CPF grant, offered by the Wisconsin Public Service Commission (PSC) was released for applicants on August 14, 2023. The evaluation of applications will adhere to the following eligibility and merit criteria which will be used to guide the Commission staff and screening panel.

Please note, that the "Merit" rating assigned by the PSC prioritizes projects that DO NOT extend into federal exclusionary zones over those that do.

Pennsylvania, for example, offers greater flexibility and space for applicants to navigate through RDOF areas and provide a method to accelerate deployment within RDOF awarded regions to increase the responsibility of RDOF awardees in delivering broadband services more promptly. Please see below for their "Combining with RDOF Funds" section and stipulation, excerpt from the Covid-19 ARPA Capital Projects Fund Broadband Infrastructure Program document, Program Guidelines, dated April 2023.

> Program applicants must take reasonable steps to determine if proposed Project areas have in whole or in part been awarded state or federal broadband funds. This includes funding from the Federal Communications Commission's (FCC) Rural Digital Opportunity Fund (RDOF). Due to the timing of when Program funds will be distributed, there could be overlap with other federal broadband-related programs, including RDOF, and some stipulations may apply.
>
> To accelerate broadband access in RDOF-awarded areas, locations in those areas may be included in Program applications to cover a portion of the infrastructure needed to reach RDOF-awarded areas. As a result, areas that were awarded funds through RDOF, regardless of bidder, are eligible to be included in an application for the Program provided that any additional funds awarded through this program must only be used to expand service to additional locations that otherwise would not be receiving service through the RDOF funding.
>
> RDOF awardees may challenge an application that includes all or portions of their final RDOF-awarded area. If the Authority determines that the challenge to the application is credible, the challenging RDOF awardee must commit to providing broadband access in the challenge area(s) within two years of the date of the Authority's determination. In this case, the challenging RDOF awardee will be required to enter into an agreement (Agreement) with the Authority, committing to construct the removed area(s). This Agreement must be entered into prior to September 19, 2023, for the challenge to be considered and be effective upon award of the application. The applicant will be required to remove the area(s) that overlap from its application. The challenging RDOF awardee must provide for the issuance of a performance bond for the difference between the amount the applicant would have received without the challenge and the amount received with the valid challenge. The performance bond must be a requirement of the Agreement and must be issued at the time the Agreement is executed.
>
> If the Authority determines that a challenge is credible based on a final RDOF award and the RDOF awardee has committed to constructing the challenge area and later defaults, the performance bond issued in connection with the Agreement shall be forfeited unless the default is the result of force majeure. RDOF areas, unless those areas are challenged by the RDOF-awardee and an Agreement has been entered into with the applicant, will be considered unserved and eligible for Program funding.
>
> The Authority reserves the right to update the guidelines to comply with federal rules and regulations.

Eligibility

The eligibility criteria listed in the table below are required for each application project. Applicants will demonstrate compliance with each of these criteria as part of their responses to the application.

An online map is available to assist applicants in identifying locations eligible for funding due to a lack of 100/20 wireline service. Use the "Capital Projects Fund Eligible Guideline" layer and take note of the "Infrastructure Support In Progress" layer.

Eligibility Criteria	**Response Required**
1. Primary applicant for the CPF Broadband Infrastructure Grant is a public or private entity that builds or operates broadband networks. Applicants may include internet service providers, local units of government, non-profit entities, electric utilities, cooperatives.	Yes
2. The applicant's broadband infrastructure project is designed to deliver, upon project completion, service that reliably meets or exceeds symmetrical download and upload speeds of 100 Mbps to all proposed locations. If the applicant has demonstrated it would not be Feasible to deliver 100/100 Mbps, the project must offer service that reliably meets or exceeds 100 Mbps download speeds and 20 Mbps upload and be scalable to a minimum of 100 Mbps symmetrical for download and upload speeds.	Yes
3. The applicant's broadband infrastructure project is designed to deliver services to households and businesses lacking access to reliable, affordable wireline service at speeds of 100 Mbps download and 20 Mbps upload.	Yes
4. The applicant's broadband infrastructure project (1) invests in capital assets designed to directly enable work, education, and health monitoring; (2) is designed to address a critical need of the community that resulted from, or was made apparent or exacerbated by, the COVID-19 public health emergency; and (3) is designed to address a critical need of the community to be served by it.	Yes
5. The service provider for the completed broadband infrastructure project will participate in applicable federal programs that provide low-income consumers with subsidies for broadband internet access services (such as the Affordable Connectivity Program).	Yes
6. If the applicant's broadband infrastructure project is within or traverses a Tribal area, the applicant received official Tribal consent, as shown through written documentation from the appropriate Tribal official submitted with this application.	Yes (if applicable)

Merit

Commission staff and the screening panel will evaluate applications consistent with the scoring criteria in the scoring rubric below based on Treasury guidance. Points will be awarded based on a sliding scale, with full points given to projects that fully realize the goals of the given priority criteria.

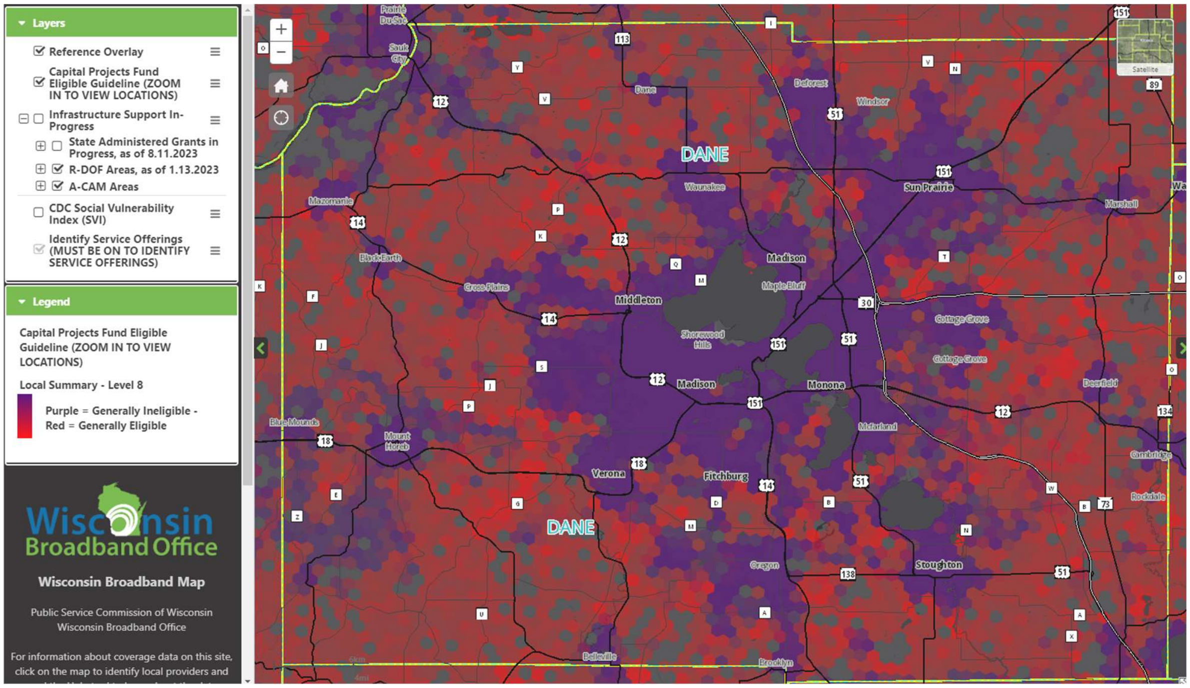
Merit Criteria	Points
Affordability of Service: Proposed subscription price for Broadband Service for all funded locations is affordable. Full points will be awarded for projects with a Broadband Service subscription of less than $65 per month for at least 100/20 service and that offers eligible low-income households service for less than $30 per month after federal subsidy programs.	10
Last-mile: Applicant's proposal prioritizes infrastructure for last-mile connections. Full points awarded for projects that propose exclusively last-mile infrastructure. Partial points are available for hybrid-projects where some of costs are associated with last-mile connections.	10
Fiber: Project uses fiber-optic technology. A project that uses a mix of technology that include fiber-optic infrastructure may be awarded partial points.	10
Community Engagement: Applicant demonstrates that the planning of their proposal included a high-level of community engagement and support. Activities and supporting documentation may include demonstrated evidence of outreach or meetings within community, a public-private partnership, evidence of local community involvement in project design, local partnerships that support implementation or adoption efforts, letters of support from diverse communities with critical need for broadband, and Tribal consultations.	10
Government, Coop or Non-profit: Applicant's proposed infrastructure project will be owned or operated by local government, a non-profit, or a cooperative.	10
Design and Performance: Applicant's project is reasonable and the network is well designed. The applicant demonstrates financial and managerial capacity to execute the project successfully within the performance period. The applicant has a demonstrated history of building broadband infrastructure and/or participating in broadband grant programs, including compliance with state and federal law, grant agreement terms, and reporting requirements.	10
Contiguous and Complete Project: The proposed locations to be served by a project represent a contiguous project area or a project area that captures all locations in need of service within the area and does not exclude locations that would otherwise be most cost-effectively served as part of a project area.	10
Cost Efficient and Match: Applicant's proposal is cost efficient and demonstrates a reasonable public investment that is consistent with the rurality, geography, or other characteristics that impact the cost per location and return on investment. The applicant and partners, if applicable, offer matching funds that reduce the grant cost per location.	10
No enforceable funding commitment: The applicant's broadband infrastructure project does not propose to serve locations with an existing Enforceable Funding Commitment from state or federal funds that will result in wireline broadband	10

service that will deliver 100 Mbps download and 20 Mbps upload before December 31, 2027.	
Highest Need: The project proposes to primarily serve locations that are located in economically distressed communities disproportionately affected by the COVID-19 pandemic and at higher risk for future disaster due to lack of investment and access to critical services such as broadband. Projects that have the highest share and highest index score of vulnerable locations, as defined by the Center for Disease Control's Social Vulnerability Index (SVI), will receive the most points.	10
	100

Grant Awards

CPF Eligible Areas noted in red below:

https://maps.psc.wi.gov/apps/BbExpGApplicants/


Layers
☑ Reference Overlay
☑ Capital Projects Fund Eligible Guideline (ZOOM IN TO VIEW LOCATIONS)
⊟ ☐ Infrastructure Support In-Progress
⊞ ☐ State Administered Grants in Progress, as of 8.11.2023
⊞ ☑ R-DOF Areas, as of 1.13.2023
⊞ ☑ A-CAM Areas
☐ CDC Social Vulnerability Index (SVI)
☑ Identify Service Offerings (MUST BE ON TO IDENTIFY SERVICE OFFERINGS)
Legend
Capital Projects Fund Eligible Guideline (ZOOM IN TO VIEW LOCATIONS)
Local Summary - Level 8
Purple = Generally Ineligible -
Red = Generally Eligible
Wisconsin Broadband Office
Wisconsin Broadband Map
Public Service Commission of Wisconsin
Wisconsin Broadband Office
For information about coverage data on this site, click on the map to identify local providers and
DANE
Waunakee
Sun Prairie
Madison
Middleton
Maple Bluff
Shorewood Hills
Monona
Fitchburg
Verona
Cross Plains
Mazomanie
Black Earth
Blue Mounds
Mount Horeb
Oregon
Stoughton
McFarland
Cottage Grove
Deerfield
Marshall
Windsor
DeForest
Dane
Belleville
Brooklyn
Cambridge
Rockdale
Prairie Du Sac
Sauk City
Satellite

B. Stakeholder List

Name	Organization	Email
Sharon Lezberg	**Dane County Broadband Task Force**	sharon.lezberg@wisc.edu
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Alexandra Andros	**Dane County Planning Staff**	n/a
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Carah Koch	**NTIA**	CKoch@ntia.gov
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Cher Laubmerier	**Ho Chunk Nation**	n/a
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Deana Zentner	**Dane County Broadband Task Force**	deanazentner@yahoo.com
Dexter General	**Lit Communities**	dgeneral@litcommunities.net

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Gene Dalhoff	**MadREP**	gdalhoff@madisonregion.org
Jaron McCallum	**Dane County – Broadband Coordinator**	mccallum.jaron@countyofdane.com
Jeff Glazer	**Dane County Broadband Task Force**	glazer.jeffrey@countyofdane.com
Joe Pichette	**Town of Westport**	n/a
John Cuccia	**Town of Westport**	n/a
John Montgomery	**Town of Stoughton**	jmontgomery@cityofstoughton.com
John Rosenbaum	**Town of Springdale**	john.rosenbaum@springdalewi.gov
Josh Schroeder	**Dane County Broadband Task Force**	Schroeder.josh@countyofdane.com
Joyce Tikalsky	**Dane County Broadband Task Force**	joyce.tikalsky@gmail.com
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Kate McGinnity	**Dane County Broadband Task Force**	Mcginnity.kate@countyofdane.com
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Neal Werner	**Town of Westport**	**n/a**
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Tim Swadley	**City of Stoughton**	**tswadley@cityofstoughton.com**
Todd Violante	**Dane County Broadband Task Force**	**violante@countyofdane.com**

C. FCC Challenge Process

Overview

As delineated in the FCC overview, accessible at this link challenging the FCC national broadband map permits individuals or entities to question the accuracy of broadband coverage data. In addition, promotional materials related to this process are accessible here.

The FCC national broadband map is an instrumental tool, offering insights into broadband availability and speeds throughout the United States. Any concerns about misrepresented or incorrect data can be rectified through internet speed tests and subsequent challenges to the map.

Process Outline

1. Conduct Internet Speed Tests: Utilizing reputable tools and services, perform internet speed tests to gauge actual internet speeds in a specific area. Multiple tests at varying times contribute to a more comprehensive understanding of speed realities.
2. Compare Results with the FCC Map: Analyze the discrepancy between actual speeds and those reported on the FCC national broadband map. If the differences are considerable, challenging the data may be warranted.
3. Gather Evidence: Compile evidence of speed test results, including dates, times, locations, and any pertinent details like network congestion or service disruptions.
4. Contact the FCC: Submit evidence by initiating a complaint or challenging the data's accuracy on the national broadband map through the FCC’s designated channels.
5. Follow Up and Provide Additional Information: If the FCC requires supplementary information or documentation to support the challenge, it must be supplied promptly and in detail.

Significance of Challenging the FCC National Broadband Map

1. Data Accuracy: Ensuring that the broadband coverage data is accurate fosters informed decision-making and appropriate resource distribution among policymakers, researchers, and consumers.
2. Access to Funding and Resources: The FCC national broadband map guides the identification of areas that qualify for governmental assistance for broadband infrastructure enhancement. Challenging incorrect data aids in pinpointing and prioritizing areas needing better broadband access.
3. Consumer Awareness and Choice: Accurate data aids consumers in making educated decisions regarding internet service providers, thereby granting consumers access to trustworthy information about available options and service quality.
4. Bridging the Digital Divide: The digital divide, or the discrepancy between those with access to reliable, high-speed internet and those without, can be addressed by identifying and focusing on areas with inadequate broadband access. Challenging incorrect data aids in spotlighting underserved areas.

Conclusion

Challenging the FCC national broadband map via internet speed tests is a fundamental step in achieving a precise data representation and fostering fair access to high-speed internet services. The process as outlined above adheres to the legal requirements set by the FCC and provides a structured pathway for those seeking to question or correct the data within the national broadband map.

D. Other Broadband Terms & Definitions

3GPP: Third Generation Partnership Project – A body comprising several organizational partners working to produce technical specifications for a third-generation mobile system based on GSM core networks and the radio technology they support.

ACF: ADMISSIONS CONFIRM message – A RAS message that the Gatekeeper sends to the calling point, accepting the ARQ.

Address Resolution: A mechanism for identifying the address of a called endpoint in terms of the network, such as an IP address.

Address Translation: The ability of a Gatekeeper to translate an alias address, such as a name or e-mail address, to a transport address. One method of translation uses a Translation Table, which is updated by the Registration messages on the RAS channel.

Affordable Connectivity Program: The Affordable Connectivity Program is an FCC benefit program that helps ensure that households can afford the broadband they need for work, school, healthcare and more.

Alias: An alternative identification string for an IP address. An alias can be a name, a URL address, an e-mail address, a transport address in the form of “IP address port number,” or a Party Number.

Algorithm: 1. Rule of thumb for doing something with a semblance of intelligence. For example, a descrambling algorithm will yield a clear, unscrambled message from an apparently meaningless one. 2. The procedure used for performing a task.

Alternate Gatekeeper: Support for an Alternate Gatekeeper enables you to make Gatekeeper failures transparent to the endpoints that are registered to the Gatekeeper. In RADVISION implementations, a backup Gatekeeper (the “Secondary” Gatekeeper) runs in parallel to each online Gatekeeper (the “Primary” Gatekeeper).

Analog: Information represented by a continuous electromagnetic wave encoded so that its power varies continuously with the power of a signal received from a sound or light source.

ANS: Automatic Noise Suppression. Reduces background noise from audio signal.

ANSI: American National Standards Institute.

ANI: Automatic Number Identification. The automatic identification of a calling station, usually for automatic message accounting. Also used in pay-per-view automated telephone order entry to identify a customer for billing and program authorization purposes.

Application-Level Gateway: Application-Level Gateways (ALGs) serve as communicators between two networks. ALGs are protocol-aware entities that examine application protocol flows and only allow messages that conform to security policies to pass. See also proxy server.

ARJ: ADMISSIONS REJECT Message – A RAS message that the Gatekeeper sends to the calling point, rejecting the ARQ.

ARQ: ADMISSIONS REQUEST Message – A RAS message send by an endpoint placing a call or an endpoint receiving a call asking for bandwidth allowance and permission to continue the Call Setup.

ATM: Asynchronous Transfer Mode. A high bandwidth, controlled-delay, fixed size packet switching and transmission system. Uses fixed size packets, also known as “cells;” ATM is often referred to as “cell relay.” ATM will provide the basis for the future broadband ISDN standards.

Authentication: The process of verifying the identity of a user trying to log on to a system, or of the sender of a message.

B Channel: Bearer Channel. In ISDN communications, a B channel transmits data or voice at 64 or 56 Kbps.

B8ZS: Binary Eight Zero Suppression. An encoding scheme for transmitting data bits over T1 transmission systems.

Bandwidth: Determines the rate at which information can be transmitted across a medium. The rates are measured in bits (b/s), kilobits (Kb/s), megabits (Mb/s) or gigabits per second (Gb/s). Typical transmission services are 56Kb/s, 64Kb/s, 1.544Mb/s (T1) and 45Mb/s (T3).

Bearer Channel: Term used to define a channel that carries voice, data or video information.

Bit: Contraction of the term Binary digit. The smallest unit of information a computer can process, representing one of two states (usually indicated by “1” or “0”).

BISDN: Broadband ISDN. In 1995-1996, BISDN began to offer dedicated circuits, switched circuits and packet services at rates of 155Mb/s and above. BISDN is still relatively in the conceptual stage. The goal is to take advantage of the raw bandwidth, which has been made available by the proliferation of fiber optic cable plants.

Blanking Level: The level of the front and back porches of the composite video signal.

Bonding: Method for making several BRI lines look like one high-rate line by use of an IMUX (inverse multiplexer).

Bps: Bits per second – A unit of measurement of the speed of data transmission and thus of bandwidth (lower case is significant).

BRI: Basic Rate Interface. An ISDN subscriber line, consisting of two 64Kb/s B channels (bearer channels) and one 16Kb/s D channel (used for signaling and synchronization purposes.) – often referred to as 2 B’s and a D.

Bridge: An interconnection device that can connect LANs using similar or dissimilar media and signaling systems such as Ethernet, Token Ring and X.25. A bridge is also called a data link relay or level 2 relay. Connects remote sites over dedicated or switched lines to create WANs. Also, the device that allows multiple locations (more than 2) to videoconference simultaneously.

Broadband: A method of transmitting larger amounts of data, voice and video than telephony networks allow. In ISDN, broadband channels support rates above the primary E1 (2.048 Mbps) and T1 (1.544 Mbps) rate.

Broadband Adoption: Residential subscribership to high-speed Internet access. Also, daily access to the Internet: at speeds, quality, and capacity necessary to accomplish common tasks, with the digital skills necessary to participate online, and on a personal device and secure convenient network.

Broadband Equity: Occurs when all people and communities can access and use affordable, high-speed, reliable internet that meets their long-term needs.

Broadcast: Transmission of data to everybody on the network or network segment.

Buffering: The process of preloading data and information into a reserved area of memory

Byte: A group of bits treated as a unit used to represent a character in some coding systems. Typically, eight bits equals a byte.

Call Acceptance: Acceptance or rejection of calls from an H.323 terminal. The Gatekeeper may reject calls from a terminal because of restricted access to or from particular terminals or Gateways, or restricted access during certain periods of time. Call Authorization is an optional Gatekeeper service.

Carrier: Vendor of transmission services operating under terms defined by the FCC as a common carrier. Owns a transmission medium and rents, leases or sells portions for a set tariff to the public via shared circuits. (AT&T, Sprint, MCI, Ameritech, etc.)

CBRS: Citizens Broadband Radio Service - is 150 MHz of spectrum – ranging from 3550 – 3700 MHz – in the 3.5 GHz band. Used sparingly by the U.S government and other entities, this band was identified by the FCC as additional spectrum for shared wireless private broadband.

Channel: A signal path of specified bandwidth for conveying information such as voice, data and video.

Chat Room: A virtual room where a chat session takes place. Technically, a chat room is really a channel, but the term room is used to promote the chat metaphor.

Chip Sets: Application-specific integrated circuits (ASICS) are being developed for use in video application products such as codecs, desktop video and home satellite entertainment. ASICS operate more like computer hardware. Programmable chips operate much like computer software. The chip sets meet the CCITT H.261 compression standard and will be the driving force in the widespread use of video communications technology because they will lower the cost and open the technology to a much larger group of users.

CIF: Common Intermediate Format. The CCITT standard that addresses the incompatibility between the European television standard PAL (Phase Alternation Line) and SECAM (Systeme Electronique pour Couleur Avec Memoire) and those in most areas of the rest of the world that utilize NTSC (National Television System Committee). In the encoding process, CIF is divided into 12 GOBs (Groups of Blocks).

Circuit: 1. Means of two-way communication between two or more points. 2. In communications systems, an electronic, electrical or electromagnetic path between two or more points capable of providing a number of channels.

Circuit Switching: A networking technology that provides a temporary but dedicated connection between two stations regardless of the number of switching devices through which data is routed. Analog circuit switching (FDM) has been replaced by digital circuit switching (TDM). The digital technology still maintains the connection until one speaker hangs up.

Cisco Proxy: The Cisco H.323 Proxy is a device that acts like a Gateway and relays H.323 data between H.323 zones.

Clustered MCUS: The Multipoint Controller (MC) and Media Processor (MP) unit components of the MCU operate independently. The MCU can be set up in a clustered layout to use a single MCU to control several units configured to operate only as MP units performing media processing. MCUs configured as MP Only units have their MC component disabled. The controlling MCU unit also makes use of the local MP component.

Codec: COder-DECoder. A video codec converts the analog video signals from a video source to digital signals for transmission over digital circuits, then converts the digital signals back to analog signals for display. An audio codec converts the audio signals to digital signals for transmission over digital circuits, then converts the digital signal back to analog for reproduction.

Common Carrier: Usually a telecommunications company that owns a transmission medium and rents, leases or sells portions for a set tariff to the general public via shared circuits through published and nondiscriminatory rates. (MCI, etc.)

Community Anchor Institution: Entities that are rooted in their local communities by mission, invested capital, or relationships to customers, employees, and vendors. Includes such entities as schools, libraries, medical and healthcare providers, public safety entities, community colleges, and other institutions of higher education, and other community support organizations and agencies that provide outreach, access, equipment, and support services to facilitate greater use of broadband service by vulnerable populations, including low-income, the unemployed, and the aged. These entities have stable organizational practices and are typically housed in a physical location that is accessible to all and expected to be sustained in that location and community long term.

Compression: The method of taking raw data and processing it so that it may be represented with less information (or bits in the digital world.) Compression falls into two categories: lossless – the original data may be completely recovered – and lossy – the representation of the original data contains errors.

Compressed Video: Processed video images; transmits changes from one frame to the next which reduces the bandwidth to send them over a telecommunications channel which reduces cost. Also called bandwidth compression or bit rate reduction.

CPE: Customer Premise Equipment. Terminal equipment located on the customer premises which connects to the telephone network.

CSU: Channel Service Unit. A device used to connect a digital phone line coming in from a carrier to network access equipment located on the customer premises. A CSU may also be built into the network interface of the network access equipment.

Definition: Also called resolution. The fidelity with which detail is reproduced by a television or video display system ranging from fuzzy to sharp appearance.

Delay: The time taken for a signal to pass through a videoconference from the sending station to the receiving station.

DES: Data Encryption Standard. An algorithm for encrypting (coding) data designed by the National Bureau of Standards so it is impossible for anyone without the decryption key to get the data back in unscrambled form.

Desktop Videoconferencing: Video conferencing on a personal computer – Most appropriate for small groups or individuals. Many desktop videoconferencing systems support document sharing.

DHCP: Dynamic Host Configuration Protocol – In a DHCP environment, IP policy is dynamic. This means that a terminal does not have a constant IP address. Management keys for identifying endpoints in a DHCP environment are the alias name or phone number of an endpoint.

Dial Plan: In traditional telephony systems, a dial plan is a front-end system that allows users to call each other by dialing a number on a telephone. In voice and videoconferencing over IP, a dial plan is a system that allows participants in point-to-point or multipoint conferences to call each other or join conferences. The RADVISION ECS Dial Plan provides “configuration tools” which allow network administrators to build am IP dial plan that suits the requirements of their organization and network.

Digital: Discrete bits of information in numerical steps. A form of information that is represented by signals encoded as a series of discrete numbers, intervals or steps, as contrasted to continuous or analog circuits.

Digital Citizenship: The responsible use of technology and etiquette pertaining to an online presence for the purposes of professional networking and development. Digital citizens have a broad understanding of the short- and long-term implications of sharing information on the internet and recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.

Digital Divide: Gap between those who have affordable access, skills, and support to effectively engage online and those who do not. As technology constantly evolves, the digital divide prevents equal participation and opportunity in all parts of life, disproportionately affecting people of color, Indigenous peoples, households with low incomes, people with disabilities, people in rural areas, and older adults.

Digital Equity: Condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy. Digital equity suggests that all workers, learners, and communities have access to training they need to gain relevant skills and the technology necessary to participate in our society and economy. Advancing digital access and skill development ensures all residents (including those who have been historically marginalized, such as disabled, minorities, and low-income) have access to reliable, affordable, and secure technological infrastructure as well as training to gain required foundational and occupational digital skills. Digital equity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services.

Digital Inclusion: The work that cities and states are doing with partners to create a state of digital equity. Digital Inclusion refers to the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to and use of information and communication technologies. 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; and 5) applications and online content designed to enable and encourage self-sufficiency, participation, and collaboration. Digital Inclusion must evolve as technology advances and requires intentional strategies and investments to reduce and eliminate historical, institutional, and structural barriers to access and use technology.

Digital Literacy: The ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.

Digital Navigator: Trusted guide who assists community members in internet adoption and the use of computing devices. Digital navigation services include ongoing assistance with affordable internet access, device acquisition, technical skills, and application support which may be provided in person, by phone, or via email or text within the context of a full- or part-time position or within an existing job function.

Digital Redlining: Discrimination by internet service providers in the deployment, maintenance, or upgrade of infrastructure or delivery of services. The denial of services has disparate impacts on people in certain areas of cities or regions, most frequently based on income, race, and ethnicity.

Digital Resilience: Awareness, skills, agility, and confidence to be empowered users of new technologies and adapt to changing digital skills demands.

Digital Skills: The abilities needed to participate in a society reliant fully, safely, and responsibly on digital technology and the Internet. Digital skills include the ability to use and continue to learn to use frequently changing devices and software platforms, and to find and access, organize, evaluate, create, and communicate information with understanding of online safety and data security to accomplish the individual’s living, learning, and working needs.

Digitally Literate Person: Someone who possesses the variety of technical and cognitive skills required to find, understand, evaluate, create, and communicate digital information in a wide variety of formats and is able to use diverse technologies to retrieve information, interpret results, and judge the quality of that information. They also understand the relationship between technology, life-long learning, personal privacy, and the stewardship of information and use these skills and the appropriate technology to communicate and collaborate with peers, colleagues, family, and the general public. They use these skills to actively participate in civic society and contribute to a vibrant, informed, and engaged community.

Digital Media: Refers to any type of information in digital format including computer-generated text, graphics and animations, as well as photographs, animation, sound and video.

Directional Microphone: A microphone that detects and transmits sound from only a certain direction. Useful in preventing unwanted sound from being transmitted.

Display: The visual presentation on the indicating device of an instrument.

Distance Learning: Incorporation of video and audio technologies so that students can “attend” classes and training sessions presented at a remote location.

DNS: Domain Name Server – On TCP/IP networks, DNS converts the domain name (URL) of a host computer into a numeric IP address using the following format xxx.xxx.xxx.xxx.

Document Sharing: A videoconferencing feature that enables multiple participants to view and edit the same computer document.

DVI: Digital Video Interactive. DVI is a programmable (variable bit and frame rate) compression / decompression technology developed by Intel offering two distinct levels and qualities of compression / decompression for motion video. Production Level Video (PLV) and Real Time Video (RTV) use variable compression rates. PLV is a proprietary compression technique that is well suited for encoding full motion. PLV emulates MPEG and has a very high image quality. RTV provides comparable image quality to frame rate (motion) JPEG and uses a symmetrical variable rate compression.

Dynamic Bandwidth Allocation: The process of determining current traffic loads over a channel and automatically increasing or decreasing the bandwidth of the channel to optimize the utilization of bandwidth efficiency.

Electronic Blackboard: A device or whiteboard that looks like an ordinary blackboard or whiteboard but has a special conductive surface for producing free hand information that can be sent over telephone lines.

Endpoint: A network element at the end of the network such as an H.323 terminal, a Gateway, a Multipoint Controller Unit (MCU), a PC terminal, IP or ISDN phone, or video conference.

Ethernet: A LAN physical and data link protocol running over the lowest two layers of the OSI Reference Model at speeds of up to 10 or 100 Mbps.

FECC: Far-End Camera Control.

Fiber Optics: A communications medium utilizing laser or “light” transmission. Uses a glass or plastic fiber carrying light to transmit voice, data and video signals. This is the standard for high-speed data transmission.

Firewall: A barrier device placed between two separate networks. A firewall can be implemented in a single router that filters out unwanted packets or it can use a variety of technologies in a combination of routers and hosts. Today many firewalls combine filtering functionality with Network Address Translations (NAT) functions.

Flow Control: Comprised of the hardware, software and procedure for controlling the transfer of IP packets between two points on a network.

Foundational Digital Literacy: Having baseline technology skills, such as typing (inputting), knowledge of basic computer functions, internet browsing, and the use of business applications.

Foundational Digital Skills: A core of base level digital skills which underpin the ability to use technologies.

Fps: Frames per second (video).

Gateway: A network element that performs conversions between different coding and transmission formats. The gateway does this by having many types of commonly used transmission equipment and / or circuits from different carriers to provide a means of interconnection. See Bridge.

Gbps: Gigabits per second. A unit of measure of data of 1,000,000,000 bits per second.

GSM: Global System for Mobile Communications – The standard digital cellular phone service of Europe, Japan, Australia and elsewhere.

GOB: Groups of Blocks. In the encoding process, each picture is subdivided into groups of blocks and then further divided into macro blocks.

HSD: High-speed data standard. HSD channels must be multiples of 64Kb/s.

HDTV: Higher than normal definition TV. HDTV is generally defined as a system that offers double the horizontal and vertical resolution compared to existing systems and provides compact disc quality sound.

IDEC: Integrated Dynamic Echo Canceller patented by PictureTel. Dynamically eliminates conference echo so that true full-duplex audio is possible.

IETF: Internet Engineering Task Force. Formed in 1986, the IETF sets the technical standards that run the Internet. IETF working groups seek the advice of the Internet community through RFCs (requests for Comment), and then submit recommendations to the IETF for final approval.

IIJA: The Infrastructure Investment and Jobs Act. Signed into law by President Biden on November 15, 2021. The law authorizes $1.2 trillion for transportation and infrastructure spending with $550 billion of that figure going toward “new” investments and programs.

IMUX: Inverse Multiplexer. Device that bonds two or more BRI lines to form a higher rate channel.

In-band Signaling: Signaling made up of defined bits which pass within the data transmission stream.

Instant Messaging (IM): A communications service that enables you to create a private chat room with another individual in order to communicate in real time over the Internet.

IP Address: The unique address of a computer attached to a TCP/IP network. IP addresses are 32 bits long. Each octet is represented in decimal and is separated by dots.

IP Multicast: A means of simultaneous transmission of data from a server to a group of selected users on a TCP/IP network, (internal, intranet or Internet). IP multicast is used for streaming audio and video over the network.

IP Network: A network that uses the TCP/IP protocol.

IP Telephony: A set of technologies that enables voice, data and video collaboration over existing IP-based LANS, WANs, and the Internet. IP technology uses open IETF and ITU standards to move multimedia traffic over any network that uses IP.

ISO: International Standardization Organization. International standards body concerned with non-telecommunications issues.

ITU: International Telecommunications Union. Organization composed of the telecommunications administrations of the participating nations. Focus is the maintenance and extension of international cooperation for improving telecommunications development and applications.

ITU-T: Standards body under the jurisdiction of the United Nations. Responsible for all international telecommunications standards.

IVDS: Interactive Video and Data Services. The name for the license which will be granted by the FCC for devices called Interactive TV Appliances (ITAs). ITAs include TV answer, a two-way television service for consumers for game shows, sporting events and respond instantly to new polls, interactive advertising as well as distance learning. The system will allow viewers to shop, bank, pay bills and order a pizza.

Jitter: The result of a change in latency or the tendency towards lack of synchronization caused by mechanical or electrical changes. Technically, jitter is the phase shift of digital pulses over a transmission medium.

Jitter Buffer: A portion of memory specifically allocated to storing IP packets awaiting transmission, or to storing received IP packets. The buffer facilitates flow control by capturing IP packets and then transmitting packets as “playback” using speeds and rates of delay that the destination device can handle without causing packet loss through overloading.

Jitter Buffer Management: Jitter buffer management represents the trade-off between a larger buffer and increased rates of jitter.

JPEG: Joint Photographic Expert Group. JPEG is an industry standard for still image compression that has moved into full motion video. JPEG is a compression technique based upon intraframe encoding technology. It allows for the full restoration of symmetrically compressed images.

Kbps: Kilobits per second. A unit of measure of data of 1,000 bits per second.

LAN: Local Area Network. A private transmission network interconnecting offices within a building or a group of buildings used to convey voice, data and video traffic.

LAN/WAN Connectivity: The practical set of tools, from operating system layer protocols to support services that make a remote access device an effective link between LANs and WANs.

Latency: A measure of accumulated waiting time or delay, representing the length of time required for information to pass through a network.

Leased Lines: A term used to describe the leased or rented use of dedicated lines between two points. LEC Local Exchange Carrier. Carriers that can carry only intra-LATA traffic. Local telephone companies such as Cincinnati Bell, Ohio Bell, Illinois Bell, Pacific Bell in California, etc.

LED: Light Emitting Diode. A display technology that uses a semiconductor diode that emits light when charged. LEDs usually indicate both correct and problematic operation.

Load Balancing: The practice of splitting communication into two (or more) routes. By balancing the traffic on each route, communication is made faster and more reliable.

MAC: Media Access Control – A system of rules used to move data from one physical medium to another.

Mbps: Megabits per second. A unit of measure of data of 1,000,000 bits per second.

MCU: Multipoint Controller Unit. videoconferencing equipment which allows multiple individual videoconference units to connect together to form a multi-party videoconference session. See Bridge #2

MGCP/MEGACO: Media Gateway Control Protocol/Media Gateway Controller – An IP telephony signaling protocol from the IETF. MGCP was the original protocol, which evolved into MEGACO. Both protocols are designed for implementation in IP phones that are cheaper than SIP or H.323 phones.

MIB: Management Information Base – An SNMP structure that describes the particular device being monitored.

MLP: Multi-layer protocol for data (in H.221). MLP data and audio can only be placed in the first 64Kb/s channels of a connection. T.120 must use the MLP or HMLP channel.

MPEG: Motion Pictures Experts Group. Multimedia compression standard for professional and consumer applications such as digital video, digital audio and systems compression. MPEG compresses similar frames of video, tracks elements which change between frames and discards the redundant information.

MPEG-4: Moving Pictures Experts Group. MPEG is a series of standards designed to reduce the storage requirements of digital video. MPEG-4 provides the standardized technological elements for the integration of interactive graphics applications and interactive multimedia.

MSN: Multiple Subscriber Number – A method of incoming call routing in which a group of phone numbers is assigned to a particular ISDN line by the telephone company. PRI ISDN lines are usually assigned multiple numbers in the US and in Europe.

Multiplexing: The process of combining several individual channels into a common frequency band or into a common bit stream for transmission. The converse equipment or process for separating a multiplexed stream into individual channels is called a demultiplexer.

Multipoint: A call involving three or more parties.

Multipoint Videoconferencing: Videoconference with more than two sites. The sites must connect via a video bridge.

Multi-Unicast: Transmission of duplicate data streams, one to each used. In multi-unicast, multiple users request the same data from the same server at the same time. Contrast with IP multicast, unicast.

NAT: Network Address Translation – NAT devices translate IP addresses so that users on a private network can see the public network, but public network users cannot see the private network users.

Neighbor Gatekeeper: A mechanism by which the RADVISION H.323 Gatekeeper optimizes inter-zone communication. A list of Neighbor Gatekeepers and their IP addresses allows the Gatekeeper to resolve destination IP addresses when the source endpoint is not in the same zone as the destination endpoint.

Network: A group of stations (computers, telephones, or other devices) connected by communications facilities for exchanging information. Connection can be permanent, via cable, or temporary, through telephone or other communication links. The transmission medium can be physical (fiber optic cable) or wireless (satellite).

Network Load Balancing: See RAI/RAC

Non-Composite Video Signal: A signal which contains only the picture signal and the blanking pulses.

NSF: Network Specific Facility – The Network Specific Facility Information Element (NSF IE) feature enables system administrators to coordinate their network and service requirements with Service Providers.

NTIA: National Telecommunications and Information Administration. NTIA is the Executive Branch agency that is principally responsible for advising the President on telecommunications and information policy issues.

NTSC: National Television System Committee. Defined the 525-line color video frequency spectrum used in the US, Canada, Mexico, Japan and a few other countries.

Online Endpoint: When an endpoint registers with a Gatekeeper, the endpoint is active and ready to receive calls. By registering, the endpoint informs the Gatekeeper that it is online.

Occupational Digital Literacy: The ability to use and continue to acquire new digital skills used at a place of employment or as a part of a job or occupation. Employers may list skills that are necessary for occupational digital literacy at a job, such as the ability to use safely and securely identified software applications to complete work on computers, laptops, tablets, or mobile devices to communicate or log transactions, interactions, time, or to create and share work products. Examples may be understanding of workplace software applications or the ability to use intermediate and advanced features of common office applications to complete required work tasks.

Occupational Digital Skills: Skills in using technology as a part of a workplace function. These skills may be required by an employer or agency before hire or to pass a probationary period.

Packet: A block of data used for transmission in packet-switched systems.

Packet Loss: The discarding of data packets in a network when a device is overloaded and cannot accept any incoming data at a given moment.

Packet Re-Ordering: Packet reordering ensures that all packets reach their destination in the correct sequential order.

Packet Switching: A network technology that breaks up a message into smaller packets for transmission and switches them to their required destination.

PAL: Phase Alternation by Line. The 625 line, 25 frame per second TV standard used in Western Europe, India, China, Argentina and parts of Africa. Brazil uses PAL-M, a 525 line variant.

Parent Filters: When the RADVISION Gatekeeper fails to resolve a destination address, the Gatekeeper searches for the destination first among its Children, then among its neighbors and then via its parent. Parent filters enable the Gatekeeper to avoid unnecessary searches among its Children and Neighbor Gatekeepers.

Party Number: The dialing number of an endpoint. This number can be a telephone number, or a number used by other mechanisms on various networks, such as telex and ISDN.

PBX: Private Branch Exchange. A private telephone exchange that serves a particular organization or business and has connections to the public telephone network. Newer PBXs have features that allow for data and video communications as well as voice.

Picture Signal: That portion of the composite video signal which lies above the blanking level and contains picture brightness information.

PIP: Picture in Picture. In videoconferencing, the ability to view the near end (you) in a small, segmented portion of the monitor screen while viewing the far end (them) simultaneously in a larger segmented portion of the screen.

Pixel: The smallest controllable element that can be illuminated on a display screen. Related to resolution.

Point to Point: A videoconference between only two points.

Point to Multipoint: A videoconference between one location to many.

PoP: Point of Presence. A central office where the inter-exchange carrier’s responsibilities for the line begins and the local exchange carrier’s responsibility ends. Location of a communications carrier’s switching or terminal equipment. (Cincinnati to AT&T)

PORTL: A pathway into and out of a computer or a network device, such as a switch or a router.

Predefined Endpoint: An endpoint entitled to register with a specified Gatekeeper.

Prefix: A prefix is a part of the dialing sequence used to access a service or conference type. See also Gateway supported prefixes and conferencing service.

Projection Television: A combination of lenses and / or mirrors that project an enlarged video picture on a screen.

Protocol: A set of rules and procedures for establishing and controlling the transmission on a line. The set of messages has specific formats for exchanging communications and assuring end-to-end integrity of links, circuits, messages, sessions and application processes.

Proxy Server: An application that breaks the connection between sender and receiver. All input is forwarded out on a different port, closing a straight path between two networks and preventing a cracker from obtaining internal addresses and details of a private network.

PSDN: Public Switched Digital Network. A term used to describe the set of digital dial-up services offered by the carriers (IXC and LEC).

PSTN: Public Switched Telephone Network – The worldwide voice telephone network. Once only an analog system, the heart of most telephone networks today is all digital. In the US, most of the remaining analog lines are the ones from your house or office to the telephone company's central office.

PTZ: Pan-Tilt-Zoom. Camera functionality.

PT724: Picture Tel's enhanced audio mode delivering 7 kHz bandwidth at 24Kb/s. Provides excellent audio quality using less bandwidth than industry standards. This allows for improved video and data transmission.

Public Network: A network operated by the carriers (IXC and LEC) which includes network-based services and network-based switching.

Px64: A common reference to the CCITT standards (H.261 et al.) which describe methods to allow for videoconferencing system interoperability.

Q.931: A protocol for Call Signaling, consisting of Setup, Teardown and Disengage. Q.931 is included in the H.225.0 Recommendation.

Q.931 + H.245 Routed Mode: The routing of the Call Setup channel (Q.931) and the Control channel (H.245) through the Gatekeeper. See also Call Setup routing, Routed Mode.

QCIF: Quarter Common Intermediate Format. The QCIF format employs half the spatial resolution of CIF (both horizontal and vertical) and is the mandatory H.261 format. During encoding, a QCIF picture is subdivided into 3 GOBs (Groups of Blocks) Versus CIFs 12 GOBs.

QoS: Quality of Service – The ability to define a level of performance in a data communications system. For example, the ATM networks specify modes of service that ensure optimum performance for traffic such as real-time voice and video.

Radius: Remote Access Dial-In User Service – A server for authentication, authorization and accounting of endpoints and endpoint aliases.

RAI/RAC: Resource Available Indication / Resource Available Confirmation – The RAI/RAC function automatically manages load balancing on the network. RAI/RAC messages are exchanged between a Gatekeeper and a Gateway to determine whether the Gateway is available to receive calls.

RAS: A protocol for Registration, Admission and Status. In an H.322 audio or video system, the RAS is a control channel over which H.225.0 signaling messages are sent.

Raster: The scanned (illuminated) area of a television picture tube.

RBOC: Regional Bell Operated Company. The name given to the seven telephone companies created subsequent to the break-up of AT&T. Often, RBOC's own the local exchange carrier (LEC). For instance, Ameritech (RBOC) owns Ohio Bell (LEC).

RCF: REGISTRATION CONFIRM Message. A RAS message that a Gatekeeper sends to the calling endpoint accepting the RRQ.

Real-Time: The processing of information that returns a result so rapidly that the interaction appears to be instantaneous. Videoconferencing is an example of a real-time application.

Real-Time Streaming: Delivery of a real-time stream of a live videoconference while the conference is in progress.

Redundancy: See Gateway Redundancy

Registered Endpoint: A registered endpoint is an endpoint that has informed the Gatekeeper that it is online, active and ready to receive calls, and has received confirmation from the Gatekeeper of its registration request.

RFP: Request for proposal. A bid that specifies and describes a system in industry terminology which the vendors understand. An RFP will prompt vendors to respond to questions about installation, training, maintenance, warranty, purchase terms and other relevant issues.

RGB: Method of transmitting video signals that feeds red, green and blue channels over separate wires; provides the highest quality video signal and is the format for most computer equipment.

Routed Mode: The routing of the Call Setup channel (Q.931) and the Control channel (H.245) through the Gatekeeper. See also Call Setup routing, Q.931 + H.245 Routed Mode.

Router: A device or setup that finds the best route between any two networks, even if there are several networks to traverse. Like bridges, remote sites can be connected using routers over dedicated or switched lines to create WANs.

RRJ: REGISTRATION REJECT message. A RAS message that a Gatekeeper sends to the requesting endpoint rejecting the RPQ.

RRQ: REGISTRATION REQUEST. A RAS message in which an endpoint identifies itself to a specific Gatekeeper and asks for service. The RRQ message binds the endpoint aliases-names or phone numbers- to the IP addresses of the endpoint.

RS366: A standard for providing dialing commands to network access equipment. In a videoconferencing application, an RS366 links the video codec and the network access equipment in order to facilitate dialing from the video codec. (e.g., IMUX)

RTP/RTCP: Real Time Transport Protocol / Real Time Control Protocol-RTP is an IP protocol that supports real-time transmission of voice and video. It is widely used for IP telephony. RTCP is a companion protocol that is used to maintain QoS.

RTP Redundancy: A method of overcoming packet loss by doubling packet payload without increasing the number of packets sent.

SDSAF: Switched Digital Services Applications Forum. A consortium of equipment vendors, service providers and users, with the goal of advancing the state of switched digital services.

Services: A service is a function that is supported by a subset of endpoints in a zone. Access a service by dialing a prefix attached to the name or phone number. Services allow you to dynamically add more resources, such as a Gateway, into the system.

Silence Suppression: Silence information within the audio stream can consume LAN bandwidth and burden MCU voice processing. Using compression techniques, Silence Suppression can greatly reduce the wasted bandwidth in a multipoint conference and on congested networks.

SIP: Session Initiation Protocol – An IP telephony signaling protocol developed by the IETF. SIP is a text-based protocol that is suitable for integrated voice-data applications. SIP is designed for voice transmission and uses fewer resources and is considerably less complex than H.323.

SNMP: Simple Network Management Protocol. Standard for retrieving and transmitting management information (configuration, control, performance monitoring, etc.). Information is formatted according to MIBs (Management Information Base.

S/NR: Signal to Noise Ratio. Final relationship between the video or audio signal level to the noise level. Ratio of the signal power to the noise power in a specified bandwidth, expressed in dbW.

Subnet: A subnet is a portion of an IP network defined by a subnet mask. Devices on the same subnet have the same subnet mask.

Switch: A mechanical or solid-state device that opens and closes circuits, changes operating parameters or selects paths for circuits on a space or time division basis.

Switched Network: Any network in which switching is present and is used to direct messages from the sender to the recipient. Usually, switching is accomplished by disconnecting and reconnecting lines in different configurations in order to set up a continuous pathway between the sender and the recipient.

Tbps: Terabytes per second. A unit of measure of data of 1,000,000,000,000 bits per second.

T.120: Standard for data conferencing and conference control for interactive multimedia communication – multipoint & point-to-point.

T.120 Data Standard: Data sharing protocol for multipoint data communication in a multimedia conferencing environment. T.120 enables white board collaborations, file transfers, graphic presentations and application between participants in a conference.

T.126: T.120 still image transfer and annotation protocol.

T.127: T.120 binary file transfer protocol.

T.128: Formally called “T-share,” used in multi-point data conferencing.

Tariff: Documents filed by a regulated telephone company with a state public utility commission (PUC) or the Federal Communications Commission (FCC). Document details services, equipment and pricing publicly offered by the telephone company.

TCP/IP: Transmission Control Protocol / Internet Protocol. Transmission Control Protocol/Internet Protocol. A set of protocols developed by the Department of Defense to link dissimilar computers across many kinds of networks, including unreliable ones.

TCS4: TCS4 is a special routing method for incoming H.320 video calls. TCS4 allows direct inward dialing to an endpoint on the IP network via the Gateway when DID is not available.

Telco: Generic name for telephone companies.

Telecommunications: Communicating over a distance. Use of wire, radio, optical or other electromagnetic channels to transmit and receive signals for voice, data and video communications.

Topology Islands: IP subnets, characterized by homogeneous and fast LAN connectivity. Dividing the network into islands enables a Gatekeeper to direct calls through the most optimal routes, thus avoiding slow connections or bottlenecks as much as possible.

TPKT: A standard way of defining blocks of data in a TCP stream, since TCP does not have delimiters. During configuration you can define the maximum number of TPKT channels allowed.

Transcoding Audio: The conversion of one audio transmission format into another using various algorithms to achieve different audio quality levels at reduced bandwidth levels.

TTL: Time to Live. A set maximum amount of time a packet is allowed to propagate through the network before it is discarded. TTL is a time, typically in seconds, after which the fragment can be deleted by any device on the network.

Twisted Pair: A pair of wires used in transmission circuits and twisted about one another to minimize coupling with other circuits.

UCF: UNREGISTRATION CONFIRM Message – A RAS message that a Gatekeeper or an endpoint sends accepting the URQ.

UDP: User Datagram Protocol – A transport protocol within the TCP/IP protocol suite that is used in place of TCP when a reliable delivery is not required.

Unicast: A means of transmitting a message from one station to another; contrast with IP.

Unrecognized Alias: An alias that is not in the registration database of the Gatekeeper.

Unregistered Endpoint: An endpoint that is no longer online and registered with a Gatekeeper.

URL: Uniform Resource Locator – An Internet address. The address that defines the route to a file on a computer connected to the Internet.

URQ: UNREGISTRATION REQUEST Message. – A RAS message sent when an endpoint wishes to terminate its session with a Gatekeeper.

VMS: Video Management System.

Video Bit Rate: Bit rate is the speed at which bits are transmitted, in bits per second.

Videoconferencing: The use of digital video transmission systems to communicate between sites using video and voice. Digital video transmission systems typically consist of camera, codec, network access equipment, video and audio system.

Video on Demand Streaming: Delivery of a Video on Demand stream to a viewer upon request at any given time. Contrast this to a real-time stream that is delivered when the conference is in progress.

Voice-Activated Video Switching: Automatic switching of a video image viewed at each conference terminal according to the voice level of each participant.

Voice Switched Video: Type of video conference in which the cameras are activated by voice signals to send a picture of a particular person in the group. Not all participants are seen at any one time in contrast to continuous presence video.

VoIP: Voice over Internet Protocol (VoIP) is a protocol optimized for the transmission of voice through the Internet or other packet switched networks. VoIP is often used abstractly to refer to the actual transmission of voice (rather than the protocol implementing it). VoIP is also known as IP Telephony, Internet telephony, Broadband telephony, Broadband Phone and Voice over Broadband. “VoIP” is pronounced voyp.

VPN: Virtual Private Network – VPN modules create closed secure tunnels for communication between two firewalled LANs. VPN technology is one of the approaches being used today for providing secure communications over IP networks.

WAN: Wide Area Network. A data network typically extending a LAN outside a building or beyond a campus, over IXC or LEC lines to link other LANs at remote sites. Typically created by using bridges or routers to connect geographically separated LANs.

Web Conferencing: Enables two or more logged in users to set up a typed, real-time, online conversation across the World Wide Web.

Wi-Fi: Wi-Fi is a wireless networking technology that allows you to connect wirelessly to the internet. It is also known as 802.11, which is the IEEE standard of wireless local area networks (WLANs).

E. Broadband Survey Questions Template

Internet Connection

1. Do you frequently utilize the internet for any of the following purposes? Please choose all that are applicable:
    a. Engage in work or income-generating activities.
    b. Take part in schooling, pursue further education, or engage in other learning objectives.
    c. Communicate with medical professionals and other healthcare providers.
    d. Maintain connections with family, friends, or for social interactions.
    e. Contribute to your local economy.
    f. Access local, state, or federal governmental services, or apply for government-provided benefits.
2. If you do not currently have regular access to the internet, what would you use it for if you had the opportunity? Please select all that apply.
    a. Engage in work or income-generating activities.
    b. Take part in schooling, pursue further education, or engage in other learning objectives.
    c. Communicate with medical professionals and other healthcare providers.
    d. Maintain connections with family, friends, or for social interactions.
    e. Contribute to your local economy.
    f. Access local, state, or federal governmental services, or apply for government-provided benefits.
3. Does your household or any of its members have home internet access through any of the following methods? Please select all that are applicable:
    a. Data plan for a smartphone or other mobile device, such as a hotspot.
    b. Cable internet service.
    c. Fiber internet service.
    d. Digital subscriber line (DSL) internet service.
    e. Fixed wireless service.
    f. Satellite internet service.
    g. Dial-up internet service.
    h. No internet service.
    i. I do not know.
4. What is your monthly payment for internet service? Please provide the amount in dollars per month.
5. How challenging, if at all, is it for you to include your monthly internet bill within your household budget?
    a. Very difficult.
    b. Somewhat difficult.
    c. Not too difficult.

   d. Not at all difficult.

6. At what monthly cost would you regard home internet service as being overly expensive? Please provide the amount in dollars per month.
7. To what extent are you satisfied with the quality of your home internet connection for engaging in any online activities that hold significance to you?
   a. Very satisfied
   b. Somewhat satisfied
   c. Not too satisfied
   d. Not at all satisfied

Devices

8. Does your household possess an adequate number of devices, such as smartphones, tablets, or laptop computers, to fulfill your requirements?
   a. Yes
   b. No
9. Over the last 6 months, which of the following devices have you utilized to connect to the internet? Please select all that apply.
   a. Mobile phone
   b. Desktop computer
   c. Laptop computer
   d. Tablet
   e. Other type of internet-connected device
10. In the previous six months, which of the following devices have experienced malfunctions or ceased to work?
   a. Mobile phone
   b. Desktop computer
   c. Laptop computer
   d. Tablet
   e. Other type of internet-connected device
11. How did you address the issue you encountered?
   a. I reached out to user support for assistance.
   b. I resolved the issue myself.
   c. I resolved the issue with assistance from my friends.
   d. I could not fix one or more of these devices.
   e. I sought assistance online.
   f. I visited a nearby store.
   g. I visited a community establishment, like a school, library, or church.

12. I am contemplating buying a desktop or laptop computer. What price range do you believe would be too expensive?
    a. $50
    b. $100
    c. $150
    d. $250
    e. $500
    f. $750
    g. More than $1000

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